An Evaluation of PAHs, Arsenic, and Lead Background Soil Concentrations in Vermont

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INTRODUCTION

In accordance with *Act 52 (H.269) An Act relating to the transportation and disposal of excavated development soils legally described as solid waste (June 5, 2015)*, this study was conducted by Vermont Agency of Natural Resources, Department of Environmental Conservation, Waste Management and Prevention Division personnel with funding and technical support provided by the U.S. Environmental Protection Agency Brownfield Program. Soil samples were collected from August through November 2015.

Surface soil samples were collected spatially throughout Vermont to determine background concentrations of polycyclic aromatic hydrocarbons (PAHs), arsenic, and lead from locations presumed to not have anthropogenic sources of these compounds. For the purposes of this study, background is defined as the concentration of PAHs, arsenic, or lead attributed to atmospheric deposition or naturally occurring minerology. These data may be used to differentiate hazardous material releases to the environment versus background conditions and subsequent soil management.

STUDY DESIGN

The process of selecting sample locations was accomplished in the following manner:

1) A 100 square mile grid was overlain on the state map of Vermont;
2) The largest municipality in each grid was identified for sample collection;
3) Properties targeted for sample collection included municipal parks and greens, municipal building lawns, school lawns, and town forests.

A minimum of 1 property per grid was selected for sample collection. The study included 115 grids identified by a specific letter (A through Q) and number (1-9) combination. Grids and samples were identified A through Q from north to south and 1 through 9 west to east (Statewide Sample Location Map). Several municipalities provided more than one property for sample

collection, which were designated by subsequent lower case letters i.e., K2b. Details of property locations and attributes are provided in Tables I and II.

A total of 130 property samples and 17 duplicate samples (13%) were collected. Duplicate samples were collected for quality assurance/quality control evaluation. Samples were not collected from grids A4, C2, D2, and H6 due to a lack of municipal cooperation and absence of state lands.

Potential properties were selected by using municipal maps and aerial photography. Within each grid, if a municipal property was not available then state owned lands were selected. State owned lands included parks, forests, and fish and wildlife management areas.

Properties excluded from consideration as a background location may have had one of the following attributes:

- Current or former industrial use;
- A state identified hazardous waste site with a surficial soil issue;
- Current or former petroleum storage;
- Recent property fire;
- Visual or olfactory evidence of contamination upon site visit or sample collection;
- Fill material containing anthropogenic debris discovered upon sample collection.

Historical property uses were researched via available Sanborn Maps and local institutional knowledge; however, a Phase I Environmental Site Assessment was not conducted on any of the sampled property locations.

FIELD SAMPLING METHODOLOGY

Using nitrile gloves and a stainless-steel hand auger, samples were collected from an interval of 0-6 inches below any observable root zone (typically 1-2 inches below ground surface). Soils were subsequently composited into a stainless-steel bowl with a stainless-steel trowel prior to sample collection. Samples were placed into 4-ounce glass jars for PAHs and 8-ounce HDPE Nalgene containers for arsenic and lead. Sample bottles were labeled with sample number, sample location, date, time, and sampler initials. While in the field, samples were kept in a cooler on ice.

The samples were then transferred to a dedicated and secure office refrigerator for holding. Chain-of-custody forms were maintained starting with the field sampler and ending with laboratory custody. Samples were shipped on a weekly basis to the EPA Region 1 New England Laboratory in Chelmsford, MA.

Field notes, inclusive of soil characteristics, photographs and site sketch of sample location, were collected and remain on file with the Waste Management and Prevention Division.

Decontamination of field equipment was conducted by first removing any adhered soils with either a paper towel or by brush, followed by brush scrubbing with Liquinox© solution and a deionized water rinse, followed by paper towel drying.

Study design and field methods adhered to the approved EPA Quality Assurance Project Plan (QAPP) for Soil Background Study (9/2015). Standard Operating Procedures for sampling shallow soil, which are included in the QAPP, were followed.

LABORATORY METHODOLOGY

PAHs samples were analyzed by a quadrapole GC/MS operating in the Selective Ion Monitoring (SIM) mode. Extraction and analysis were based on SW-846 methods 3545A, 3630C, and 8270C.

Arsenic and Lead Preparation and analysis were based on "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846, 3rd Edition, Revision 2, Final Update III, Methods 3050B and 6010B," respectively. Samples were analyzed using a Perkin Elmer Dual View Inductively Coupled Plasma - Optical Emission Spectrometer.

Laboratory reports are included in the Appendices.

DATA AND EVALUATION

The VTDEC's Sites Management Section Program has reviewed the results presented by USEPA Region 1 Laboratory, and concluded that the data set is of sufficient scope and quality to establish a statewide surface soil background threshold value (BTV)[1] for: Arsenic (As), and

[1] Based upon the extensive experience of the developers in environmental statistical methods, published environmental literature, and procedures described in various EPA guidance documents, ProUCL calculates the

industrial/residential background threshold values for Lead (Pb) and Benzo(a)Pyrene TEQ for PAHs[2].

The data for each of the target characteristic (PAHs, lead or arsenic) was reviewed statistically. VTDEC used a software package produced by EPA, that is distributed at no cost, to ensure the public and the consulting community could reproduce our analysis of the data. With this software VTDEC was able to evaluate if the data had a normal, lognormal, gamma, parametric distribution or described through non parametric analysis. Although normal distribution is most commonly known, environmental sample data is quite often skewed and is commonly not well described by "normal distribution" statistical parameters.

For the purposes of this background study, the VTDEC referred to numerous authors to substantiate which parameters were best suited to describe each data set. In some cases the data presented a lognormal distribution, and in other cases the distribution was best described with non-parametric analysis. For each case the overall statistical analytical approach was the same, but the conclusion may be different in response to the different data distributions.

The VTDEC utilized the same data evaluation protocol approach to each data set. Outliers were first identified with a set of well established software evaluations. This first evaluation was followed up with graphical evaluations as well as consideration of ancillary geographical information that could potentially explain the conditions. Subsequently the data was evaluated to establish the proper statistical distribution characteristics. This evaluation included establishing whether or not the data set was differentiated by urban or non-urban characteristics, which could suggest a pattern based on industrial/commercial versus domestic residential land use.

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data set Upper Threshold Limit (UTLs) based upon background data sets, and point-by-point onsite observations that are compared with those limits. The UTLs are the background threshold values for the data that was analyzed. Individual site observations should be compared with these UTLs.

[2] **Total Equivalent Quotient** method for Polyaromatic Hydrocarbons is defined by Florida Department of Environmental Protection in their "Dose Additivity Guidance", Table 4. August 3, 2016 and previously by USEPA in Table 7, page 22 "*Provisional Guidance for Quantitative Risk Assessment of Polycyclic Aromatic Hydrocarbons". USEPA. July 1993*.

For this study, the VTDEC's goal was to provide a consistent analysis that can be followed and reproduced easily. To that end, we chose ProUCL as our statistical evaluation software.

EPA's ProUCL version 5.0 software[3] was applied to analyze each dataset for distribution (histogram and boxplot), goodness of fit, and Rosner's Outlier Test (to verify and remove outliers). After outliers were removed, each dataset was re-evaluated (histogram, boxplot and goodness of fit). The background threshold value was then evaluated for each dataset.

Outliers were omitted from the data sets by using a combination of Rosner's Outlier Test and visual inspection of the histogram and box and whisker plots. 95% confidence interval and 95% coverage were utilized in determining the background threshold value.

Each data set of analytical results (Arsenic, Lead, and TEQ PAHs) was evaluated to determine whether the data reflected a statistically significant separation, as a result of discernable land use patterns. The Density of Habitable Buildings GIS layer, located on the ANR Atlas, was used to establish areas of high population density in Vermont and were considered "urban". Areas outside of this layer were considered "rural". The two subsets, established by this visual filtering, were evaluated statistically. The data set for Arsenic did not indicate a statistically significant subset separation. The Lead and PAHs subsets however indicated that this visual filtering paralleled the statistical separation of the data. Upon observation of these statistically significant separations of the subsets for the respective study parameters (Arsenic, Lead, and TEQ PAHs), it was clear that for Arsenic one statewide background threshold value would be appropriate, and that for Lead and TEQ PAHs the data is clearly different in urban and rural subsets of the state. The Sites Management Section (SMS) also analyzed the dataset to create a single Statewide BTV

[3] U.S. EPA's statistical ProUCL program is the same software used in USGS studies as in numerous state environmental agency studies. It is useful in evaluating site specific data distribution (normal or non-normal) and in identifying potential outliers. ProUCL is available at: www.epa.gov/osp/hstl/tsc/software.htm.

as well as use of the median as the BTV. Lead and PAH data did not support use of these analyses based on the varied distribution of the data.

In order to comply with the statutory requirements to create statewide or regional background concentrations and the distribution of the data, the Vermont DEC determined that use of the urban and rural datasets would best be applied to the current model of how soils are regulated and categorize the "rural" dataset as "residential" and the "urban" dataset at "commercial/industrial". These values will be used statewide and will be consistent with how all other contaminated soils in the State are currently regulated.

Duplicates were assessed for quality assurance and control by relative percent difference (RPD). There was one failure in the duplicate data, and those data were removed from further evaluation.

RESULTS AND FINDINGS

ARSENIC

The full data set was evaluated statistically using EPA's ProUCL, to establish whether or not there is validity in distinguishing "residential" from "commercial/industrial" conditions. In the case of Arsenic, the two tailed t-test analysis indicated that there is no statistically significant difference between the datasets, and that one statewide (residential and commercial/industrial) background level applies.

The sampling results and the ProUCL statistical analysis of the data indicate the data is either Gamma or Lognormal in distribution. The highest Arsenic value obtained that is not considered a statistical outlier is 17 mg/kg (=17ppm). The median is 5.4ppm. The background threshold level at 95% is either 14.27 ppm (Gamma) or 15.56 ppm (Lognormal) respectively based on distribution analysis. **VTDEC has adopted 16 ppm as the statewide arsenic background threshold value.**

LEAD

COMMERCIAL/INDUSTRIAL LEAD

The full data set was evaluated statistically using EPA's ProUCL software, to establish whether or not there is validity in distinguishing between the datasets. In the case of Lead, the two tailed t-test analysis indicated that there is a statistically significant separation, and that this dataset is best evaluated as two separate data sets (residential and commercial/industrial).

The sampling results and the ProUCL statistical analysis of the data indicate the data is Lognormal in distribution. The highest commercial/industrial Lead value obtained that is not considered a statistical outlier is 100 mg/kg (=100 ppm). The median is 25 ppm. The background threshold level at 95% is 111 ppm based on Lognormal distribution analysis. **VTDEC has adopted 111 ppm as the commercial/industrial statewide soil lead background threshold value.**

RESIDENTIAL LEAD

The sampling results and the ProUCL statistical analysis of the residential data indicate the data is either Gamma or Lognormal in distribution. The highest Residential Lead value obtained that is not considered a statistical outlier is 37 mg/kg (=37 ppm). The median is 14 ppm. The background threshold level at 95% is either 36.75 ppm (Gamma) or 41.02 ppm (Lognormal) respectively based on distribution analysis. **VTDEC has adopted 41 ppm as the residential statewide soil lead background threshold value.**

TEQ PAHs

PAHs were evaluated as a Total Equivalency Quotient (TEQ) using the World Health Organizations (WHO) 2005 TEF (toxicity equivalence factor) values. Non detect values were included as ½ the detection limit of the laboratory instrument. This is due to the definition of the TEQ PAHs value, and is not the result of statistical evaluation.

The full data set was evaluated statistically using EPA's ProUCL software, to establish whether or not there is validity in distinguishing the two datasets. In the case of TEQ PAHs, the two tailed t-test analysis indicated that there is a statistically significant separation and that the dataset should be evaluated as two distinct data sets.

COMMERCIAL/INDUSTRIAL TEQ PAHs

The sampling results and the statistical analysis of the data indicate the data is Lognormal in Distribution. The highest Urban TEQ PAHs value obtained, that is not considered a statistical outlier is 425.7µg/kg (=425.7ppb). The median is 93.83 ppb. The background threshold level at 95% is 579.6 ppb based on Lognormal distribution analysis. **VTDEC has adopted 580 ppb as the Commercial/Industrial TEQ PAHs background threshold value.**

RESIDENTIAL TEQ PAHs

The sampling results and the statistical analysis of the data indicate the data does not follow a discrete distribution. The highest residential TEQ PAHs value obtained not considered a statistical outlier is 26.18 µg/kg (=26.18 ppb). The median is 8.81 ppb. The background threshold level at 95% is 26.18 ppb based on Non-parametric distribution analysis. **VTDEC has adopted 26 ppb as the Residential TEQ PAHs background threshold value.**

SUMMARY TABLE[4]

	Background Threshold Value
Arsenic - Statewide	16 mg/kg
Lead – Commercial/Industrial	111 mg/kg
Lead – Residential	41 mg/kg
TEQ PAHs - Commercial/Industrial	580 µg/kg
TEQ PAHs – Residential	26 µg/kg

REGIONAL EVALUATIONS OF DATA

The separate data sets for arsenic, lead, and PAHs were visually reviewed to discern any groupings related to the six physiographic regions of the State (Map 3). Those regions include the Vermont Lowlands, Green Mountains, Taconic Mountains, Valley of Vermont, Vermont Piedmont, and Northeast Highlands. No discernable visual trends were identified for either the PAHs or lead data sets. The following concentration groupings were observed for the arsenic data set. This information in addition to the statistical analysis of arsenic discussed herein supports

[4] Quality Assurance was evaluated by calculating the relative percent difference (RPD) between parent and duplicate samples (Table III). An RPD of 50% or greater was considered unacceptable. As such, sample F1 was not included in the calculation of As-BTV.

the conclusion that the concentrations of arsenic observed state wide are dependent on geology and are not related to atmospheric deposition resultant from anthropogenic activities.

Physiographic Region	Arsenic Concentration Range (mg/kg)
Lowlands	Less than 10
Green Mountains	Less than 5
Taconic Mountains	Less than 20
Valley of Vermont	Less than 10
Vermont Piedmont	Less than 31
Northeast Highlands	Less than 10

DEVIATIONS FROM QAPP:

1. One field book was lost by the field crew. This affects a number of sample locations, as the field book was shared with previous sampling teams. Two other field books remain.
    a. It is not possible to see the field notes for certain sample locations.
2. Some municipalities offered sampling locations. These locations were not identified by the sampling team, and may not have reflected the original selection criteria.
    a. Subsequently some of the accepted sampling locations from this subset, reflected some of the highest "outlier" concentrations. Example is K2b, which had an outlier concentration of TEQ PAHs.
        i. This location appears to be in the flood plain, a few hundred feet downstream of a known past manufactured gas plant, located on the river bank.
        ii. It is reasonable to exclude outliers with suspected or known anthropogenic sources of the subject compounds.
    b. The statistical analysis of the data was able to discern which data were outliers, however some anthropogenically disturbed sites may be part of the data set.
    c. VTDEC did not conduct a Phase I ESA of each proposed sampling location and cannot assert if any location in particular had verifiable recognized environmental conditions.
    d. The deviation of accepting sampling locations suggested by other parties may have contributed location sites with anthropogenic activity. This may bias the data higher.

Although there were deviations from the QAPP the VTDEC does not believe that any of these deviations impacted the validity of the data or our ability to determine background threshold values for Arsenic, Lead and PAHs in Vermont.

TABLE I. URBAN SAMPLE LOCATIONS RESULTS
(Commercial/Industrial)

Sample ID	Latitude	Longitude	Property Name	TEQ PAH (ug/kg)	As (mg/kg)	Pb (mg/kg)
A1	44.91885	-73.125502	Swanton Village Green	1172.95	3.2	23
A2	44.93841	-73.04803	Highgate Center Town Park	34.99	4.4	18
A6	44.947727	-72.202765	North Country Union High School, Newport	84.99	15	13
A7	44.94857	-72.13053	N. Country Union Jr. High School	217.59	25	19
B2	44.811007	-73.082994	St. Albans Taylor Park	544.94	5.8	47
B3	44.78469	-72.805041	Bakersfield Elementary	9.17	4.1	11
B6	44.8125	-72.193333	Willoughby Falls Fishing Access Area	22.92	12	13
C3	44.64285	-72.82619	Cambridge Elementary School	14.85	3.9	9.7
D1	44.49901	-73.17505	Winooski High School	25.57	5.5	14
D4	44.56188	-72.59152	Peoples Academy-Morrisville	14.57	21	26
D5	44.50899	-72.36681	Hazen Union High-Hardwick	11.92	13	12
E1	44.46287	-73.21308	Callahan Park-Burlington	99.44	8.9	32
E1a	44.49366	-73.23303	Lakeview Cementery	24.27	8.8	20
E1b	44.48328	-73.2133	Elmwood Cementery	306	6.4	67
E1c	44.48149	-73.21984	Battery Park	86.13	6.2	42
E1d	44.47641	-73.21339	City Hall Park	160.14	6.7	26
E1e	44.45897	-73.22045	Lakeside Park	98.84	4.6	42
E1f	44.48932	-73.21124	Roosevelt Park	124.83	5.6	30
E2	44.40326	-73.0014	RichmondVolunteer's Green	17.87	6.2	15
E4a	44.473345	-72.694895	Cady Hill Forest	2.68	17	8.9
E6	44.403139	-72.310053	Cabot Village Green	43.17	1.95	34
E7	44.42454	-72.00634	St. J. Municipal Forest	164.36	4	16
E8	44.42903	-71.89388	Concord Recreation Field	21.49	2.9	21
F1	44.309876	-73.24948	Charlotte Town Green	41.9	RPD Failure	51
F2	44.29511	-72.96385	Huntington Schools	13.52	3	13
F3	44.33292	-72.75203	Waterbury State Complex	74.94	11	38
F4	44.26173	-72.5813	Montpelier-State Capital	1149.6	11	140
F5	44.27654	-72.42725	Plainfield Recreation Field	19.88	5.5	12
G1	44.17023	-73.26196	Former Week's School	33.66	6.9	37
G2	44.13381	-73.079457	Bristol Town green	748.07	6.5	56
G3	44.183434	-72.837982	Waitsfield Green	46.55	6.6	89
G5	44.19007	-72.49627	Barre Spaulding High	34.82	7.9	20
H1	44.01405	-73.16315	Mahady Courthouse	52.97	6.5	66
H4	44.042436	-72.603756	Brookfield Floating Bridge	556.96	5.6	100
H5	43.98881	-72.44696	Chelsea Common	81.54	3.6	74
H7	43.9966	-72.122778	Bugbee Landing	54.93	3.7	18
I3	43.873834	-72.807872	Rochester Town Green	267.95	9.3	34
I4	43.92746	-72.6725	Randolph Recreation Fields	27.78	5.7	25
I6	43.90829	-72.26104	Westshire Elementary School-W. Fairlee	17.86	2	22
I7	43.90846	-72.14523	Samuel Morey Elementary-Fairlee	64.96	22	18
J1	43.799538	-73.204564	Sudbury Green	9.26	5.4	20
J2	43.798028	-73.087183	Brandon Green	1363.62	13	68
J3	43.771171	-72.812813	Pittsfield Village Green	285.15	5	83
J6	43.71329	-72.3079	Norwich Green	393.69	3.8	73
K1	43.594167	-73.266111	Fair Haven Village Green	567.58	3.6	42
K2	43.608056	-72.973056	Main Street Park-Rutland	4759.35	5.1	75
K2a	43.619167	-72.976111	North Street Park	111.96	2.8	17
K2b	43.604722	-72.988056	Meadow Street Park	3846.6	3.4	50
K2c	43.617222	-72.962778	Temple Street Park	12.11	2.8	13
K2d	43.618333	-72.957222	Oak Street Extension Park	143.79	2.4	14
K6	43.64401	-72.31656	Ratcliffe Park-WRJ	115.39	12	30
K6A	43.6476	-72.42283	Quechee Green	11.28	9.2	14
K6D	43.64998	-72.31678	Lyman's Point Park	16.45	5.8	13
L2	43.46922	-72.98029	Wallingford Recreation Fields	12.19	3.1	7.1
L5	43.480885	-72.387983	Windsor Green	425.73	6	70
M5	43.29884	-72.47818	The Commons Park-Springfield	424.54	5.2	53
P1	42.88611	-73.19813	Bennington Memorial Park	29.33	4.6	23
Q4	42.857222	-72.561944	Brattleboro Common	187.62	9.4	68

TABLE II. RURAL SAMPLE LOCATIONS RESULTS
(Residential)

Sample ID	Latitude	Longitude	Property Name	TEQ PAH (ug/kg)	As (mg/kg)	Pb (mg/kg)
A3	44.9625	-72.874167	Lake Carmi State Park	2.6	5.5	13
A5	44.95206	-72.43537	Jay Elementary	21.45	13	18
A8	44.92408	-71.87123	Norton Pond FPR Land	8.2	5.3	12
A9	44.99522	-71.70654	Great Averill Pond Boat Launch	14.72	9.5	6.4
B1	44.77859	-73.18258	Kill Kare State Park	25.52	8.5	24
B4	44.822222	-72.73	Avery's Gore Wildlife Management Area	2.2	5.3	9.2
B5	44.83991	-72.516175	Hazen's Notch Natural Area	2.6	15	7.7
B7	44.87741	-72.05226	Pensioner Pond	55.15	2.3	9.6
B8	44.79647	-71.85522	Brighton State Park	8.67	2.8	6
B9	44.79404	-71.66442	FPR Managed Land	8.67	2.8	7
C1	44.69045	-73.28973	Grand Isle State Park	10.05	9.6	24
C4	44.69792	-72.61652	FPR Managed Land	10.58	6.8	5.1
C5	44.7287	-72.49623	Eden Boat Launch - field repositioned	10.87	6	27
C6	44.74703	-72.16972	Crystal Lake State Park	43.98	14	17
C7	44.71641	-72.03065	Willoughby State Forest	53.3	2.7	18
C8	44.714539	-71.92287	Center Pond Boat Launch	8.55	2.2	6.4
C9	44.65277	-71.63894	Maidstone State Forest	15.97	6.7	35
D3	44.52938	-72.84293	Underhill State Park	10.86	4.3	19
D6	44.56431	-72.21493	Flagg Pond	18.44	11	33
D7	44.502141	-71.988788	Lyndon State Forest	2.2	2	3.75
D8	44.578758	-71.892672	Darling State Forest	94.62	2.3	19
D9	44.54906	-71.73987	Victory State Forest	9.36	5.5	12
E3	44.389893	-72.767779	Little River State Park	18.25	11	9.4
E4	44.459862	-72.681579	Stowe Memorial park	12.32	14	55
E5	44.46686	-72.39734	Buck Lake WMA	8.9	10	6.4
E9	44.48256	-71.69158	Neal Pond Launch	3.14	3.6	11
F6	44.279533	-72.27427	Groton State Forest @ Stillwater	9.17	2	3.8
F7	44.287957	-72.133728	Harvey Lake Launch	2.65	2.7	11
G4	44.211533	-72.608108	Boyer State Forest	3.98	6.3	25
G6	44.17597	-72.30544	Groton Forest @ Gore Rd/302	10.52	3.5	14
G7	44.15551	-72.08078	Blue Mtn. Union School-Wells River	8.78	2	6.1
H2	43.98557	-73.0388	Ripton Elementary	9.1	5.5	16
H3	44.0281	-72.8336	Granville Reservation State Forest	309.01	16	27
I1	43.858609	-73.200692	Whiting Elementary	9.71	6	16
I2	43.876111	-73.063333	Green Mtn National Forest	4.83	2	9.1
I5	43.82742	-72.48353	McIntosh Pond	2.57	2	14
J4	43.73138	-72.61445	Silver Lake State Park	15.93	3.5	7.6
J5	43.74474	-72.52428	Amity Pond Natural Area State Park	2.43	2	14
K3	43.674397	-72.810191	Gifford Woods State Park	26.18	3.5	74
K4	43.563611	-72.618611	Coolidge State Forest	2.56	2	8.6
K5	43.638333	-72.41	Quecee State Park	8.84	7.4	15
K6b	43.647057	-72.349079	Hurricane Wildlife Refuge	4.59	3.2	14
K6C	43.6607	-72.38163	Meeting House Common	11.08	2.5	260
L1	43.480556	-73.206389	Lake Catherine State Park	13.26	7.9	31
L3	43.475028	-72.760444	FPR Managed Land - Lake Ninevah	5.7	4	14.5
L4	43.47723	-72.69802	Camp Plymouth State Park	11.38	31	13
M1	43.293056	-73.140556	Mettawee River Boat Launch	60.24	5.6	17
M2	43.348889	-72.991111	Green Mt National Forest	62.17	5.6	29
M3	43.30557	-72.75759	Okemo State Forest	22.481	2.2	52
M4	43.368722	-72.649278	Proctor Piper State Forest	15.133	6.8	17
N1	43.230278	-73.12	Rupert State Forest	3.03	11	21
N2	43.281944	-73.005	Emerald Lake State Park	11.81	5.5	17
N3	43.224028	-72.764833	Lowell Lake State Park	18.458	2	54
N4	43.231306	-72.668222	Williams River State Forest	3.045	2	7.4
N5	43.26116	-72.42876	Hoyts Landing	137.24	6.5	21
O1	43.02132	-73.17919	Shaftsbury State Park	3.04	5.4	10
O2	43.04704	-72.95176	Grout Pond Rec Area	4.66	2	4.2
O3	43.106111	-72.773611	Jamaica State Park	2.31	2	9.7
O4	43.041667	-72.691667	Townshend State Forest	5.04	2.8	37
O5	43.128611	-72.451389	Rockingham Recreation Fields-Bellows Falls	22.99	4.8	12
P2	42.889454	-73.038824	Woodford State Park	7.96	4.3	30
P3	42.884167	-72.819722	Lake Raponda Boat Launch	17.32	3.3	9.9
P4	42.906667	-72.598889	Black Mountain, Nature Conservancy	2.57	2	8.5
P5	42.922068	-72.537515	Dutton Pines State Park	2.5	22	28
Q1	42.81145	-73.17642	South Stream Boat Launch	2.88	4.8	21
Q2	42.78586	-72.98047	Howe Pond at GMNF	7.69	12	16
Q3	42.854722	-72.814444	Molly Stark State Park	3	2	8.2
Q5	42.74378	-72.49995	Vernon Hatchery Pond	10.67	12	17

TABLE III.
QUALITY ASSURANCE/CONTROL OF DUPLICATE SAMPLES COLLECTED

Sample ID	Duplicate ID	TEQ -PAHs(ug/kg)	PAHs, % RPD =abs (sample result - duplicate result) /((sample result + duplicate result)/2)*100	Arsenic (mg/kg)	AS, % RPD	Lead (mg/kg)	Pb, % RPD
A6	Dup-1	105.79/64.19	48.95	15.0/12.0	22.22	13.0/12.0	8.00
B3	Dup-2	8.90/9.43	5.78	4.1/3.9	5.00	11.0/11.0	0.00
C4	Dup-3	10.63/10.52	1.04	6.8/7.3	7.09	5.1/5.4	5.71
D7	Dup-4	2.20/2.20	0.00	1.0/1.0	0.00	3.7/3.8	2.67
E3	Dup-5	17.84/18.65	4.44	11.0/9.9	10.53	9.4/8.6	8.89
F1	Dup-6	45.83/37.97	18.76	7.1/19.5	138.39	51.0/76.0	39.37
G3	Dup-7	50.46/42.63	16.82	6.6/7.2	8.70	89.0/96.0	7.57
H1	Dup-8	57.28/48.66	16.27	6.5/6.8	4.51	66.0/70.0	5.88
I4	Dup-9	27.14/28.41	4.57	5.7/6.1	6.78	25.0/27.0	7.69
J2	Dup-10	1309.64/1417.60	7.92	13.0/14.0	7.41	68.0/78.0	13.70
K2	Dup-11	3686.90/5831.80	45.07	5.1/5.1	0.00	75.0/80.0	6.45
L3	Dup-12	4.80/6.59	31.43	2.0/1.95	2.53	15.0/14.0	6.90
M5	Dup-13	372.65/476.43	24.45	5.2/6.5	22.22	53.0/57.0	7.27
N2	Dup-14	13.56/10.05	29.73	5.5/6.1	10.34	17.0/20.0	16.22
O1	Dup-15	2.46/3.61	37.89	5.4/5.8	7.14	10.0/11.0	9.52
P1	Dup-16	29.48/29.17	1.06	4.6/4.4	4.44	23.0/22.0	4.44
Q4	Dup-17	199.58/175.66	12.75	9.4/9.2	2.15	68.0/68.0	0.00

2015 Surface Soil Sample Locations

Vermont Agency of Natural Resources

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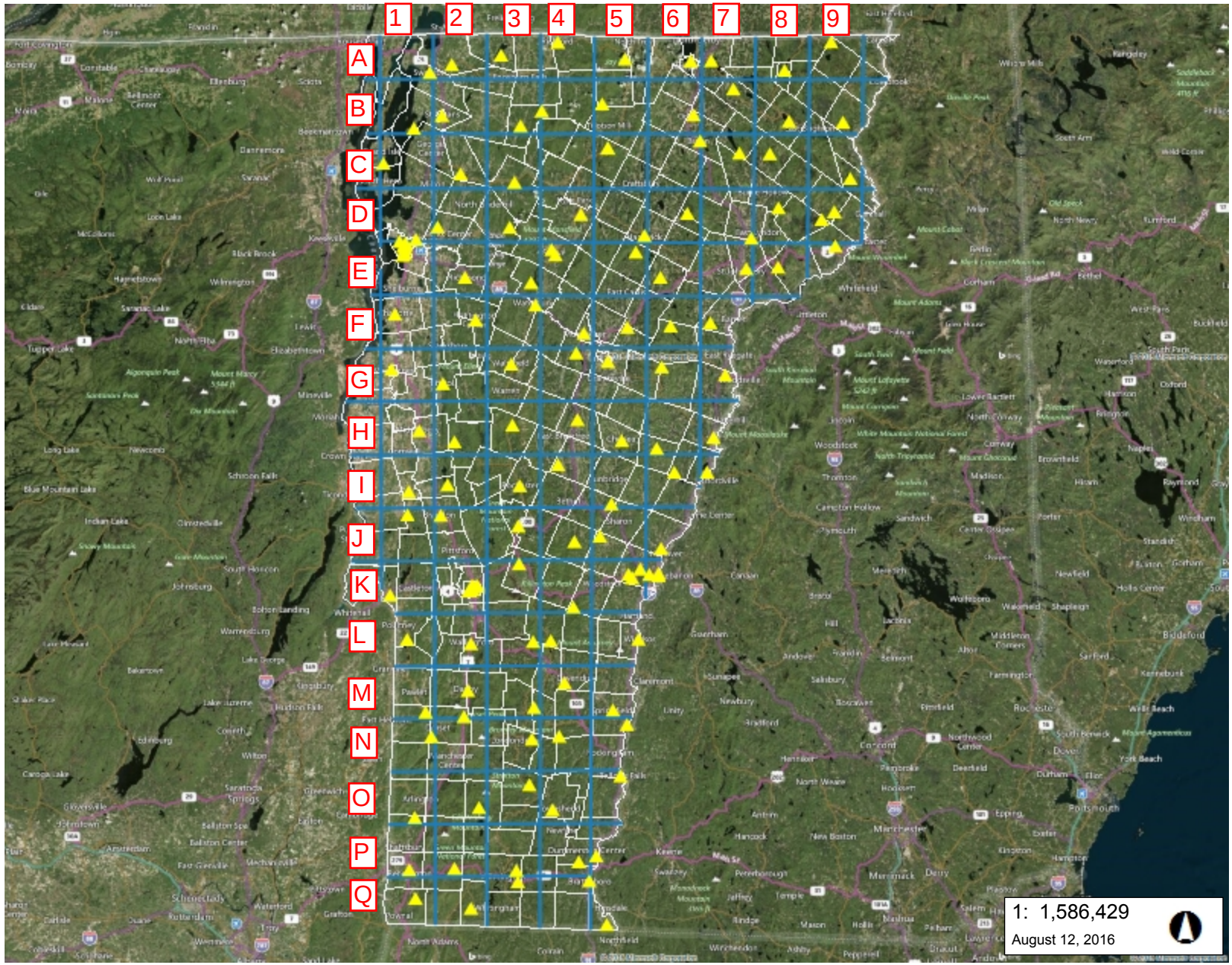

LEGEND

Town Boundary

NOTES

80,591.0 0 40,296.00 80,591.0 Meters

WGS_1984_Web_Mercator_Auxiliary_Sphere 1" = 132202 Ft. 1cm = 15864 Meters

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2015 Surface Soil Survey - Grid A1

Vermont Agency of Natural Resources

vermont.gov

Grid	Property Name	TEQ -PAHs(ug/kg)	Arsenic(mg/kg)	Lead(mg/kg)
A1	Swanton Village Green	1172.95	3.2	23

1: 87,779

April 29, 2016

LEGEND

Town Boundary

Density of Habitable Buildings

- Low
- Medium
- High
- Highest

Sampling Location

NOTES

Location A1 is considered an Urban Sample Point

4,459.0 0 2,230.00 4,459.0 Meters

WGS_1984_Web_Mercator_Auxiliary_Sphere 1" = 7315 Ft. 1cm = 878 Meters

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2015 Surface Soil Survey - Grid A2

Vermont Agency of Natural Resources

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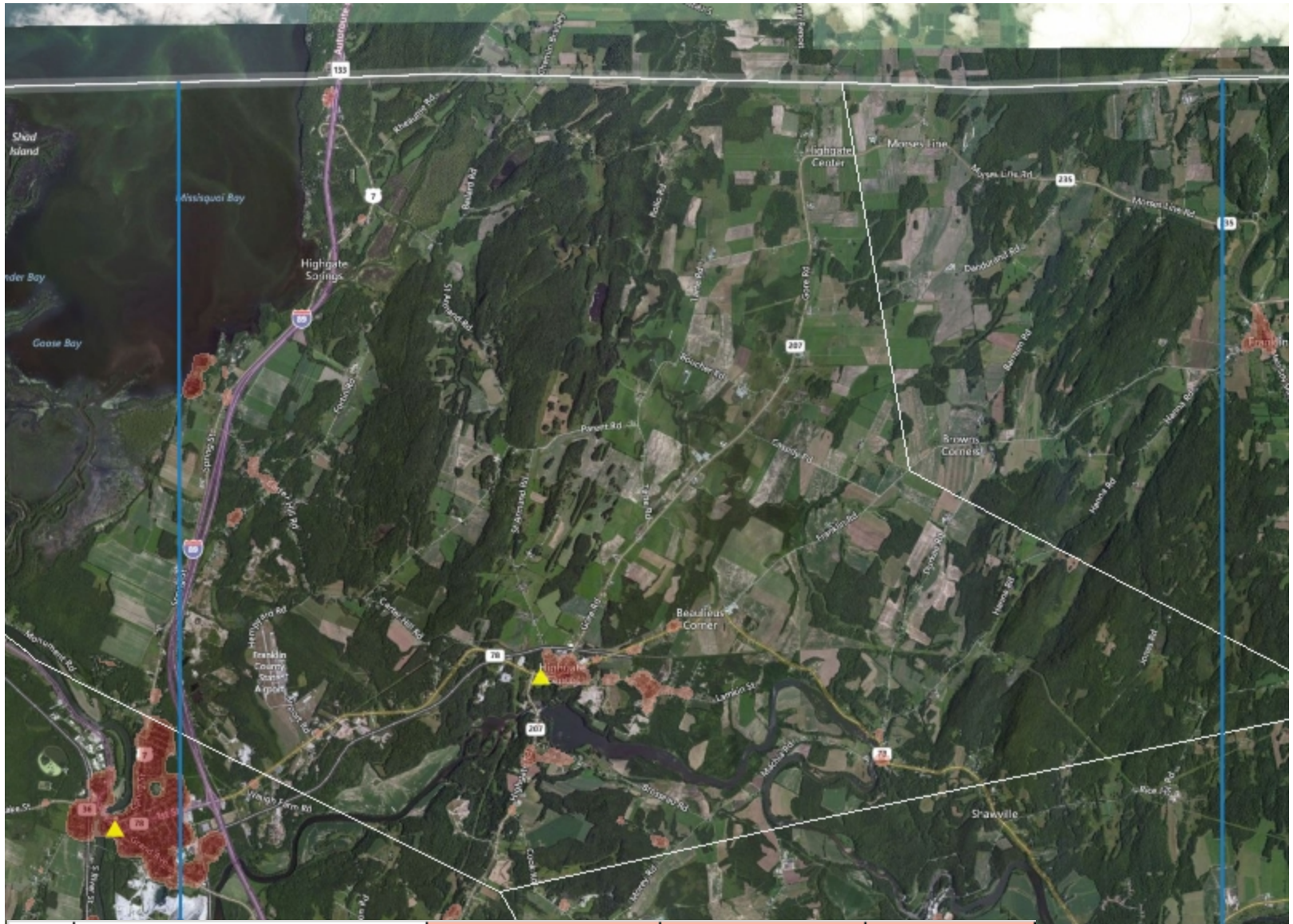

Grid	Property Name	TEQ -PAHs(ug/kg)	Arsenic(mg/kg)	Lead(mg/kg)
A2	Highgate Center Town Park	34.99	4.4	18

1: 85,575

April 29, 2016

LEGEND

Town Boundary

Density of Habitable Buildings

- Low
- Medium
- High
- Highest

Sampling Location

NOTES

Location A2 is considered an Urban Sample Point

4,347.0 0 2,174.00 4,347.0 Meters

WGS_1984_Web_Mercator_Auxiliary_Sphere 1" = 7131 Ft. 1cm = 856 Meters

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2015 Surface Soil Survey - Grid A3

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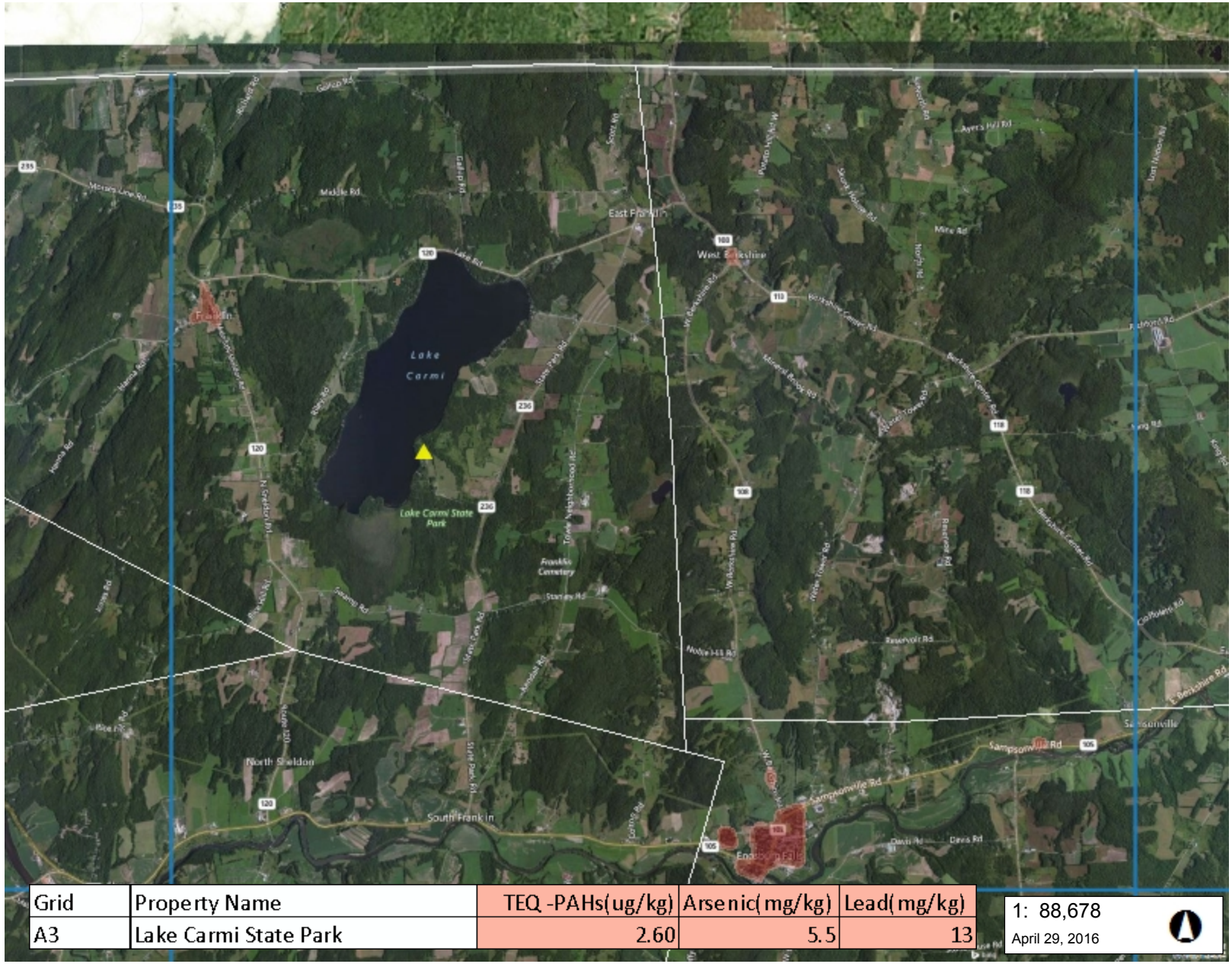

Grid	Property Name	TEQ -PAHs(ug/kg)	Arsenic(mg/kg)	Lead(mg/kg)
A3	Lake Carmi State Park	2.60	5.5	13

1: 88,678

April 29, 2016

LEGEND

Town Boundary

Density of Habitable Buildings

- Low
- Medium
- High
- Highest

Sampling Location

NOTES

Location A3 is considered a Non Urban Sample Point

4,505.0 0 2,252.00 4,505.0 Meters

WGS_1984_Web_Mercator_Auxiliary_Sphere 1" = 7390 Ft. 1cm = 887 Meters

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2015 Surface Soil Survey - Grid A5

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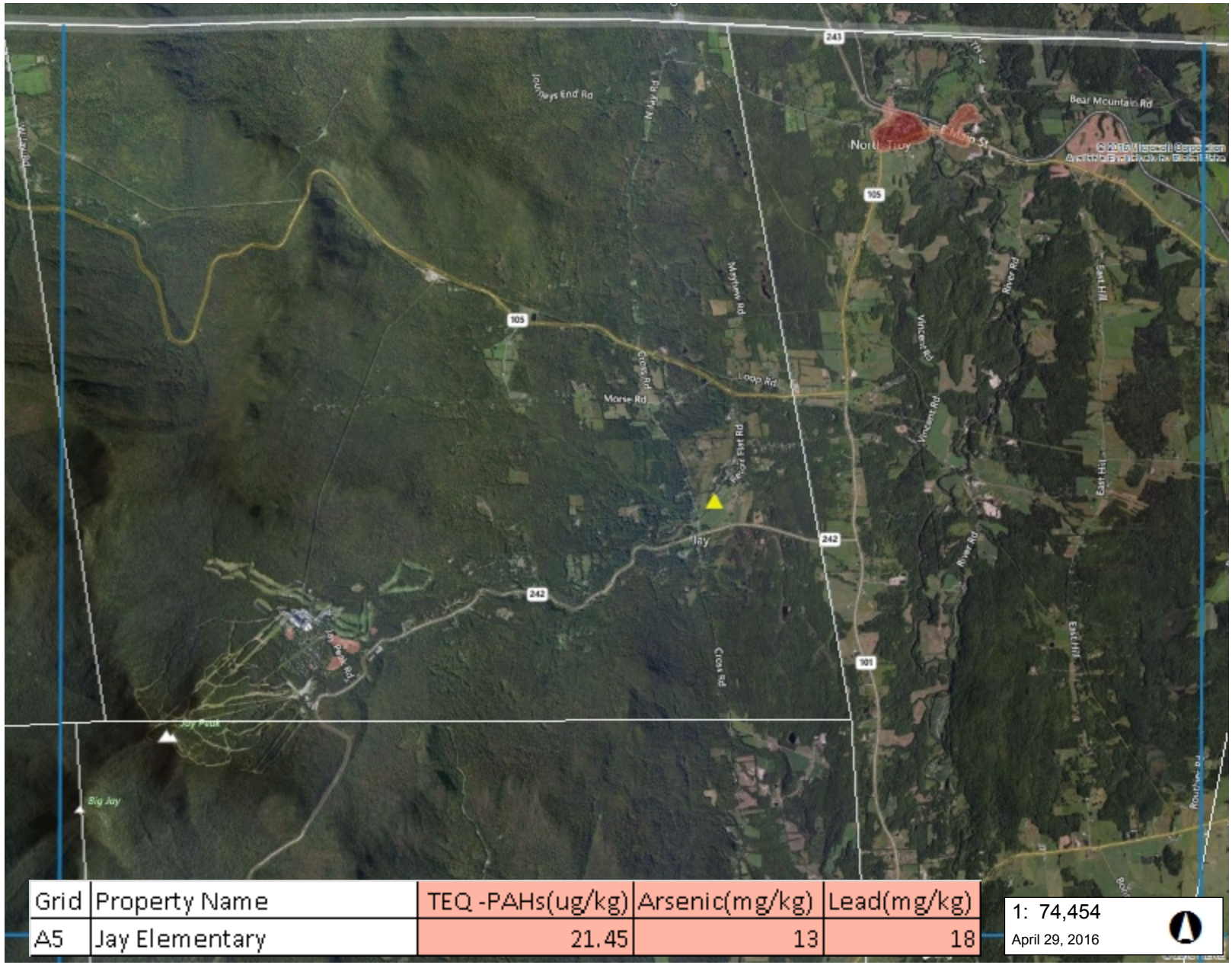

Grid	Property Name	TEQ -PAHs(ug/kg)	Arsenic(mg/kg)	Lead(mg/kg)
A5	Jay Elementary	21.45	13	18

1: 74,454

April 29, 2016

LEGEND

Town Boundary

Density of Habitable Buildings

- Low
- Medium
- High
- Highest

Sampling Location

NOTES

Location A5 is considered a Non Urban Sample Point

3,782.0 0 1,891.00 3,782.0 Meters

WGS_1984_Web_Mercator_Auxiliary_Sphere 1" = 6204 Ft. 1cm = 745 Meters

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2015 Surface Soil Survey - Grid A6

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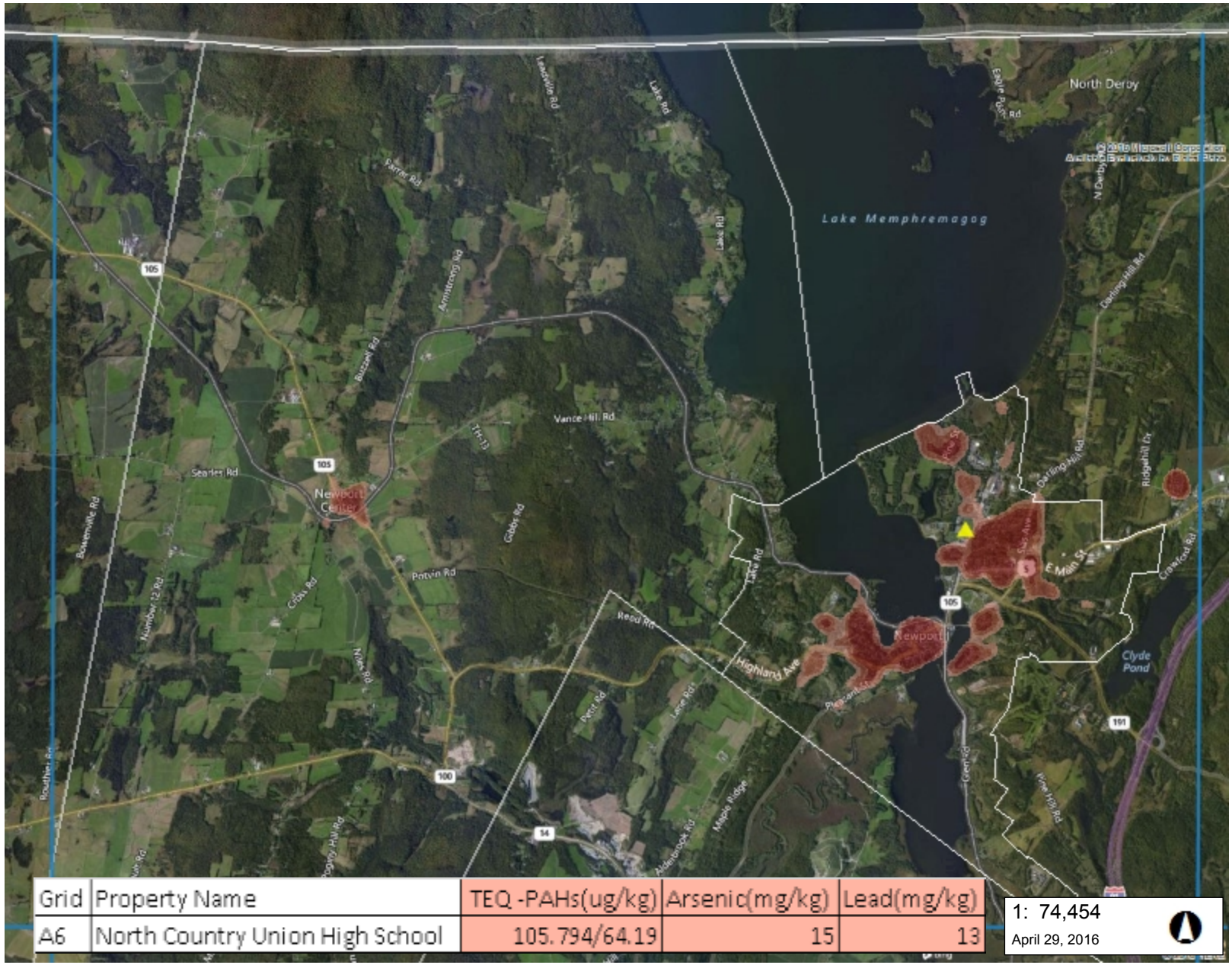

Grid	Property Name	TEQ -PAHs(ug/kg)	Arsenic(mg/kg)	Lead(mg/kg)
A6	North Country Union High School	105.794/64.19	15	13

1: 74,454

April 29, 2016

LEGEND

Town Boundary

Density of Habitable Buildings

- Low
- Medium
- High
- Highest

Sampling Location

NOTES

Location A6 is considered an Urban Sample Point

3,782.0 0 1,891.00 3,782.0 Meters

WGS_1984_Web_Mercator_Auxiliary_Sphere 1" = 6204 Ft. 1cm = 745 Meters

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2015 Surface Soil Survey - Grid A7

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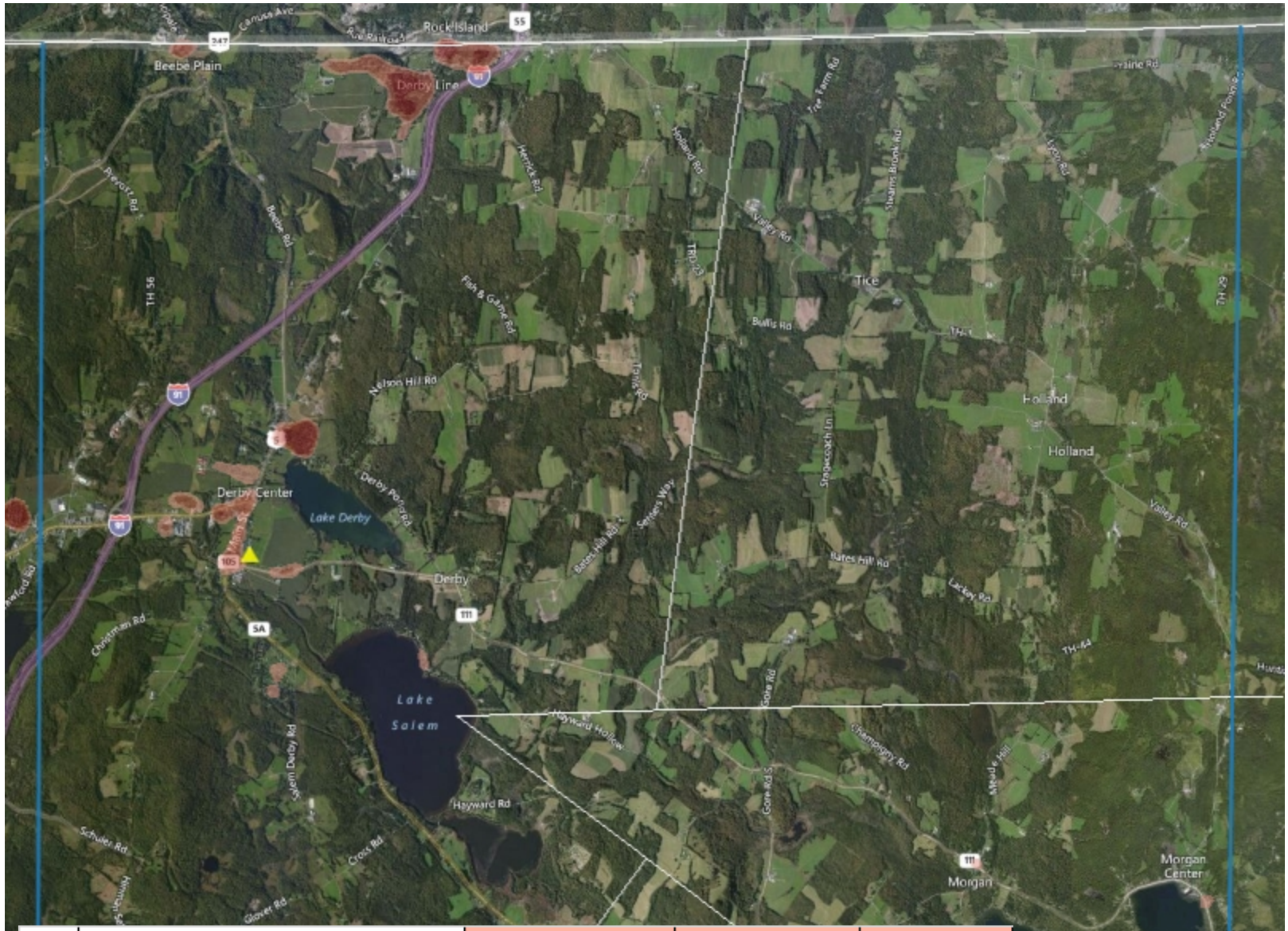

Grid	Property Name	TEQ -PAHs(ug/kg)	Arsenic(mg/kg)	Lead(mg/kg)
A7	N. Country Union Jr. High School	217.59	25	19

1: 74,454

April 29, 2016

LEGEND

Town Boundary

Density of Habitable Buildings

- Low
- Medium
- High
- Highest

Sampling Location

NOTES

Location A7 is considered a Urban Sample Point

3,782.0 0 1,891.00 3,782.0 Meters

WGS_1984_Web_Mercator_Auxiliary_Sphere 1" = 6204 Ft. 1cm = 745 Meters

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2015 Surface Soil Survey - Grid A8

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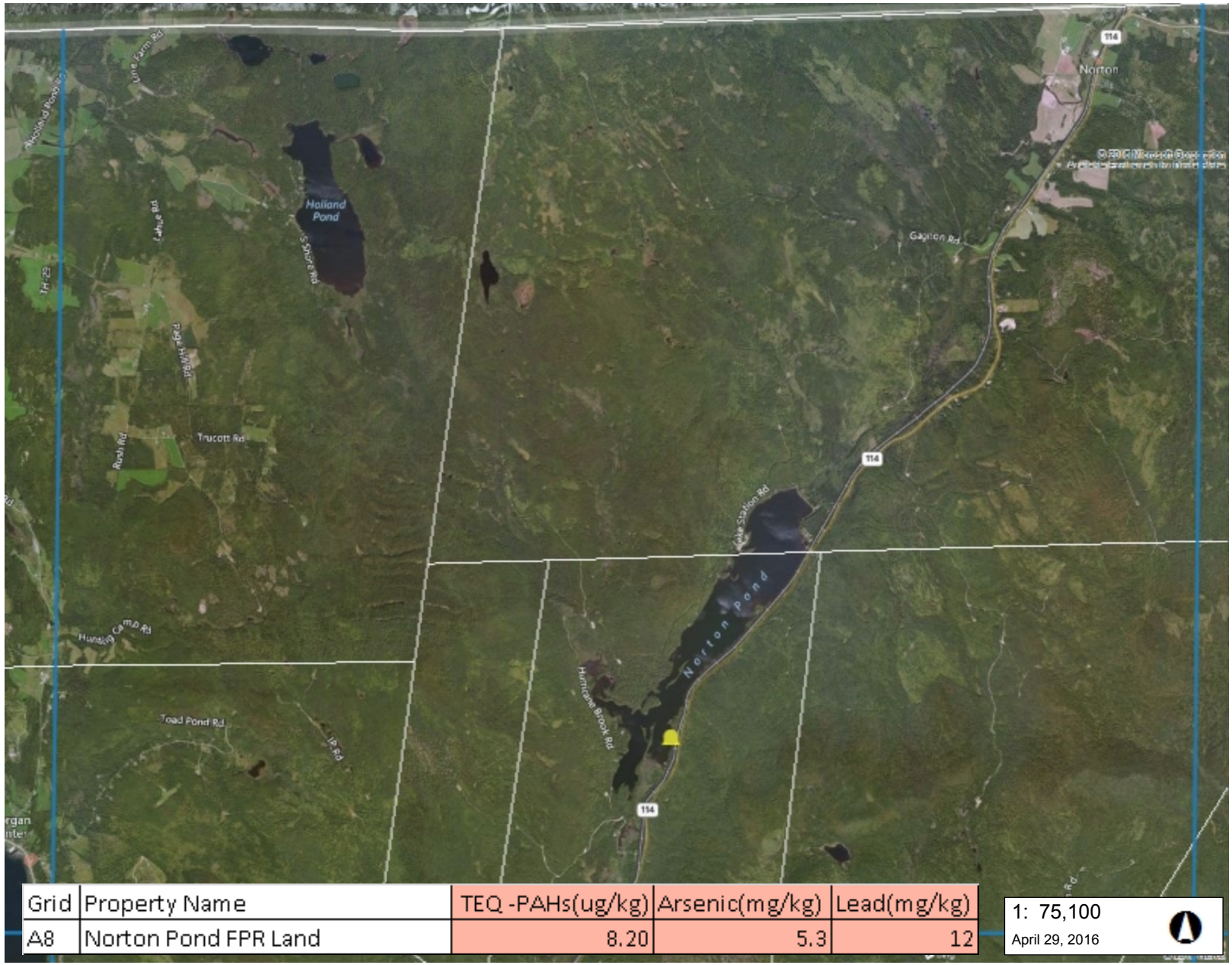

Grid	Property Name	TEQ -PAHs(ug/kg)	Arsenic(mg/kg)	Lead(mg/kg)
A8	Norton Pond FPR Land	8.20	5.3	12

1: 75,100

April 29, 2016

LEGEND

Town Boundary

Density of Habitable Buildings

- Low
- Medium
- High
- Highest

Sampling Location

NOTES

Location A8 is considered a Non Urban Sample Point

3,815.0 0 1,908.00 3,815.0 Meters

WGS_1984_Web_Mercator_Auxiliary_Sphere 1" = 6258 Ft. 1cm = 751 Meters

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2015 Surface Soil Survey - Grid A9

Vermont Agency of Natural Resources

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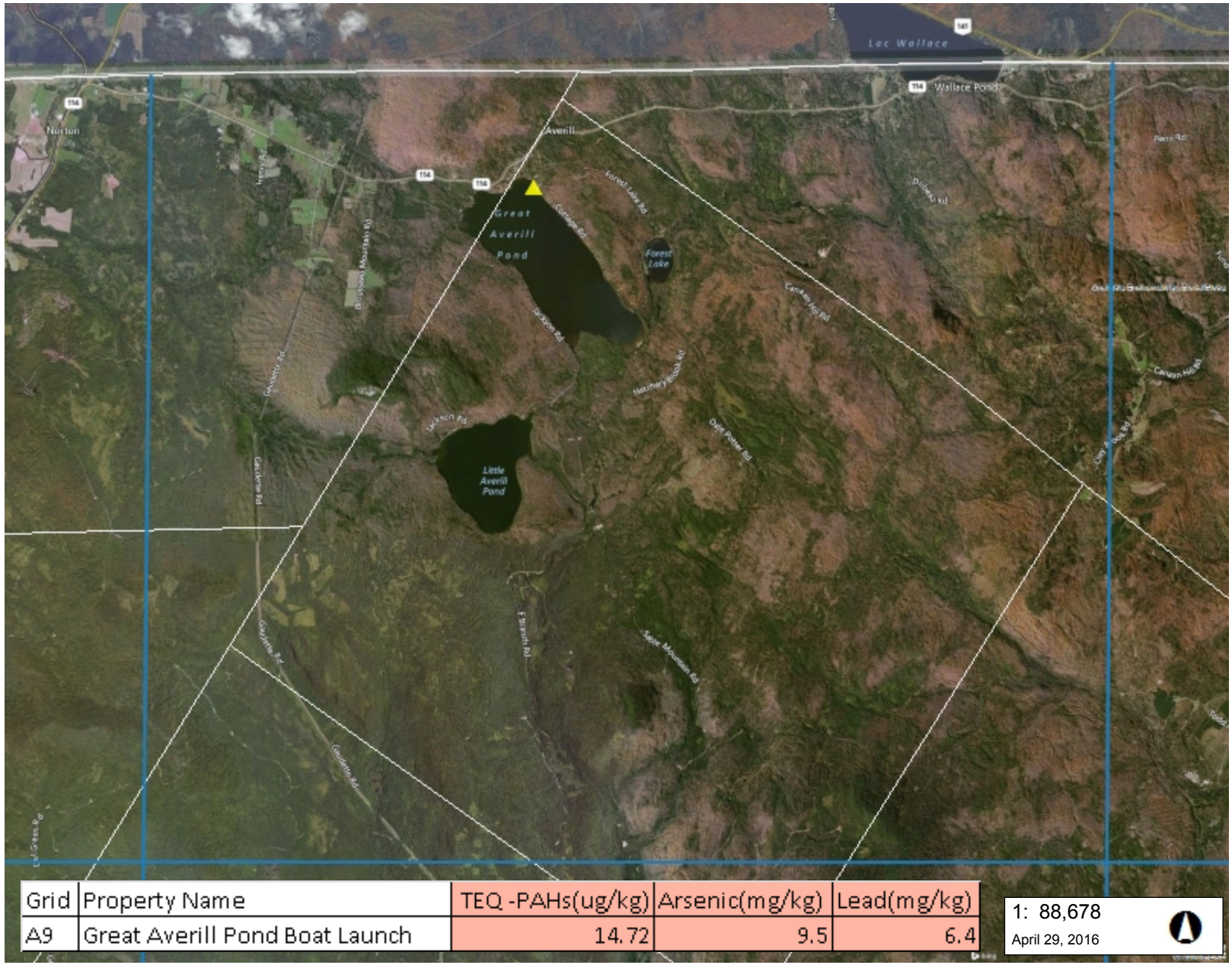

Grid	Property Name	TEQ -PAHs(ug/kg)	Arsenic(mg/kg)	Lead(mg/kg)
A9	Great Averill Pond Boat Launch	14.72	9.5	6.4

1: 88,678

April 29, 2016

LEGEND

Town Boundary

Density of Habitable Buildings

- Low
- Medium
- High
- Highest

Sampling Location

NOTES

Location A9 is considered a Non Urban Sample Point

4,505.0 0 2,252.00 4,505.0 Meters

WGS_1984_Web_Mercator_Auxiliary_Sphere 1" = 7390 Ft. 1cm = 887 Meters

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2015 Surface Soil Survey - Grid B1

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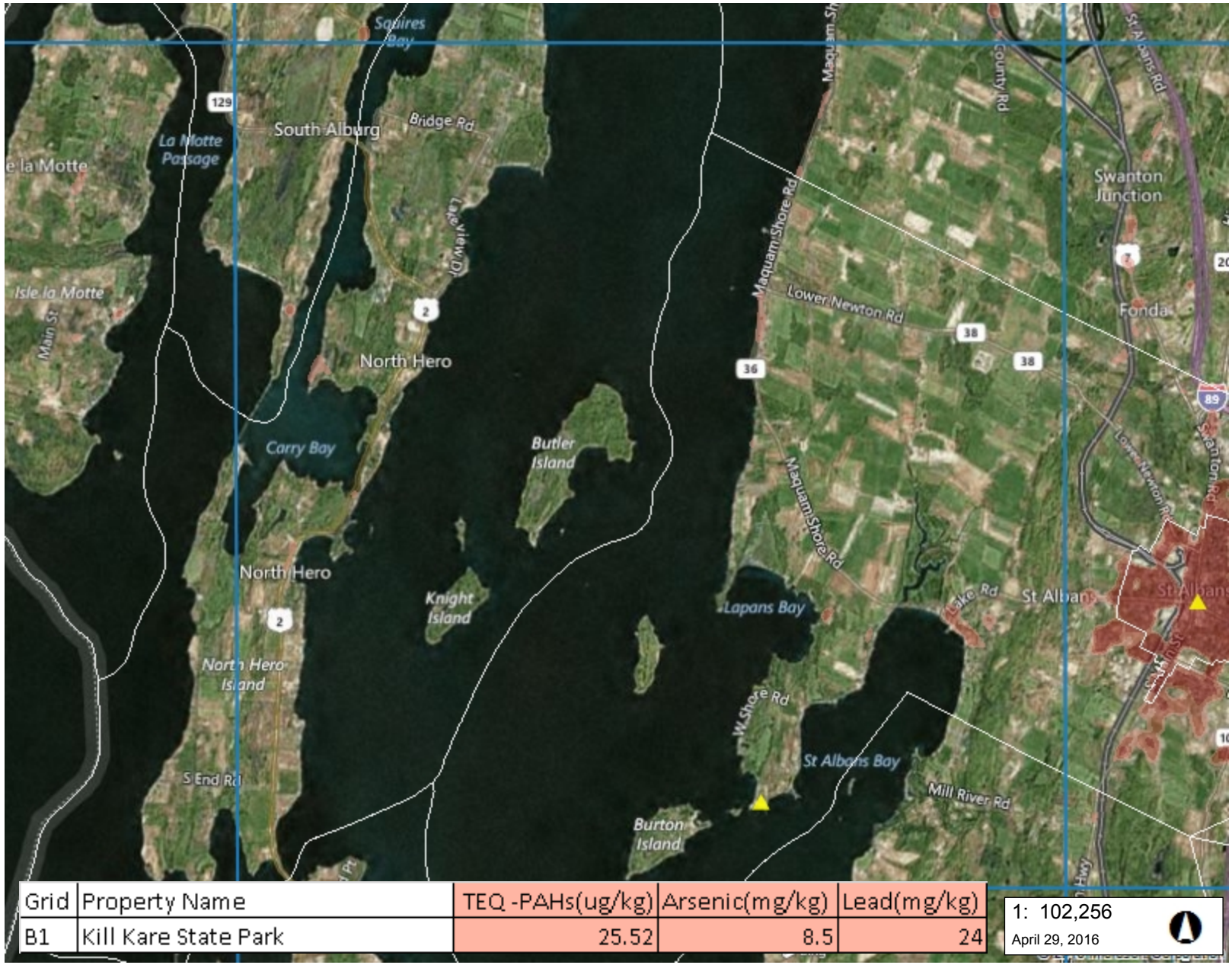

Grid	Property Name	TEQ -PAHs(ug/kg)	Arsenic(mg/kg)	Lead(mg/kg)
B1	Kill Kare State Park	25.52	8.5	24

1: 102,256

April 29, 2016

LEGEND

Town Boundary

Density of Habitable Buildings

- Low
- Medium
- High
- Highest

Sampling Location

NOTES

Location B1 is considered a Non Urban Sample Point

5,195.0 0 2,598.00 5,195.0 Meters

WGS_1984_Web_Mercator_Auxiliary_Sphere 1" = 8521 Ft. 1cm = 1023 Meters

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2015 Surface Soil Survey - Grid B2

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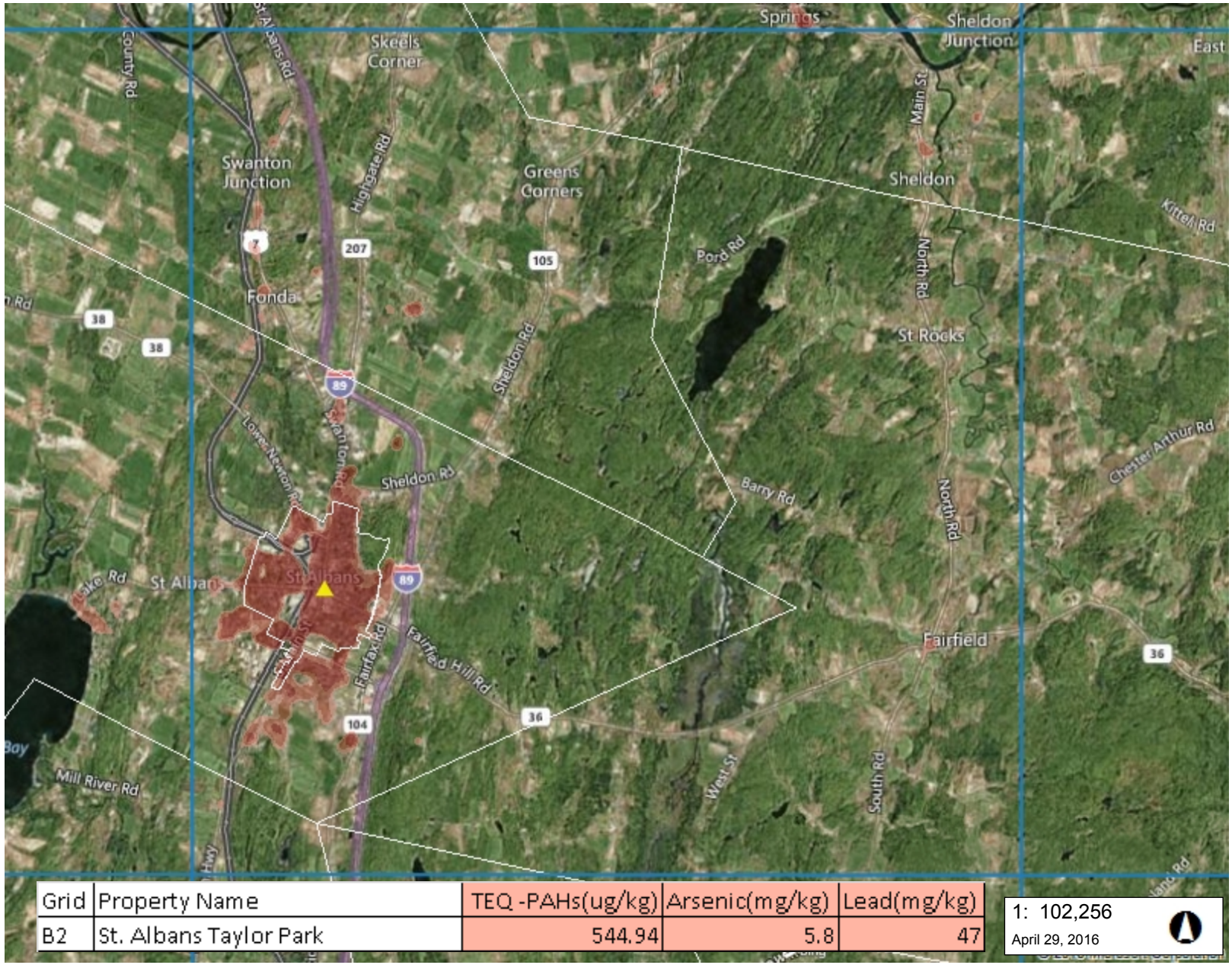

Grid	Property Name	TEQ -PAHs(ug/kg)	Arsenic(mg/kg)	Lead(mg/kg)
B2	St. Albans Taylor Park	544.94	5.8	47

1: 102,256

April 29, 2016

LEGEND

Town Boundary

Density of Habitable Buildings

- Low
- Medium
- High
- Highest

Sampling Location

NOTES

Location B2 is considered a Urban Sample Point

5,195.0 0 2,598.00 5,195.0 Meters

WGS_1984_Web_Mercator_Auxiliary_Sphere 1" = 8521 Ft. 1cm = 1023 Meters

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2015 Surface Soil Survey - Grid B3

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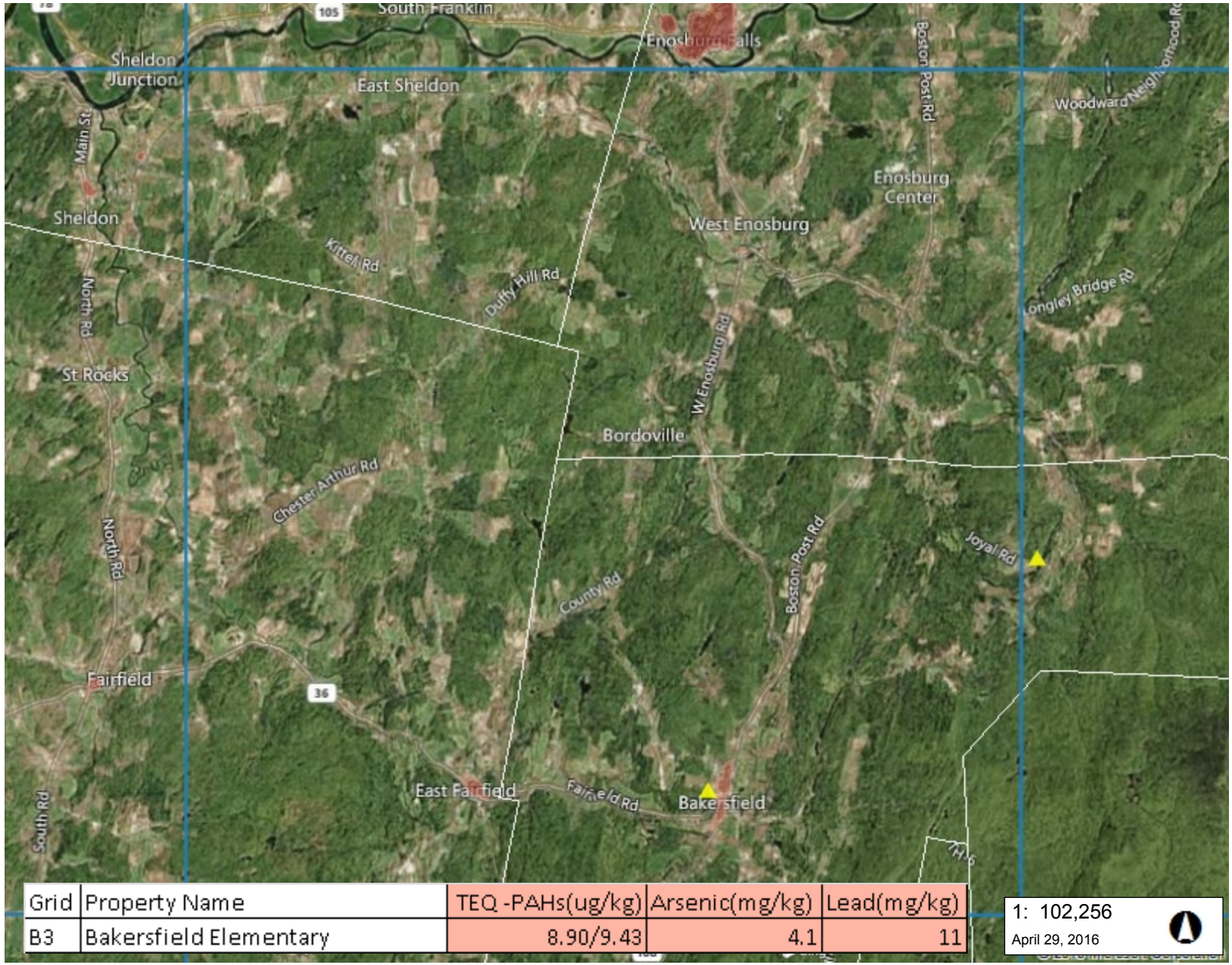

Grid	Property Name	TEQ -PAHs(ug/kg)	Arsenic(mg/kg)	Lead(mg/kg)
B3	Bakersfield Elementary	8.90/9.43	4.1	11

1: 102,256

April 29, 2016

LEGEND

Town Boundary

Density of Habitable Buildings

- Low
- Medium
- High
- Highest

Sampling Location

NOTES

Location B3 is considered a Urban Sample Point

5,195.0 0 2,598.00 5,195.0 Meters

WGS_1984_Web_Mercator_Auxiliary_Sphere 1" = 8521 Ft. 1cm = 1023 Meters

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2015 Surface Soil Survey - Grid B4

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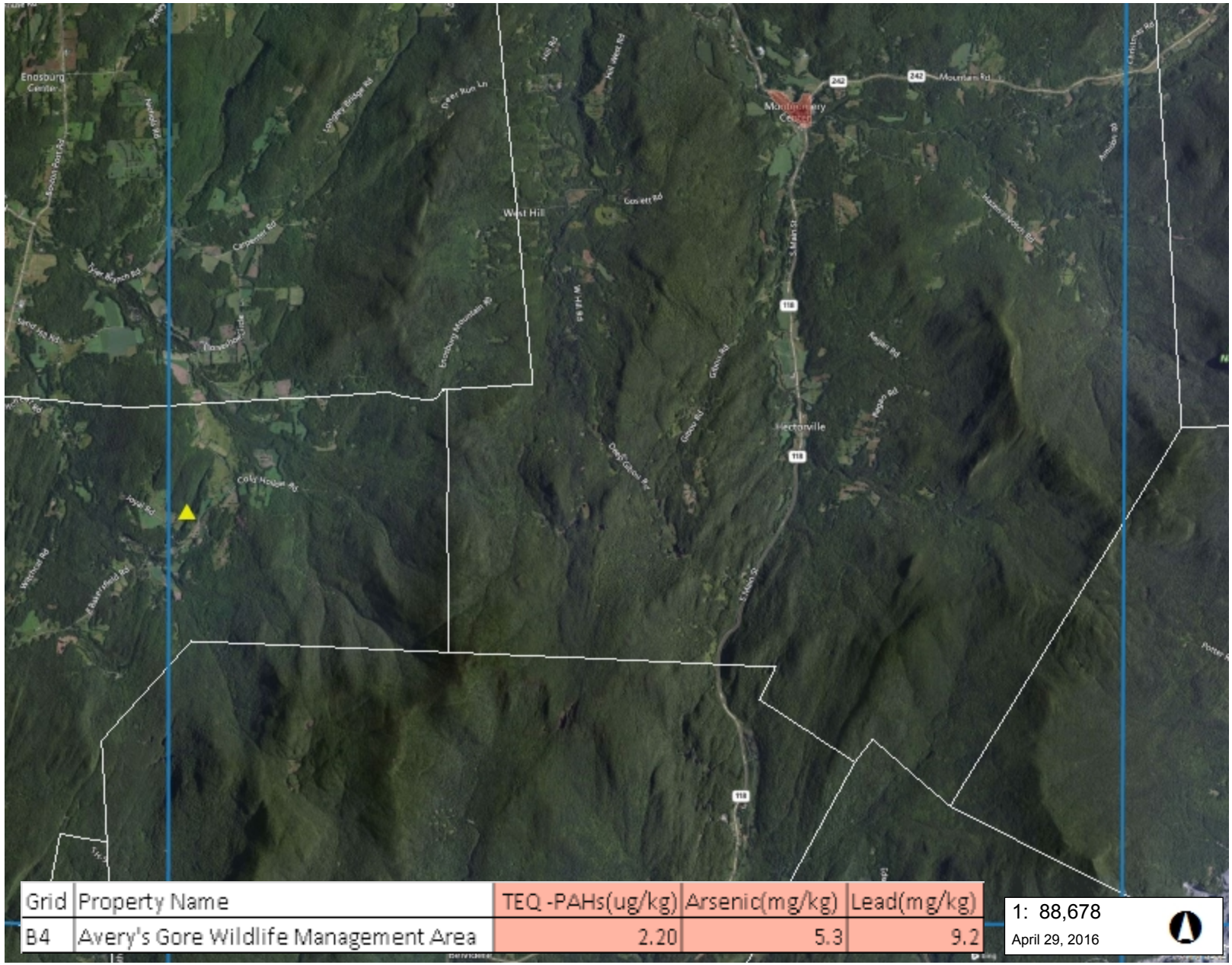

Grid	Property Name	TEQ -PAHs(ug/kg)	Arsenic(mg/kg)	Lead(mg/kg)
B4	Avery's Gore Wildlife Management Area	2.20	5.3	9.2

1: 88,678

April 29, 2016

LEGEND

Town Boundary

Density of Habitable Buildings

- Low
- Medium
- High
- Highest

Sampling Location

NOTES

Location B4 is considered a Non Urban Sample Point

4,505.0 0 2,252.00 4,505.0 Meters

WGS_1984_Web_Mercator_Auxiliary_Sphere 1" = 7390 Ft. 1cm = 887 Meters

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2015 Surface Soil Survey - Grid B5

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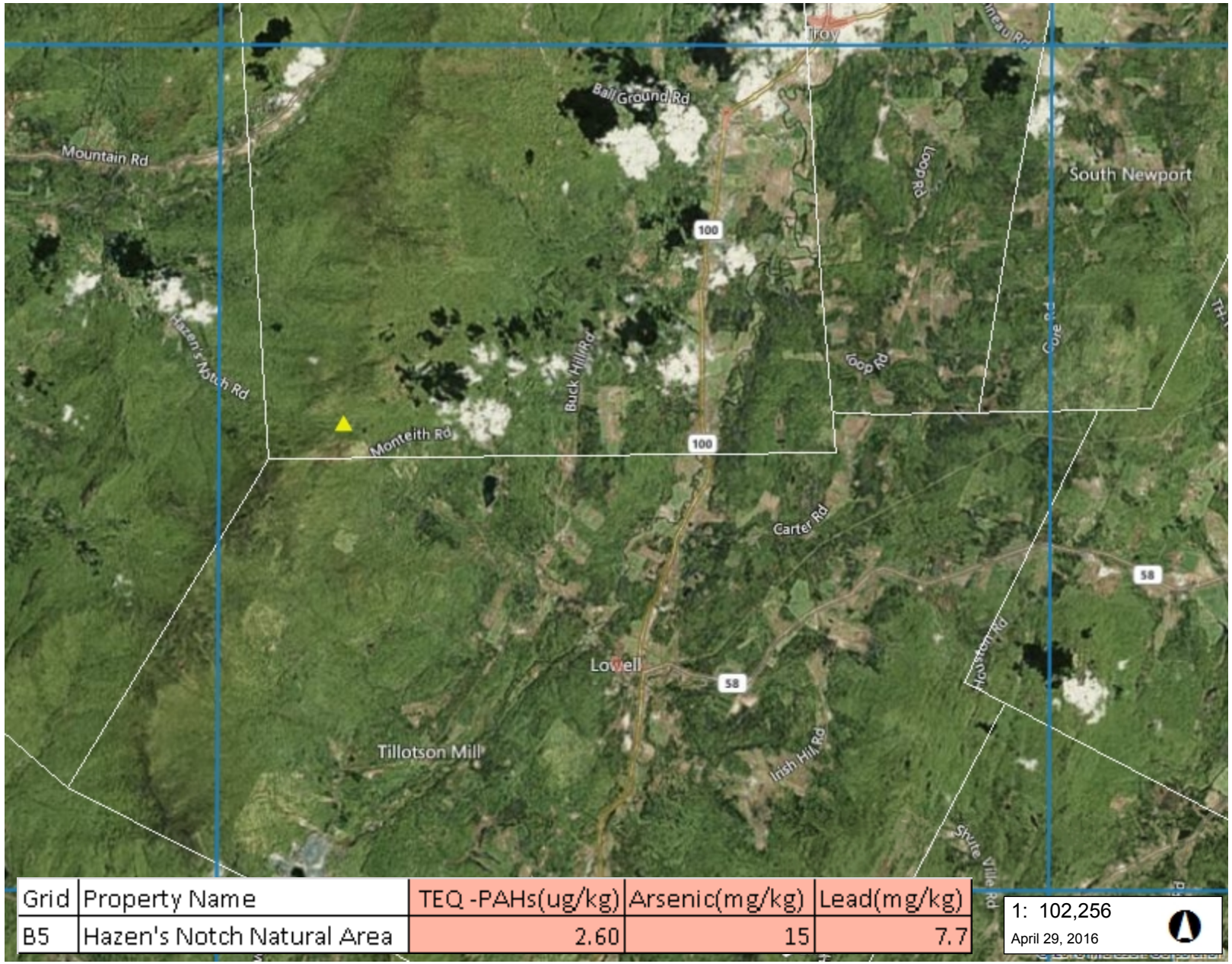

Grid	Property Name	TEQ -PAHs(ug/kg)	Arsenic(mg/kg)	Lead(mg/kg)
B5	Hazen's Notch Natural Area	2.60	15	7.7

1: 102,256

April 29, 2016

LEGEND

Town Boundary

Density of Habitable Buildings

- Low
- Medium
- High
- Highest

Sampling Location

NOTES

Location B5 is considered a Non Urban Sample Point

5,195.0 0 2,598.00 5,195.0 Meters

WGS_1984_Web_Mercator_Auxiliary_Sphere 1" = 8521 Ft. 1cm = 1023 Meters

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2015 Surface Soil Survey - Grid B6

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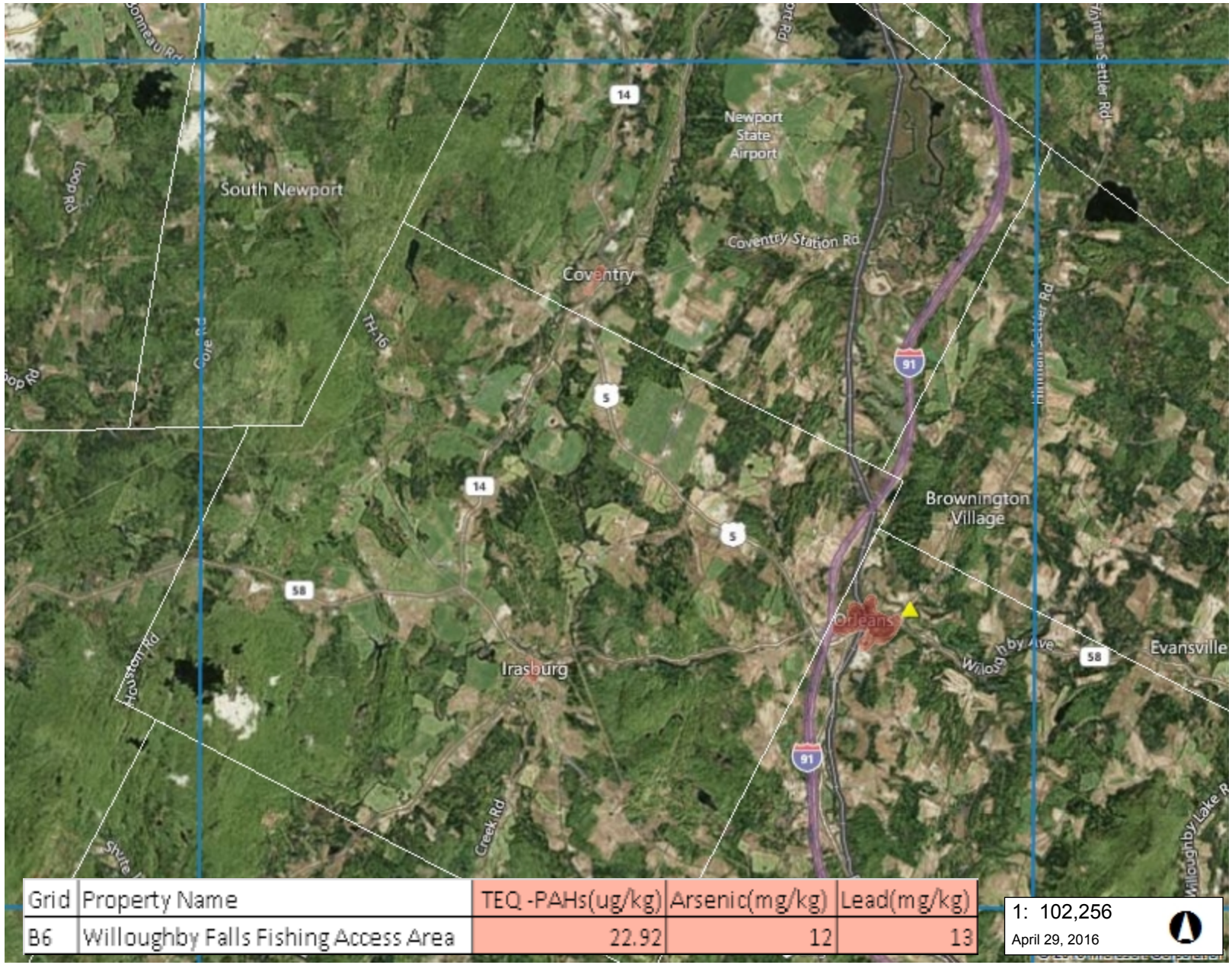

Grid	Property Name	TEQ -PAHs(ug/kg)	Arsenic(mg/kg)	Lead(mg/kg)
B6	Willoughby Falls Fishing Access Area	22.92	12	13

1: 102,256

April 29, 2016

LEGEND

Town Boundary

Density of Habitable Buildings

- Low
- Medium
- High
- Highest

Sampling Location

NOTES

Location B6 is considered a Urban Sample Point

5,195.0 0 2,598.00 5,195.0 Meters

WGS_1984_Web_Mercator_Auxiliary_Sphere 1" = 8521 Ft. 1cm = 1023 Meters

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2015 Surface Soil Survey - Grid B7

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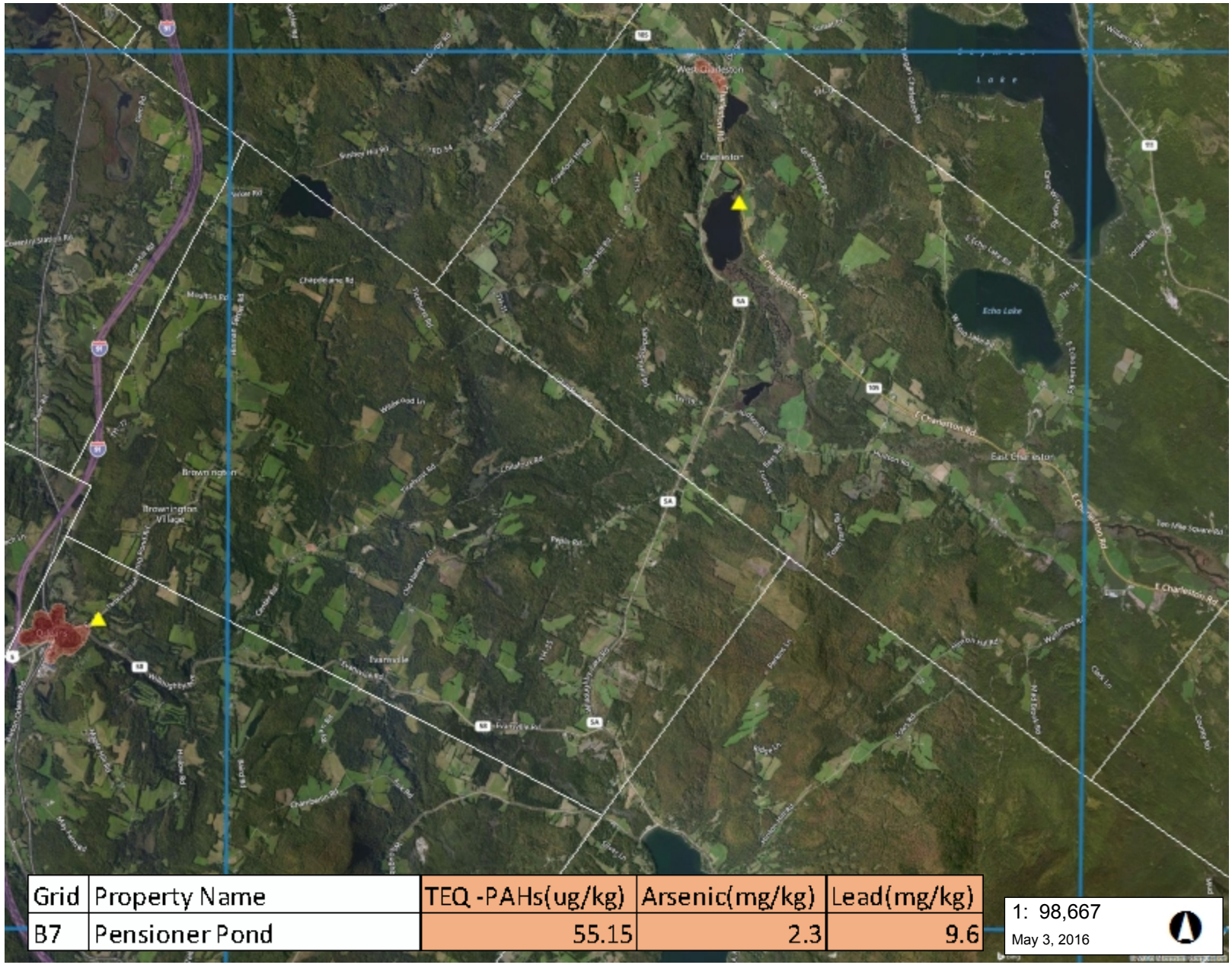

Grid	Property Name	TEQ -PAHs(ug/kg)	Arsenic(mg/kg)	Lead(mg/kg)
B7	Pensioner Pond	55.15	2.3	9.6

1: 98,667

May 3, 2016

LEGEND

Town Boundary

Density of Habitable Buildings

- Low
- Medium
- High
- Highest

Sampling Location

NOTES

Location B7 is considered a Non Urban Sample Point

5,012.0 0 2,506.00 5,012.0 Meters

WGS_1984_Web_Mercator_Auxiliary_Sphere 1" = 8222 Ft. 1cm = 987 Meters

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2015 Surface Soil Survey - Grid B8

Vermont Agency of Natural Resources

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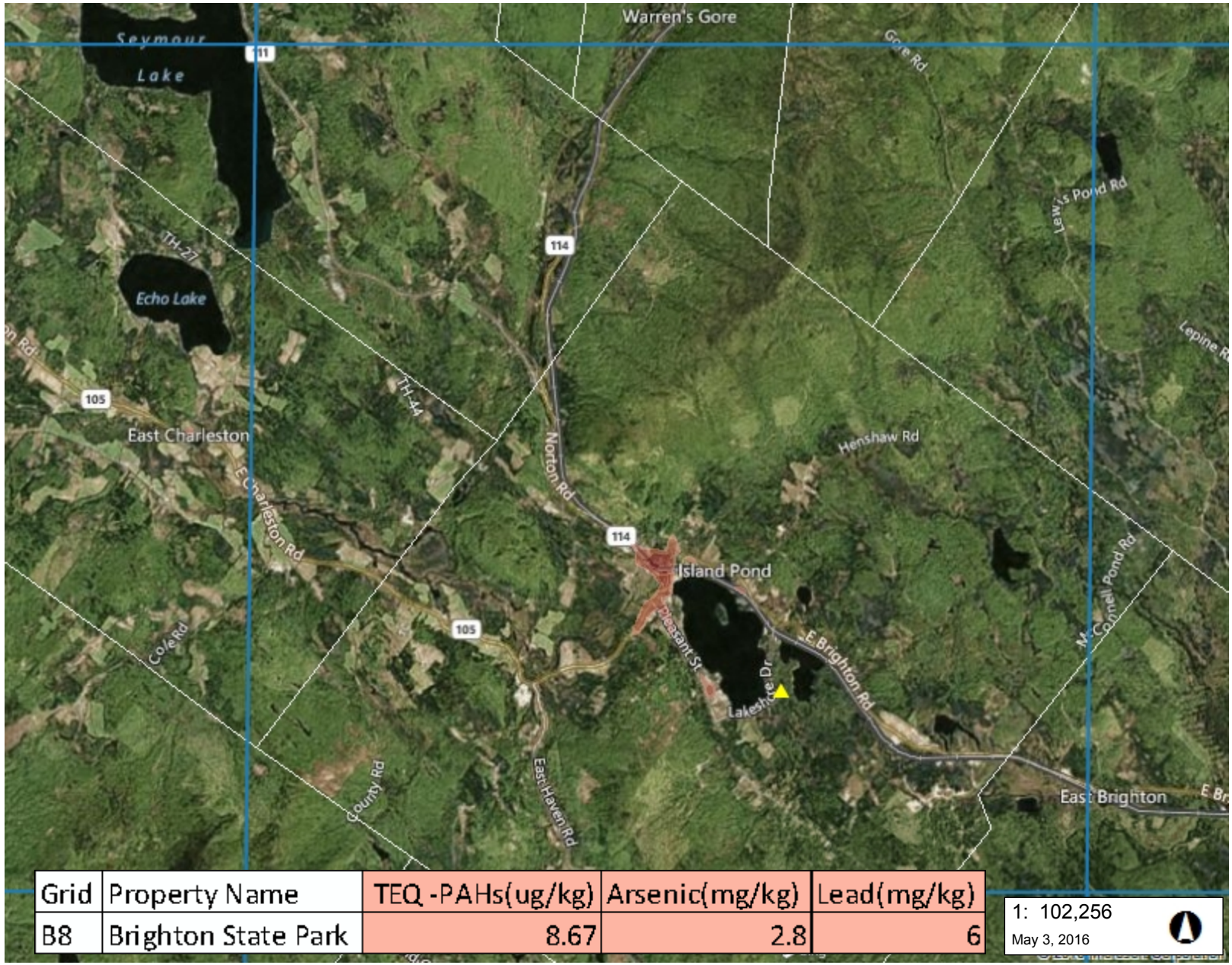

Grid	Property Name	TEQ -PAHs(ug/kg)	Arsenic(mg/kg)	Lead(mg/kg)
B8	Brighton State Park	8.67	2.8	6

1: 102,256

May 3, 2016

LEGEND

Town Boundary

Density of Habitable Buildings

- Low
- Medium
- High
- Highest

Sampling Location

NOTES

Location B8 is considered a Non Urban Sample Point

5,195.0 0 2,598.00 5,195.0 Meters

WGS_1984_Web_Mercator_Auxiliary_Sphere 1" = 8521 Ft. 1cm = 1023 Meters

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2015 Surface Soil Survey - Grid B9

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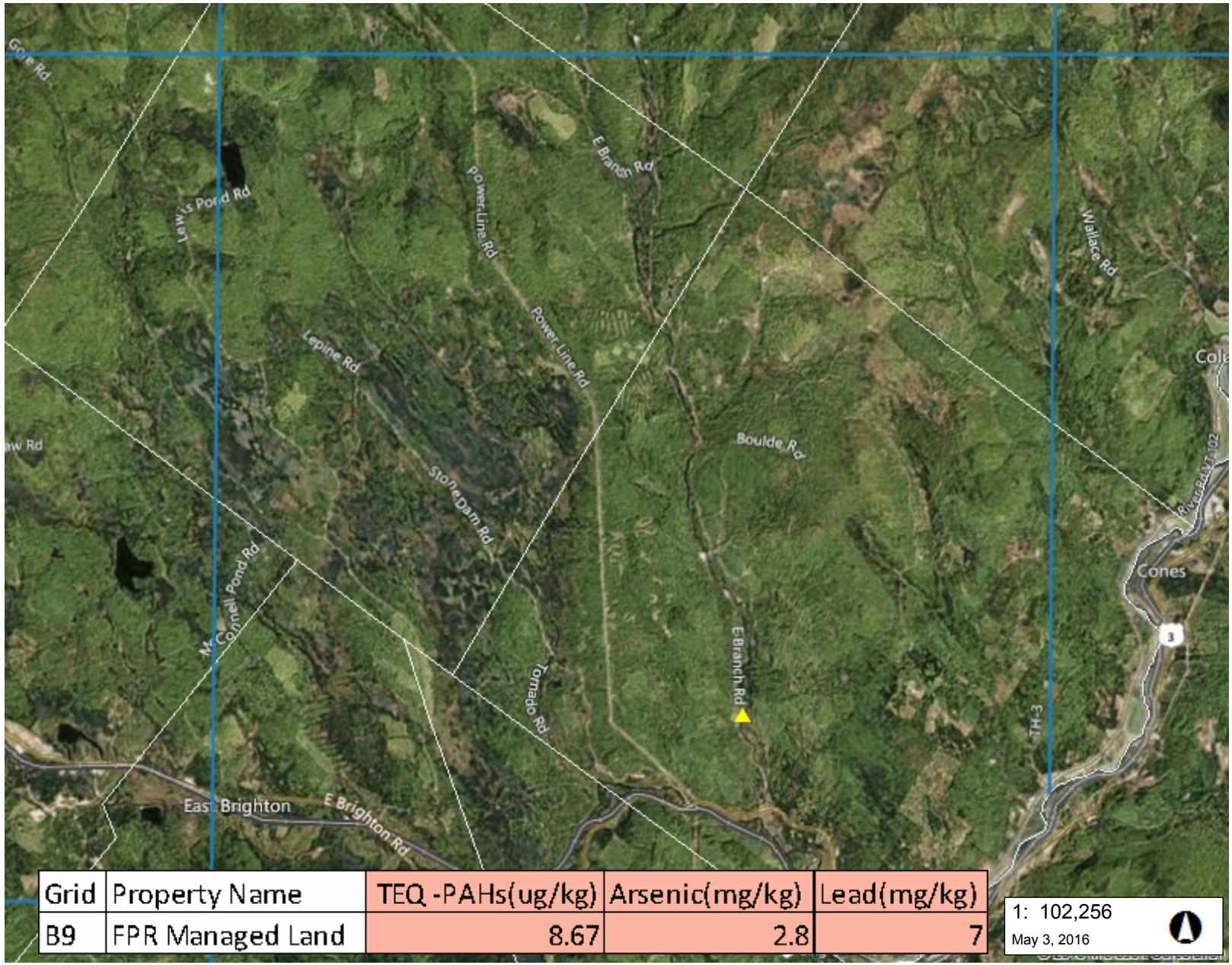
vermont.gov



Grid	Property Name	TEQ -PAHs(ug/kg)	Arsenic(mg/kg)	Lead(mg/kg)
B9	FPR Managed Land	8.67	2.8	7

1: 102,256

May 3, 2016

LEGEND

Town Boundary

Density of Habitable Buildings

- Low
- Medium
- High
- Highest

Sampling Location

NOTES

Location B9 is considered a Non Urban Sample Point

5,195.0 0 2,598.00 5,195.0 Meters

WGS_1984_Web_Mercator_Auxiliary_Sphere 1" = 8521 Ft. 1cm = 1023 Meters

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2015 Surface Soil Survey - Grid C1

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Grid	Property Name	TEQ -PAHs(ug/kg)	Arsenic(mg/kg)	Lead(mg/kg)
C1	Grand Isle State Park	10.05	9.6	24

1: 104,131

May 3, 2016

LEGEND

Town Boundary

Density of Habitable Buildings

- Low
- Medium
- High
- Highest

Sampling Location

NOTES

Location C1 is considered a Non Urban Sample Point

5,290.0 0 2,645.00 5,290.0 Meters

WGS_1984_Web_Mercator_Auxiliary_Sphere 1" = 8678 Ft. 1cm = 1041 Meters

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2015 Surface Soil Survey - Grid C3

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vermont.gov

Grid	Property Name	TEQ -PAHs(ug/kg)	Arsenic(mg/kg)	Lead(mg/kg)
C3	Cambridge Elementary School	14.85	3.9	9.7

1: 102,256

May 3, 2016

LEGEND

Town Boundary

Density of Habitable Buildings

- Low
- Medium
- High
- Highest

Sampling Location

NOTES

Location C3 is considered an Urban Sample Point

5,195.0 0 2,598.00 5,195.0 Meters

WGS_1984_Web_Mercator_Auxiliary_Sphere 1" = 8521 Ft. 1cm = 1023 Meters

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2015 Surface Soil Survey - Grid C4

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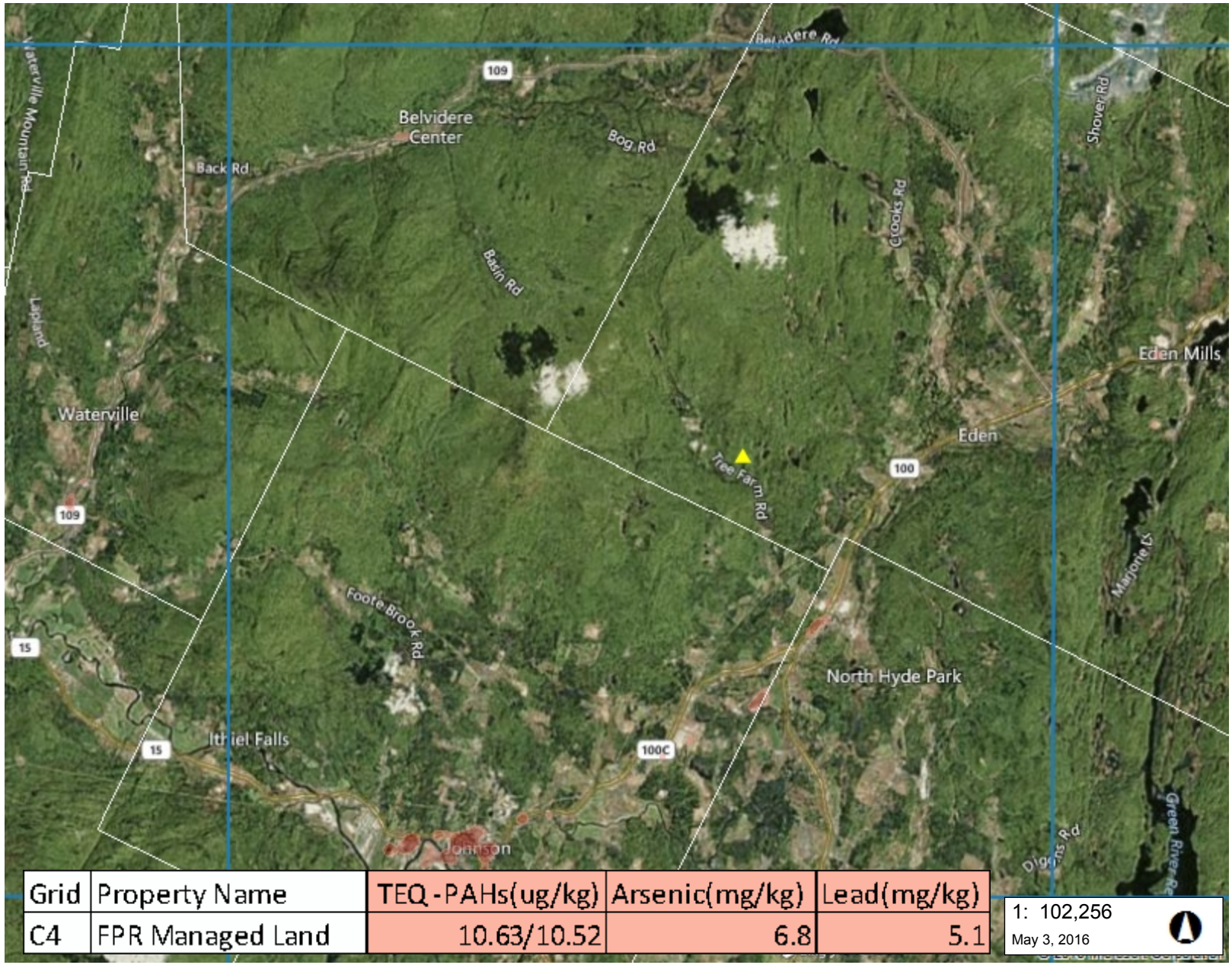

Grid	Property Name	TEQ-PAHs(ug/kg)	Arsenic(mg/kg)	Lead(mg/kg)
C4	FPR Managed Land	10.63/10.52	6.8	5.1

1: 102,256

May 3, 2016

LEGEND

Town Boundary

Density of Habitable Buildings

- Low
- Medium
- High
- Highest

Sampling Location

NOTES

Location C4 is considered a Non Urban Sample Point

5,195.0 0 2,598.00 5,195.0 Meters

WGS_1984_Web_Mercator_Auxiliary_Sphere 1" = 8521 Ft. 1cm = 1023 Meters

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2015 Surface Soil Survey - Grid C5

Vermont Agency of Natural Resources

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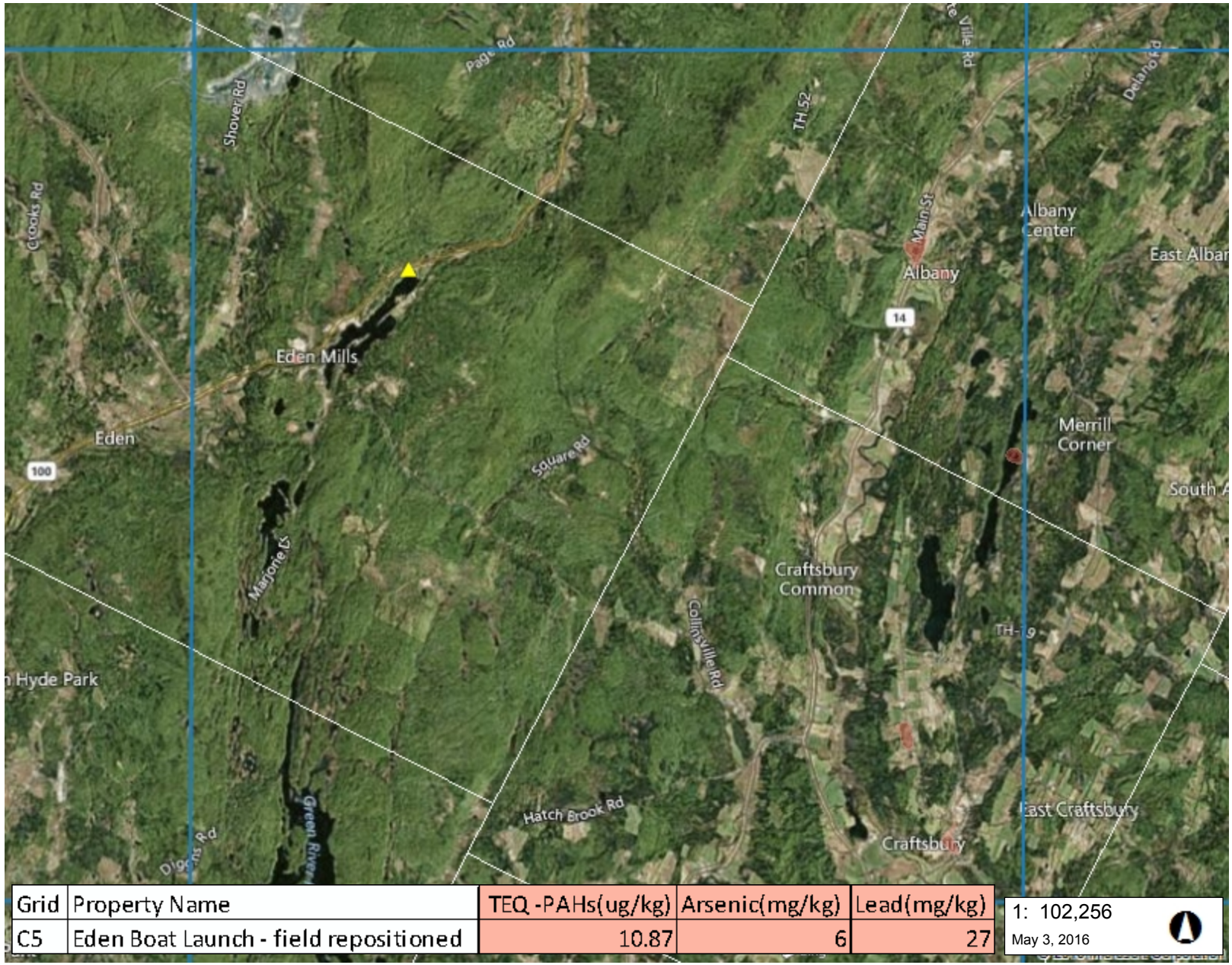

Grid	Property Name	TEQ -PAHs(ug/kg)	Arsenic(mg/kg)	Lead(mg/kg)
C5	Eden Boat Launch - field repositioned	10.87	6	27

1: 102,256

May 3, 2016

LEGEND

Town Boundary

Density of Habitable Buildings

- Low
- Medium
- High
- Highest

Sampling Location

NOTES

Location C5 is considered a Non Urban Sample Point

5,195.0 0 2,598.00 5,195.0 Meters

WGS_1984_Web_Mercator_Auxiliary_Sphere 1" = 8521 Ft. 1cm = 1023 Meters

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2015 Surface Soil Survey - Grid C6

Vermont Agency of Natural Resources

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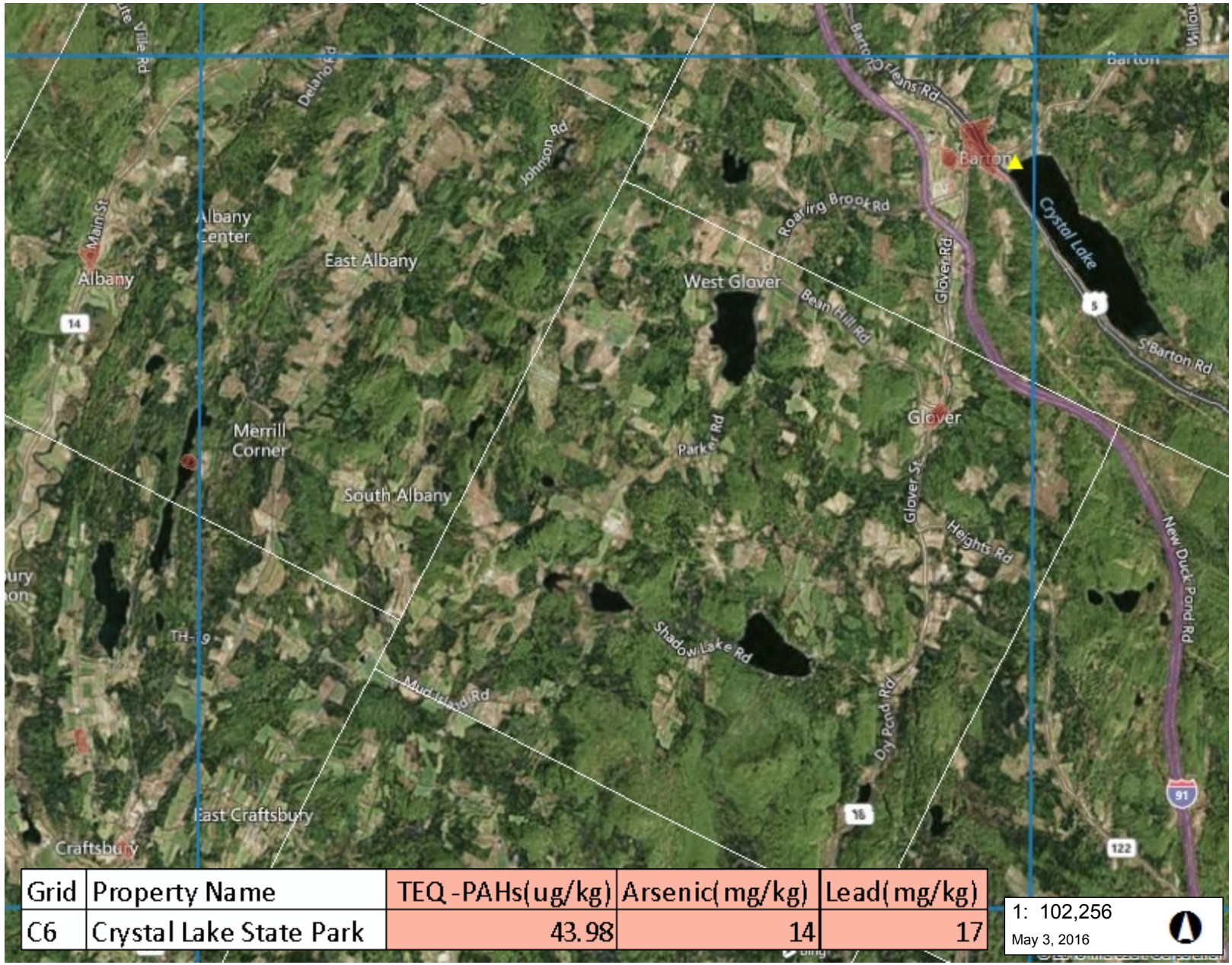

Grid	Property Name	TEQ -PAHs(ug/kg)	Arsenic(mg/kg)	Lead(mg/kg)
C6	Crystal Lake State Park	43.98	14	17

1: 102,256

May 3, 2016

LEGEND

Town Boundary

Density of Habitable Buildings

- Low
- Medium
- High
- Highest

Sampling Location

NOTES

Location C6 is considered a Non Urban Sample Point

5,195.0 0 2,598.00 5,195.0 Meters

WGS_1984_Web_Mercator_Auxiliary_Sphere 1" = 8521 Ft. 1cm = 1023 Meters

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2015 Surface Soil Survey - Grid C7

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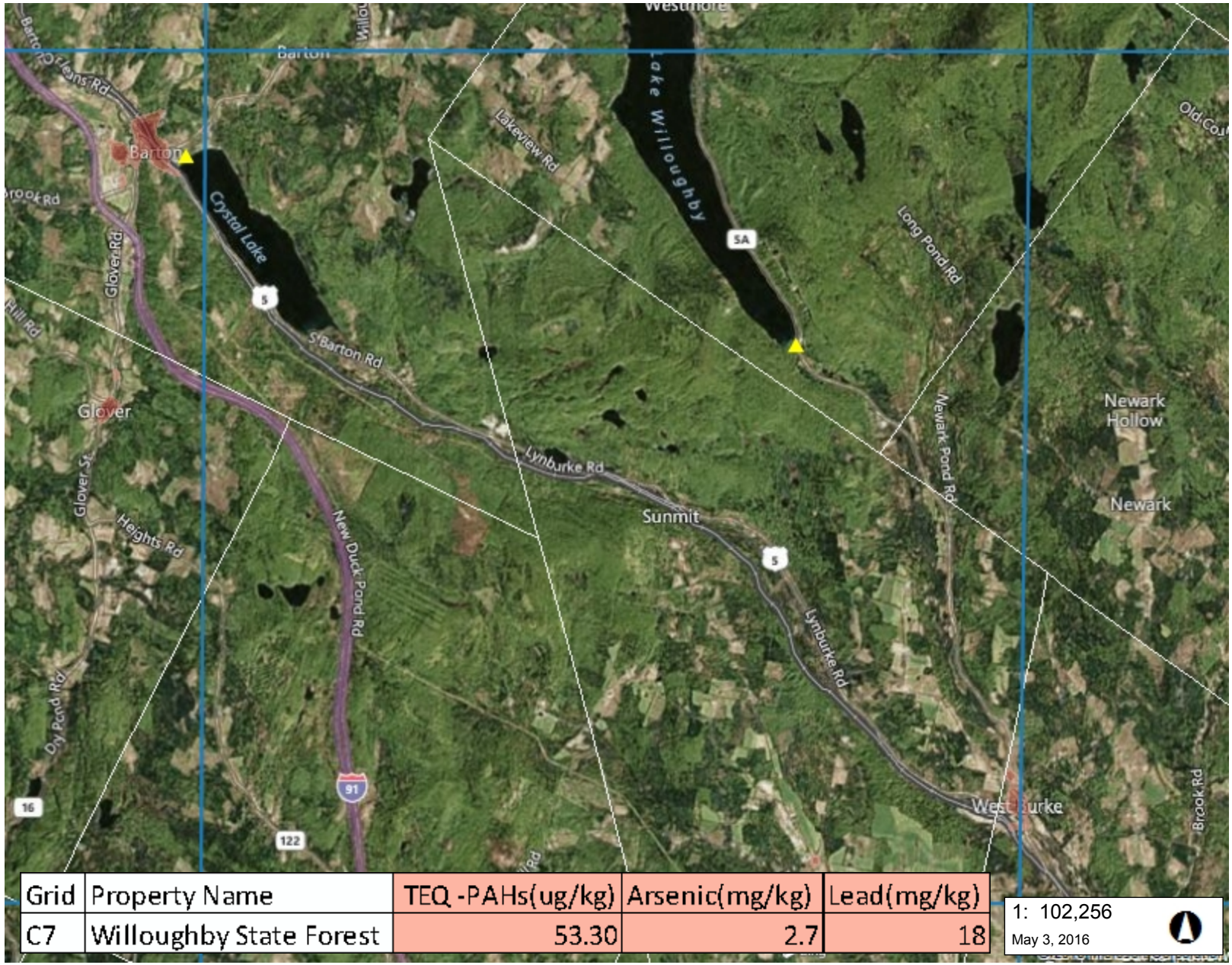

Grid	Property Name	TEQ -PAHs(ug/kg)	Arsenic(mg/kg)	Lead(mg/kg)
C7	Willoughby State Forest	53.30	2.7	18

1: 102,256

May 3, 2016

LEGEND

Town Boundary

Density of Habitable Buildings

- Low
- Medium
- High
- Highest

Sampling Location

NOTES

Location C7 is considered a Non Urban Sample Point

5,195.0 0 2,598.00 5,195.0 Meters

WGS_1984_Web_Mercator_Auxiliary_Sphere 1" = 8521 Ft. 1cm = 1023 Meters

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2015 Surface Soil Survey - Grid C8

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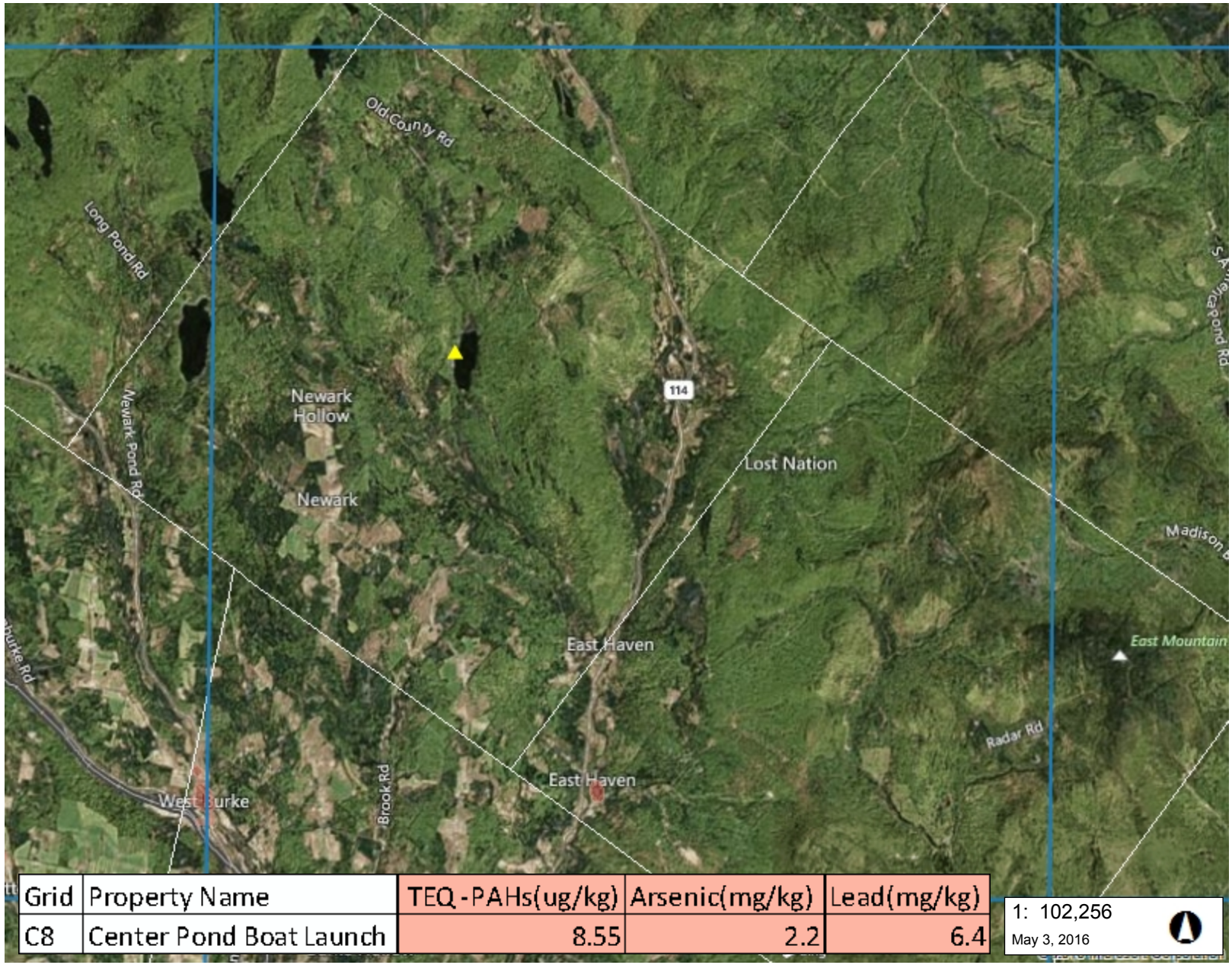

Grid	Property Name	TEQ-PAHs(ug/kg)	Arsenic(mg/kg)	Lead(mg/kg)
C8	Center Pond Boat Launch	8.55	2.2	6.4

1: 102,256

May 3, 2016

LEGEND

Town Boundary

Density of Habitable Buildings

- Low
- Medium
- High
- Highest

Sampling Location

NOTES

Location C8 is considered a Non Urban Sample Point

5,195.0 0 2,598.00 5,195.0 Meters

WGS_1984_Web_Mercator_Auxiliary_Sphere 1" = 8521 Ft. 1cm = 1023 Meters

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2015 Surface Soil Survey - Grid C9

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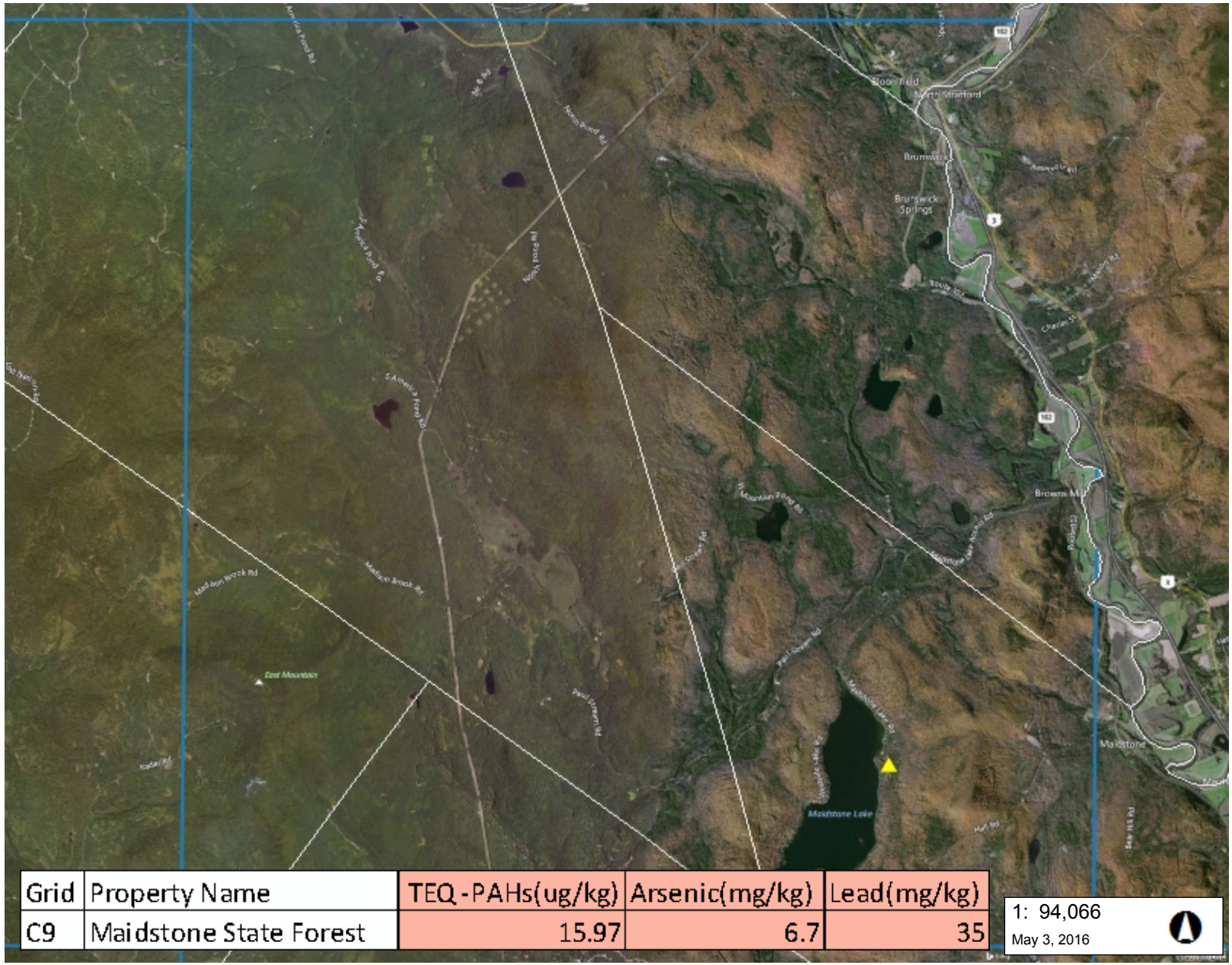

Grid	Property Name	TEQ-PAHs(ug/kg)	Arsenic(mg/kg)	Lead(mg/kg)
C9	Maidstone State Forest	15.97	6.7	35

1: 94,066

May 3, 2016

LEGEND

Town Boundary

Density of Habitable Buildings

- Low
- Medium
- High
- Highest

Sampling Location

NOTES

Location C9 is considered a Non Urban Sample Point

4,779.0 0 2,390.00 4,779.0 Meters

WGS_1984_Web_Mercator_Auxiliary_Sphere 1" = 7839 Ft. 1cm = 941 Meters

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2015 Surface Soil Survey - Grid D1

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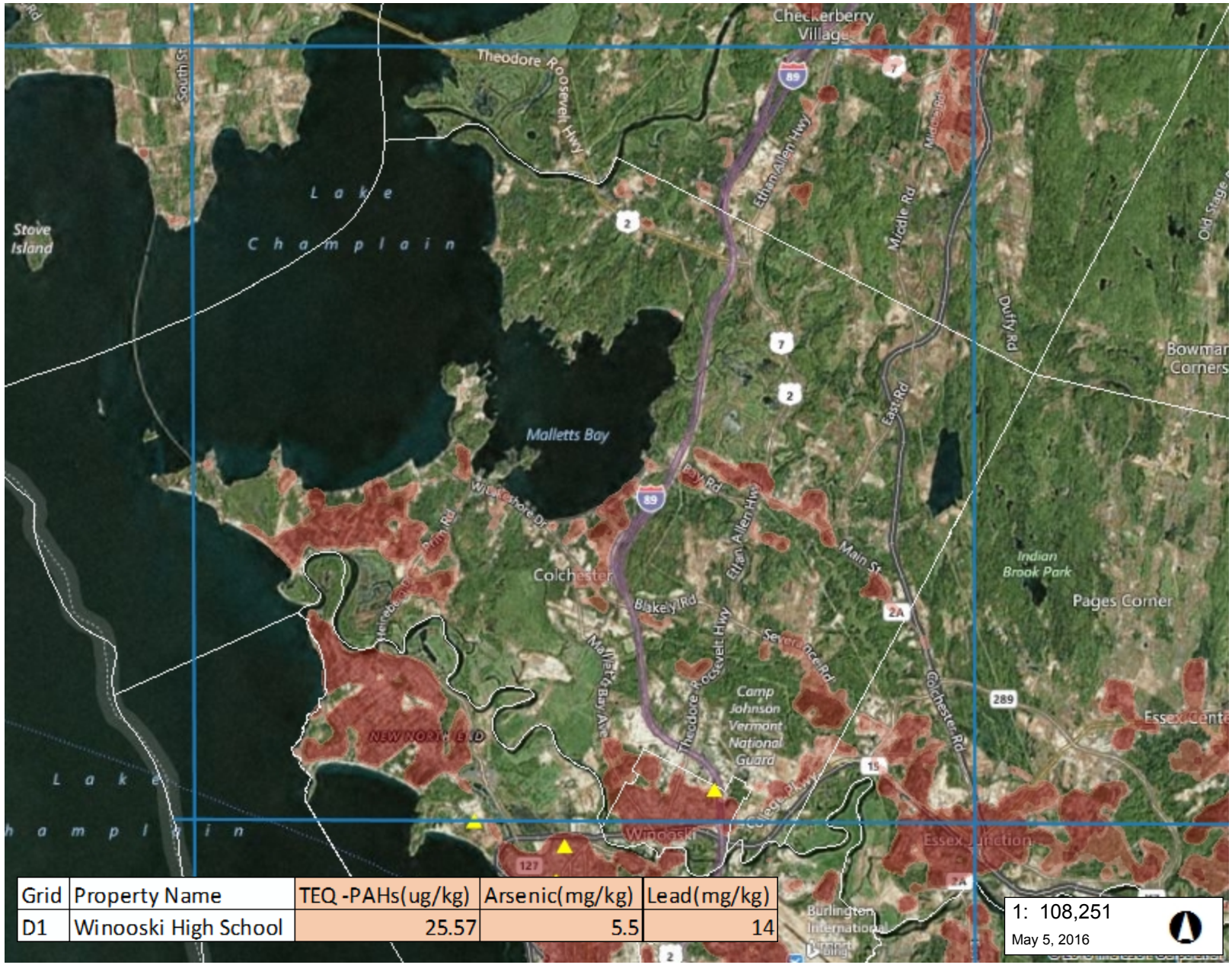

Grid	Property Name	TEQ -PAHs(ug/kg)	Arsenic(mg/kg)	Lead(mg/kg)
D1	Winooski High School	25.57	5.5	14

1: 108,251

May 5, 2016

LEGEND

Town Boundary

Density of Habitable Buildings

- Low
- Medium
- High
- Highest

Sampling Location

NOTES

Location D1 is considered an Urban Sample Point.

5,499.0 0 2,750.00 5,499.0 Meters

WGS_1984_Web_Mercator_Auxiliary_Sphere 1" = 9021 Ft. 1cm = 1083 Meters

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2015 Surface Soil Survey - Grid D3

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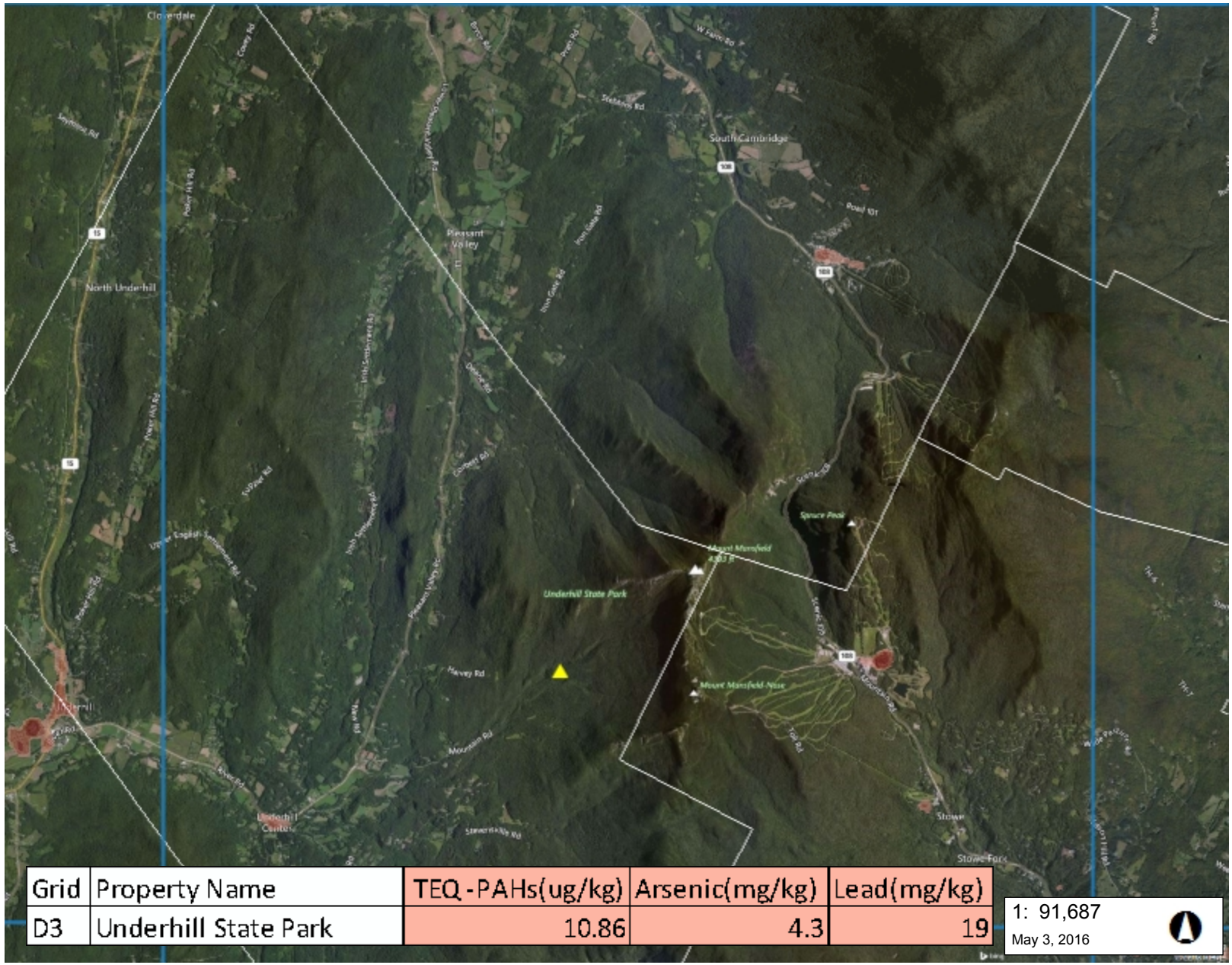

Grid	Property Name	TEQ-PAHs(ug/kg)	Arsenic(mg/kg)	Lead(mg/kg)
D3	Underhill State Park	10.86	4.3	19

1: 91,687

May 3, 2016

LEGEND

Town Boundary

Density of Habitable Buildings

- Low
- Medium
- High
- Highest

Sampling Location

NOTES

Location D3 is considered a Non Urban Sample Point

4,658.0 0 2,329.00 4,658.0 Meters

WGS_1984_Web_Mercator_Auxiliary_Sphere 1" = 7641 Ft. 1cm = 917 Meters

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2015 Surface Soil Survey - Grid D4

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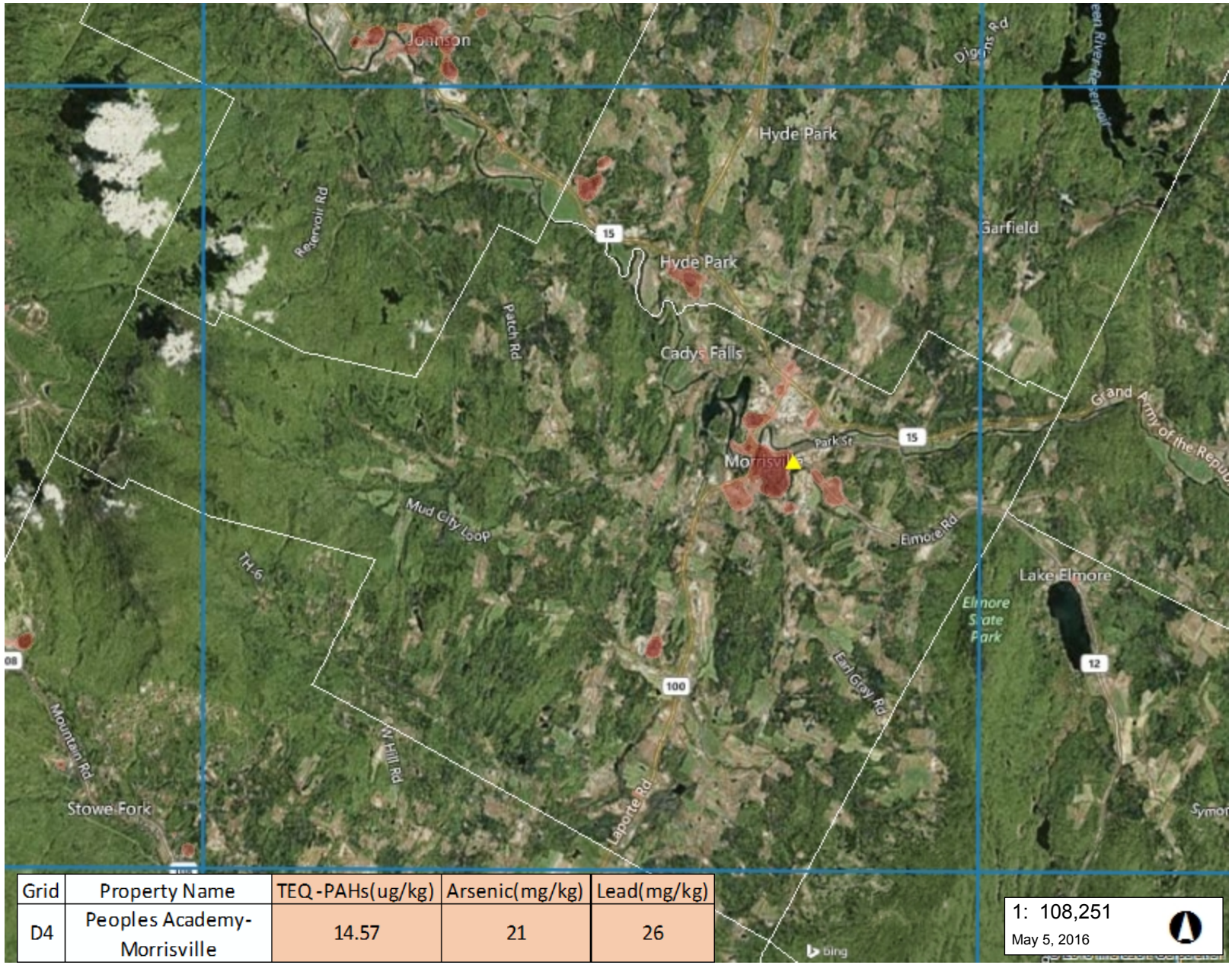

Grid	Property Name	TEQ -PAHs(ug/kg)	Arsenic(mg/kg)	Lead(mg/kg)
D4	Peoples Academy-Morrisville	14.57	21	26

1: 108,251

May 5, 2016

LEGEND

Town Boundary

Density of Habitable Buildings

- Low
- Medium
- High
- Highest

Sampling Location

NOTES

Location D4 is considered an Urban Sample Point.

5,499.0 0 2,750.00 5,499.0 Meters

WGS_1984_Web_Mercator_Auxiliary_Sphere 1" = 9021 Ft. 1cm = 1083 Meters

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2015 Surface Soil Survey - Grid D5

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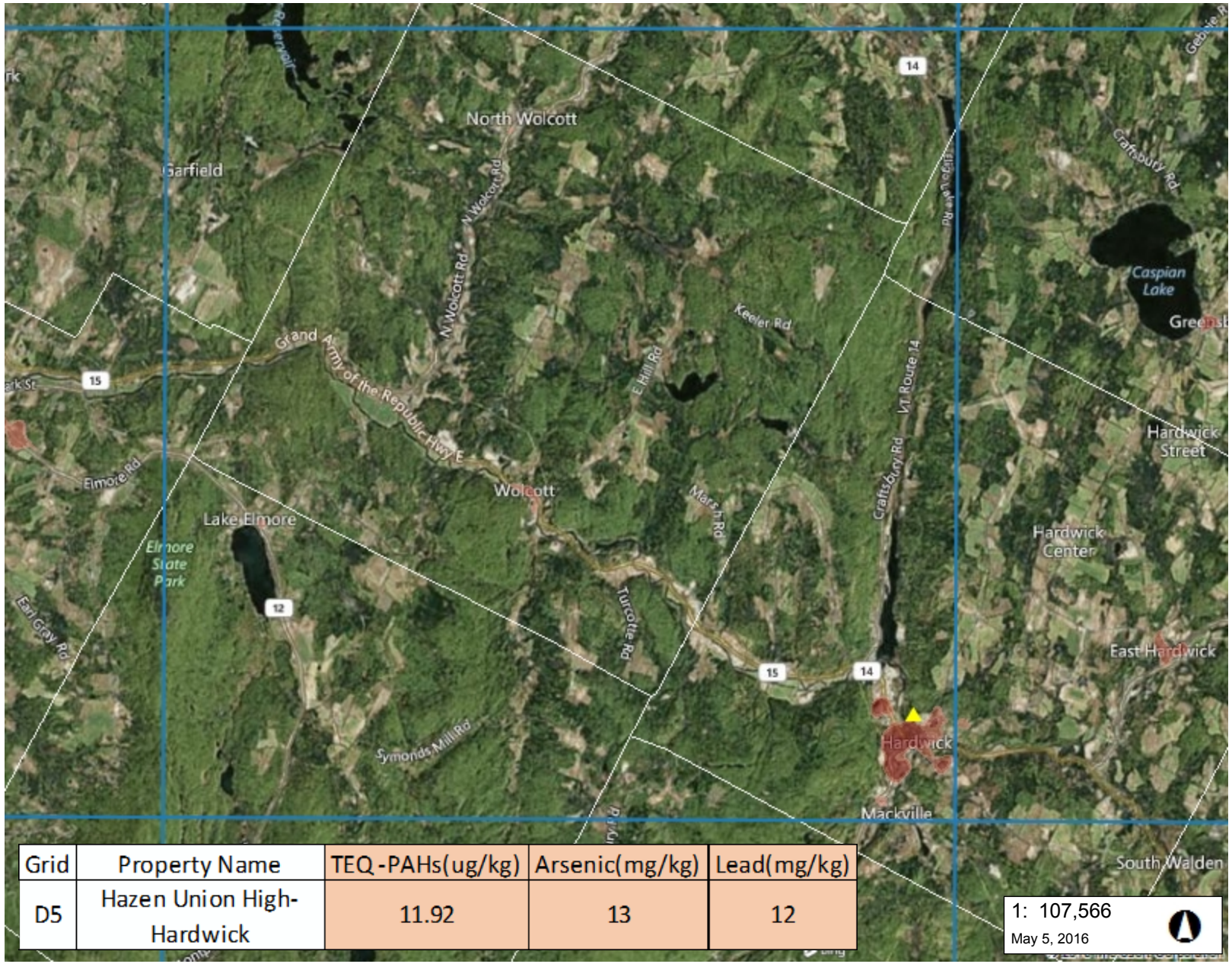

Grid	Property Name	TEQ-PAHs(ug/kg)	Arsenic(mg/kg)	Lead(mg/kg)
D5	Hazen Union High-Hardwick	11.92	13	12

1: 107,566

May 5, 2016

LEGEND

Town Boundary

Density of Habitable Buildings

- Low
- Medium
- High
- Highest

Sampling Location

NOTES

Location D5 is considered an Urban Sample Point.

5,464.0 0 2,732.00 5,464.0 Meters

WGS_1984_Web_Mercator_Auxiliary_Sphere 1" = 8964 Ft. 1cm = 1076 Meters

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2015 Surface Soil Survey - Grid D6

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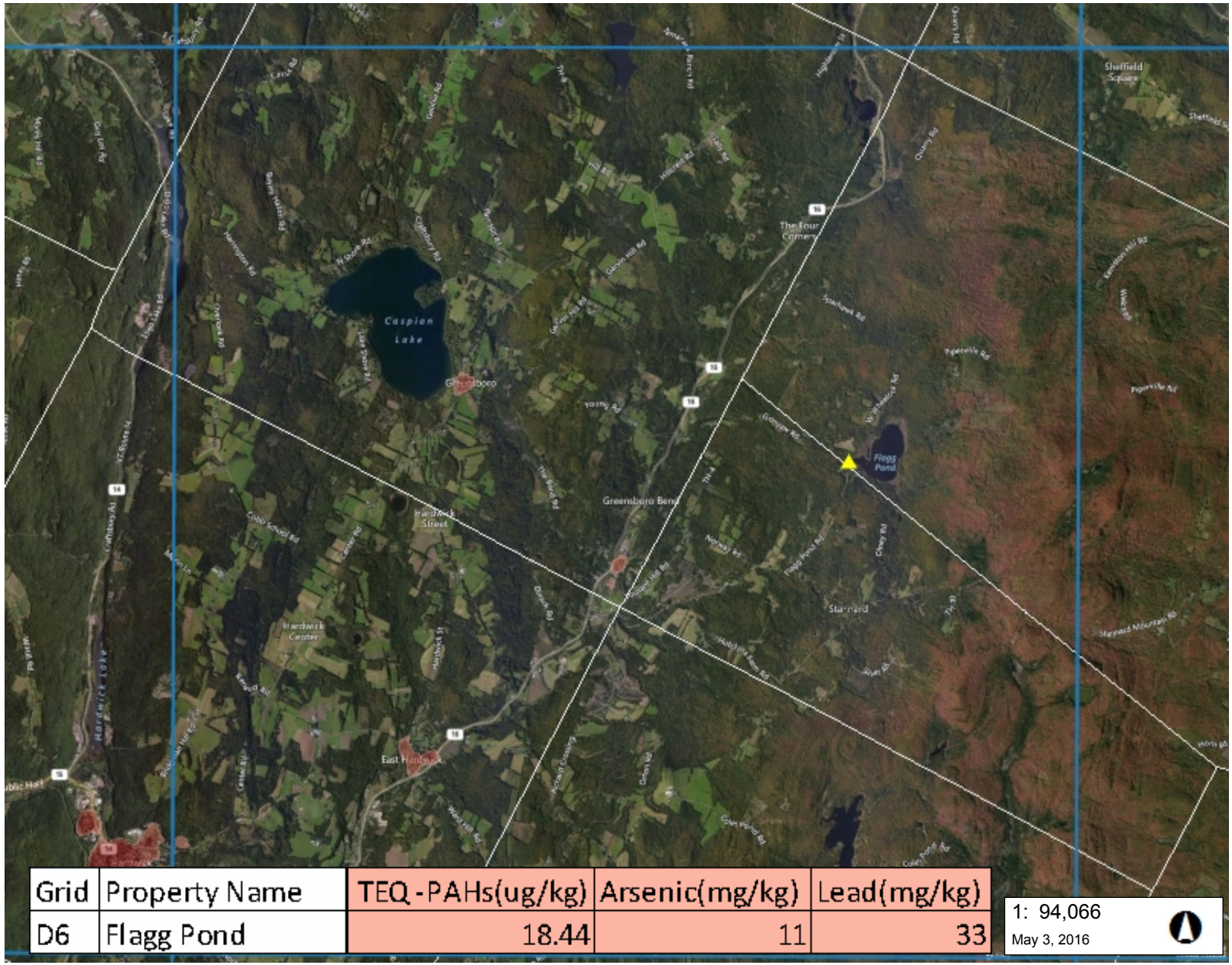

Grid	Property Name	TEQ-PAHs(ug/kg)	Arsenic(mg/kg)	Lead(mg/kg)
D6	Flagg Pond	18.44	11	33

1: 94,066

May 3, 2016

LEGEND

Town Boundary

Density of Habitable Buildings

- Low
- Medium
- High
- Highest

Sampling Location

NOTES

Location D6 is considered a Non Urban Sample Point

4,779.0 0 2,390.00 4,779.0 Meters

WGS_1984_Web_Mercator_Auxiliary_Sphere 1" = 7839 Ft. 1cm = 941 Meters

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2015 Surface Soil Survey - Grid D7

Vermont Agency of Natural Resources

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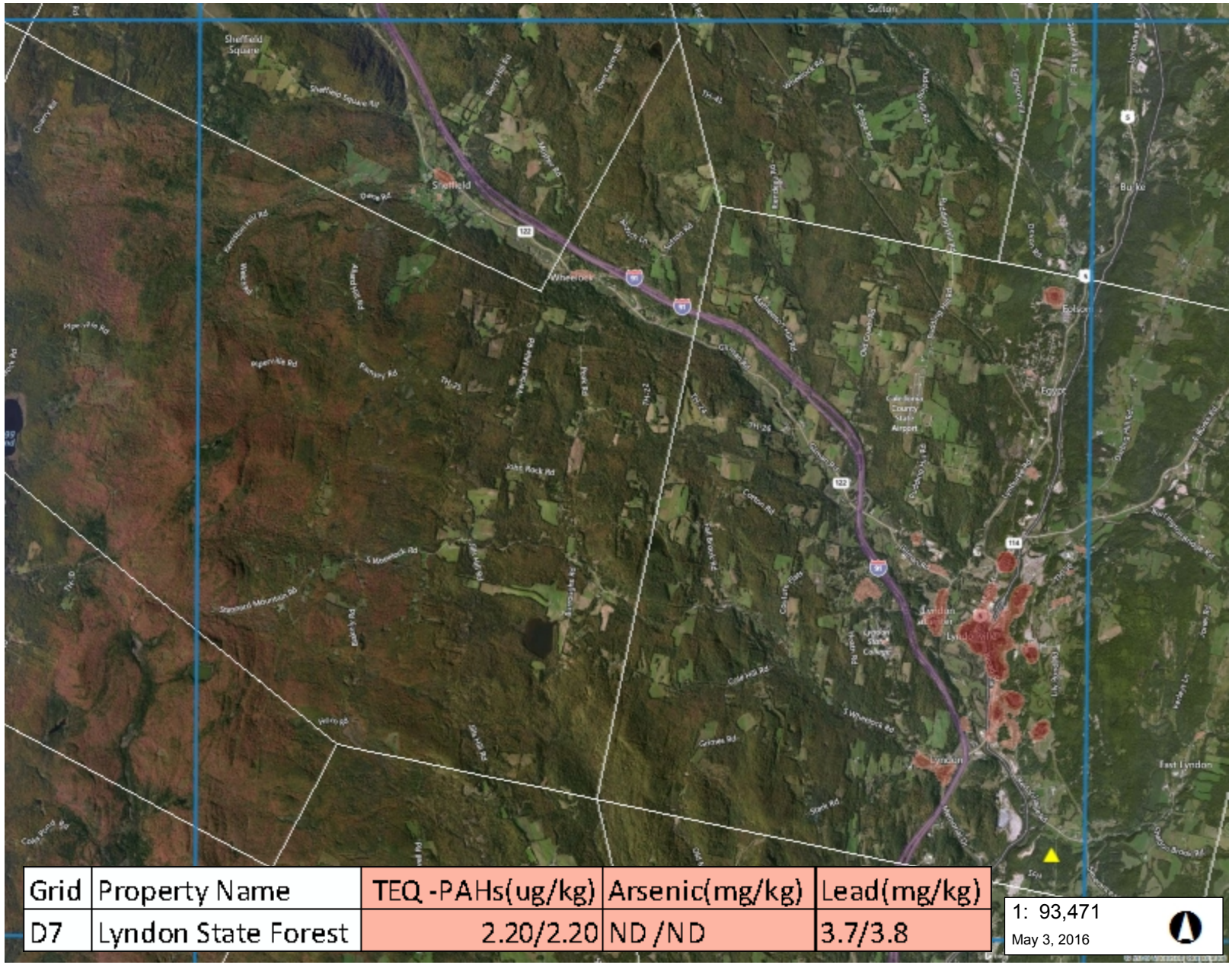

Grid	Property Name	TEQ -PAHs(ug/kg)	Arsenic(mg/kg)	Lead(mg/kg)
D7	Lyndon State Forest	2.20/2.20	ND /ND	3.7/3.8

1: 93,471

May 3, 2016

LEGEND

Town Boundary

Density of Habitable Buildings

- Low
- Medium
- High
- Highest

Sampling Location

NOTES

Location D7 is considered a Non Urban Sample Point

4,748.0 0 2,374.00 4,748.0 Meters

WGS_1984_Web_Mercator_Auxiliary_Sphere 1" = 7789 Ft. 1cm = 935 Meters

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2015 Surface Soil Survey - Grid D8

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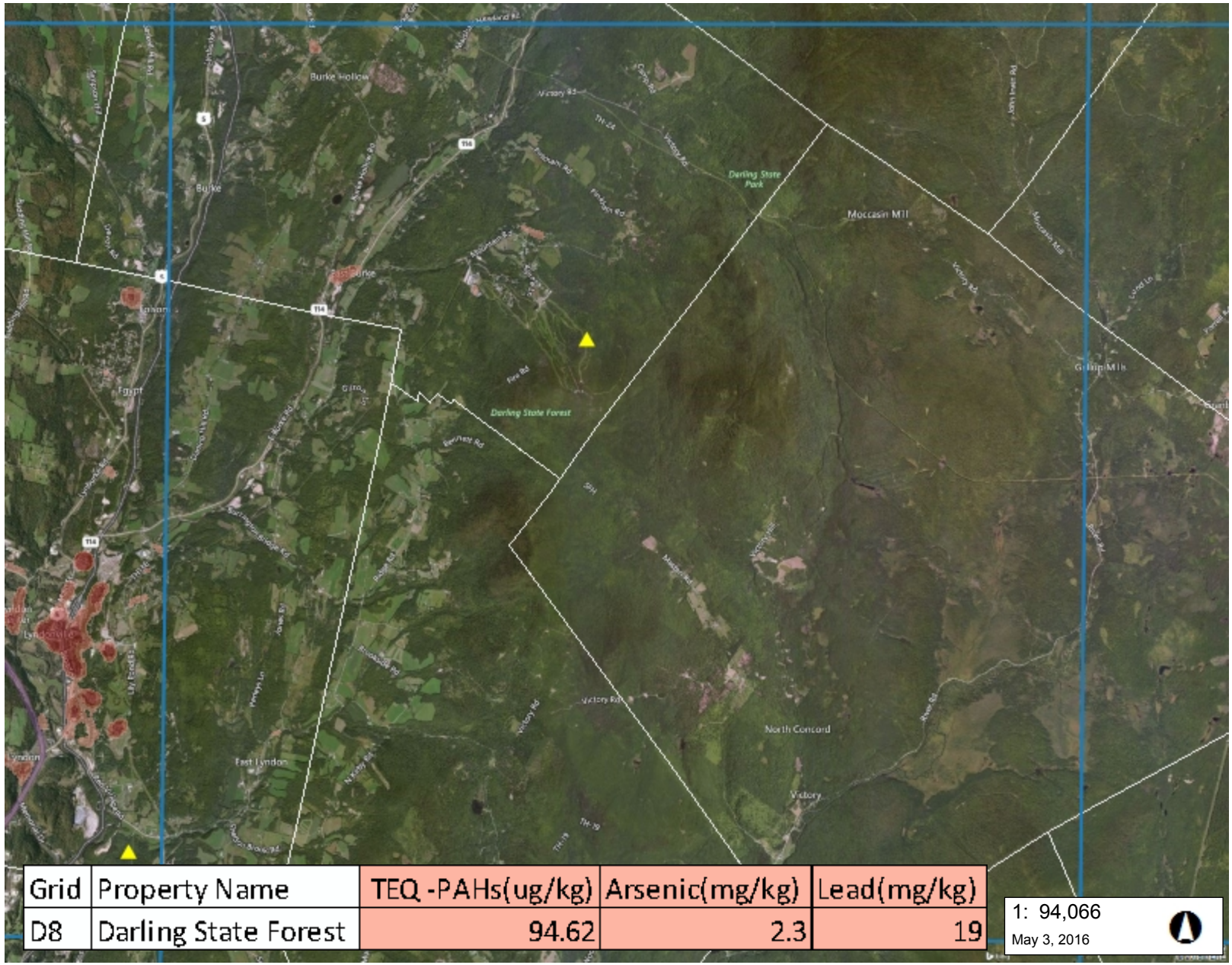

Grid	Property Name	TEQ -PAHs(ug/kg)	Arsenic(mg/kg)	Lead(mg/kg)
D8	Darling State Forest	94.62	2.3	19

1: 94,066

May 3, 2016

LEGEND

Town Boundary

Density of Habitable Buildings

- Low
- Medium
- High
- Highest

Sampling Location

NOTES

Location D8 is considered a Non Urban Sample Point

4,779.0 0 2,390.00 4,779.0 Meters

WGS_1984_Web_Mercator_Auxiliary_Sphere 1" = 7839 Ft. 1cm = 941 Meters

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2015 Surface Soil Survey - Grid D9

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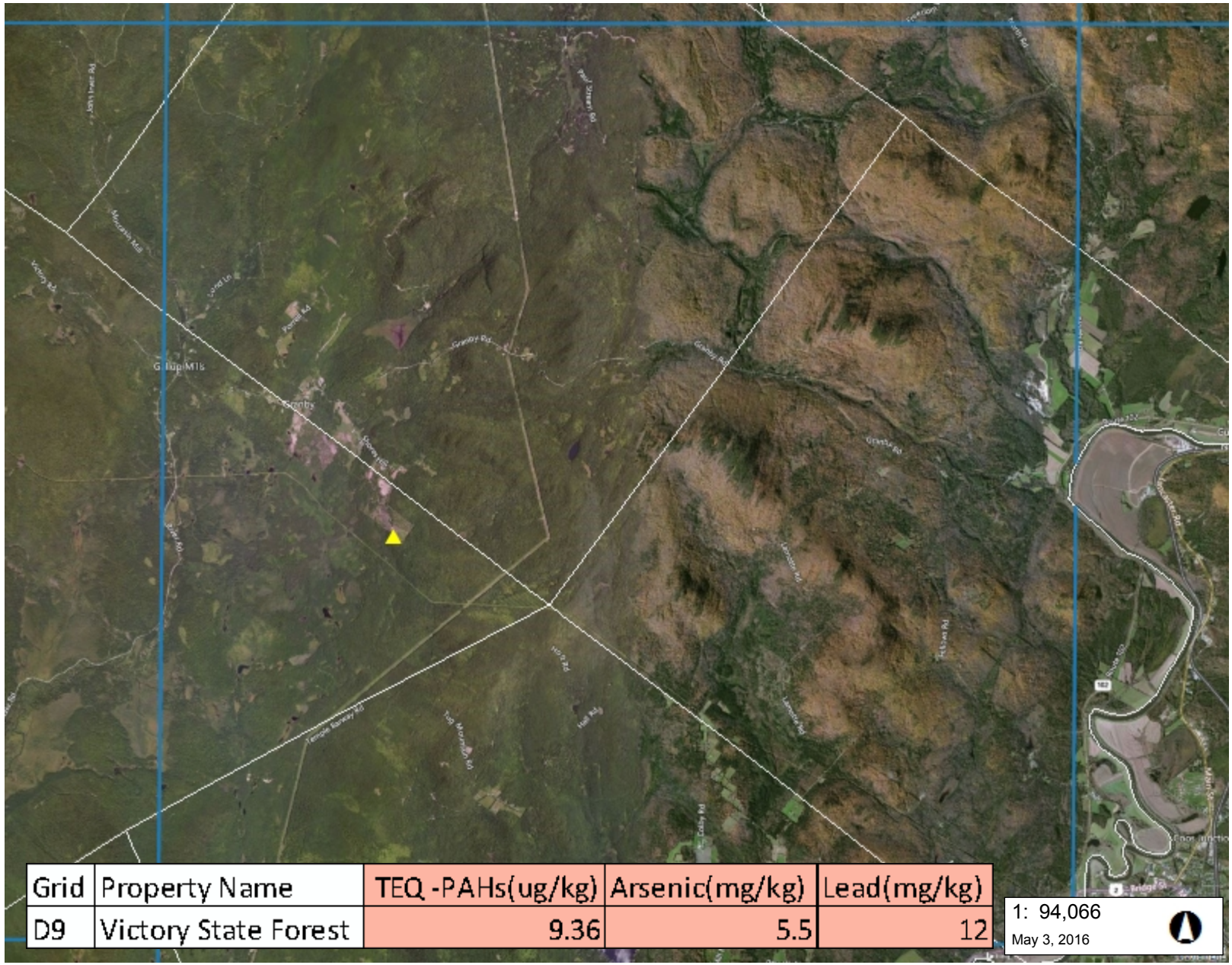

Grid	Property Name	TEQ -PAHs(ug/kg)	Arsenic(mg/kg)	Lead(mg/kg)
D9	Victory State Forest	9.36	5.5	12

1: 94,066

May 3, 2016

LEGEND

Town Boundary

Density of Habitable Buildings

- Low
- Medium
- High
- Highest

Sampling Location

NOTES

Location D9 is considered a Non Urban Sample Point

4,779.0 0 2,390.00 4,779.0 Meters

WGS_1984_Web_Mercator_Auxiliary_Sphere 1" = 7839 Ft. 1cm = 941 Meters

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2015 Surface Soil Survey - Grid E1

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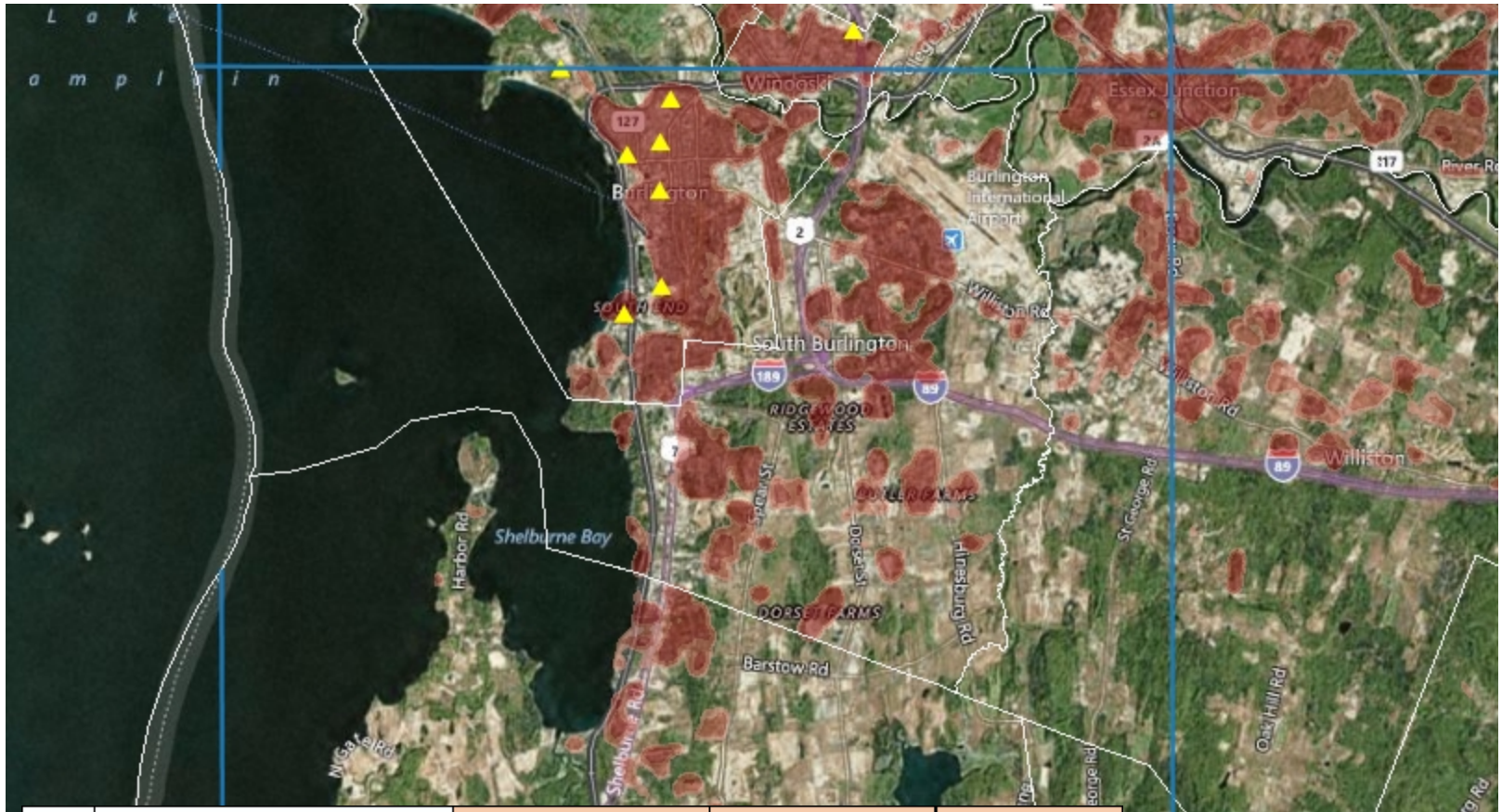

Grid	Property Name	TEQ -PAHs(ug/kg)	Arsenic(mg/kg)	Lead(mg/kg)
E1	Callahan Park-Burlington	99.44	8.9	32
E1a	Lakeview Cementery	24.27	8.8	20
E1b	Elmwood Cementery	306	6.4	67
E1c	Battery Park	86.13	6.2	42
E1d	City Hall Park	160.14	6.7	26
E1e	Lakeside Park	98.84	4.6	42
E1f	Roosevelt Park	124.83	5.6	30

1: 108,251

May 5, 2016

LEGEND

Town Boundary

Density of Habitable Buildings

- Low
- Medium
- High
- Highest

Sampling Location

NOTES

Location E1, E1a, E1b, E1c, E1d, E1e, E1f are considered Urban Sample Points.

5,499.0 0 2,750.00 5,499.0 Meters

WGS_1984_Web_Mercator_Auxiliary_Sphere 1" = 9021 Ft. 1cm = 1083 Meters

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2015 Surface Soil Survey - Grid E2

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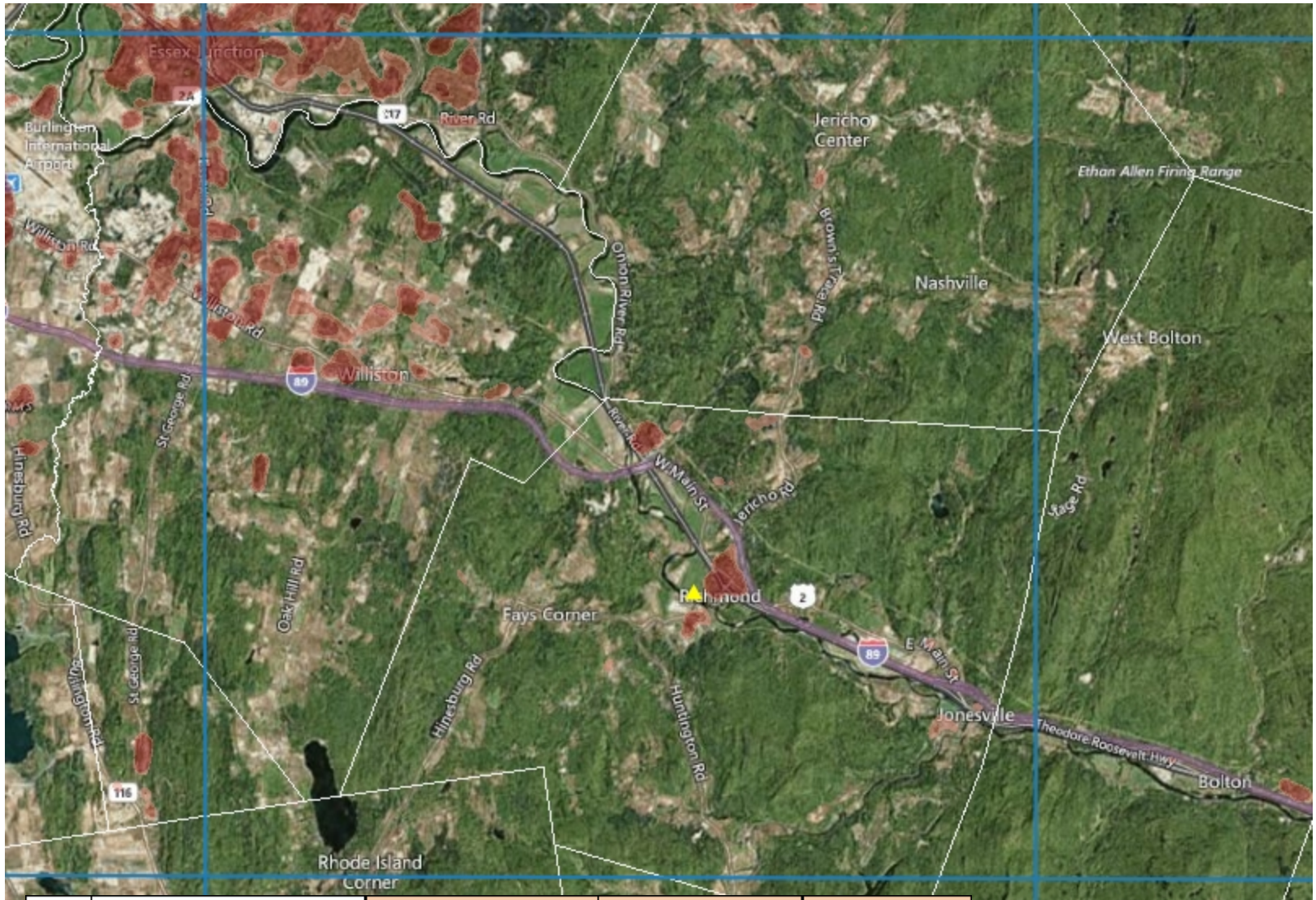

Grid	Property Name	TEQ -PAHs(ug/kg)	Arsenic(mg/kg)	Lead(mg/kg)
E2	Richmond Volunteer's Green	17.87	6.2	15

1: 108,251

May 5, 2016

LEGEND

Town Boundary

Density of Habitable Buildings

- Low
- Medium
- High
- Highest

Sampling Location

NOTES

Location E2 are considered Urban Sample Points.

5,499.0 0 2,750.00 5,499.0 Meters

WGS_1984_Web_Mercator_Auxiliary_Sphere 1" = 9021 Ft. 1cm = 1083 Meters

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2015 Surface Soil Survey - Grid E3

Vermont Agency of Natural Resources

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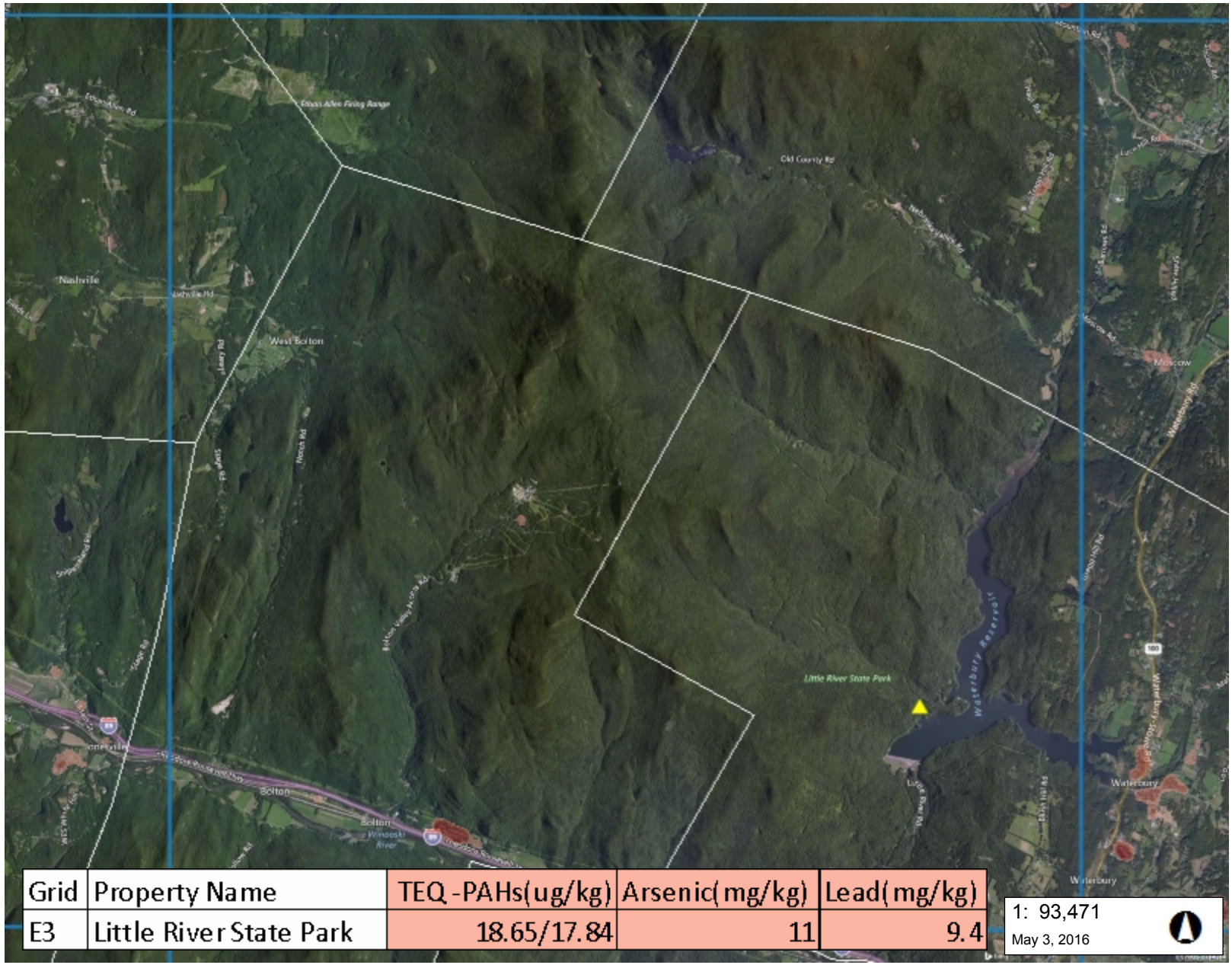

Grid	Property Name	TEQ -PAHs(ug/kg)	Arsenic(mg/kg)	Lead(mg/kg)
E3	Little River State Park	18.65/17.84	11	9.4

1: 93,471

May 3, 2016

LEGEND

Town Boundary

Density of Habitable Buildings

- Low
- Medium
- High
- Highest

Sampling Location

NOTES

Location E3 is considered a Non Urban Sample Point

4,748.0 0 2,374.00 4,748.0 Meters

WGS_1984_Web_Mercator_Auxiliary_Sphere 1" = 7789 Ft. 1cm = 935 Meters

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2015 Surface Soil Survey - Grid E4

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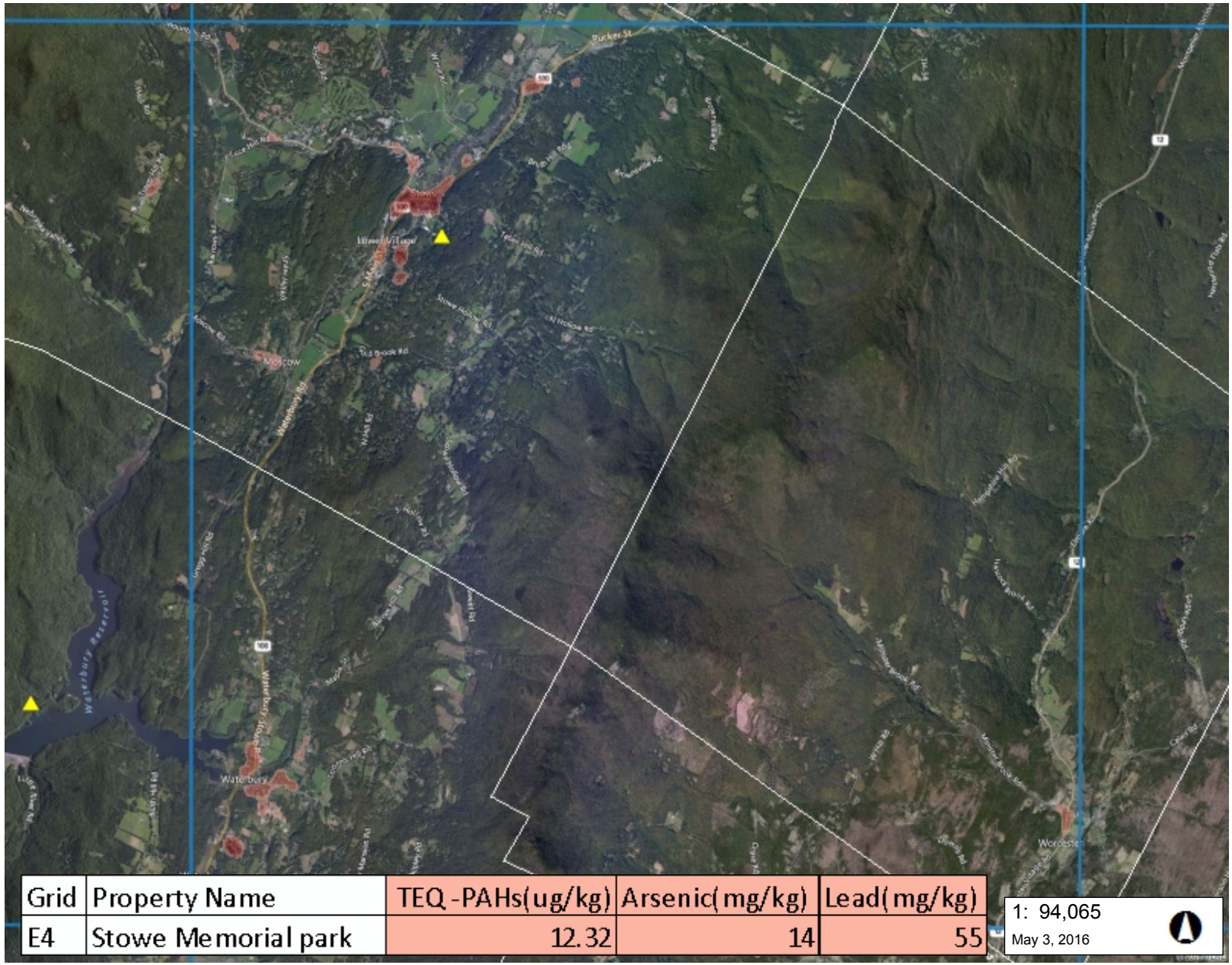

Grid	Property Name	TEQ -PAHs(ug/kg)	Arsenic(mg/kg)	Lead(mg/kg)
E4	Stowe Memorial park	12.32	14	55

1: 94,065

May 3, 2016

LEGEND

Town Boundary

Density of Habitable Buildings

- Low
- Medium
- High
- Highest

Sampling Location

NOTES

Location E4 is considered a Non Urban Sample Point

4,778.0 0 2,389.00 4,778.0 Meters

WGS_1984_Web_Mercator_Auxiliary_Sphere 1" = 7839 Ft. 1cm = 941 Meters

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2015 Surface Soil Survey - Grid E4

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Grid	Property Name	TEQ -PAHs(ug/kg)	Arsenic(mg/kg)	Lead(mg/kg)
E4a	Cady Hill Forest	2.68	17	8.9

LEGEND

Town Boundary

Density of Habitable Buildings

- Low
- Medium
- High
- Highest

Sampling Location

NOTES

Location E4a is considered an Urban Sample Point.

5,499.0 0 2,750.00 5,499.0 Meters

WGS_1984_Web_Mercator_Auxiliary_Sphere 1" = 9021 Ft. 1cm = 1083 Meters

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2015 Surface Soil Survey - Grid E5

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Grid	Property Name	TEQ-PAHs(ug/kg)	Arsenic(mg/kg)	Lead(mg/kg)
E5	Buck Lake WMA	8.90	10	6.4

1: 93,471

May 3, 2016

LEGEND

Town Boundary

Density of Habitable Buildings

- Low
- Medium
- High
- Highest

Sampling Location

NOTES

Location E5 is considered a Non Urban Sample Point

4,748.0 0 2,374.00 4,748.0 Meters

WGS_1984_Web_Mercator_Auxiliary_Sphere 1" = 7789 Ft. 1cm = 935 Meters

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2015 Surface Soil Survey - Grid E6

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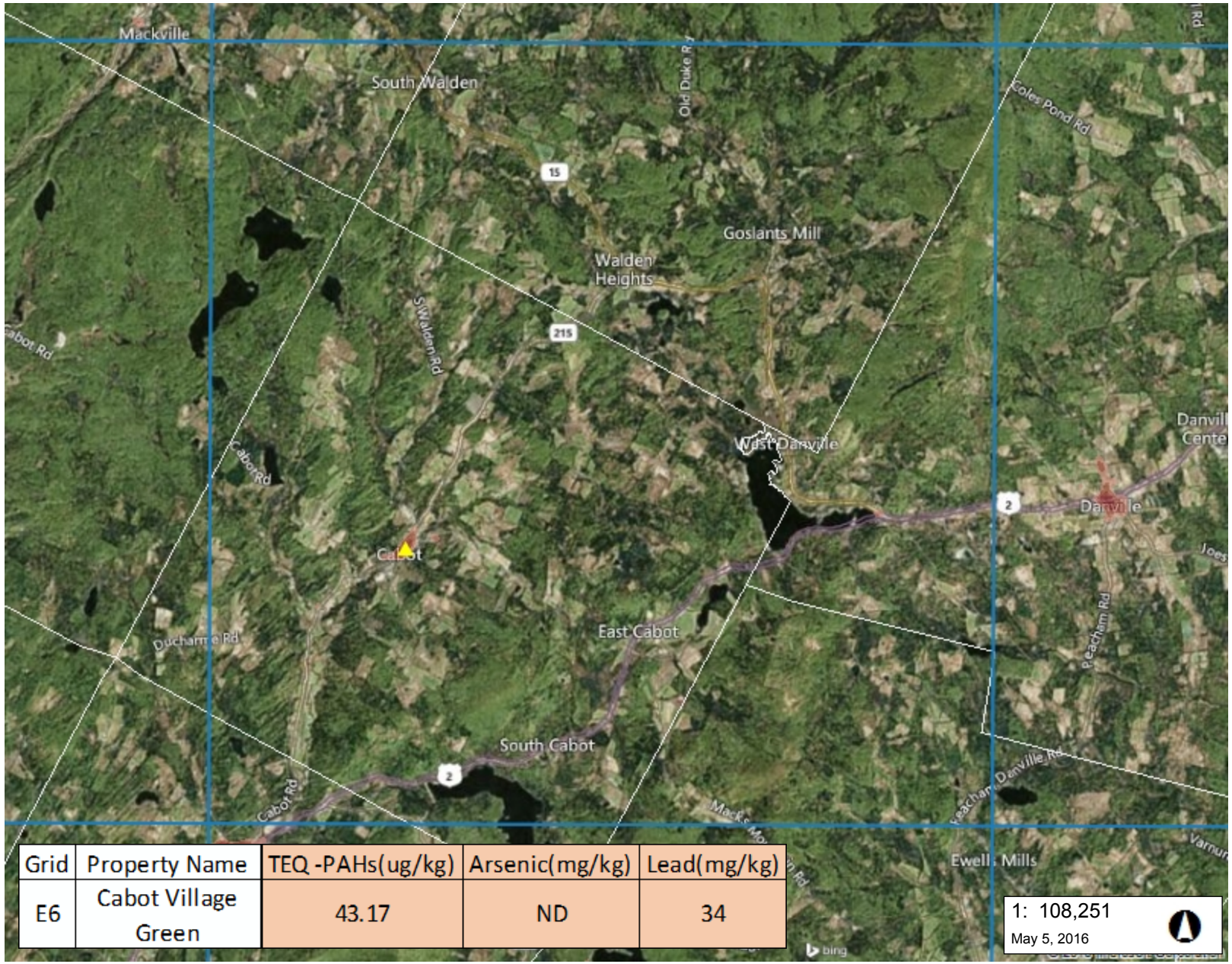

Grid	Property Name	TEQ -PAHs(ug/kg)	Arsenic(mg/kg)	Lead(mg/kg)
E6	Cabot Village Green	43.17	ND	34

LEGEND

Town Boundary

Density of Habitable Buildings

- Low
- Medium
- High
- Highest

Sampling Location

NOTES

Location E6 is considered an Urban Sample Point.

5,499.0 0 2,750.00 5,499.0 Meters

WGS_1984_Web_Mercator_Auxiliary_Sphere 1" = 9021 Ft. 1cm = 1083 Meters

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2015 Surface Soil Survey - Grid E7

Vermont Agency of Natural Resources

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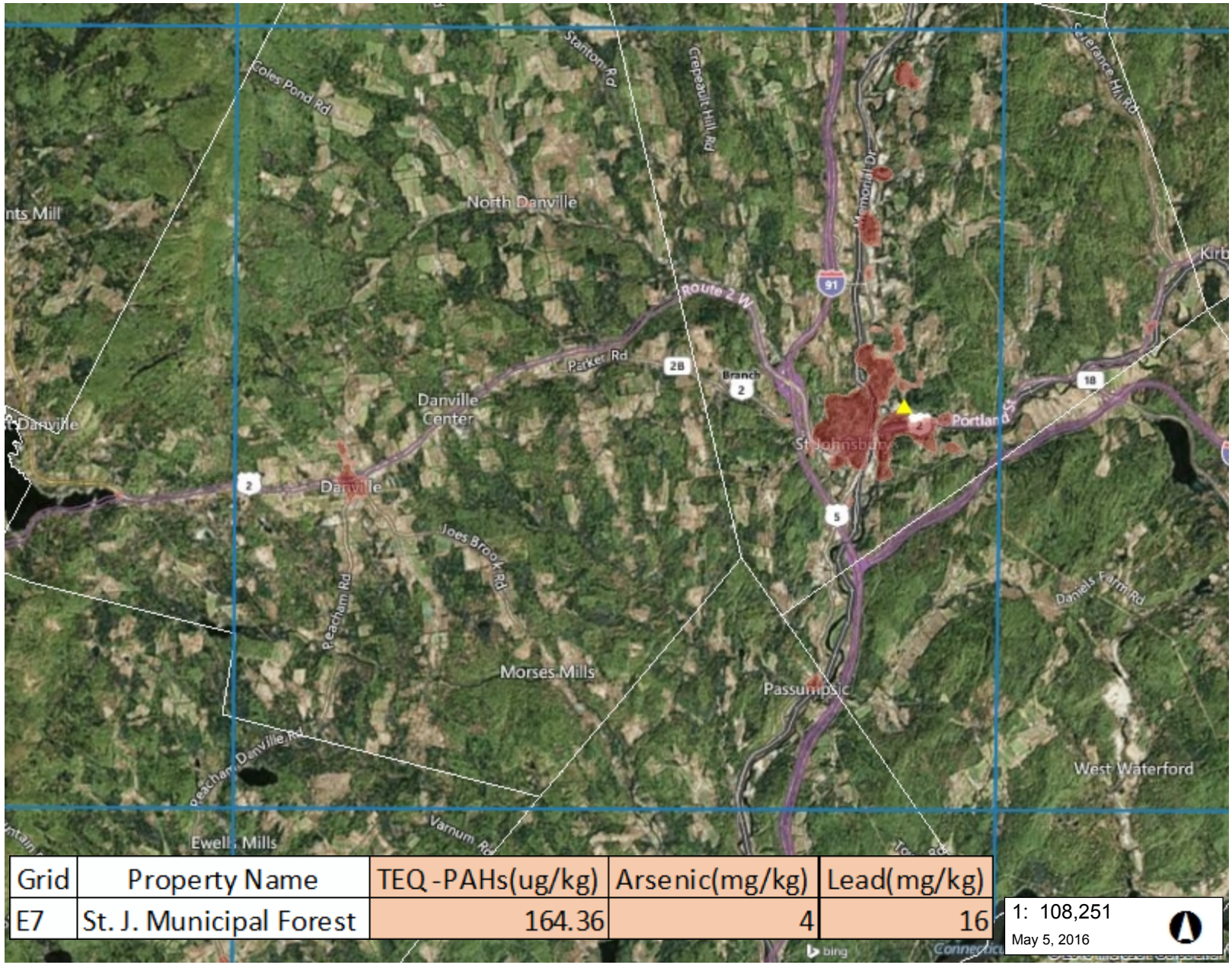

Grid	Property Name	TEQ -PAHs(ug/kg)	Arsenic(mg/kg)	Lead(mg/kg)
E7	St. J. Municipal Forest	164.36	4	16

1: 108,251

May 5, 2016

LEGEND

Town Boundary

Density of Habitable Buildings

- Low
- Medium
- High
- Highest

Sampling Location

NOTES

Location E7 is considered an Urban Sample Point.

5,499.0 0 2,750.00 5,499.0 Meters

WGS_1984_Web_Mercator_Auxiliary_Sphere 1" = 9021 Ft. 1cm = 1083 Meters

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2015 Surface Soil Survey - Grid E8

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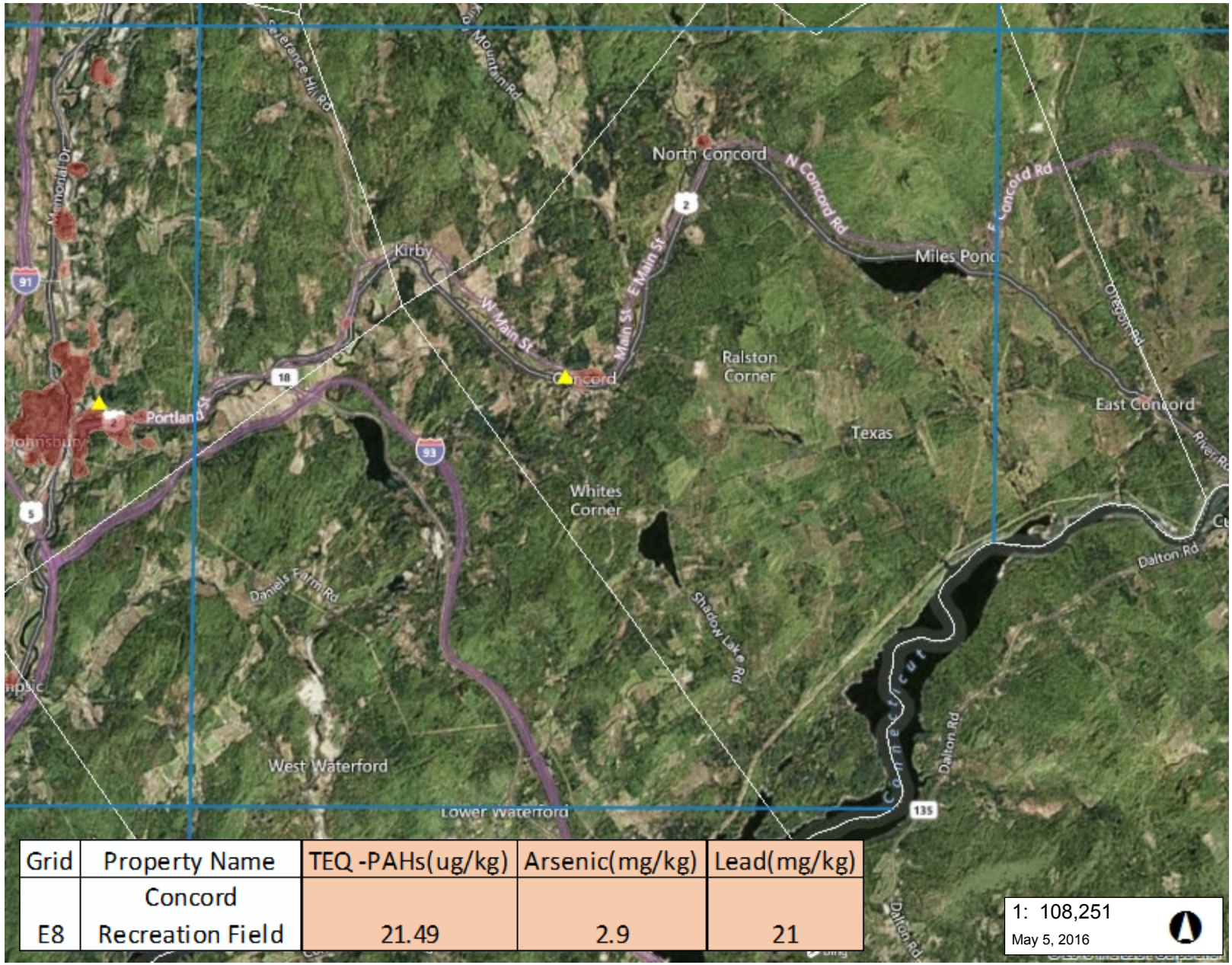

Grid	Property Name	TEQ -PAHs(ug/kg)	Arsenic(mg/kg)	Lead(mg/kg)
E8	Concord Recreation Field	21.49	2.9	21

1: 108,251

May 5, 2016

LEGEND

Town Boundary

Density of Habitable Buildings

- Low
- Medium
- High
- Highest

Sampling Location

NOTES

Location E8 is considered an Urban Sample Point.

5,499.0 0 2,750.00 5,499.0 Meters

WGS_1984_Web_Mercator_Auxiliary_Sphere 1" = 9021 Ft. 1cm = 1083 Meters

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2015 Surface Soil Survey - Grid E9

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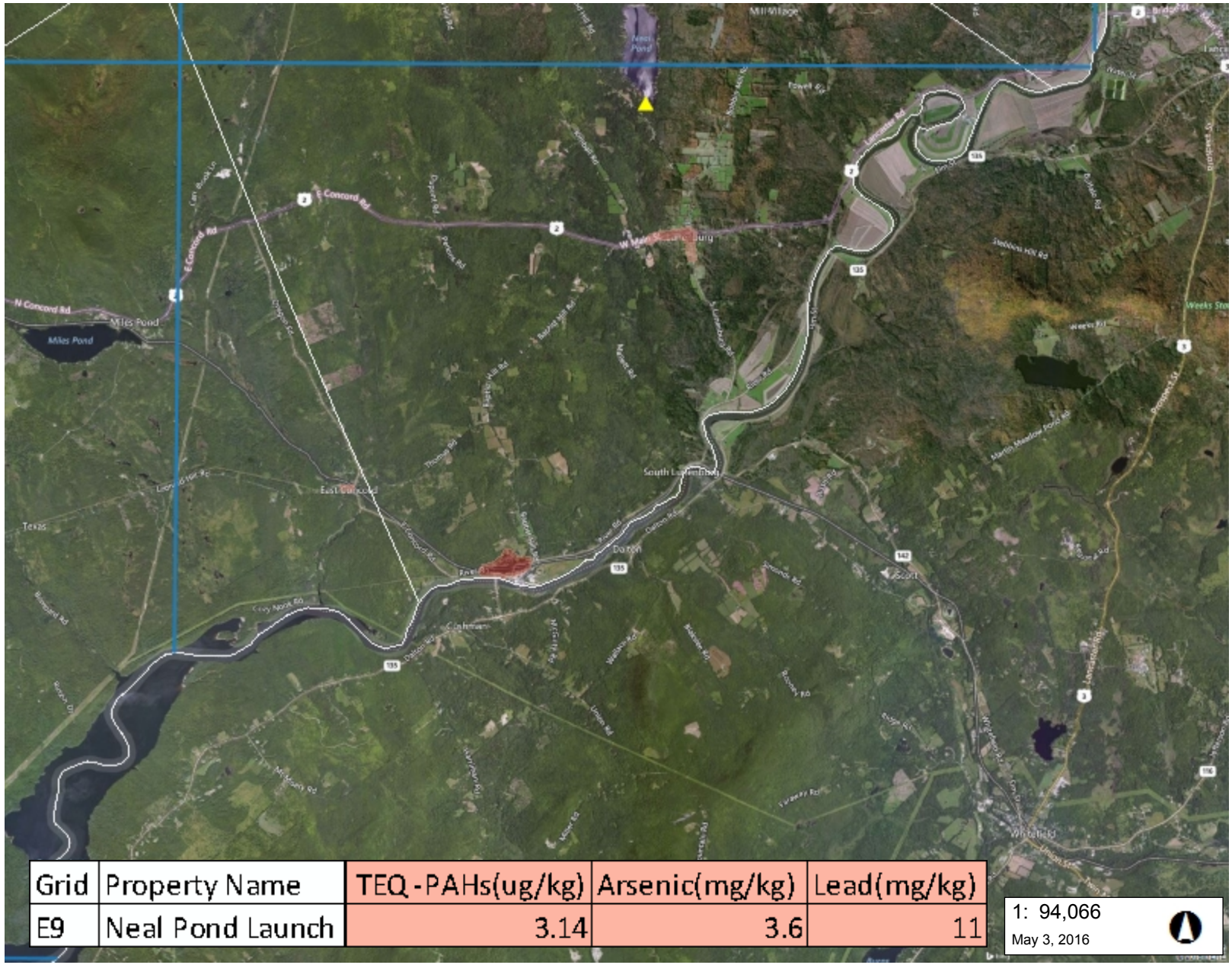

Grid	Property Name	TEQ-PAHs(ug/kg)	Arsenic(mg/kg)	Lead(mg/kg)
E9	Neal Pond Launch	3.14	3.6	11

1: 94,066

May 3, 2016

LEGEND

Town Boundary

Density of Habitable Buildings

- Low
- Medium
- High
- Highest

Sampling Location

NOTES

Location E9 is considered a Non Urban Sample Point

4,779.0 0 2,390.00 4,779.0 Meters

WGS_1984_Web_Mercator_Auxiliary_Sphere 1" = 7839 Ft. 1cm = 941 Meters

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2015 Surface Soil Survey - Grid F1

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Grid	Property Name	TEQ-PAHs(ug/kg)	Arsenic(mg/kg)	Lead(mg/kg)
F1	Charlotte Town Green	37.97/45.83	7.1	51

1: 108,251

May 5, 2016

LEGEND

Town Boundary

Density of Habitable Buildings

- Low
- Medium
- High
- Highest

Sampling Location

NOTES

Location F1 is considered an Urban Sample Point.

5,499.0 0 2,750.00 5,499.0 Meters

WGS_1984_Web_Mercator_Auxiliary_Sphere 1" = 9021 Ft. 1cm = 1083 Meters

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2015 Surface Soil Survey - Grid F2

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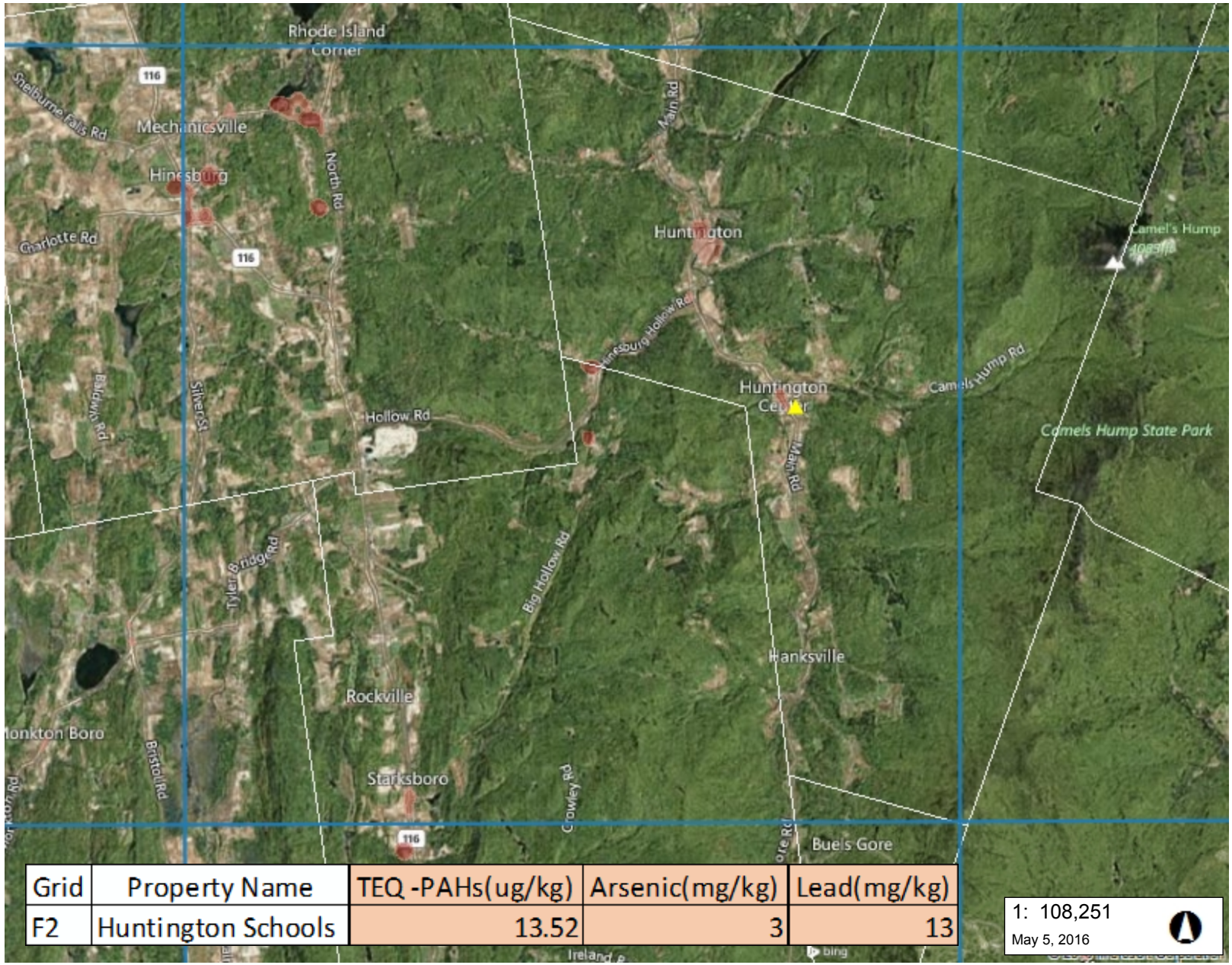

Grid	Property Name	TEQ -PAHs(ug/kg)	Arsenic(mg/kg)	Lead(mg/kg)
F2	Huntington Schools	13.52	3	13

1: 108,251

May 5, 2016

LEGEND

Town Boundary

Density of Habitable Buildings

- Low
- Medium
- High
- Highest

Sampling Location

NOTES

Location F2 is considered an Urban Sample Point.

5,499.0 0 2,750.00 5,499.0 Meters

WGS_1984_Web_Mercator_Auxiliary_Sphere 1" = 9021 Ft. 1cm = 1083 Meters

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2015 Surface Soil Survey - Grid F3

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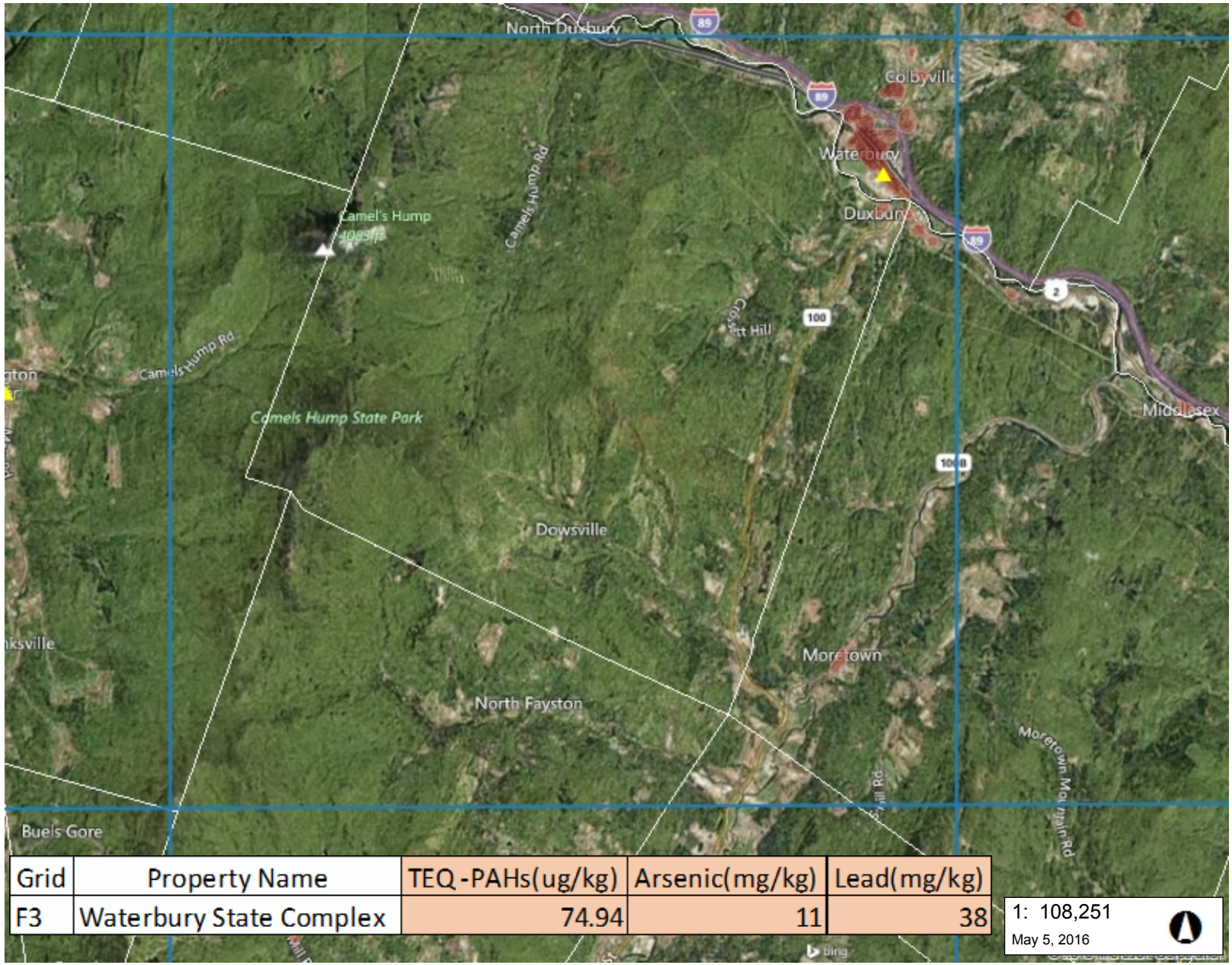

Grid	Property Name	TEQ-PAHs(ug/kg)	Arsenic(mg/kg)	Lead(mg/kg)
F3	Waterbury State Complex	74.94	11	38

1: 108,251

May 5, 2016

LEGEND

Town Boundary

Density of Habitable Buildings

- Low
- Medium
- High
- Highest

Sampling Location

NOTES

Location F3 is considered an Urban Sample Point.

5,499.0 0 2,750.00 5,499.0 Meters

WGS_1984_Web_Mercator_Auxiliary_Sphere 1" = 9021 Ft. 1cm = 1083 Meters

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2015 Surface Soil Survey - Grid F4

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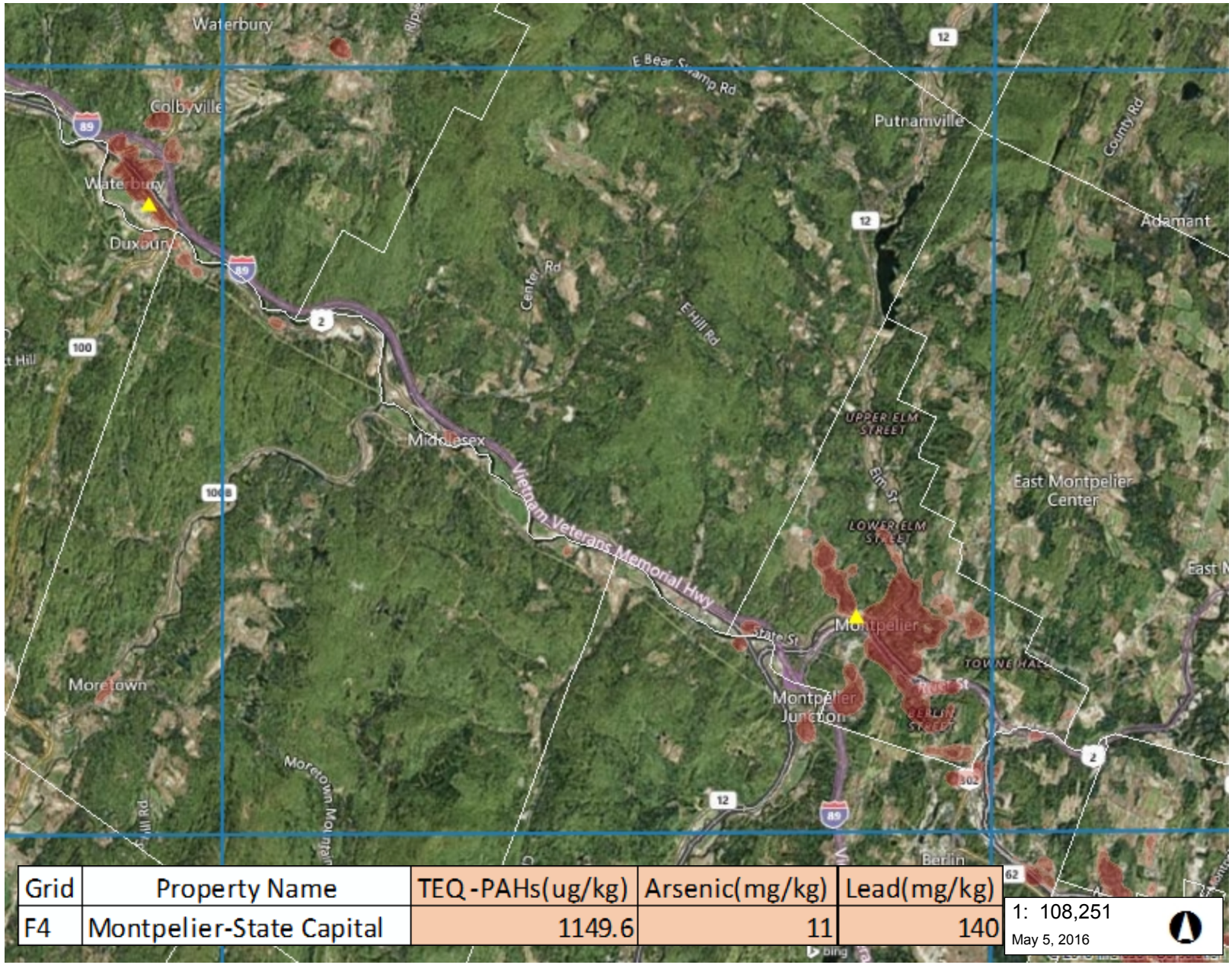

Grid	Property Name	TEQ-PAHs(ug/kg)	Arsenic(mg/kg)	Lead(mg/kg)
F4	Montpelier-State Capital	1149.6	11	140

1: 108,251

May 5, 2016

LEGEND

Town Boundary

Density of Habitable Buildings

- Low
- Medium
- High
- Highest

Sampling Location

NOTES

Location F4 is considered an Urban Sample Point.

5,499.0 0 2,750.00 5,499.0 Meters

WGS_1984_Web_Mercator_Auxiliary_Sphere 1" = 9021 Ft. 1cm = 1083 Meters

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2015 Surface Soil Survey - Grid F5

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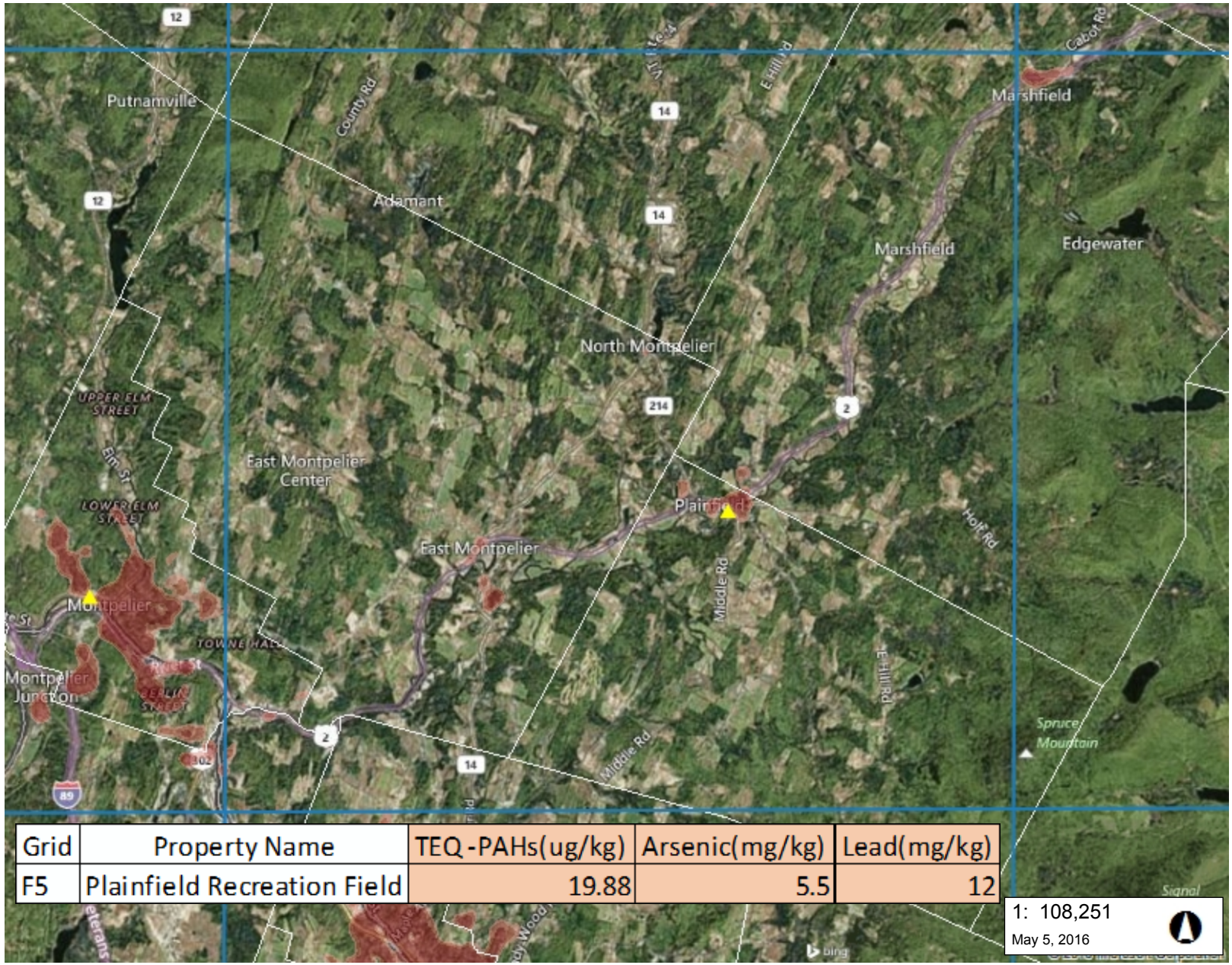

Grid	Property Name	TEQ -PAHs(ug/kg)	Arsenic(mg/kg)	Lead(mg/kg)
F5	Plainfield Recreation Field	19.88	5.5	12

1: 108,251

May 5, 2016

LEGEND

Town Boundary

Density of Habitable Buildings

- Low
- Medium
- High
- Highest

Sampling Location

NOTES

Location F5 is considered an Urban Sample Point.

5,499.0 0 2,750.00 5,499.0 Meters

WGS_1984_Web_Mercator_Auxiliary_Sphere 1" = 9021 Ft. 1cm = 1083 Meters

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2015 Surface Soil Survey - Grid F6

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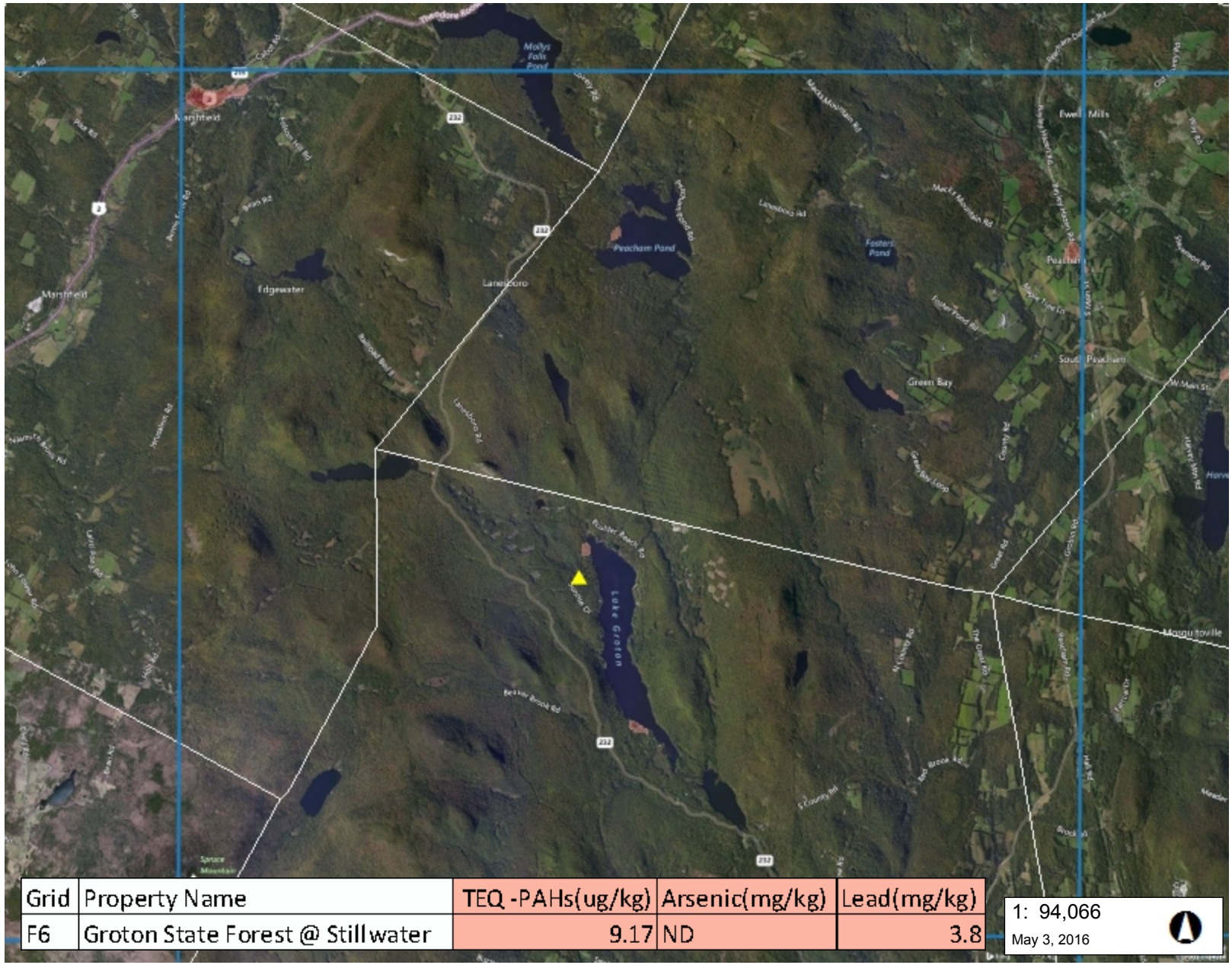

Grid	Property Name	TEQ -PAHs(ug/kg)	Arsenic(mg/kg)	Lead(mg/kg)
F6	Groton State Forest @ Stillwater	9.17	ND	3.8

1: 94,066

May 3, 2016

LEGEND

Town Boundary

Density of Habitable Buildings

- Low
- Medium
- High
- Highest

Sampling Location

NOTES

Location F6 is considered a Non Urban Sample Point

4,779.0 0 2,390.00 4,779.0 Meters

WGS_1984_Web_Mercator_Auxiliary_Sphere 1" = 7839 Ft. 1cm = 941 Meters

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2015 Surface Soil Survey - Grid F7

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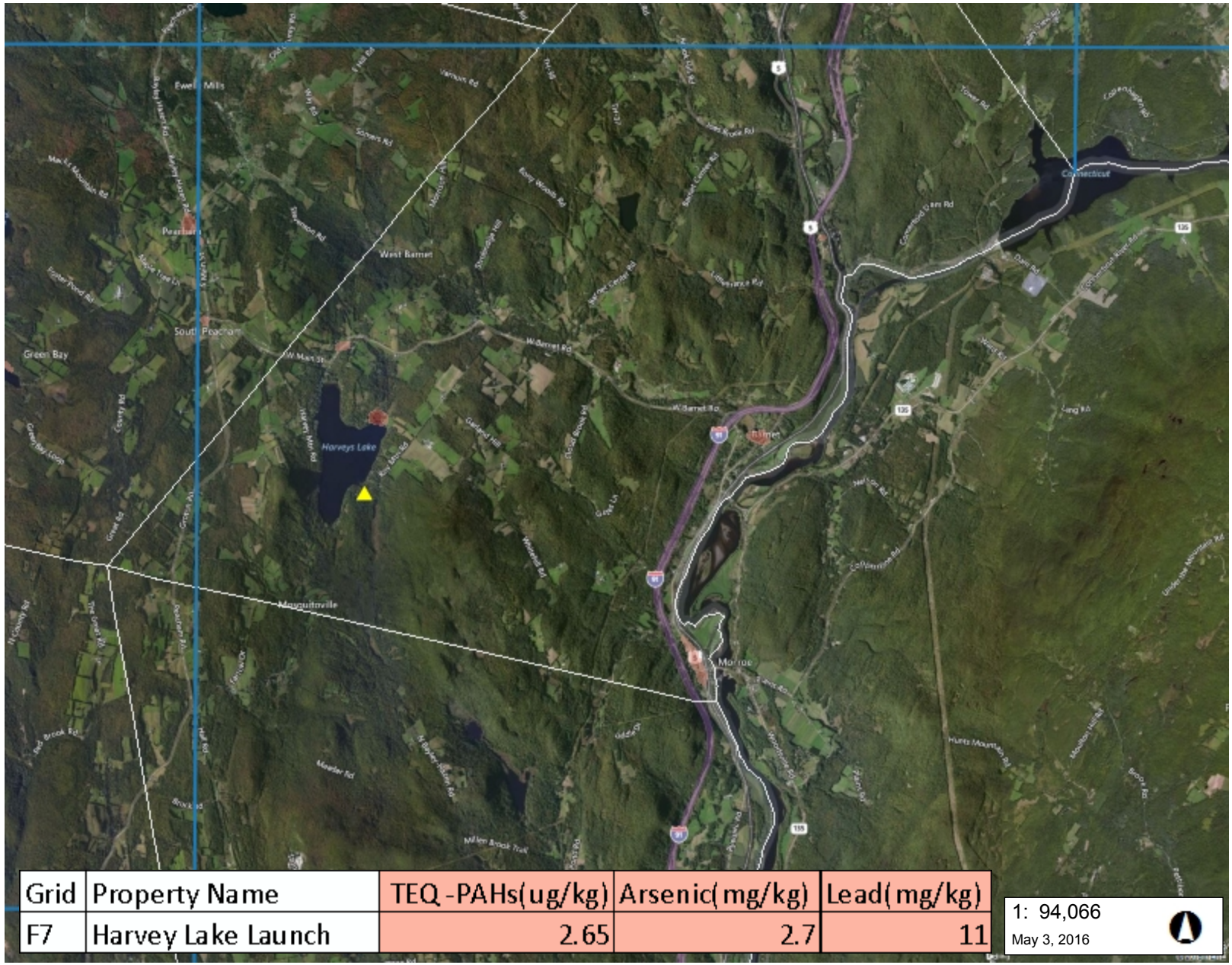

Grid	Property Name	TEQ-PAHs(ug/kg)	Arsenic(mg/kg)	Lead(mg/kg)
F7	Harvey Lake Launch	2.65	2.7	11

1: 94,066

May 3, 2016

LEGEND

Town Boundary

Density of Habitable Buildings

- Low
- Medium
- High
- Highest

Sampling Location

NOTES

Location F7 is considered a Non Urban Sample Point

4,779.0 0 2,390.00 4,779.0 Meters

WGS_1984_Web_Mercator_Auxiliary_Sphere 1" = 7839 Ft. 1cm = 941 Meters

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2015 Surface Soil Survey - Grid G1

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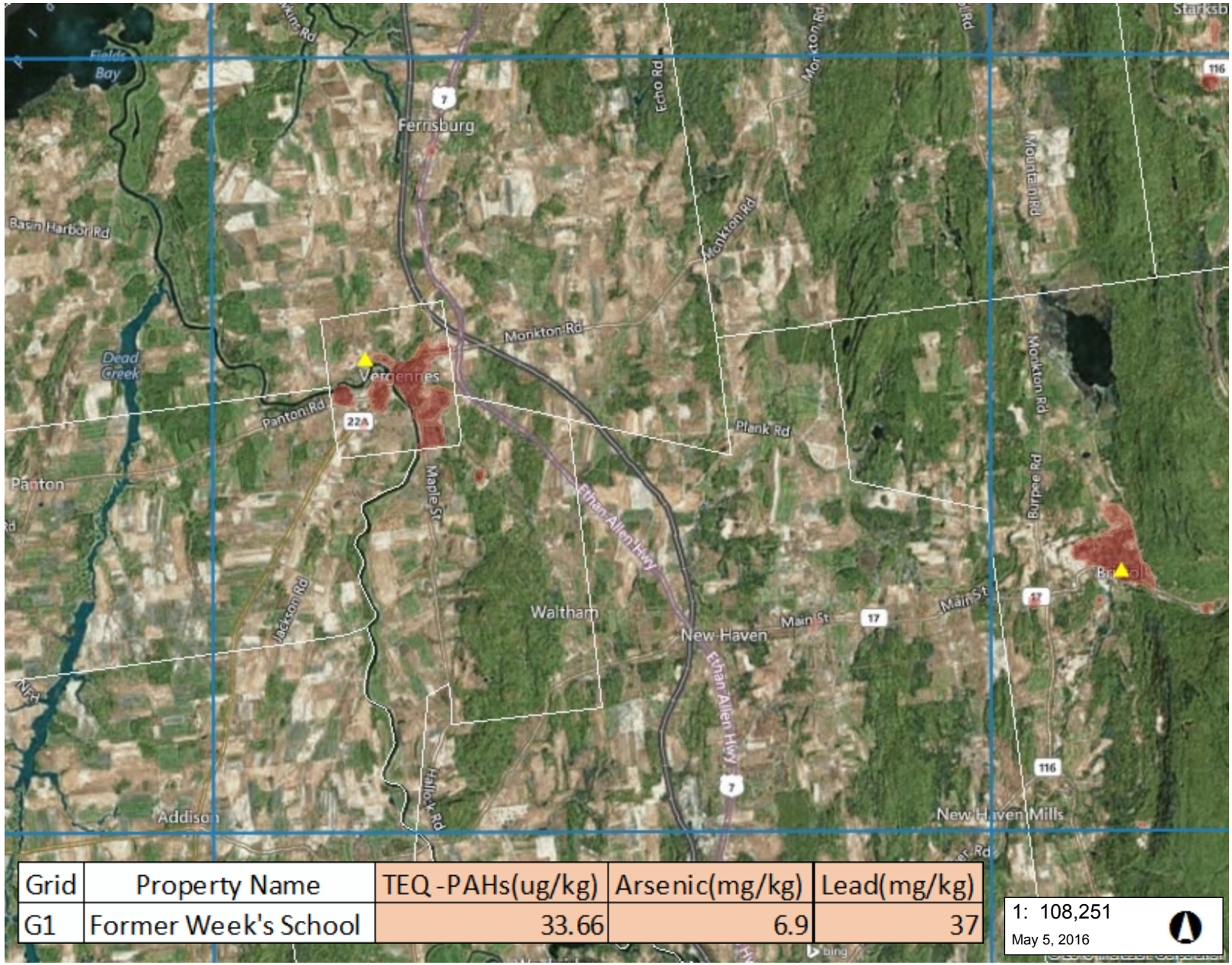

Grid	Property Name	TEQ -PAHs(ug/kg)	Arsenic(mg/kg)	Lead(mg/kg)
G1	Former Week's School	33.66	6.9	37

1: 108,251

May 5, 2016

LEGEND

Town Boundary

Density of Habitable Buildings

- Low
- Medium
- High
- Highest

Sampling Location

NOTES

Location G1 is considered an Urban Sample Point.

5,499.0 0 2,750.00 5,499.0 Meters

WGS_1984_Web_Mercator_Auxiliary_Sphere 1" = 9021 Ft. 1cm = 1083 Meters

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2015 Surface Soil Survey - Grid G2

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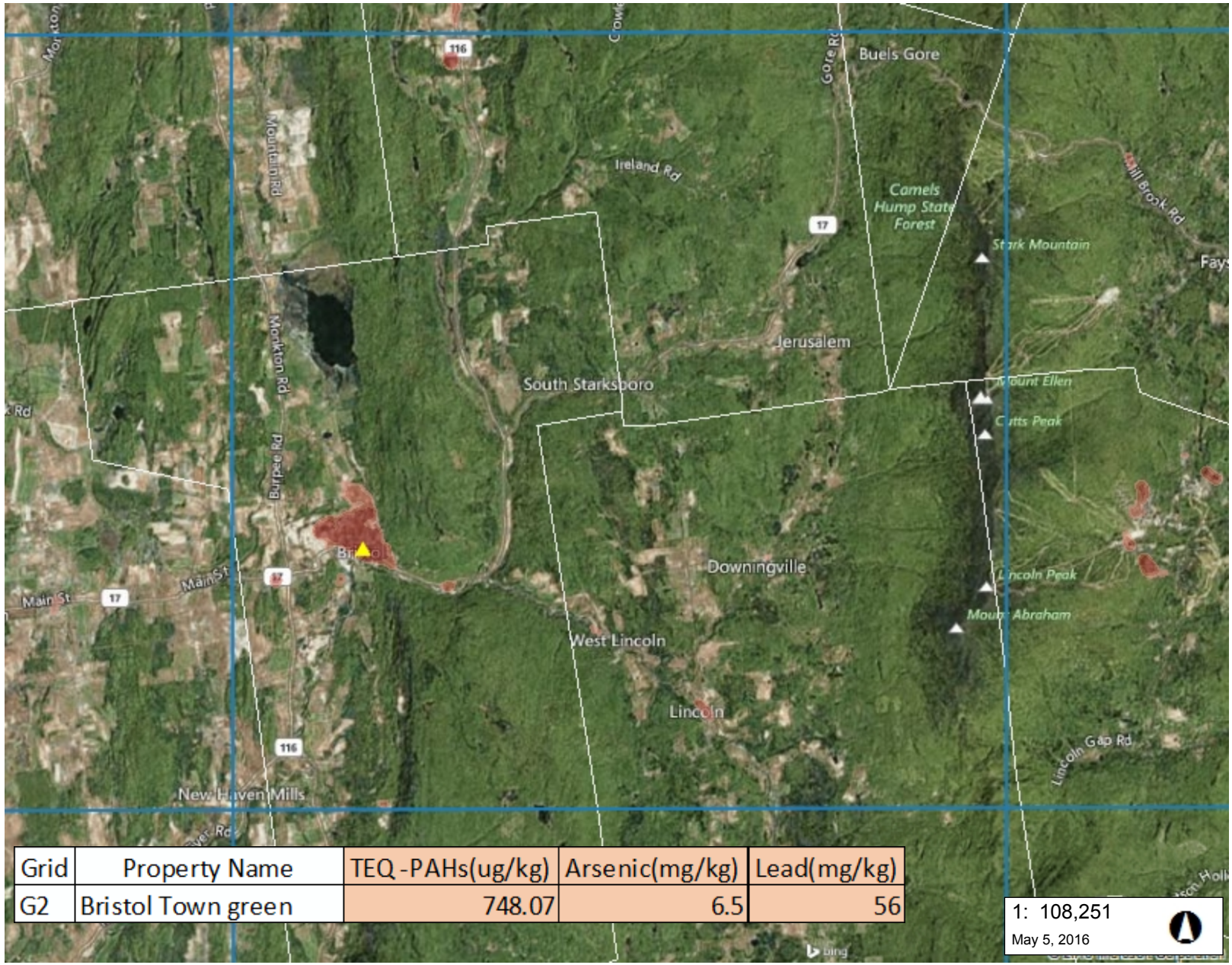

Grid	Property Name	TEQ -PAHs(ug/kg)	Arsenic(mg/kg)	Lead(mg/kg)
G2	Bristol Town green	748.07	6.5	56

1: 108,251

May 5, 2016

LEGEND

Town Boundary

Density of Habitable Buildings

- Low
- Medium
- High
- Highest

Sampling Location

NOTES

Location G2 is considered an Urban Sample Point.

5,499.0 0 2,750.00 5,499.0 Meters

WGS_1984_Web_Mercator_Auxiliary_Sphere 1" = 9021 Ft. 1cm = 1083 Meters

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2015 Surface Soil Survey - Grid G3

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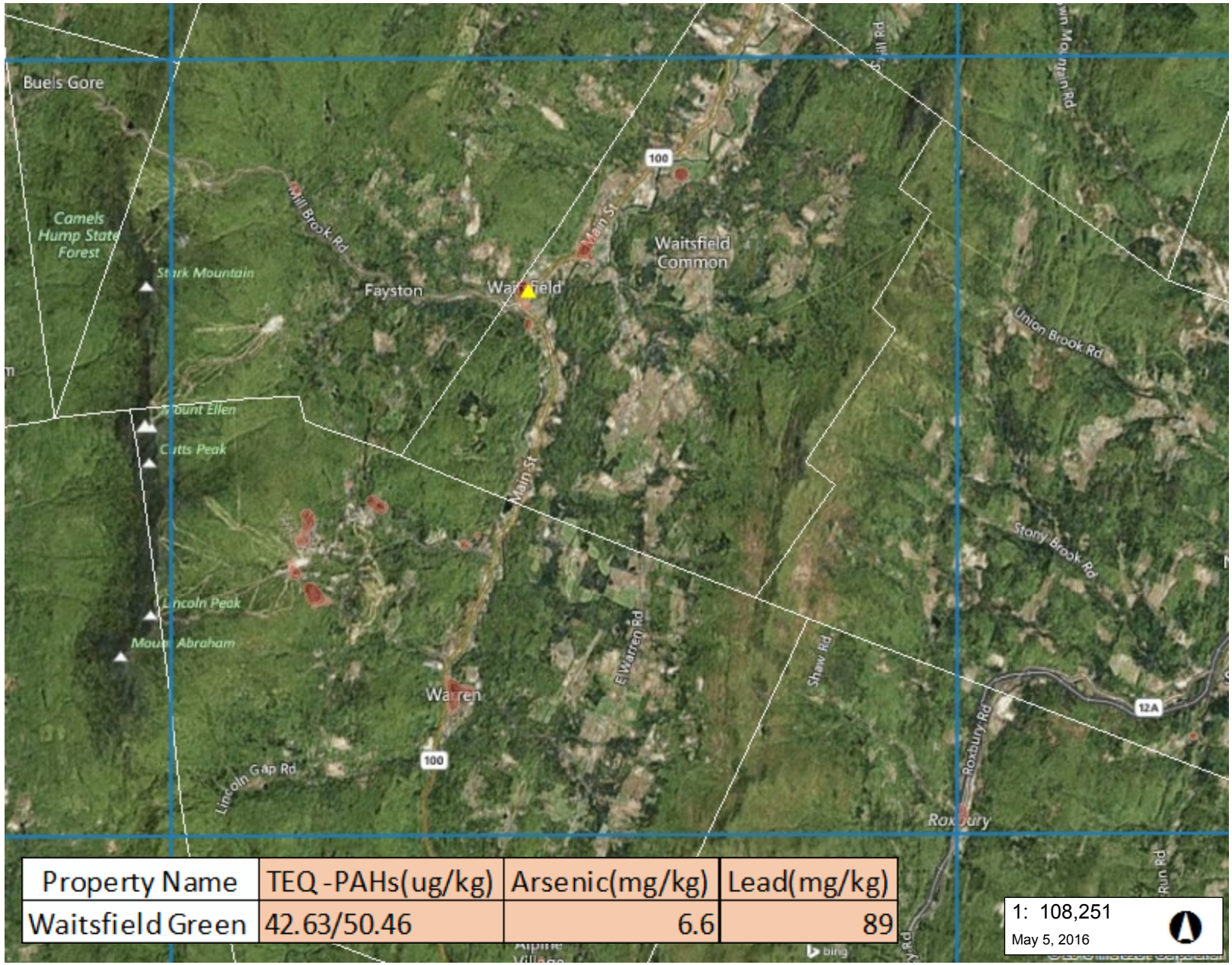

Property Name	TEQ -PAHs(ug/kg)	Arsenic(mg/kg)	Lead(mg/kg)
Waitsfield Green	42.63/50.46	6.6	89

1: 108,251

May 5, 2016

LEGEND

Town Boundary

Density of Habitable Buildings

- Low
- Medium
- High
- Highest

Sampling Location

NOTES

Location G3 is considered an Urban Sample Point.

5,499.0 0 2,750.00 5,499.0 Meters

WGS_1984_Web_Mercator_Auxiliary_Sphere 1" = 9021 Ft. 1cm = 1083 Meters

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2015 Surface Soil Survey - Grid G4

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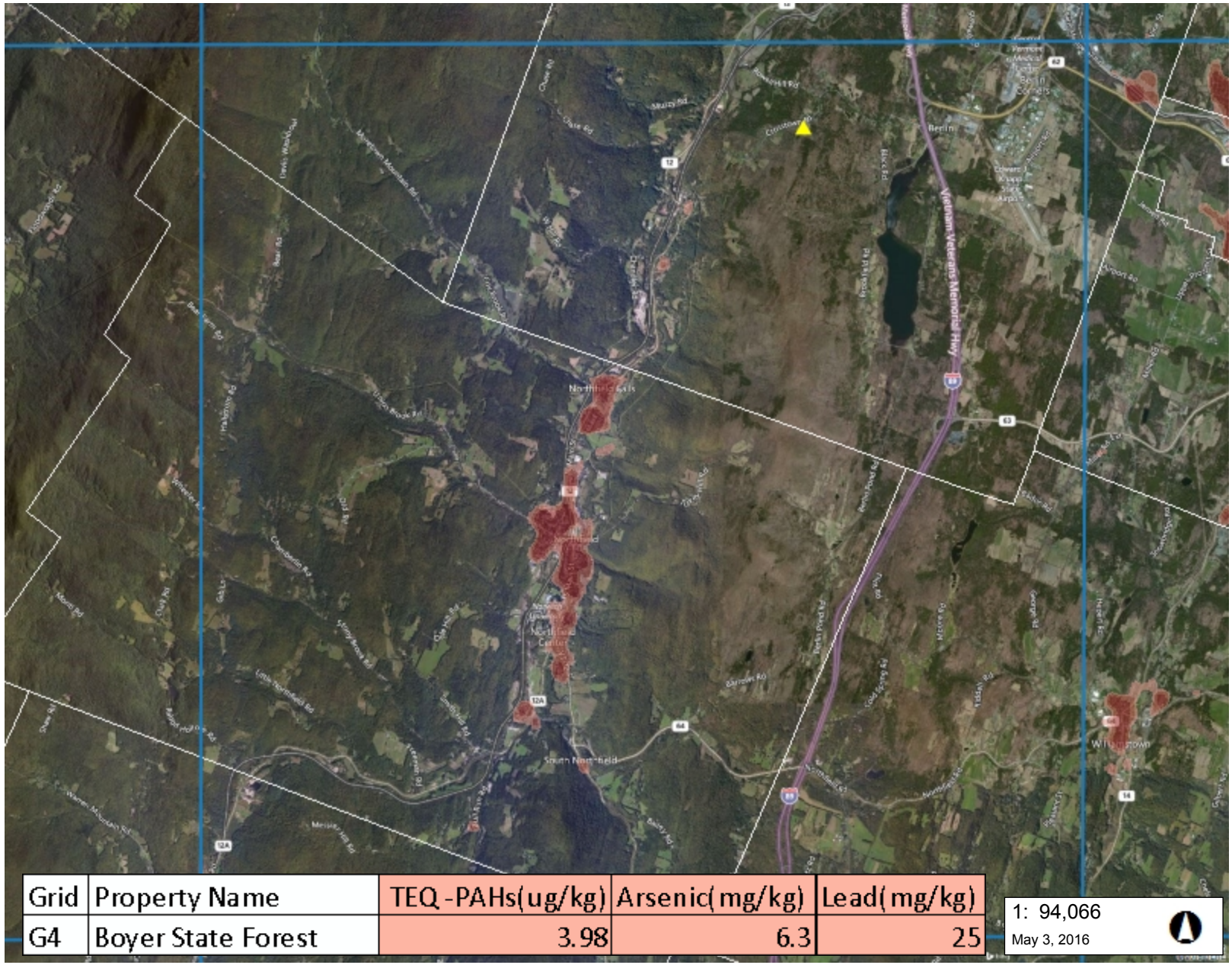

Grid	Property Name	TEQ -PAHs(ug/kg)	Arsenic(mg/kg)	Lead(mg/kg)
G4	Boyer State Forest	3.98	6.3	25

1: 94,066

May 3, 2016

LEGEND

Town Boundary

Density of Habitable Buildings

- Low
- Medium
- High
- Highest

Sampling Location

NOTES

Location G4 is considered a Non Urban Sample Point

4,779.0 0 2,390.00 4,779.0 Meters

WGS_1984_Web_Mercator_Auxiliary_Sphere 1" = 7839 Ft. 1cm = 941 Meters

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2015 Surface Soil Survey - Grid G5

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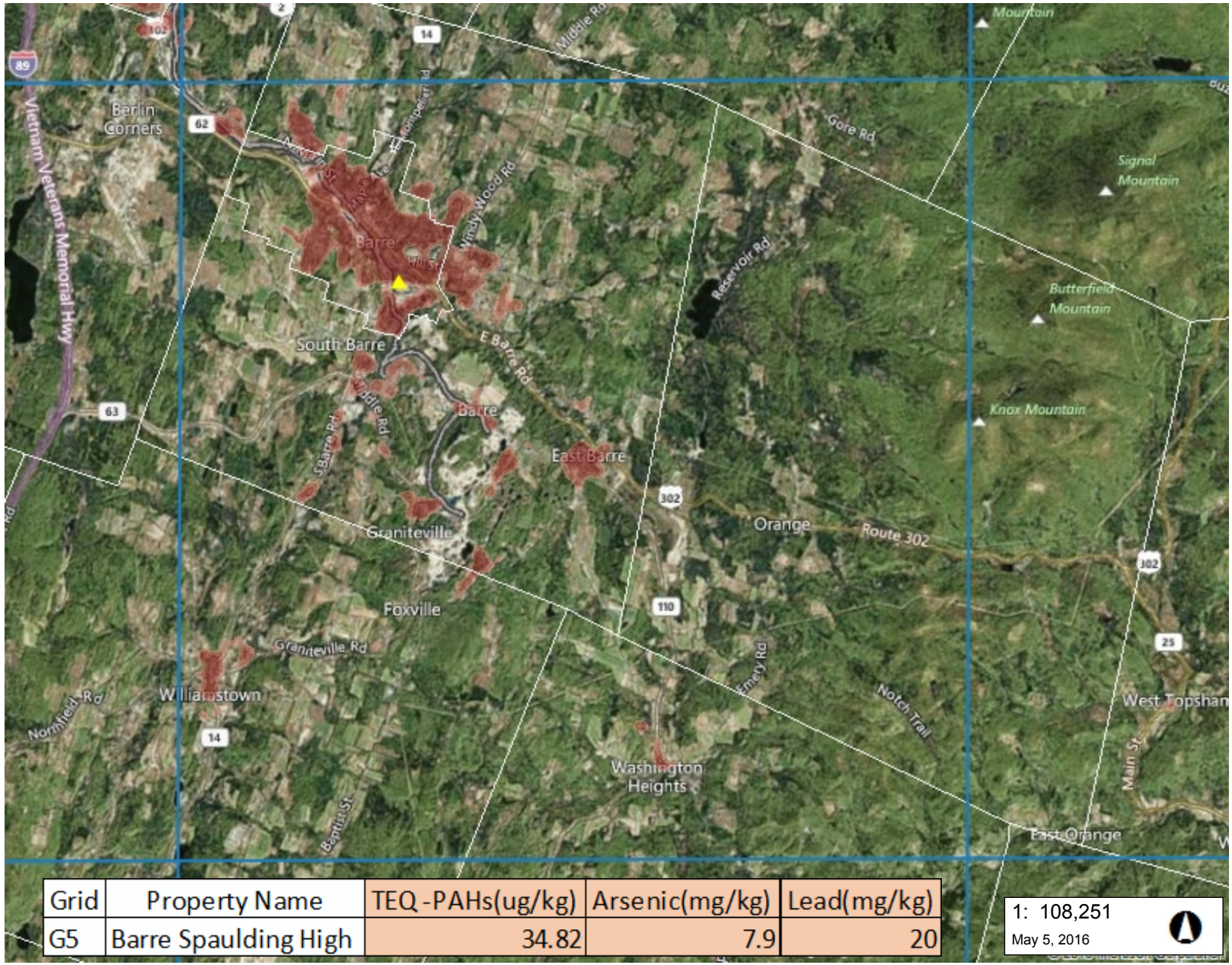

Grid	Property Name	TEQ -PAHs(ug/kg)	Arsenic(mg/kg)	Lead(mg/kg)
G5	Barre Spaulding High	34.82	7.9	20

1: 108,251

May 5, 2016

LEGEND

Town Boundary

Density of Habitable Buildings

- Low
- Medium
- High
- Highest

Sampling Location

NOTES

Location G5 is considered an Urban Sample Point.

5,499.0 0 2,750.00 5,499.0 Meters

WGS_1984_Web_Mercator_Auxiliary_Sphere 1" = 9021 Ft. 1cm = 1083 Meters

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2015 Surface Soil Survey - Grid G6

Vermont Agency of Natural Resources

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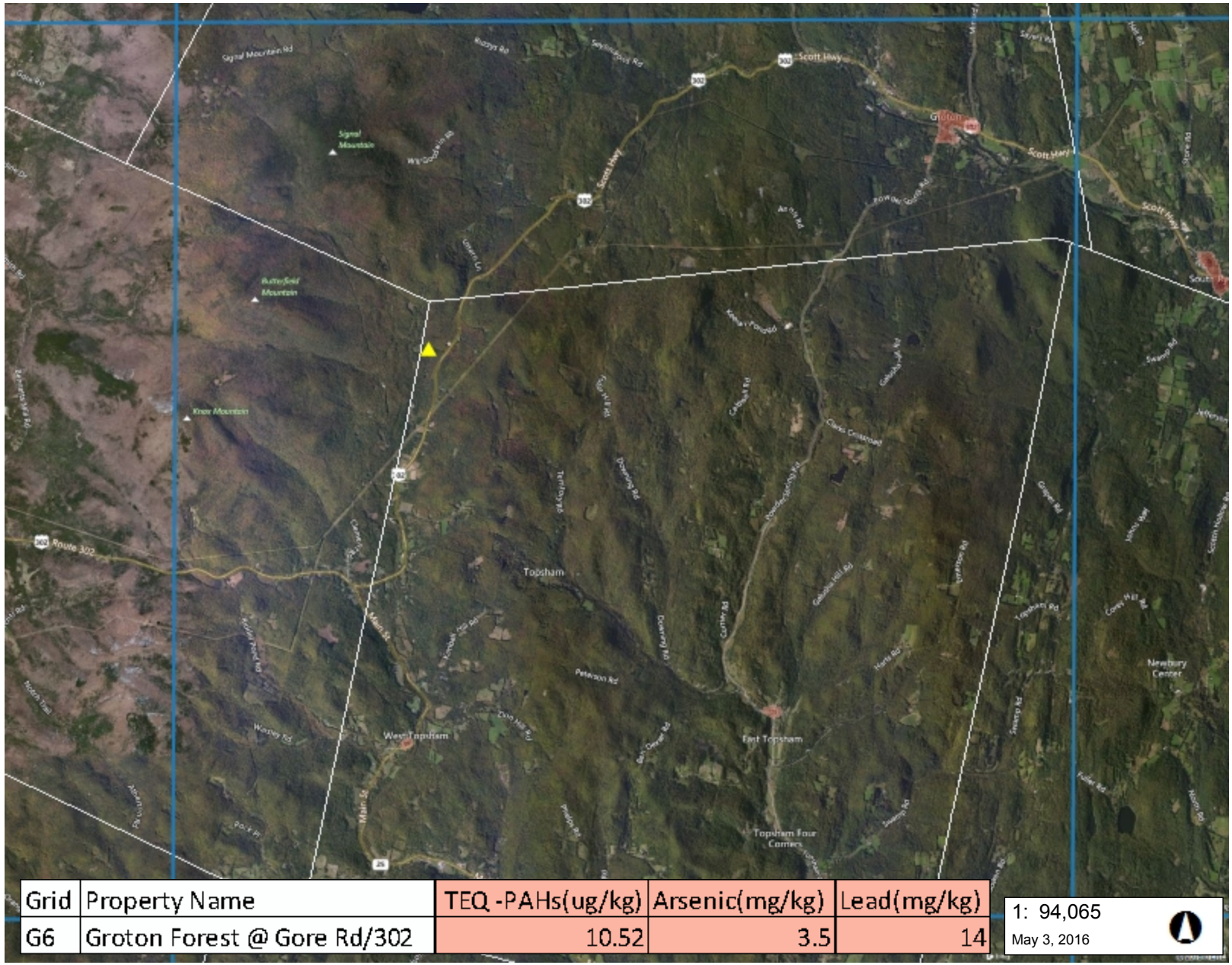

Grid	Property Name	TEQ -PAHs(ug/kg)	Arsenic(mg/kg)	Lead(mg/kg)
G6	Groton Forest @ Gore Rd/302	10.52	3.5	14

1: 94,065

May 3, 2016

LEGEND

Town Boundary

Density of Habitable Buildings

- Low
- Medium
- High
- Highest

Sampling Location

NOTES

Location G6 is considered a Non Urban Sample Point

4,778.0 0 2,389.00 4,778.0 Meters

WGS_1984_Web_Mercator_Auxiliary_Sphere 1" = 7839 Ft. 1cm = 941 Meters

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2015 Surface Soil Survey - Grid G7

Vermont Agency of Natural Resources

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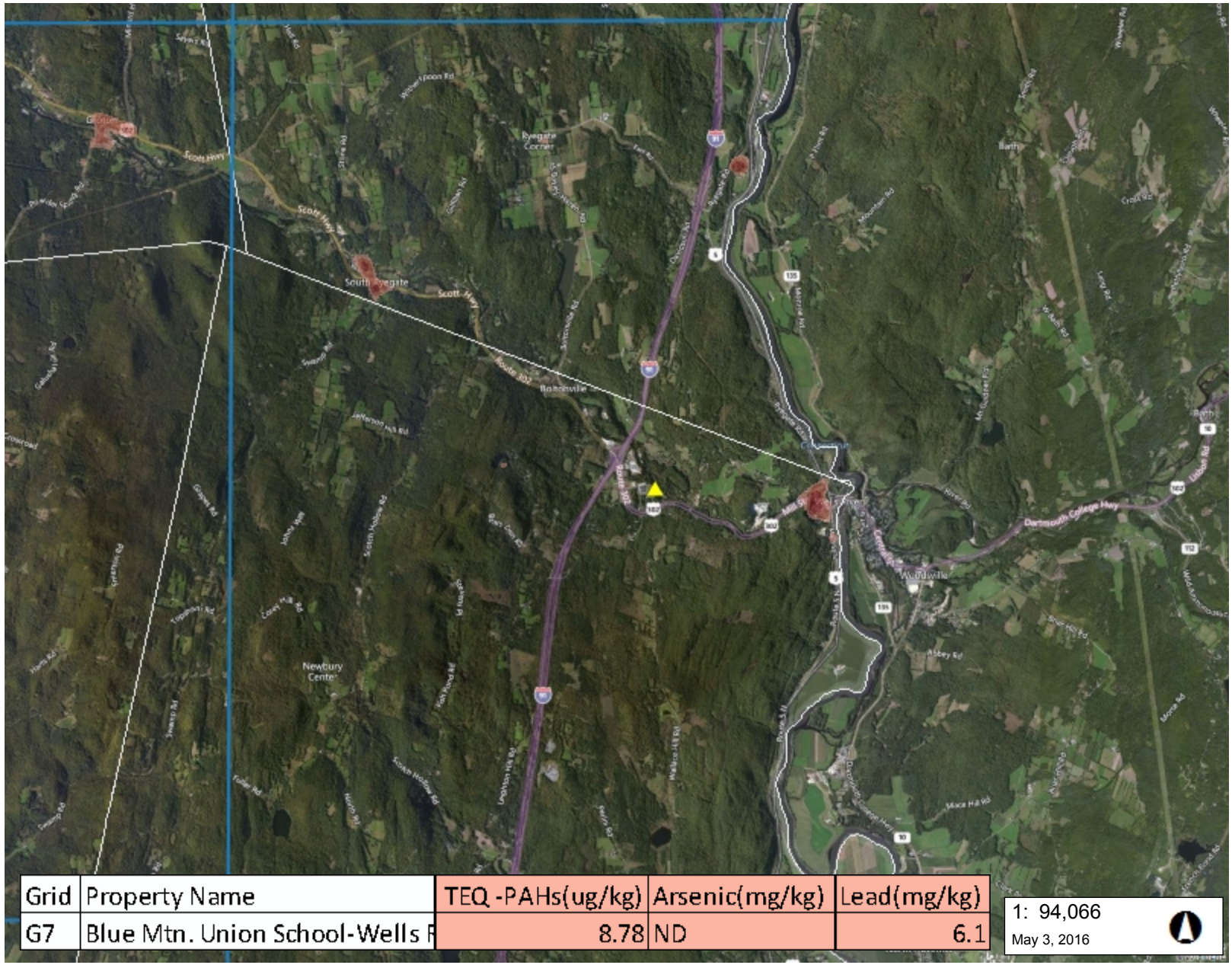

Grid	Property Name	TEQ -PAHs(ug/kg)	Arsenic(mg/kg)	Lead(mg/kg)
G7	Blue Mtn. Union School-Wells F	8.78	ND	6.1

1: 94,066

May 3, 2016

LEGEND

Town Boundary

Density of Habitable Buildings

- Low
- Medium
- High
- Highest

Sampling Location

NOTES

Location G7 is considered a Non Urban Sample Point

4,779.0 0 2,390.00 4,779.0 Meters

WGS_1984_Web_Mercator_Auxiliary_Sphere 1" = 7839 Ft. 1cm = 941 Meters

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2015 Surface Soil Survey - Grid H1

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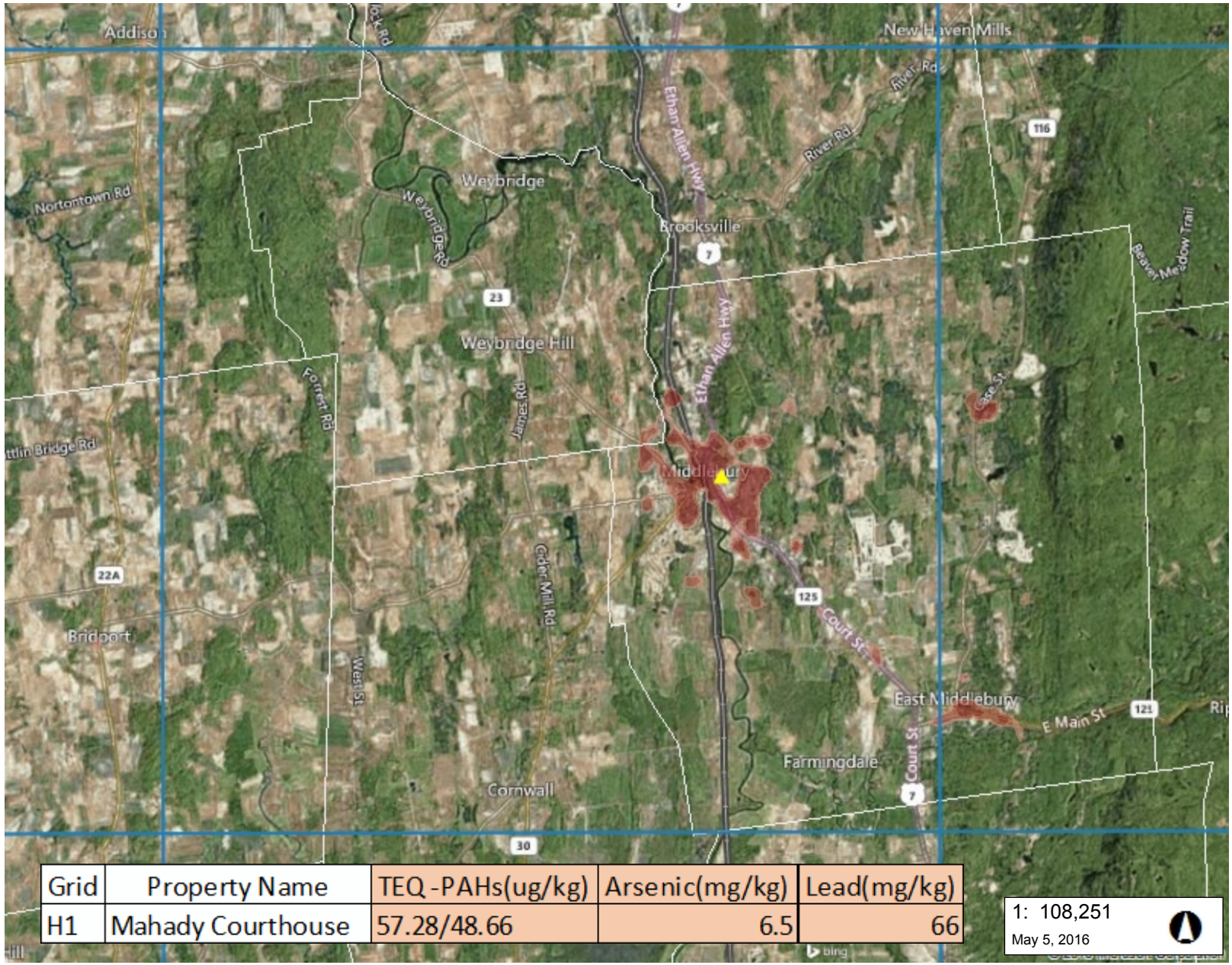

Grid	Property Name	TEQ -PAHs(ug/kg)	Arsenic(mg/kg)	Lead(mg/kg)
H1	Mahady Courthouse	57.28/48.66	6.5	66

1: 108,251

May 5, 2016

LEGEND

Town Boundary

Density of Habitable Buildings

- Low
- Medium
- High
- Highest

Sampling Location

NOTES

Location H1 is considered an Urban Sample Point.

5,499.0 0 2,750.00 5,499.0 Meters

WGS_1984_Web_Mercator_Auxiliary_Sphere 1" = 9021 Ft. 1cm = 1083 Meters

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2015 Surface Soil Survey - Grid H2

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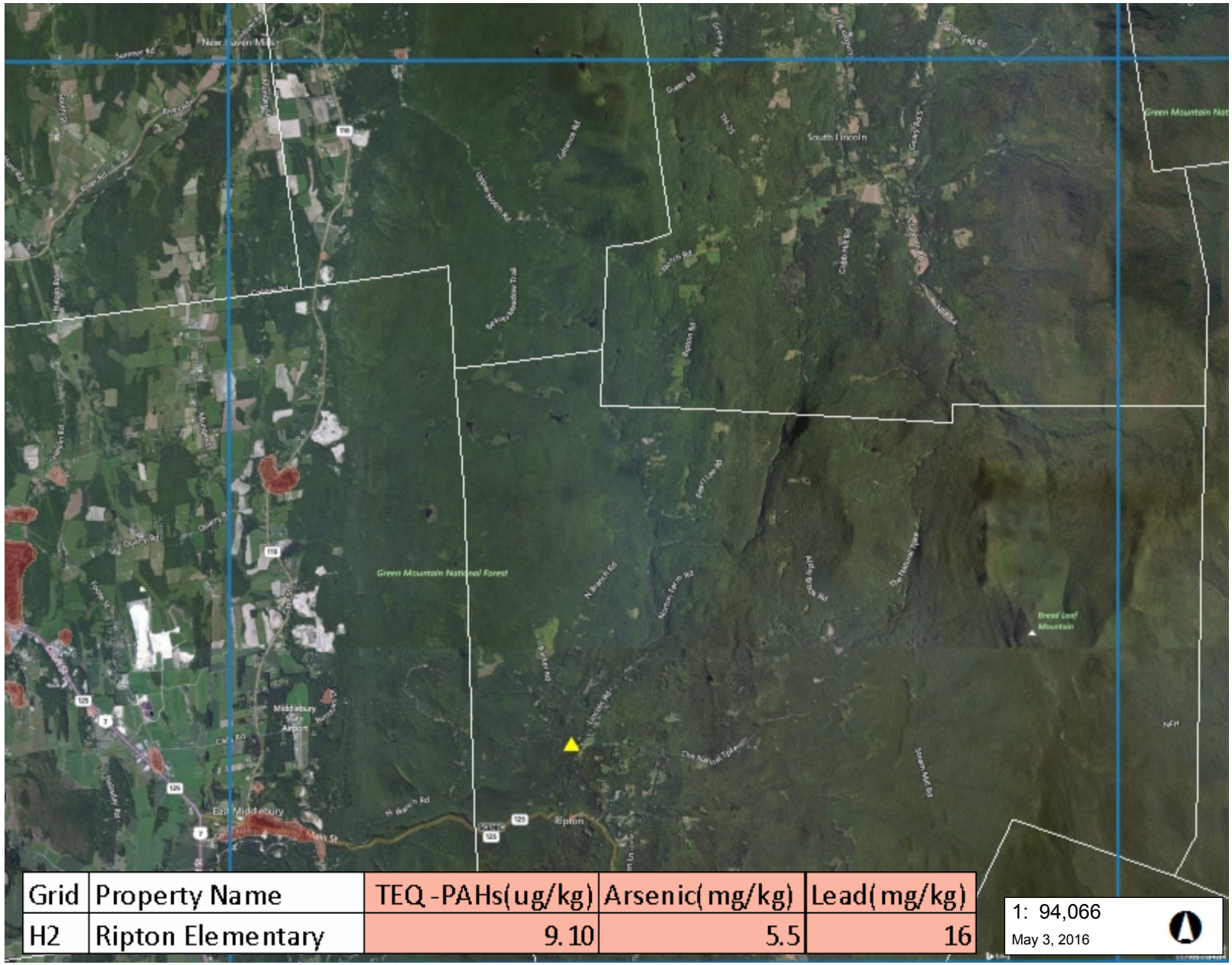

Grid	Property Name	TEQ -PAHs(ug/kg)	Arsenic(mg/kg)	Lead(mg/kg)
H2	Ripton Elementary	9.10	5.5	16

1: 94,066

May 3, 2016

LEGEND

Town Boundary

Density of Habitable Buildings

- Low
- Medium
- High
- Highest

Sampling Location

NOTES

Location H2 is considered a Non Urban Sample Point

4,779.0 0 2,390.00 4,779.0 Meters

WGS_1984_Web_Mercator_Auxiliary_Sphere 1" = 7839 Ft. 1cm = 941 Meters

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2015 Surface Soil Survey - Grid H3

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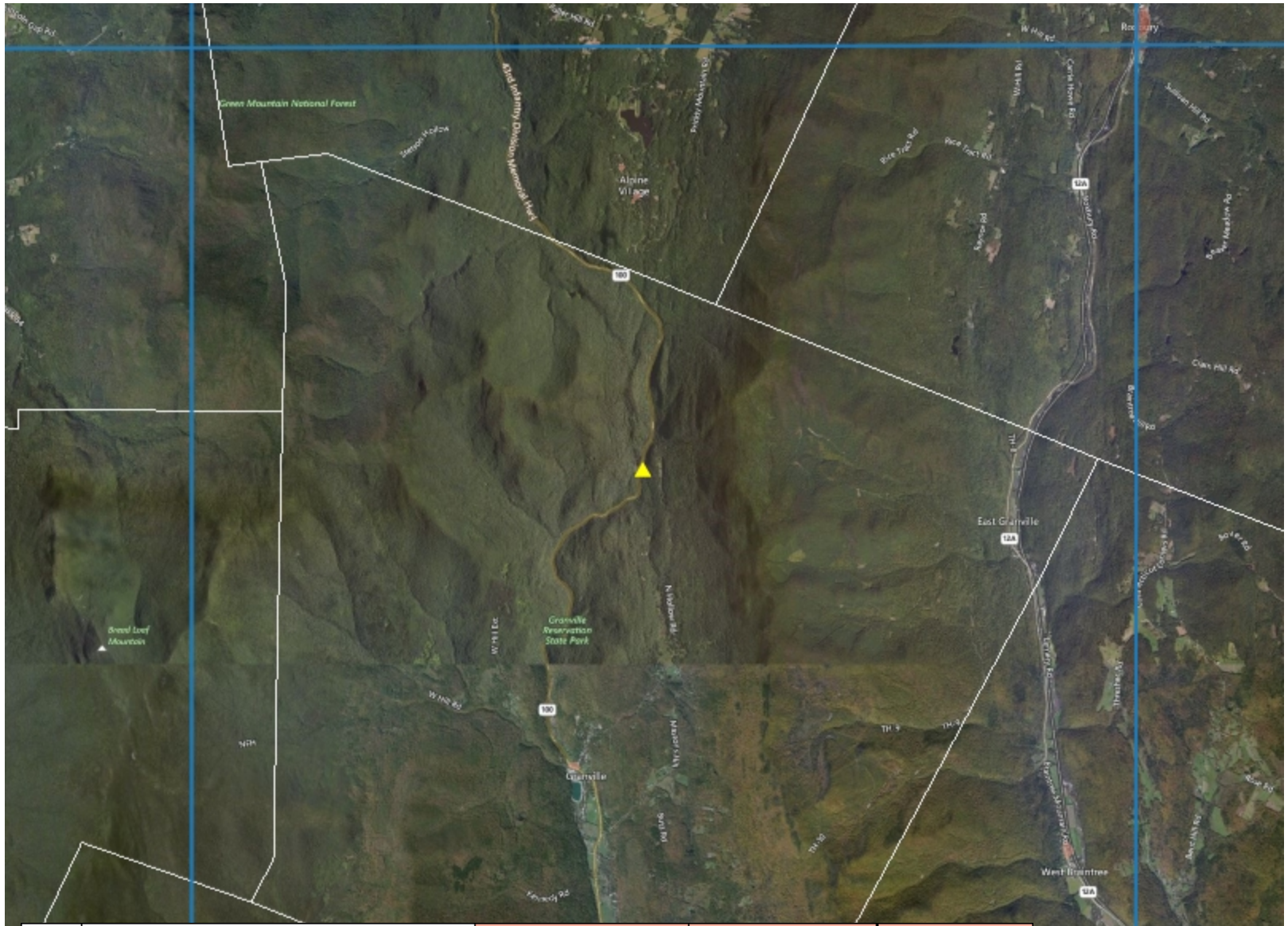

Grid	Property Name	TEQ -PAHs(ug/kg)	Arsenic(mg/kg)	Lead(mg/kg)
H3	Granville Reservation State Forest	309.01	16	27

1: 94,065

May 3, 2016

LEGEND

Town Boundary

Density of Habitable Buildings

- Low
- Medium
- High
- Highest

Sampling Location

NOTES

Location H3 is considered a Non Urban Sample Point

4,779.0 0 2,390.00 4,779.0 Meters

WGS_1984_Web_Mercator_Auxiliary_Sphere 1" = 7839 Ft. 1cm = 941 Meters

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2015 Surface Soil Survey - Grid H4

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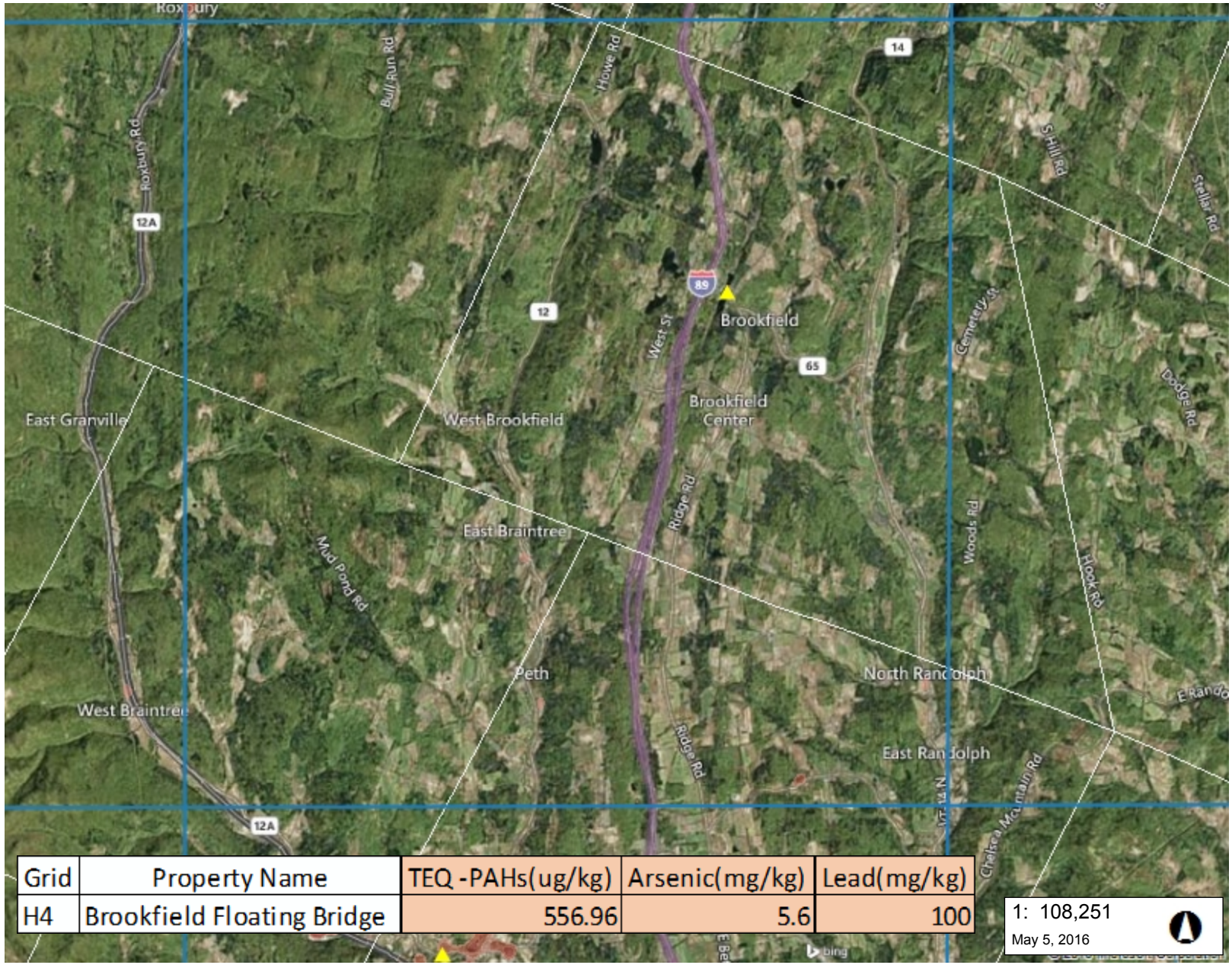

Grid	Property Name	TEQ -PAHs(ug/kg)	Arsenic(mg/kg)	Lead(mg/kg)
H4	Brookfield Floating Bridge	556.96	5.6	100

1: 108,251

May 5, 2016

LEGEND

Town Boundary

Density of Habitable Buildings

- Low
- Medium
- High
- Highest

Sampling Location

NOTES

Location H4 is considered an Urban Sample Point.

5,499.0 0 2,750.00 5,499.0 Meters

WGS_1984_Web_Mercator_Auxiliary_Sphere 1" = 9021 Ft. 1cm = 1083 Meters

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2015 Surface Soil Survey - Grid H5

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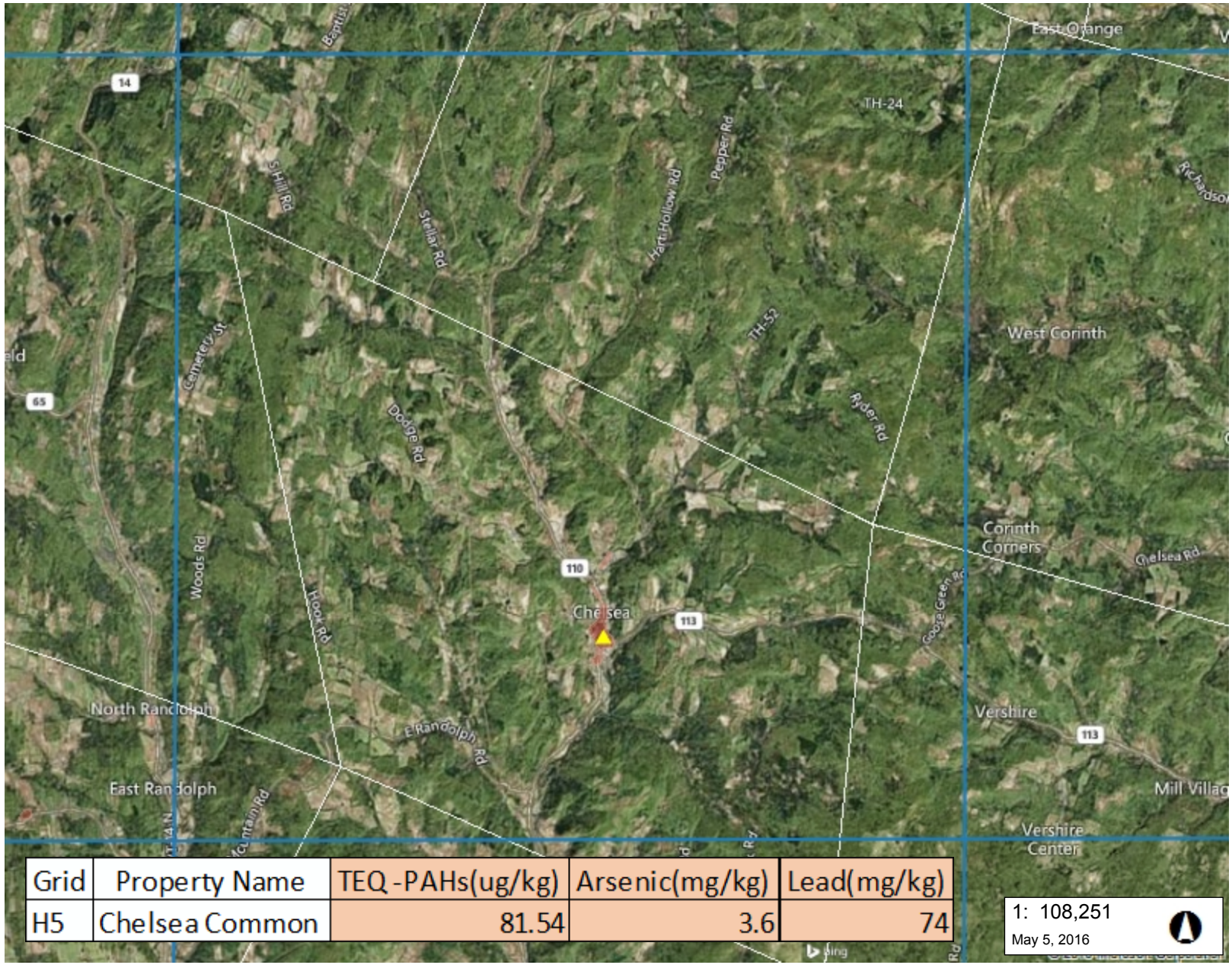

Grid	Property Name	TEQ -PAHs(ug/kg)	Arsenic(mg/kg)	Lead(mg/kg)
H5	Chelsea Common	81.54	3.6	74

1: 108,251

May 5, 2016

LEGEND

Town Boundary

Density of Habitable Buildings

- Low
- Medium
- High
- Highest

Sampling Location

NOTES

Location H5 is considered an Urban Sample Point.

5,499.0 0 2,750.00 5,499.0 Meters

WGS_1984_Web_Mercator_Auxiliary_Sphere 1" = 9021 Ft. 1cm = 1083 Meters

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2015 Surface Soil Survey - Grid H7

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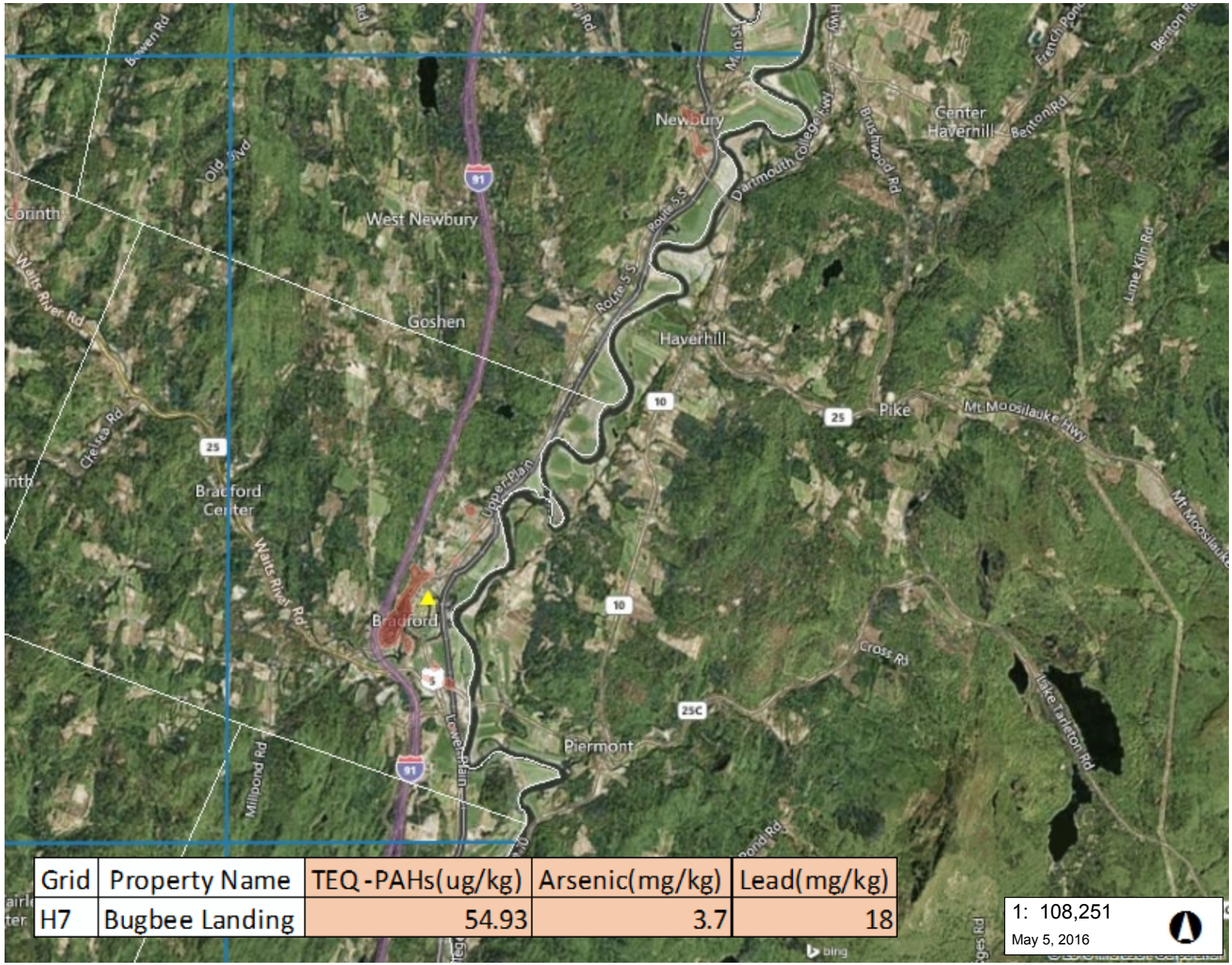

Grid	Property Name	TEQ-PAHs(ug/kg)	Arsenic(mg/kg)	Lead(mg/kg)
H7	Bugbee Landing	54.93	3.7	18

1: 108,251

May 5, 2016

LEGEND

Town Boundary

Density of Habitable Buildings

- Low
- Medium
- High
- Highest

Sampling Location

NOTES

Location H7 is considered an Urban Sample Point.

5,499.0 0 2,750.00 5,499.0 Meters

WGS_1984_Web_Mercator_Auxiliary_Sphere 1" = 9021 Ft. 1cm = 1083 Meters

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2015 Surface Soil Survey - Grid I1

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Grid	Property Name	TEQ -PAHs(ug/kg)	Arsenic(mg/kg)	Lead(mg/kg)
I1	Whiting Elementary	9.71	6	16

1: 94,064

May 3, 2016

LEGEND

Town Boundary

Density of Habitable Buildings

- Low
- Medium
- High
- Highest

Sampling Location

NOTES

Location I1 is considered a Non Urban Sample Point

4,778.0 0 2,389.00 4,778.0 Meters

WGS_1984_Web_Mercator_Auxiliary_Sphere 1" = 7839 Ft. 1cm = 941 Meters

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2015 Surface Soil Survey - Grid I2

Vermont Agency of Natural Resources

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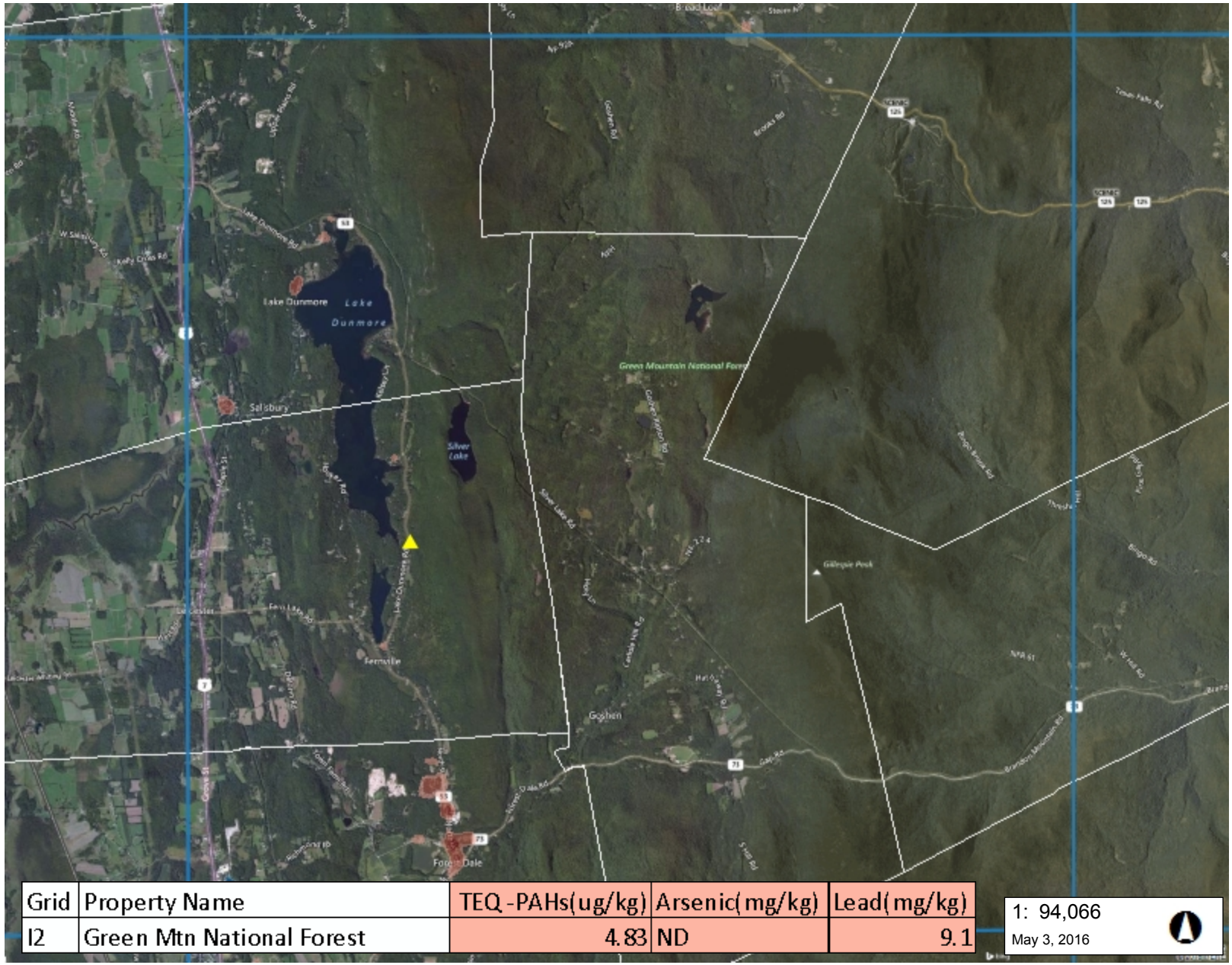

Grid	Property Name	TEQ -PAHs(ug/kg)	Arsenic(mg/kg)	Lead(mg/kg)
I2	Green Mtn National Forest	4.83	ND	9.1

1: 94,066

May 3, 2016

LEGEND

Town Boundary

Density of Habitable Buildings

- Low
- Medium
- High
- Highest

Sampling Location

NOTES

Location I2 is considered a Non Urban Sample Point

4,779.0 0 2,390.00 4,779.0 Meters

WGS_1984_Web_Mercator_Auxiliary_Sphere 1" = 7839 Ft. 1cm = 941 Meters

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2015 Surface Soil Survey - Grid I3

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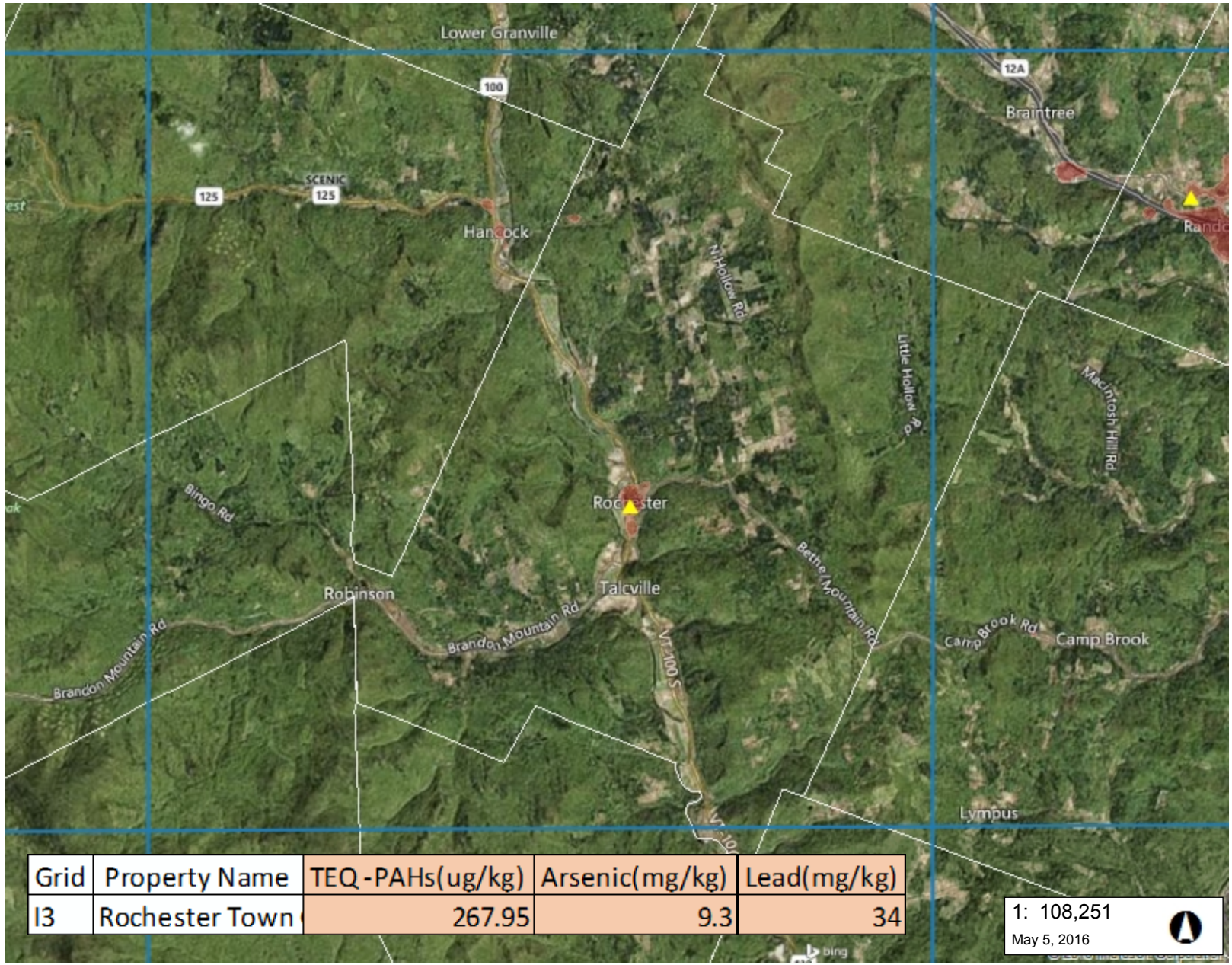

Grid	Property Name	TEQ-PAHs(ug/kg)	Arsenic(mg/kg)	Lead(mg/kg)
I3	Rochester Town	267.95	9.3	34

1: 108,251

May 5, 2016

LEGEND

Town Boundary

Density of Habitable Buildings

- Low
- Medium
- High
- Highest

Sampling Location

NOTES

Location I3 is considered an Urban Sample Point.

5,499.0 0 2,750.00 5,499.0 Meters

WGS_1984_Web_Mercator_Auxiliary_Sphere 1" = 9021 Ft. 1cm = 1083 Meters

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2015 Surface Soil Survey - Grid I4

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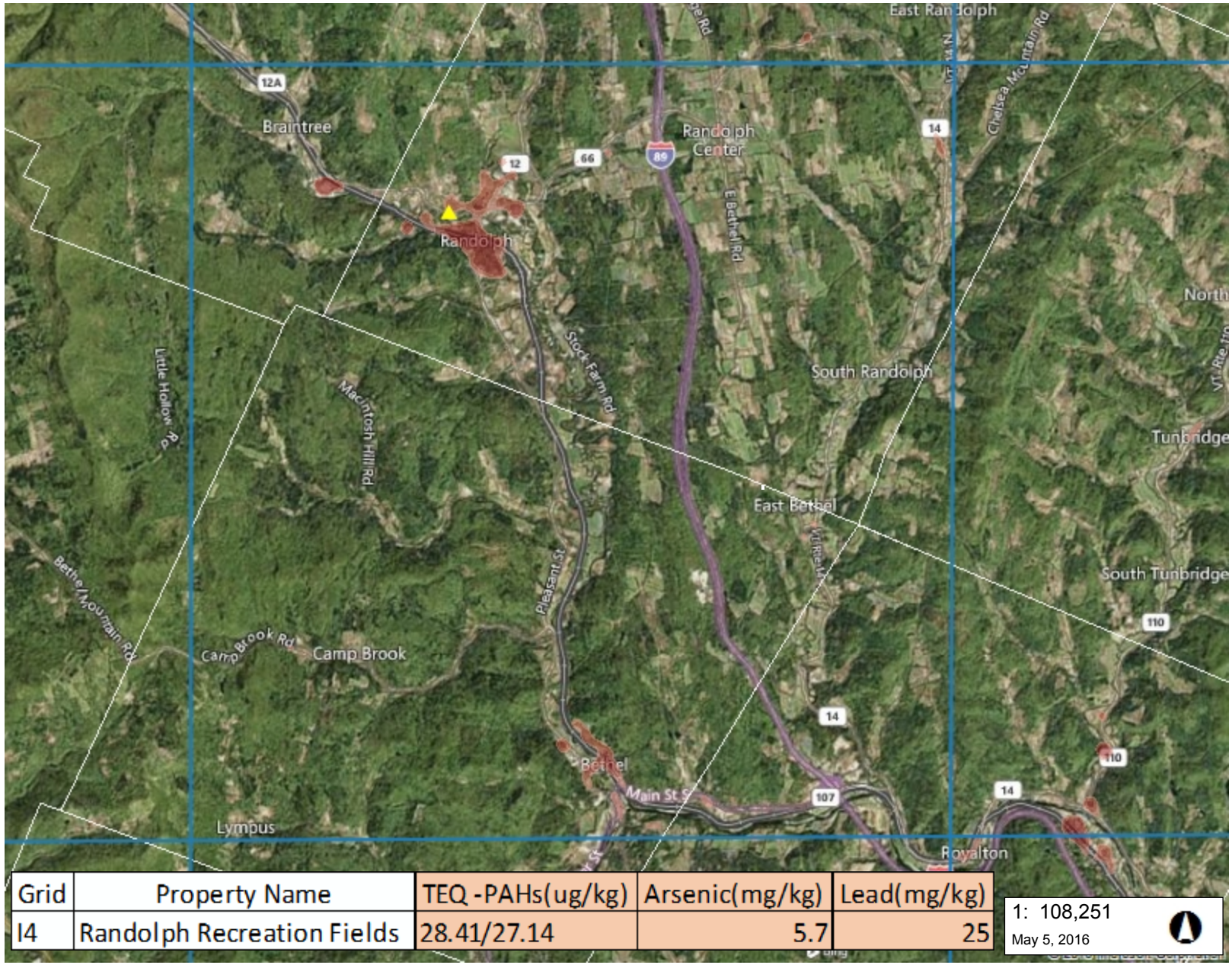

Grid	Property Name	TEQ -PAHs(ug/kg)	Arsenic(mg/kg)	Lead(mg/kg)
I4	Randolph Recreation Fields	28.41/27.14	5.7	25

1: 108,251

May 5, 2016

LEGEND

Town Boundary

Density of Habitable Buildings

- Low
- Medium
- High
- Highest

Sampling Location

NOTES

Location I4 is considered an Urban Sample Point.

5,499.0 0 2,750.00 5,499.0 Meters

WGS_1984_Web_Mercator_Auxiliary_Sphere 1" = 9021 Ft. 1cm = 1083 Meters

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2015 Surface Soil Survey - Grid I5

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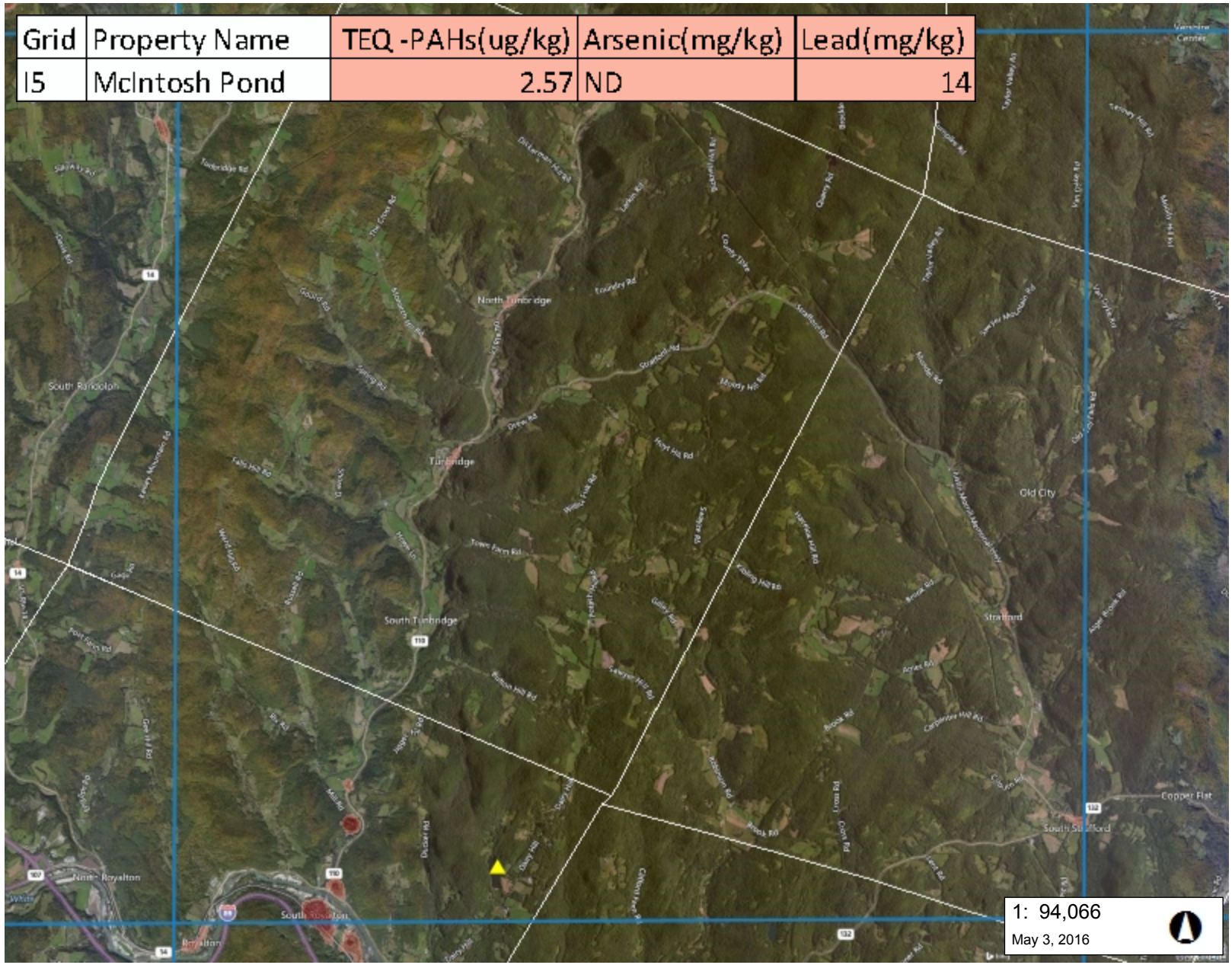
Grid	Property Name	TEQ -PAHs(ug/kg)	Arsenic(mg/kg)	Lead(mg/kg)
I5	McIntosh Pond	2.57	ND	14



LEGEND

Town Boundary

Density of Habitable Buildings

- Low
- Medium
- High
- Highest

Sampling Location

NOTES

Location I5 is considered a Non Urban Sample Point

4,779.0 0 2,390.00 4,779.0 Meters

WGS_1984_Web_Mercator_Auxiliary_Sphere 1" = 7839 Ft. 1cm = 941 Meters

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2015 Surface Soil Survey - Grid I6

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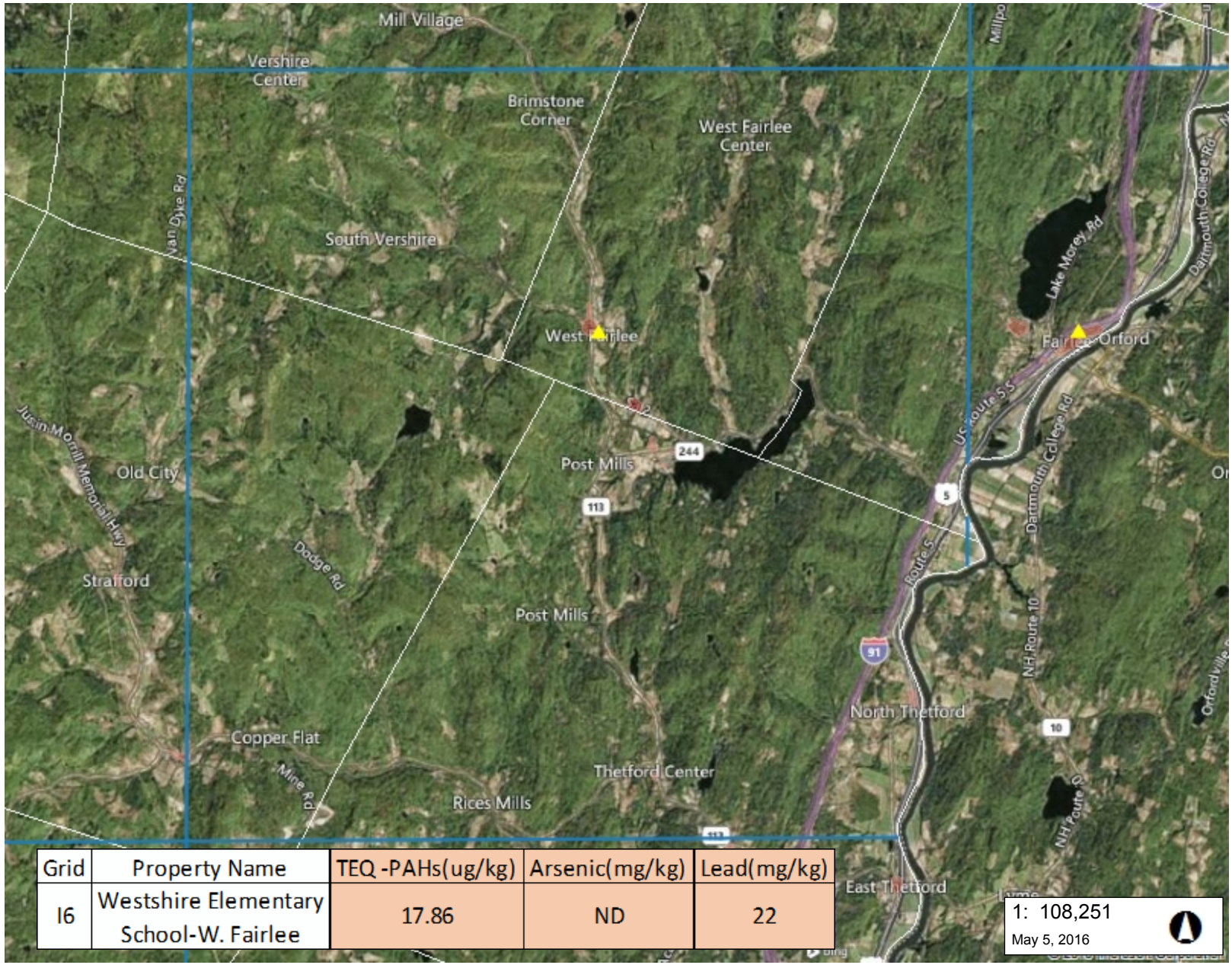

Grid	Property Name	TEQ -PAHs(ug/kg)	Arsenic(mg/kg)	Lead(mg/kg)
I6	Westshire Elementary School-W. Fairlee	17.86	ND	22

1: 108,251

May 5, 2016

LEGEND

Town Boundary

Density of Habitable Buildings

- Low
- Medium
- High
- Highest

Sampling Location

NOTES

Location I6 is considered an Urban Sample Point.

5,499.0 0 2,750.00 5,499.0 Meters

WGS_1984_Web_Mercator_Auxiliary_Sphere 1" = 9021 Ft. 1cm = 1083 Meters

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2015 Surface Soil Survey - Grid I7

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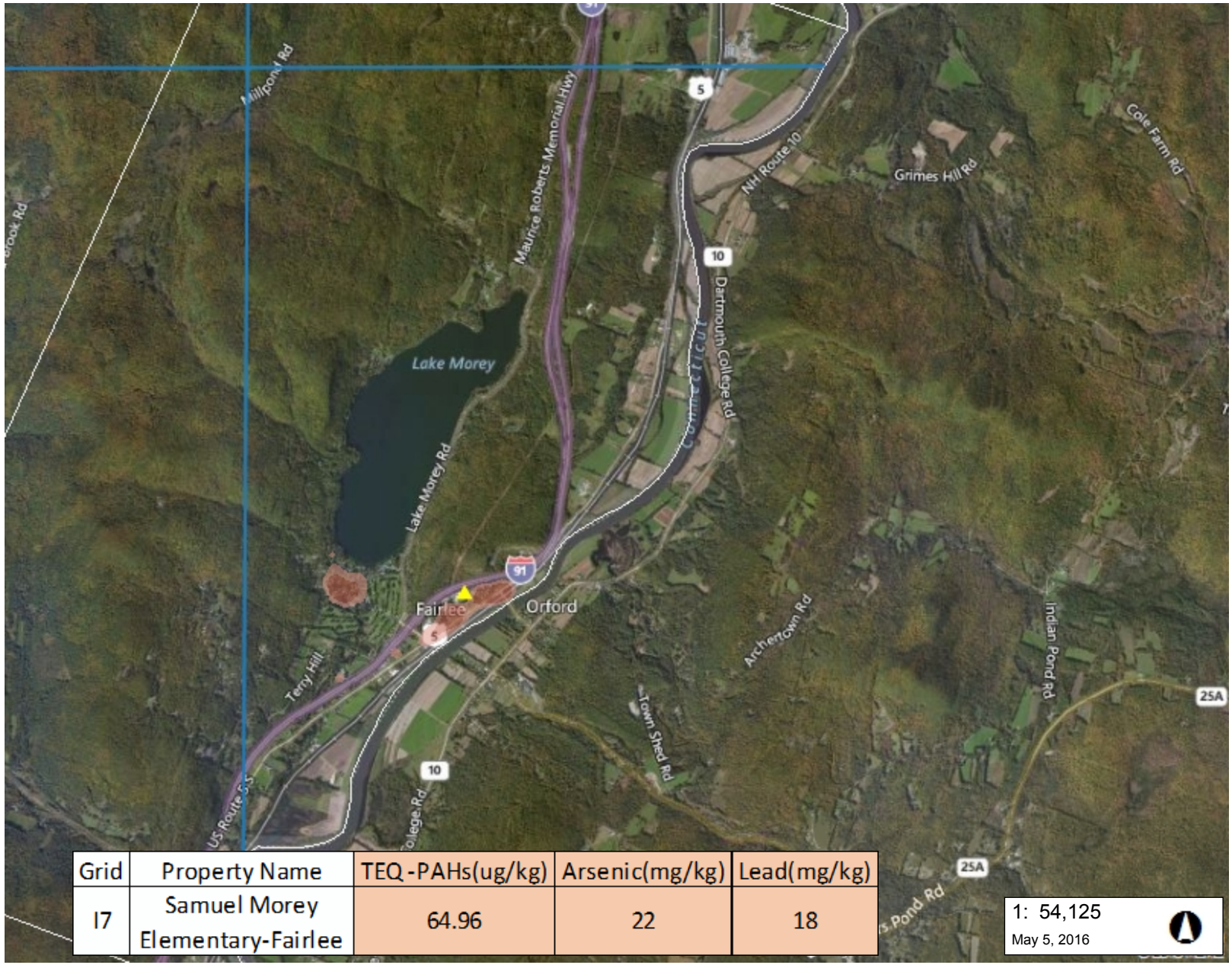

Grid	Property Name	TEQ-PAHs(ug/kg)	Arsenic(mg/kg)	Lead(mg/kg)
I7	Samuel Morey Elementary-Fairlee	64.96	22	18

1: 54,125

May 5, 2016

LEGEND

Town Boundary

Density of Habitable Buildings

- Low
- Medium
- High
- Highest

Sampling Location

NOTES

Location I7 is considered an Urban Sample Point.

2,750.0 0 1,375.00 2,750.0 Meters

WGS_1984_Web_Mercator_Auxiliary_Sphere 1" = 4510 Ft. 1cm = 541 Meters

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2015 Surface Soil Survey - Grid J1

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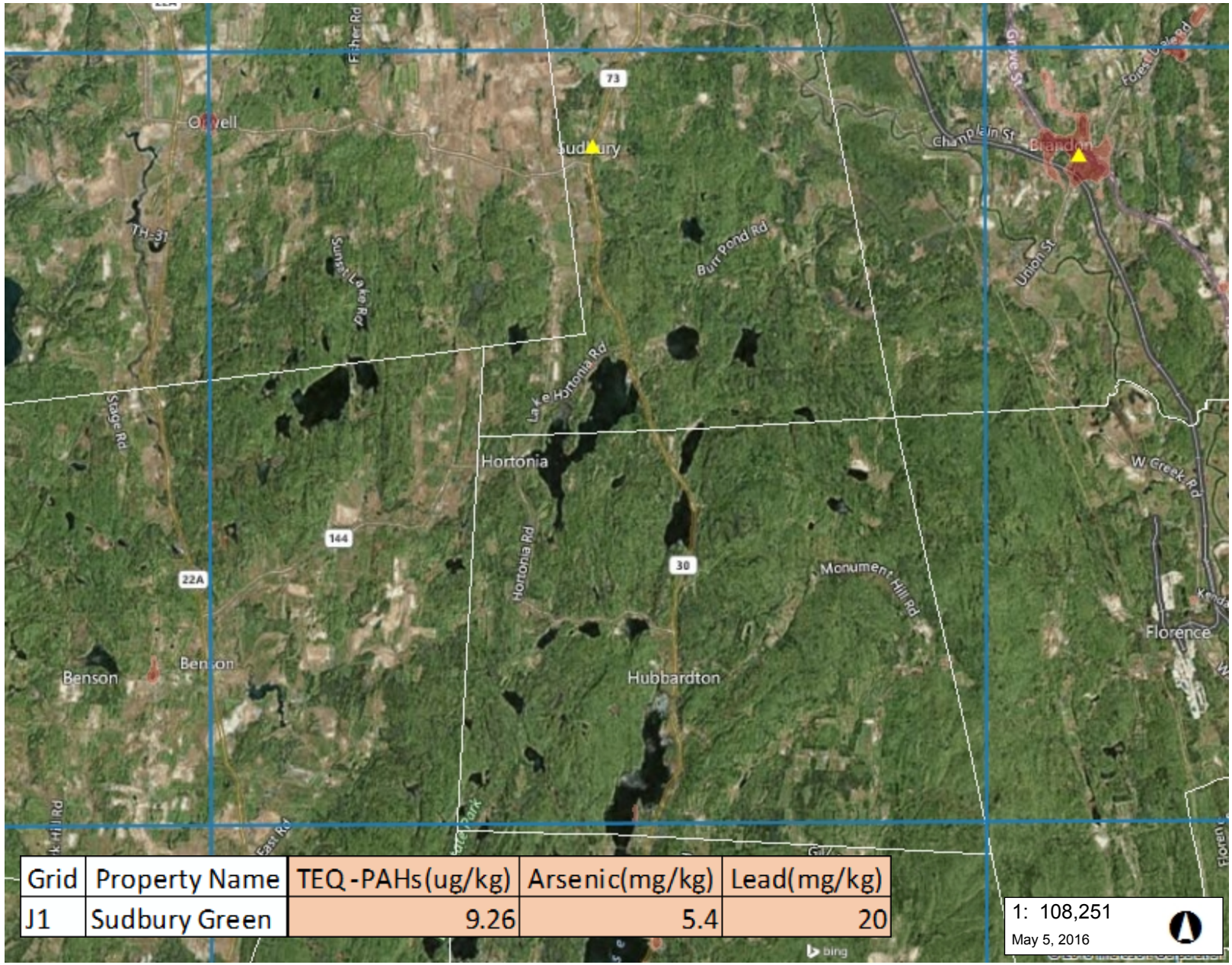

Grid	Property Name	TEQ-PAHs(ug/kg)	Arsenic(mg/kg)	Lead(mg/kg)
J1	Sudbury Green	9.26	5.4	20

LEGEND

Town Boundary

Density of Habitable Buildings

- Low
- Medium
- High
- Highest

Sampling Location

NOTES

Location J1 is considered an Urban Sample Point.

5,499.0 0 2,750.00 5,499.0 Meters

WGS_1984_Web_Mercator_Auxiliary_Sphere 1" = 9021 Ft. 1cm = 1083 Meters

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2015 Surface Soil Survey - Grid J2

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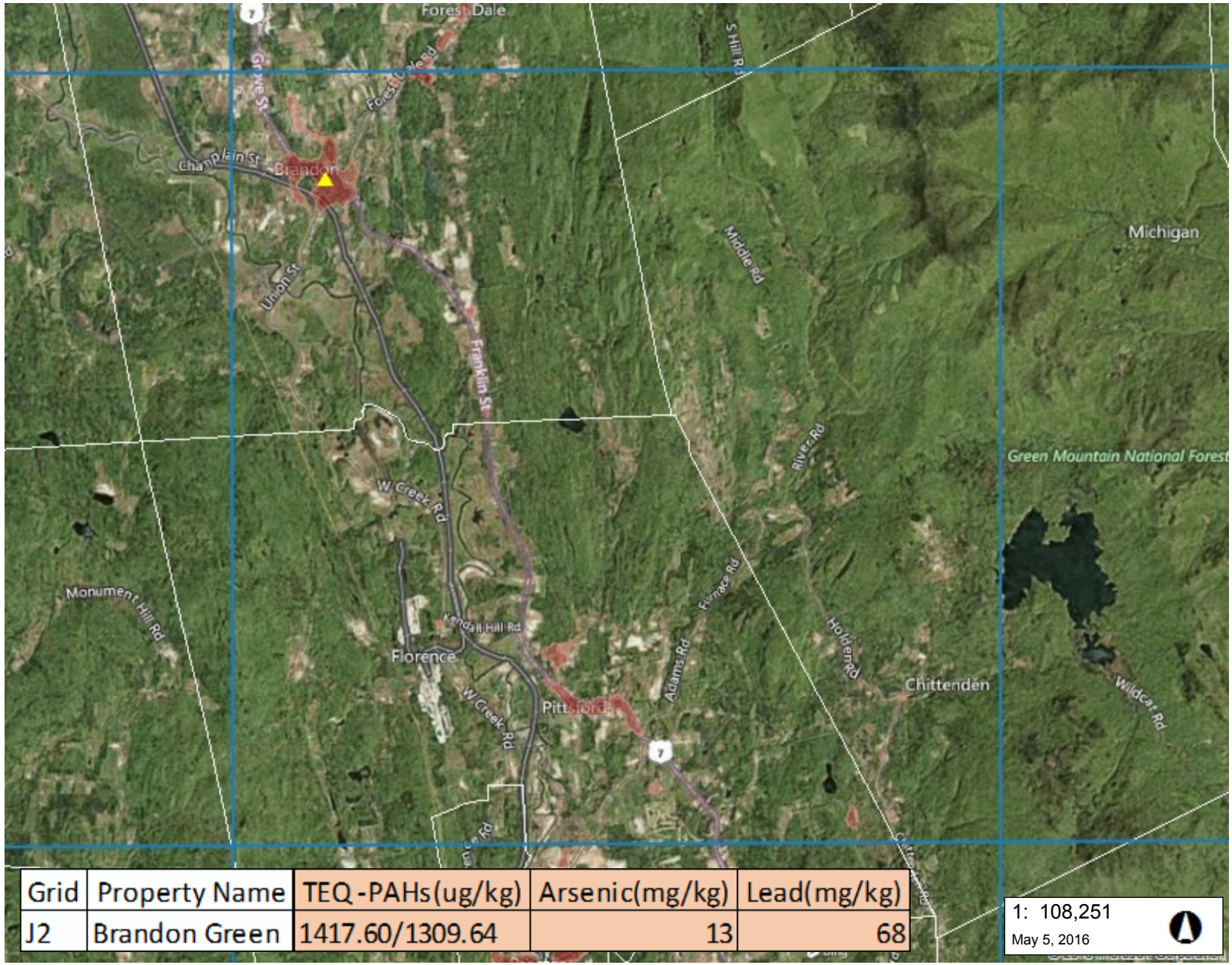

Grid	Property Name	TEQ-PAHs(ug/kg)	Arsenic(mg/kg)	Lead(mg/kg)
J2	Brandon Green	1417.60/1309.64	13	68

1: 108,251

May 5, 2016

LEGEND

Town Boundary

Density of Habitable Buildings

- Low
- Medium
- High
- Highest

Sampling Location

NOTES

Location J2 is considered an Urban Sample Point.

5,499.0 0 2,750.00 5,499.0 Meters

WGS_1984_Web_Mercator_Auxiliary_Sphere 1" = 9021 Ft. 1cm = 1083 Meters

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2015 Surface Soil Survey - Grid J3

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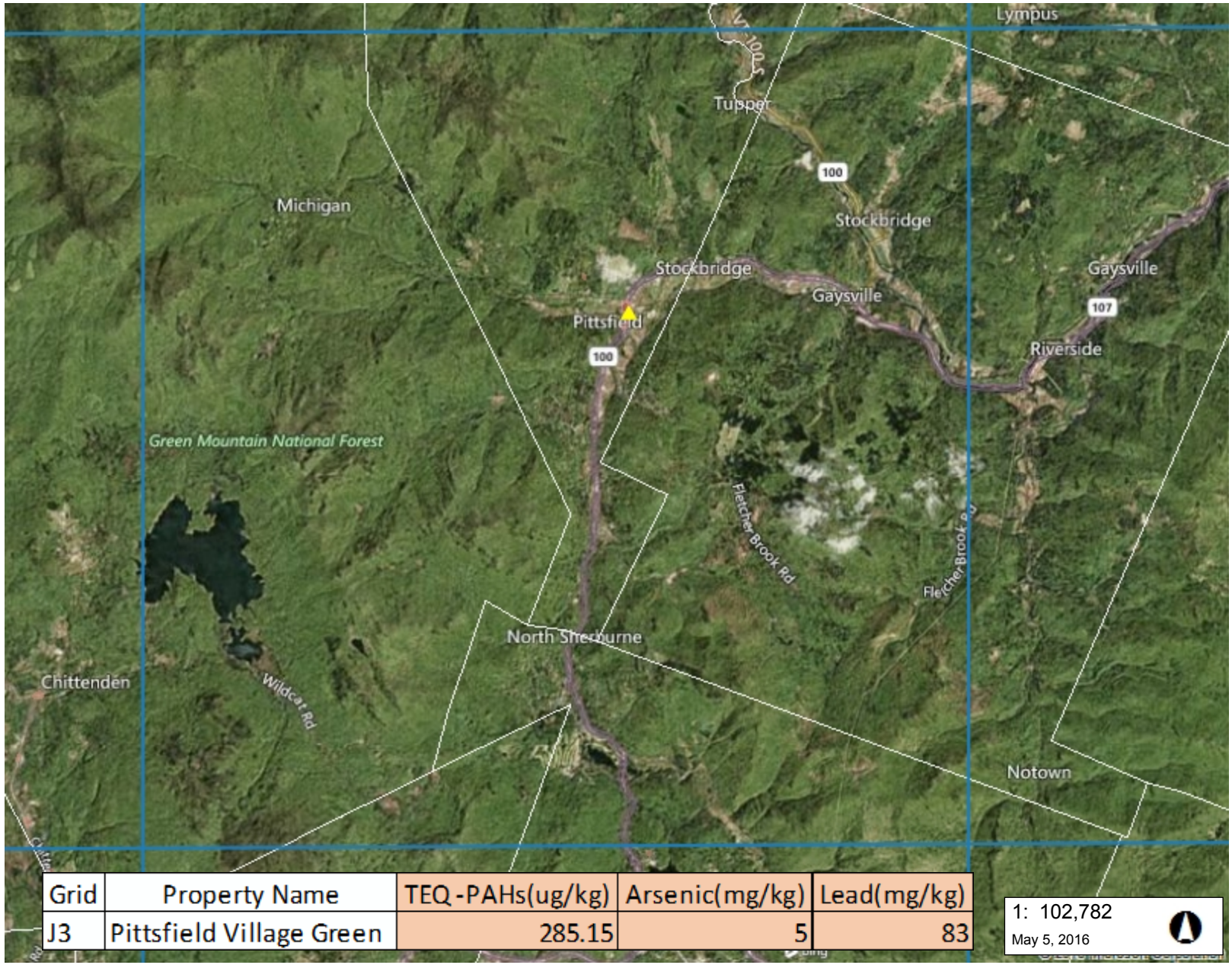

Grid	Property Name	TEQ-PAHs(ug/kg)	Arsenic(mg/kg)	Lead(mg/kg)
J3	Pittsfield Village Green	285.15	5	83

1: 102,782

May 5, 2016

LEGEND

Town Boundary

Density of Habitable Buildings

- Low
- Medium
- High
- Highest

Sampling Location

NOTES

Location J3 is considered an Urban Sample Point.

5,221.0 0 2,610.00 5,221.0 Meters

WGS_1984_Web_Mercator_Auxiliary_Sphere 1" = 8565 Ft. 1cm = 1028 Meters

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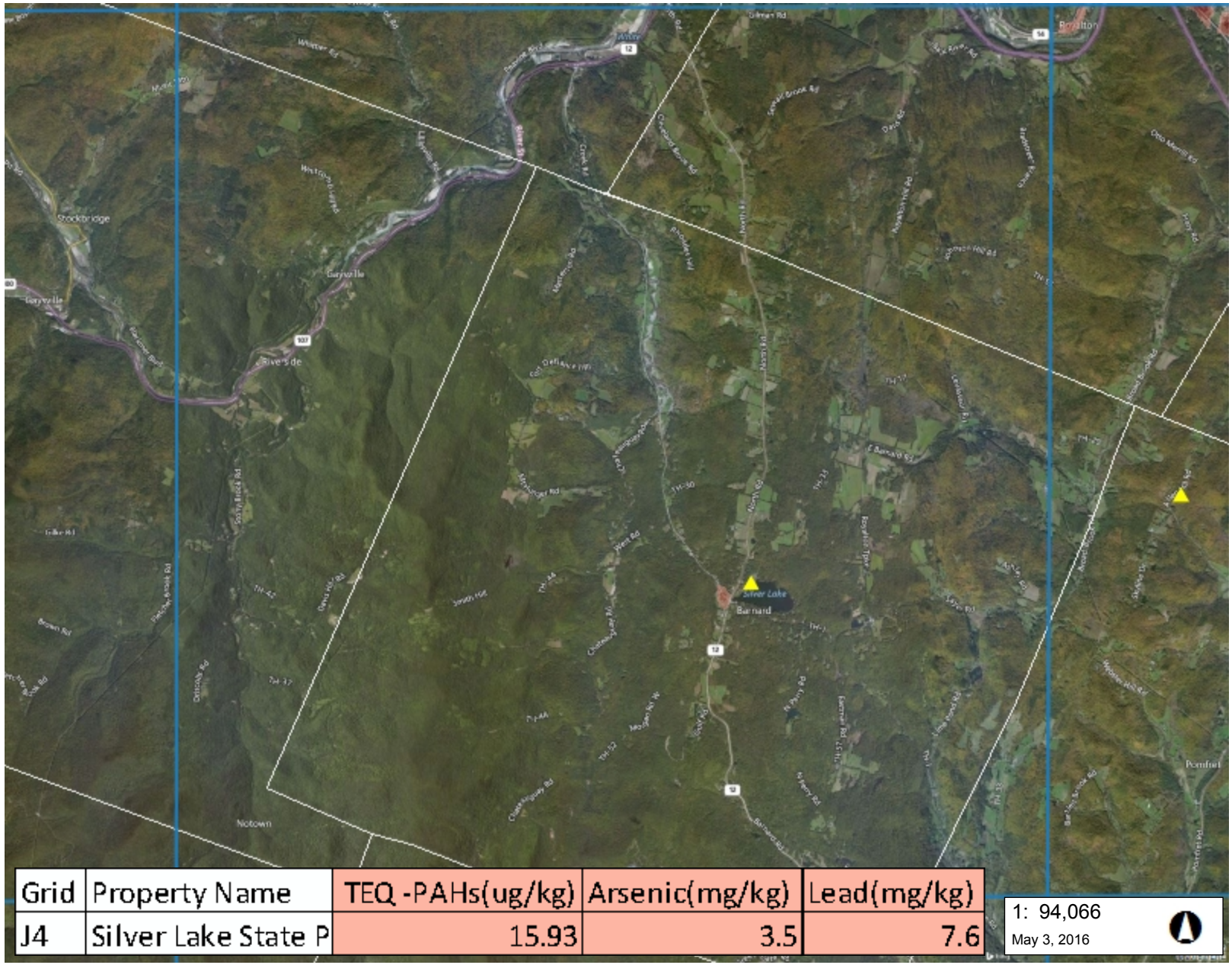
2015 Surface Soil Survey - Grid J4

Vermont Agency of Natural Resources

vermont.gov



Grid	Property Name	TEQ -PAHs(ug/kg)	Arsenic(mg/kg)	Lead(mg/kg)
J4	Silver Lake State P	15.93	3.5	7.6

1: 94,066

May 3, 2016

LEGEND

Town Boundary

Density of Habitable Buildings

- Low
- Medium
- High
- Highest

Sampling Location

NOTES

Location J4 is considered a Non Urban Sample Point

4,779.0 0 2,390.00 4,779.0 Meters

WGS_1984_Web_Mercator_Auxiliary_Sphere 1" = 7839 Ft. 1cm = 941 Meters

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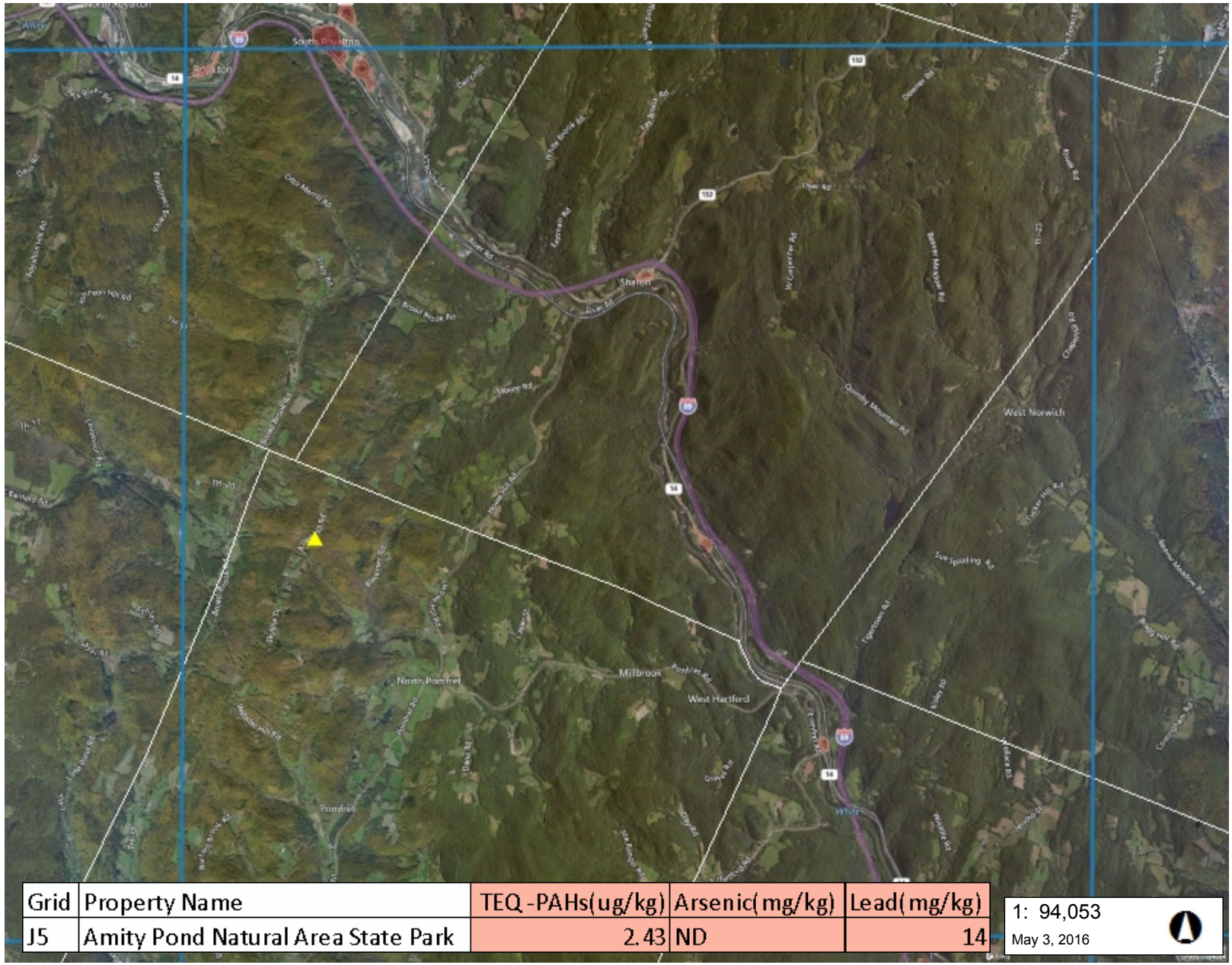
2015 Surface Soil Survey - Grid J5

Vermont Agency of Natural Resources

vermont.gov



Grid	Property Name	TEQ -PAHs(ug/kg)	Arsenic(mg/kg)	Lead(mg/kg)
J5	Amity Pond Natural Area State Park	2.43	ND	14

1: 94,053

May 3, 2016

LEGEND

Town Boundary

Density of Habitable Buildings

- Low
- Medium
- High
- Highest

Sampling Location

NOTES

Location J5 is considered a Non Urban Sample Point

4,778.0 0 2,389.00 4,778.0 Meters

WGS_1984_Web_Mercator_Auxiliary_Sphere 1" = 7838 Ft. 1cm = 941 Meters

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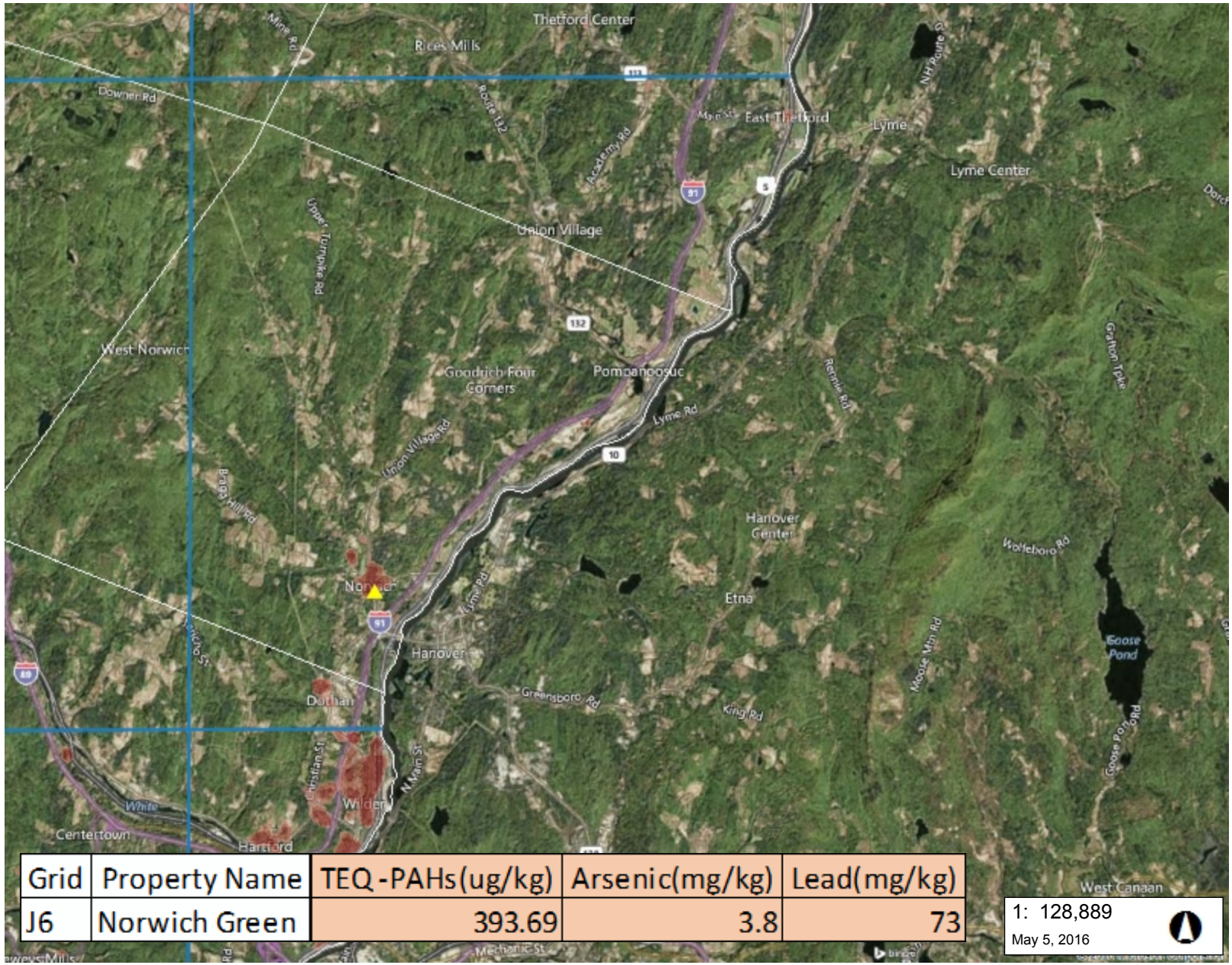
2015 Surface Soil Survey - Grid J6

Vermont Agency of Natural Resources

vermont.gov



Grid	Property Name	TEQ-PAHs(ug/kg)	Arsenic(mg/kg)	Lead(mg/kg)
J6	Norwich Green	393.69	3.8	73

1: 128,889

May 5, 2016

LEGEND

Town Boundary

Density of Habitable Buildings

- Low
- Medium
- High
- Highest

Sampling Location

NOTES

Location J6 is considered an Urban Sample Point.

6,548.0 0 3,274.00 6,548.0 Meters

WGS_1984_Web_Mercator_Auxiliary_Sphere 1" = 10741 Ft. 1cm = 1289 Meters

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2015 Surface Soil Survey - Grid K1

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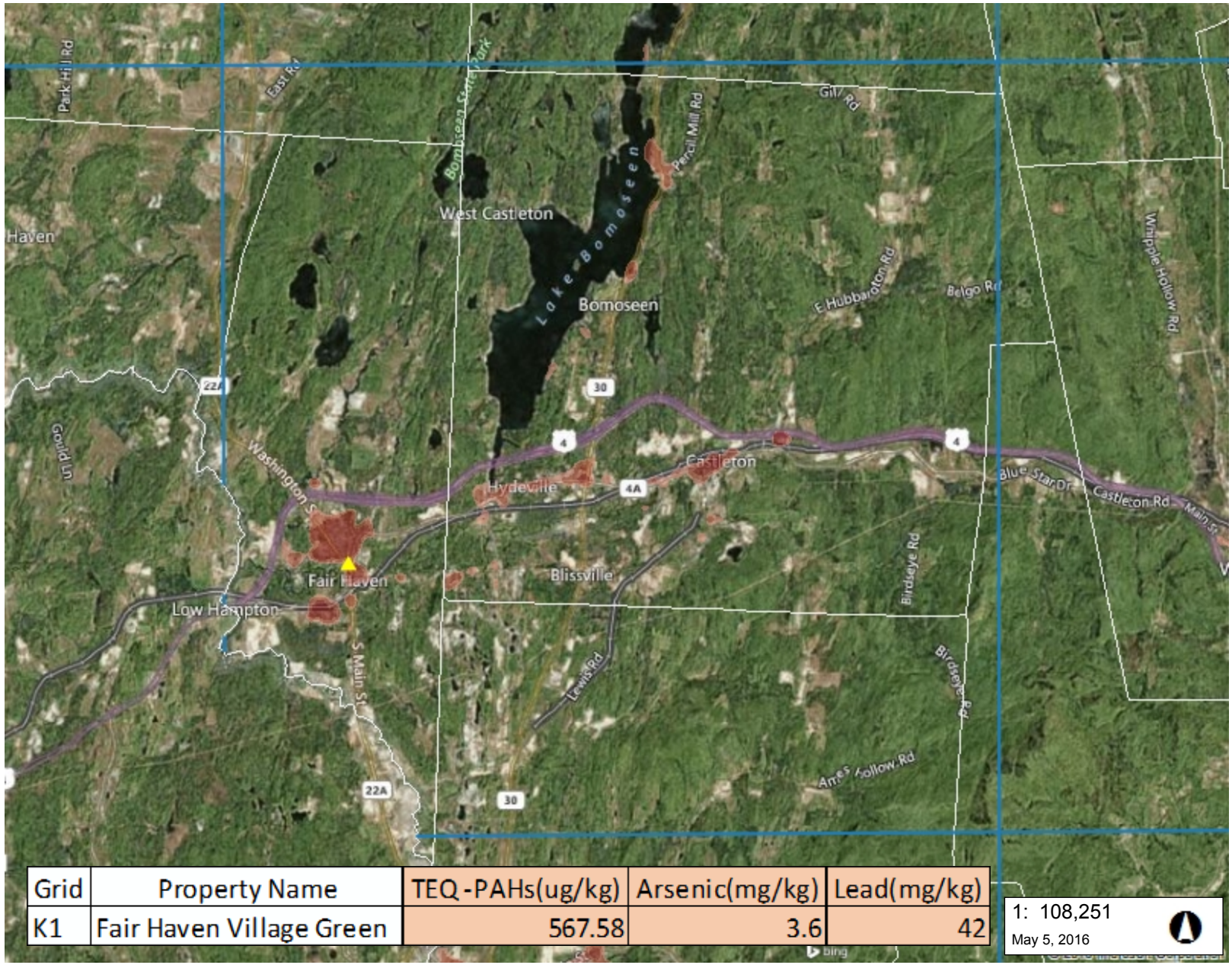

Grid	Property Name	TEQ-PAHs(ug/kg)	Arsenic(mg/kg)	Lead(mg/kg)
K1	Fair Haven Village Green	567.58	3.6	42

1: 108,251

May 5, 2016

LEGEND

Town Boundary

Density of Habitable Buildings

- Low
- Medium
- High
- Highest

Sampling Location

NOTES

Location K1 is considered an Urban Sample Point.

5,499.0 0 2,750.00 5,499.0 Meters

WGS_1984_Web_Mercator_Auxiliary_Sphere 1" = 9021 Ft. 1cm = 1083 Meters

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2015 Surface Soil Survey - Grid K2

Vermont Agency of Natural Resources

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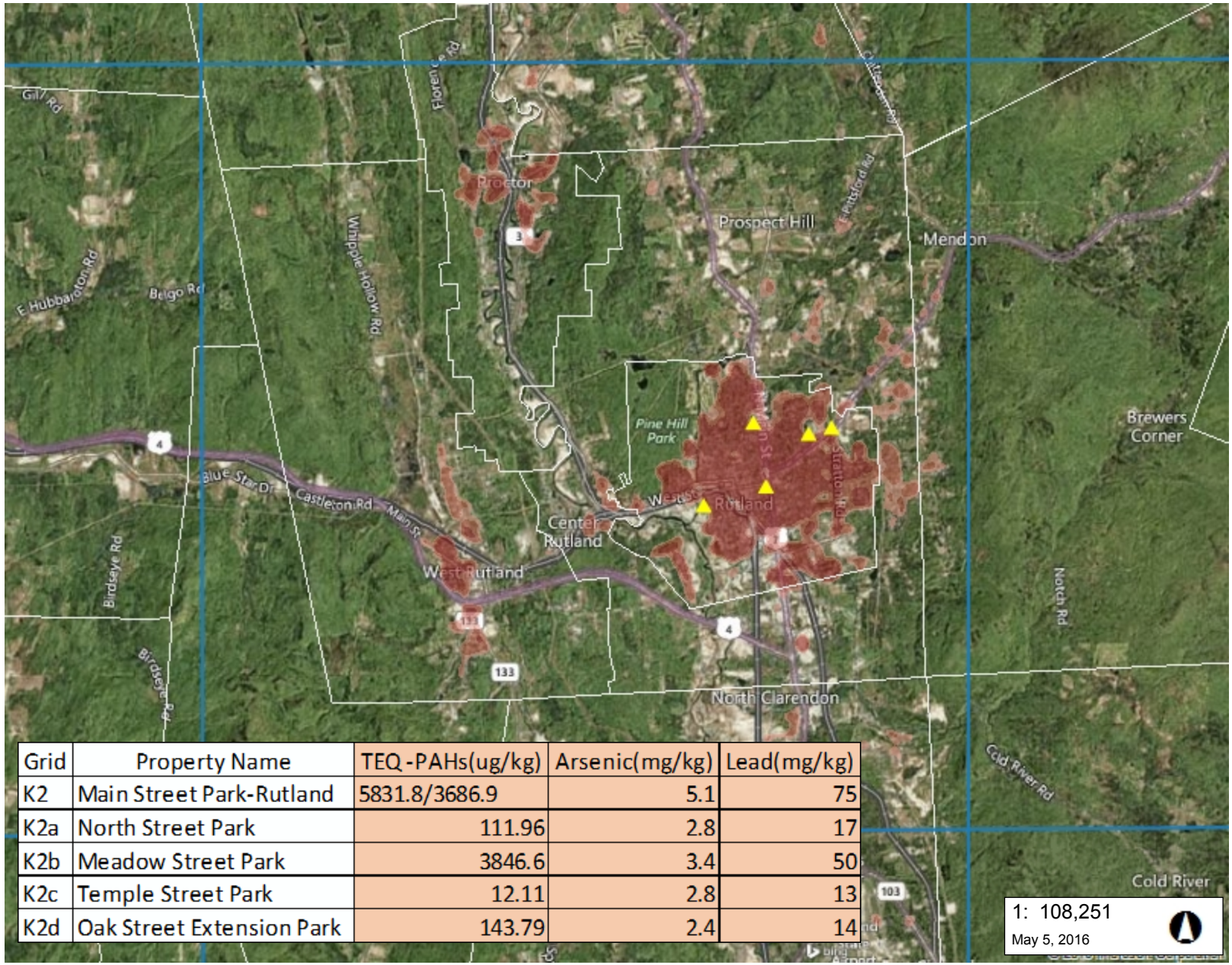

Grid	Property Name	TEQ-PAHs(ug/kg)	Arsenic(mg/kg)	Lead(mg/kg)
K2	Main Street Park-Rutland	5831.8/3686.9	5.1	75
K2a	North Street Park	111.96	2.8	17
K2b	Meadow Street Park	3846.6	3.4	50
K2c	Temple Street Park	12.11	2.8	13
K2d	Oak Street Extension Park	143.79	2.4	14

1: 108,251

May 5, 2016

LEGEND

Town Boundary

Density of Habitable Buildings

- Low
- Medium
- High
- Highest

Sampling Location

NOTES

Locations K2, K2a-d, are considered Urban Sample Points.

5,499.0 0 2,750.00 5,499.0 Meters

WGS_1984_Web_Mercator_Auxiliary_Sphere 1" = 9021 Ft. 1cm = 1083 Meters

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2015 Surface Soil Survey - Grid K3

Vermont Agency of Natural Resources

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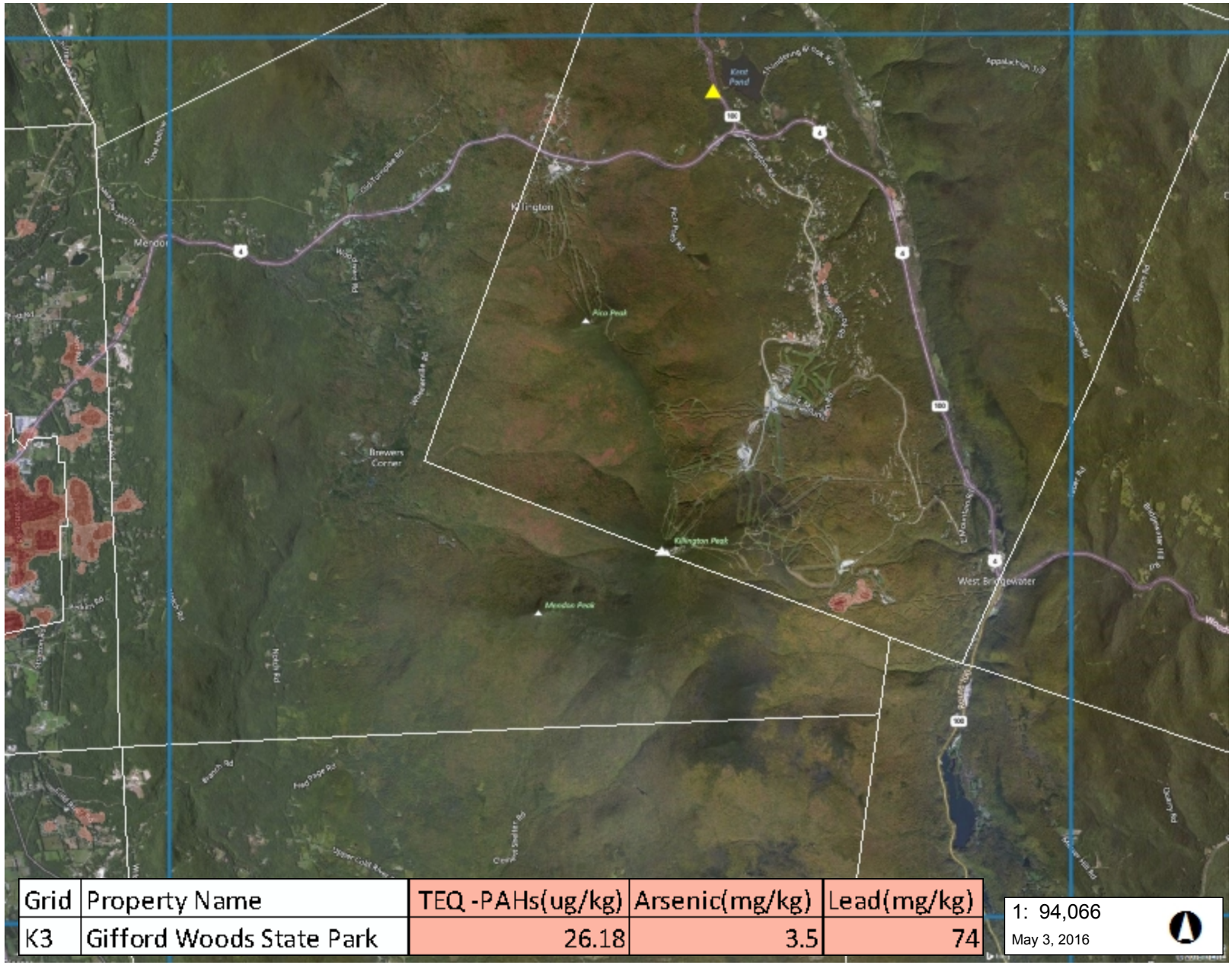

Grid	Property Name	TEQ -PAHs(ug/kg)	Arsenic(mg/kg)	Lead(mg/kg)
K3	Gifford Woods State Park	26.18	3.5	74

1: 94,066

May 3, 2016

LEGEND

Town Boundary

Density of Habitable Buildings

- Low
- Medium
- High
- Highest

Sampling Location

NOTES

Location K3 is considered a Non Urban Sample Point

4,779.0 0 2,390.00 4,779.0 Meters

WGS_1984_Web_Mercator_Auxiliary_Sphere 1" = 7839 Ft. 1cm = 941 Meters

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2015 Surface Soil Survey - Grid K4

Vermont Agency of Natural Resources

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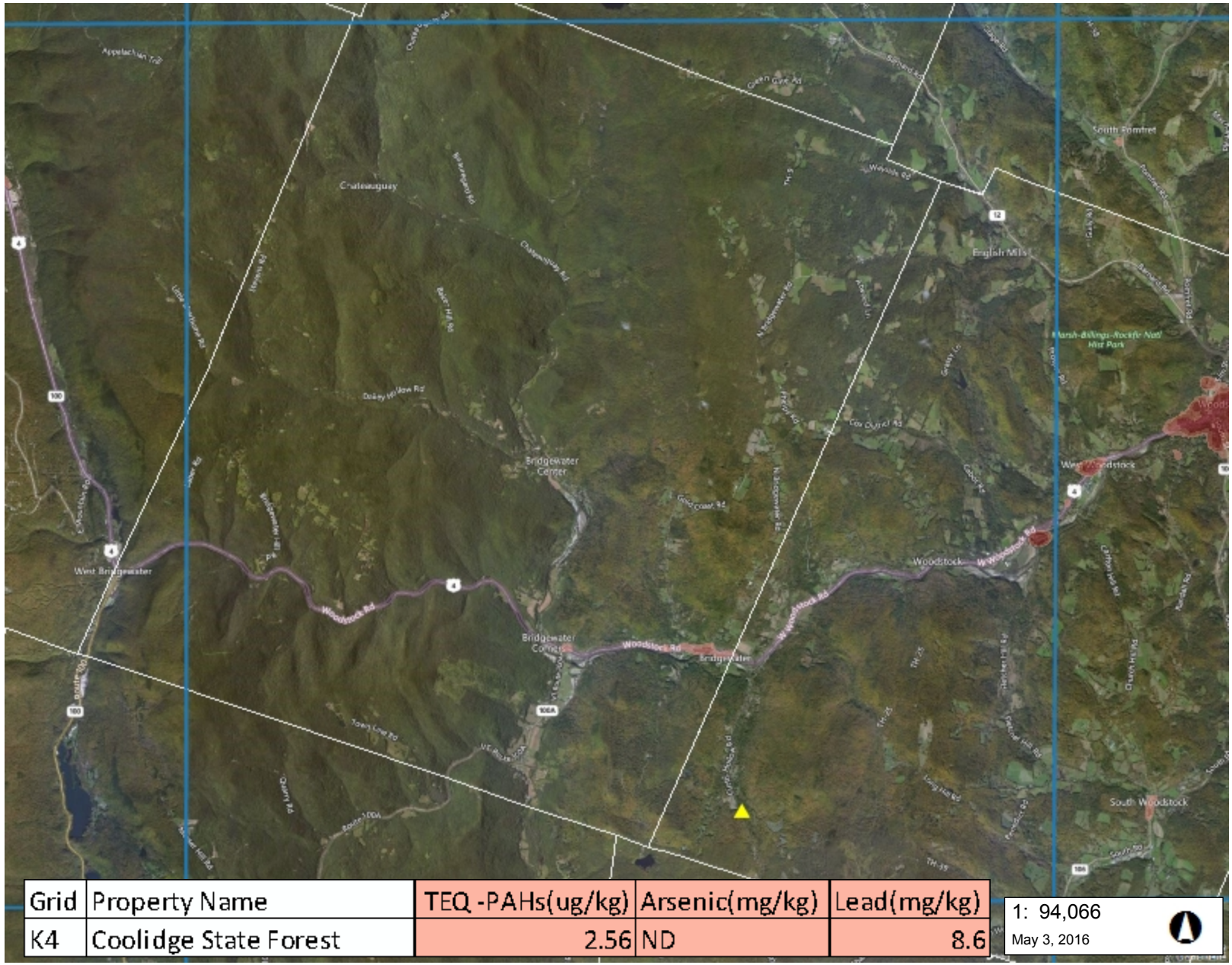

Grid	Property Name	TEQ -PAHs(ug/kg)	Arsenic(mg/kg)	Lead(mg/kg)
K4	Coolidge State Forest	2.56	ND	8.6

1: 94,066

May 3, 2016

LEGEND

Town Boundary

Density of Habitable Buildings

- Low
- Medium
- High
- Highest

Sampling Location

NOTES

Location K4 is considered a Non Urban Sample Point

4,779.0 0 2,390.00 4,779.0 Meters

WGS_1984_Web_Mercator_Auxiliary_Sphere 1" = 7839 Ft. 1cm = 941 Meters

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2015 Surface Soil Survey - Grid K5

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Grid	Property Name	TEQ -PAHs(ug/kg)	Arsenic(mg/kg)	Lead(mg/kg)
K5	Quecee State Park	8.84	7.4	15
K6C	Meeting House Common	11.08	2.5	260

1: 94,066

May 3, 2016

LEGEND

Town Boundary

Density of Habitable Buildings

- Low
- Medium
- High
- Highest

K6c is under administration of Town of Hartford (K6)

Sampling Location

NOTES

Location K5 and K6c are considered Non Urban Sample Points

4,779.0 0 2,390.00 4,779.0 Meters

WGS_1984_Web_Mercator_Auxiliary_Sphere 1" = 7839 Ft. 1cm = 941 Meters

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2015 Surface Soil Survey - Grid K6

Vermont Agency of Natural Resources

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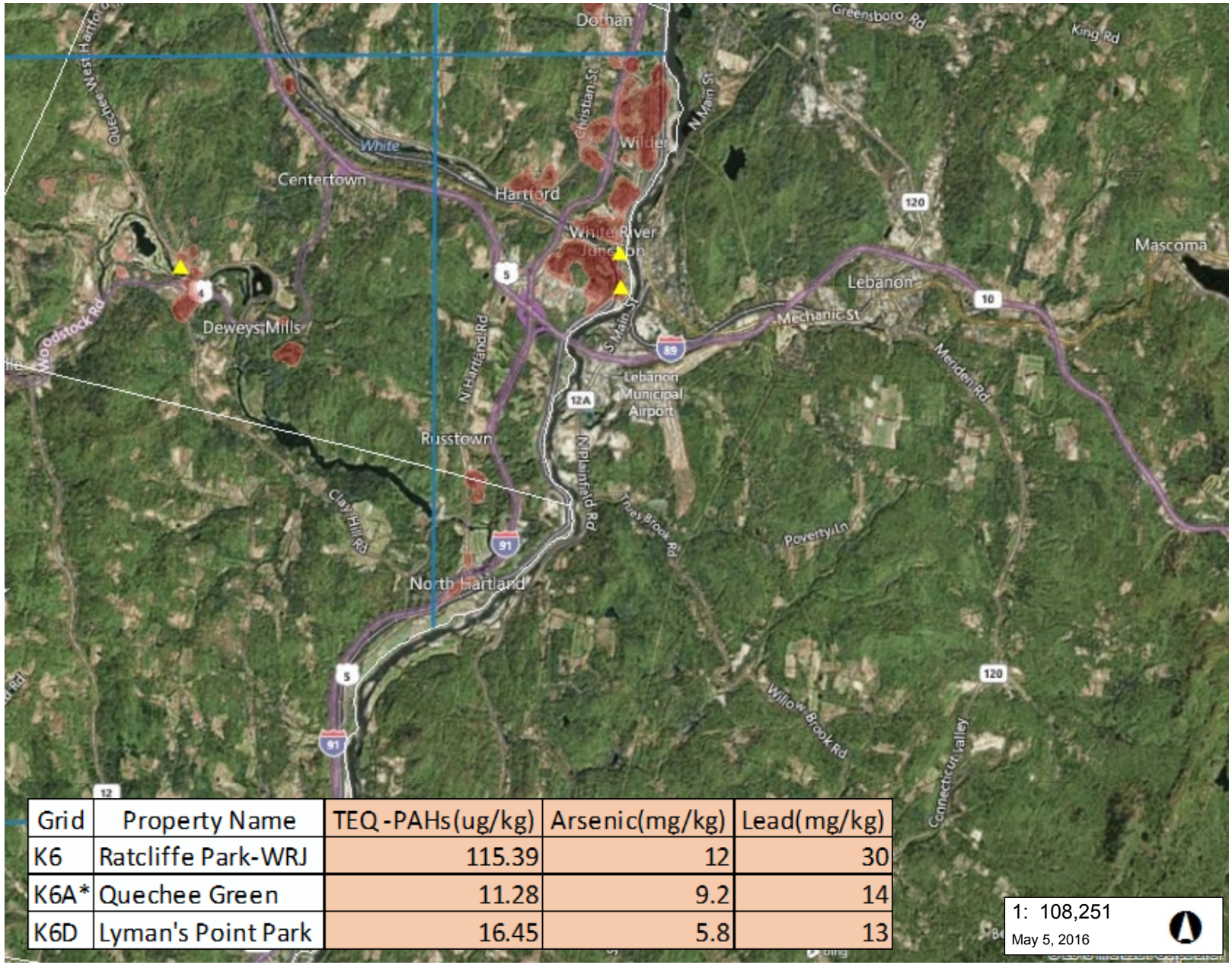

Grid	Property Name	TEQ-PAHs(ug/kg)	Arsenic(mg/kg)	Lead(mg/kg)
K6	Ratcliffe Park-WRJ	115.39	12	30
K6A*	Quechee Green	11.28	9.2	14
K6D	Lyman's Point Park	16.45	5.8	13

1: 108,251

May 5, 2016

LEGEND

Town Boundary

Density of Habitable Buildings

- Low
- Medium
- High
- Highest

Sampling Location

NOTES

Locations K6, K6A and K6d, are considered Urban Sample Points.

5,499.0 0 2,750.00 5,499.0 Meters

WGS_1984_Web_Mercator_Auxiliary_Sphere 1" = 9021 Ft. 1cm = 1083 Meters

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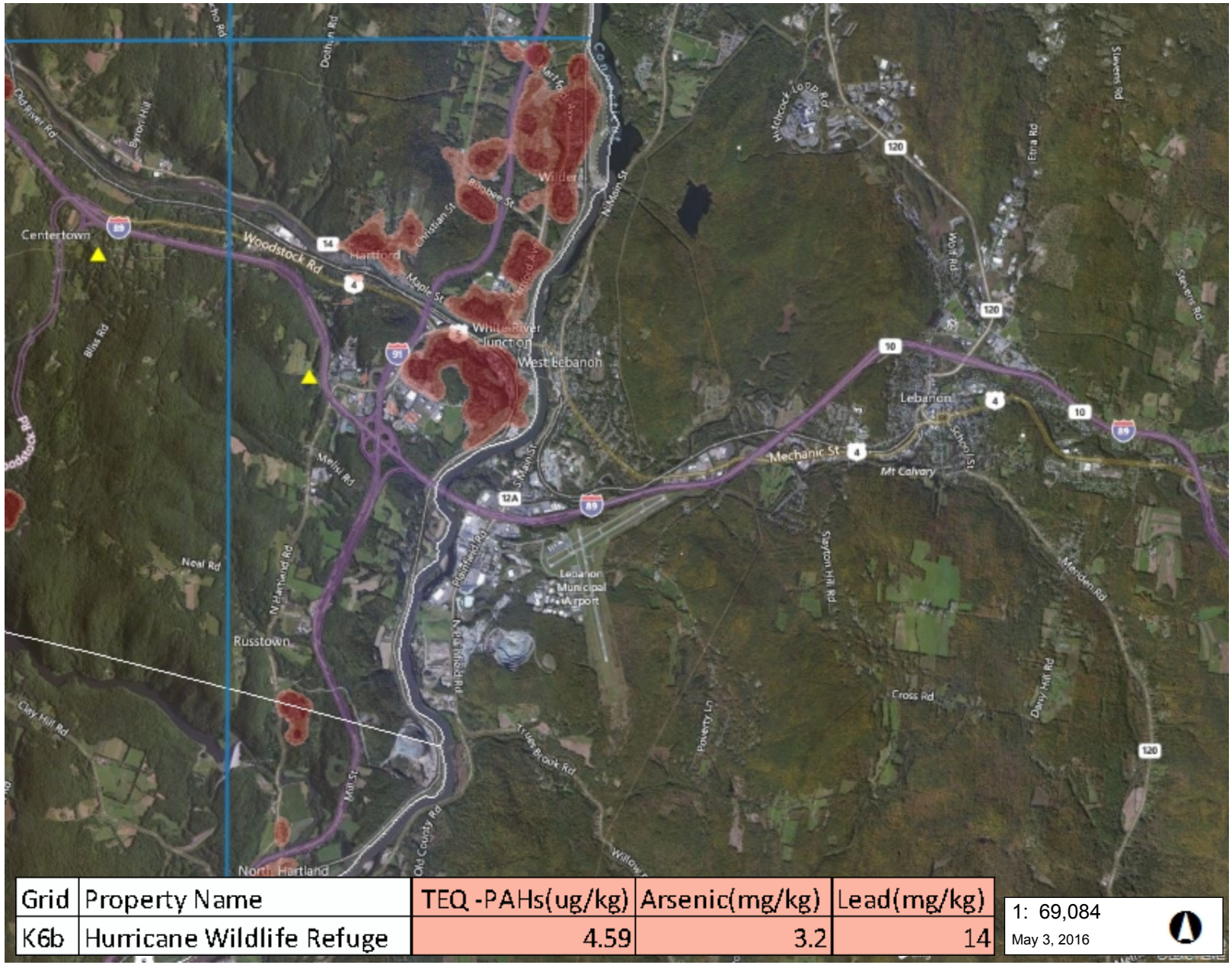
2015 Surface Soil Survey - Grid K6b

Vermont Agency of Natural Resources

vermont.gov



Grid	Property Name	TEQ -PAHs(ug/kg)	Arsenic(mg/kg)	Lead(mg/kg)
K6b	Hurricane Wildlife Refuge	4.59	3.2	14

1: 69,084

May 3, 2016

LEGEND

Town Boundary

Density of Habitable Buildings

- Low
- Medium
- High
- Highest

NOTES

Location K6b is considered a Non Urban Sample Point

3,509.0 0 1,754.00 3,509.0 Meters

WGS_1984_Web_Mercator_Auxiliary_Sphere 1" = 5757 Ft. 1cm = 691 Meters

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2015 Surface Soil Survey - Grid L1

Vermont Agency of Natural Resources

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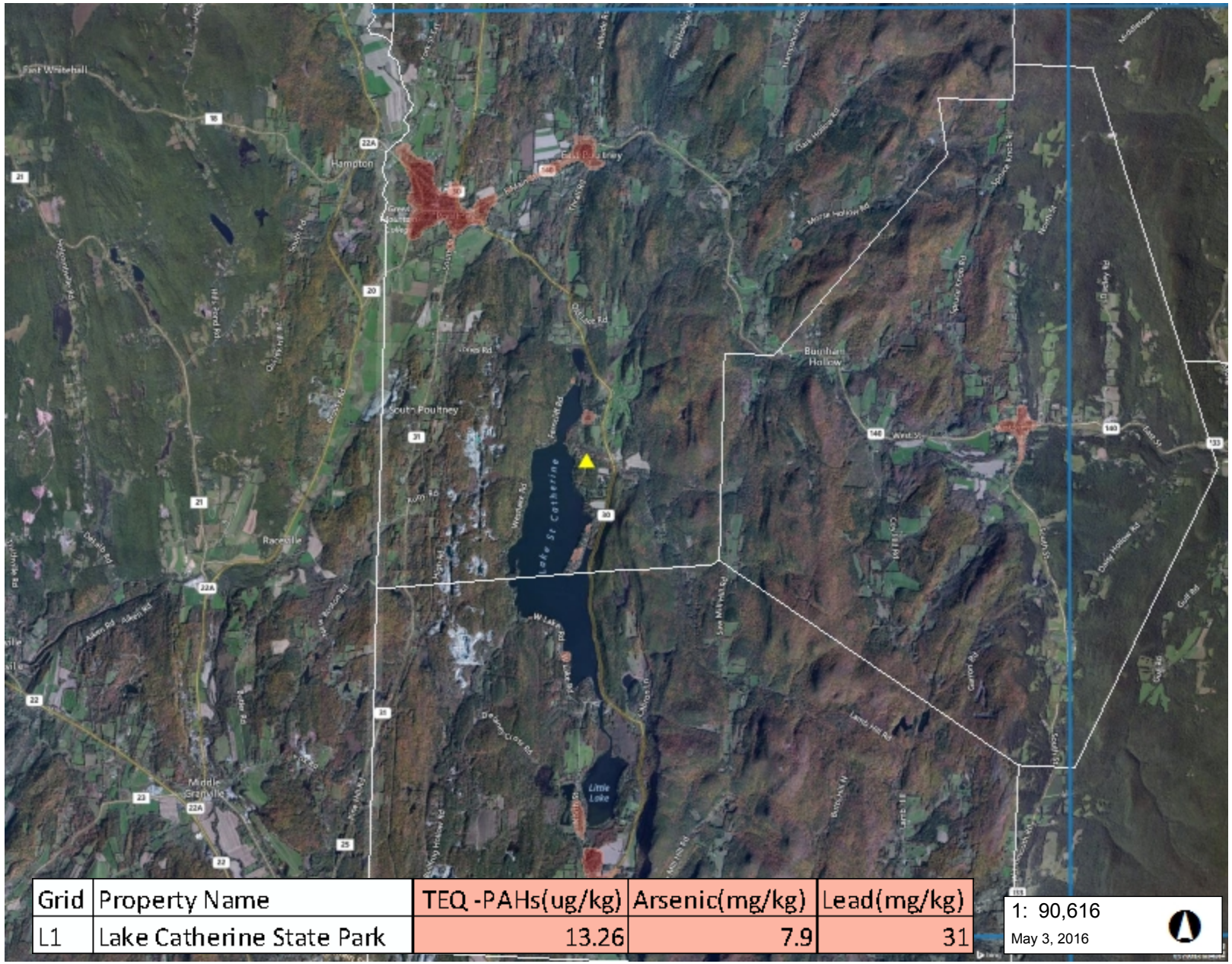

Grid	Property Name	TEQ -PAHs(ug/kg)	Arsenic(mg/kg)	Lead(mg/kg)
L1	Lake Catherine State Park	13.26	7.9	31

1: 90,616

May 3, 2016

LEGEND

Town Boundary

Density of Habitable Buildings

- Low
- Medium
- High
- Highest

Sampling Location

NOTES

Location L1 is considered a Non Urban Sample Point

4,603.0 0 2,302.00 4,603.0 Meters

WGS_1984_Web_Mercator_Auxiliary_Sphere 1" = 7551 Ft. 1cm = 906 Meters

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2015 Surface Soil Survey - Grid L2

Vermont Agency of Natural Resources

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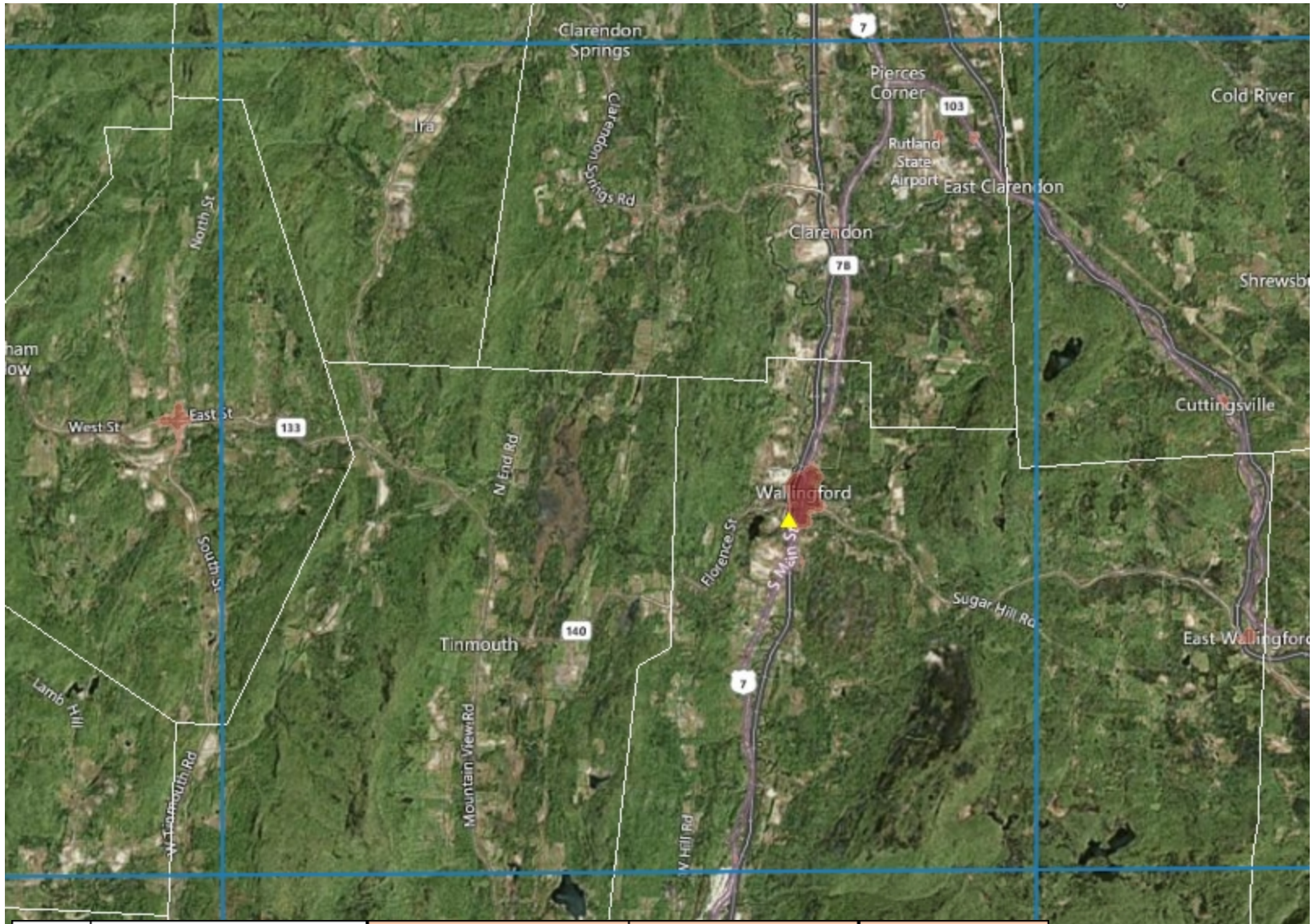

Grid	Property Name	TEQ-PAHs(ug/kg)	Arsenic(mg/kg)	Lead(mg/kg)
L2	Wallingford Recreat	12.19	3.1	7.1

1: 108,251

May 5, 2016

LEGEND

Town Boundary

Density of Habitable Buildings

- Low
- Medium
- High
- Highest

Sampling Location

NOTES

Location L2 is considered an Urban Sample Point.

5,499.0 0 2,750.00 5,499.0 Meters

WGS_1984_Web_Mercator_Auxiliary_Sphere 1" = 9021 Ft. 1cm = 1083 Meters

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2015 Surface Soil Survey - Grid L3

Vermont Agency of Natural Resources

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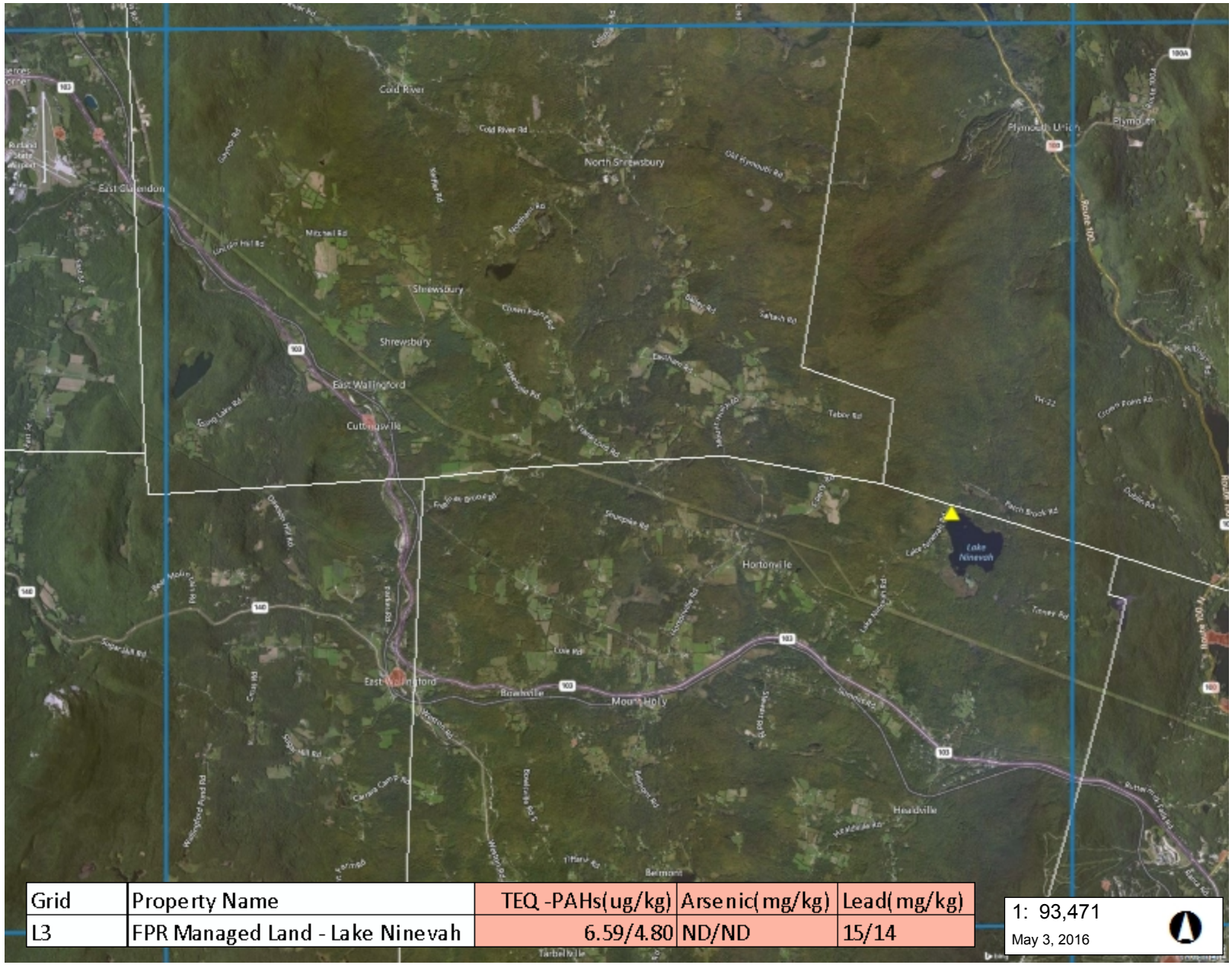

Grid	Property Name	TEQ -PAHs(ug/kg)	Arsenic(mg/kg)	Lead(mg/kg)
L3	FPR Managed Land - Lake Ninevah	6.59/4.80	ND/ND	15/14

1: 93,471

May 3, 2016

LEGEND

Town Boundary

Density of Habitable Buildings

- Low
- Medium
- High
- Highest

Sampling Location

NOTES

Location L3 is considered a Non Urban Sample Point

4,748.0 0 2,374.00 4,748.0 Meters

WGS_1984_Web_Mercator_Auxiliary_Sphere 1" = 7789 Ft. 1cm = 935 Meters

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2015 Surface Soil Survey - Grid L4

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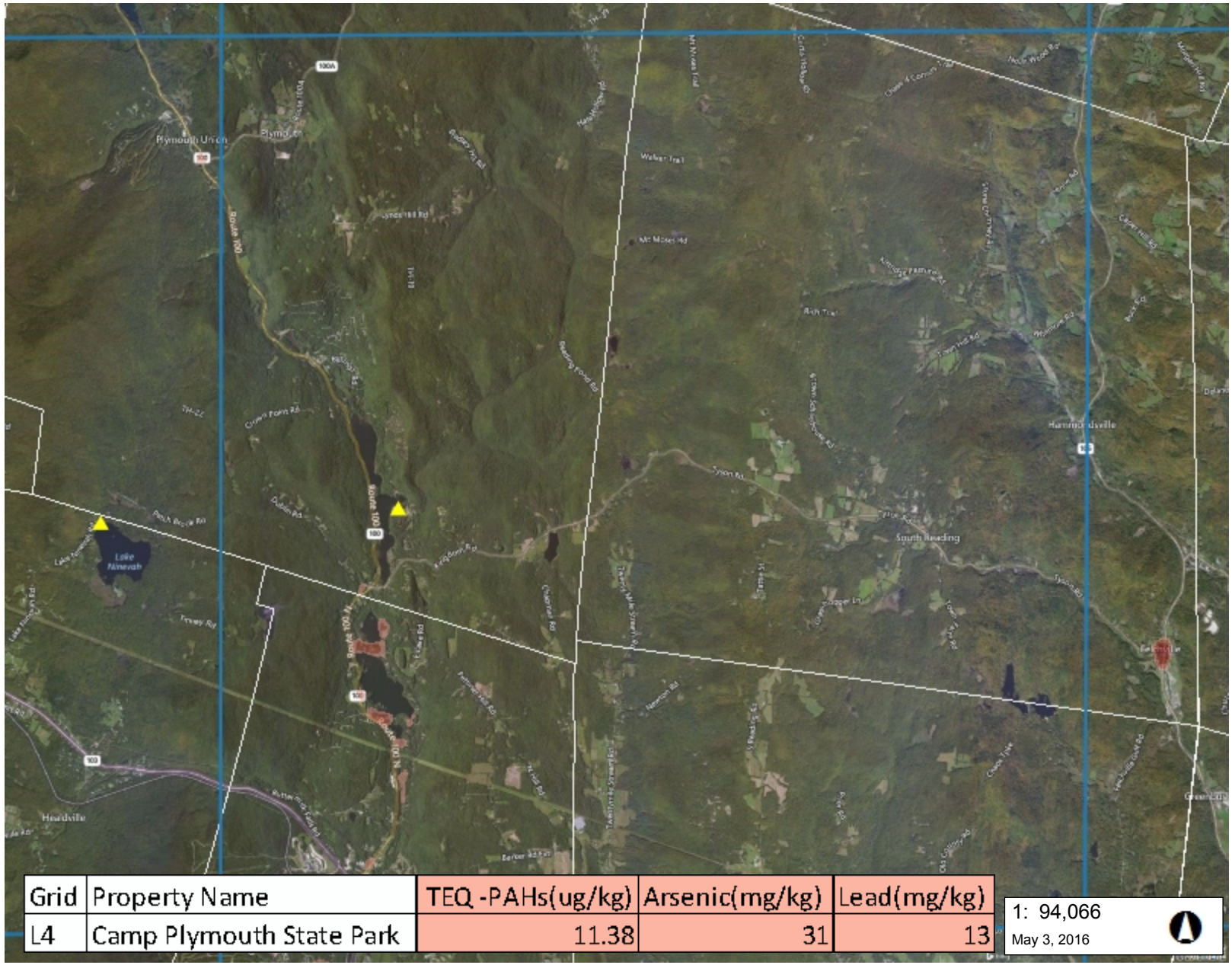

Grid	Property Name	TEQ -PAHs(ug/kg)	Arsenic(mg/kg)	Lead(mg/kg)
L4	Camp Plymouth State Park	11.38	31	13

1: 94,066

May 3, 2016

LEGEND

Town Boundary

Density of Habitable Buildings

- Low
- Medium
- High
- Highest

Sampling Location

NOTES

Location L4 is considered a Non Urban Sample Point

4,779.0 0 2,390.00 4,779.0 Meters

WGS_1984_Web_Mercator_Auxiliary_Sphere 1" = 7839 Ft. 1cm = 941 Meters

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2015 Surface Soil Survey - Grid L5

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Grid	Property Name	TEQ-PAHs(ug/kg)	Arsenic(mg/kg)	Lead(mg/kg)
L5	Windsor Green	425.73	6	70

1: 108,251

May 5, 2016

LEGEND

Town Boundary

Density of Habitable Buildings

- Low
- Medium
- High
- Highest

Sampling Location

NOTES

Location L5 is considered an Urban Sample Point.

5,499.0 0 2,750.00 5,499.0 Meters

WGS_1984_Web_Mercator_Auxiliary_Sphere 1" = 9021 Ft. 1cm = 1083 Meters

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2015 Surface Soil Survey - Grid M1

Vermont Agency of Natural Resources

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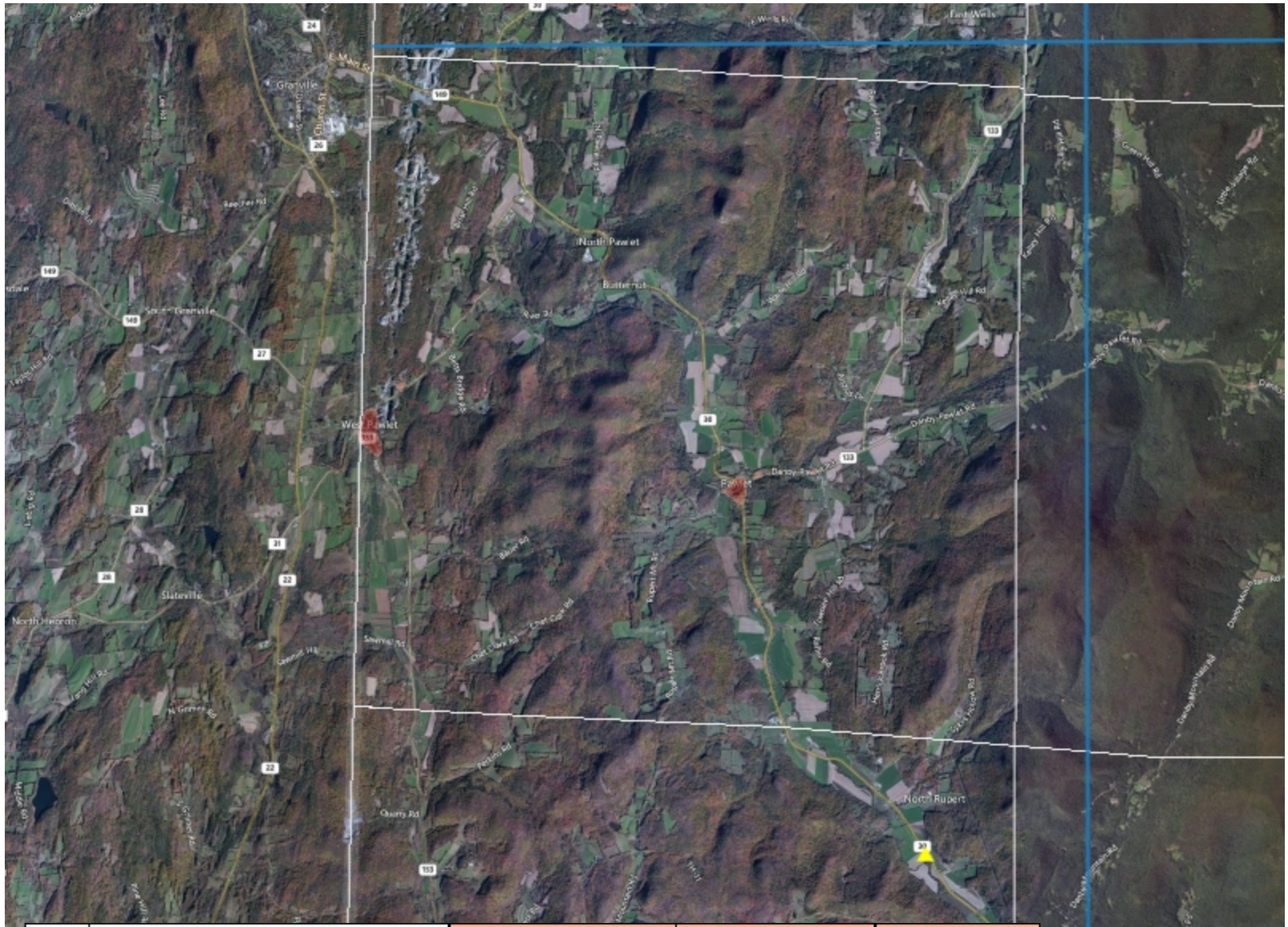

Grid	Property Name	TEQ -PAHs(ug/kg)	Arsenic(mg/kg)	Lead(mg/kg)
M1	Mettawee River Boat Launch	60.24	5.6	17

1: 93,471

May 3, 2016

LEGEND

Town Boundary

Density of Habitable Buildings

- Low
- Medium
- High
- Highest

Sampling Location

NOTES

Location M1 is considered a Non Urban Sample Point

4,748.0 0 2,374.00 4,748.0 Meters

WGS_1984_Web_Mercator_Auxiliary_Sphere 1" = 7789 Ft. 1cm = 935 Meters

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2015 Surface Soil Survey - Grid M2

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Grid	Property Name	TEQ -PAHs(ug/kg)	Arsenic(mg/kg)	Lead(mg/kg)
M2	Green Mt National Forest	62.17	5.6	29
N2	Emerald Lake State Park	10.05/13.56	5.5	17

LEGEND

Town Boundary

Sampling Location

NOTES

Location M2 and N2 are considered Non Urban Sample Points

5,195.0 0 2,598.00 5,195.0 Meters

WGS_1984_Web_Mercator_Auxiliary_Sphere 1" = 8521 Ft. 1cm = 1023 Meters

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2015 Surface Soil Survey - Grid M3

Vermont Agency of Natural Resources

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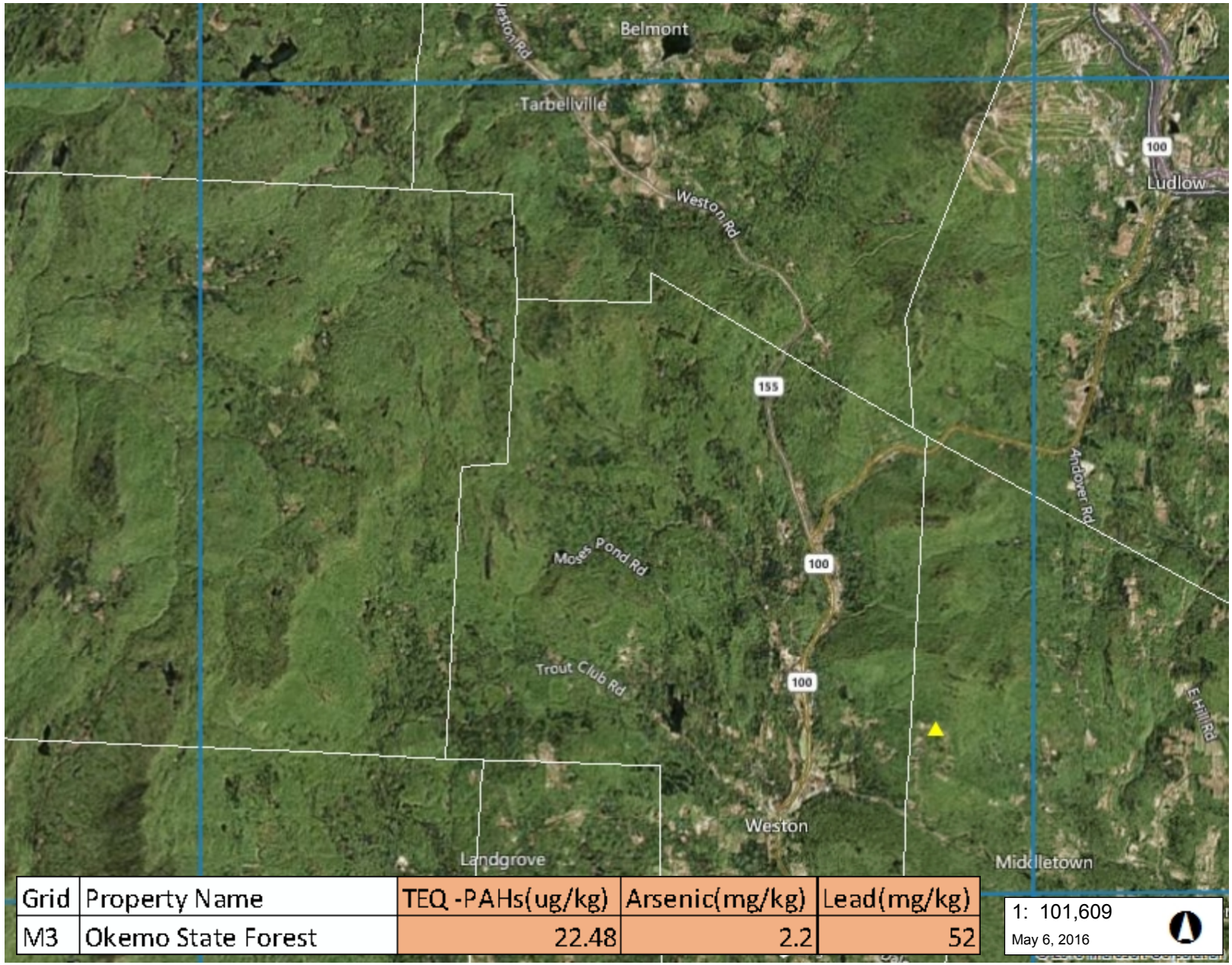

Grid	Property Name	TEQ -PAHs(ug/kg)	Arsenic(mg/kg)	Lead(mg/kg)
M3	Okemo State Forest	22.48	2.2	52

1: 101,609

May 6, 2016

LEGEND

Town Boundary

Sampling Location

NOTES

Location M3 is considered a Non Urban Sample Point

5,162.0 0 2,581.00 5,162.0 Meters

WGS_1984_Web_Mercator_Auxiliary_Sphere 1" = 8467 Ft. 1cm = 1016 Meters

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2015 Surface Soil Survey - Grid M4

Vermont Agency of Natural Resources

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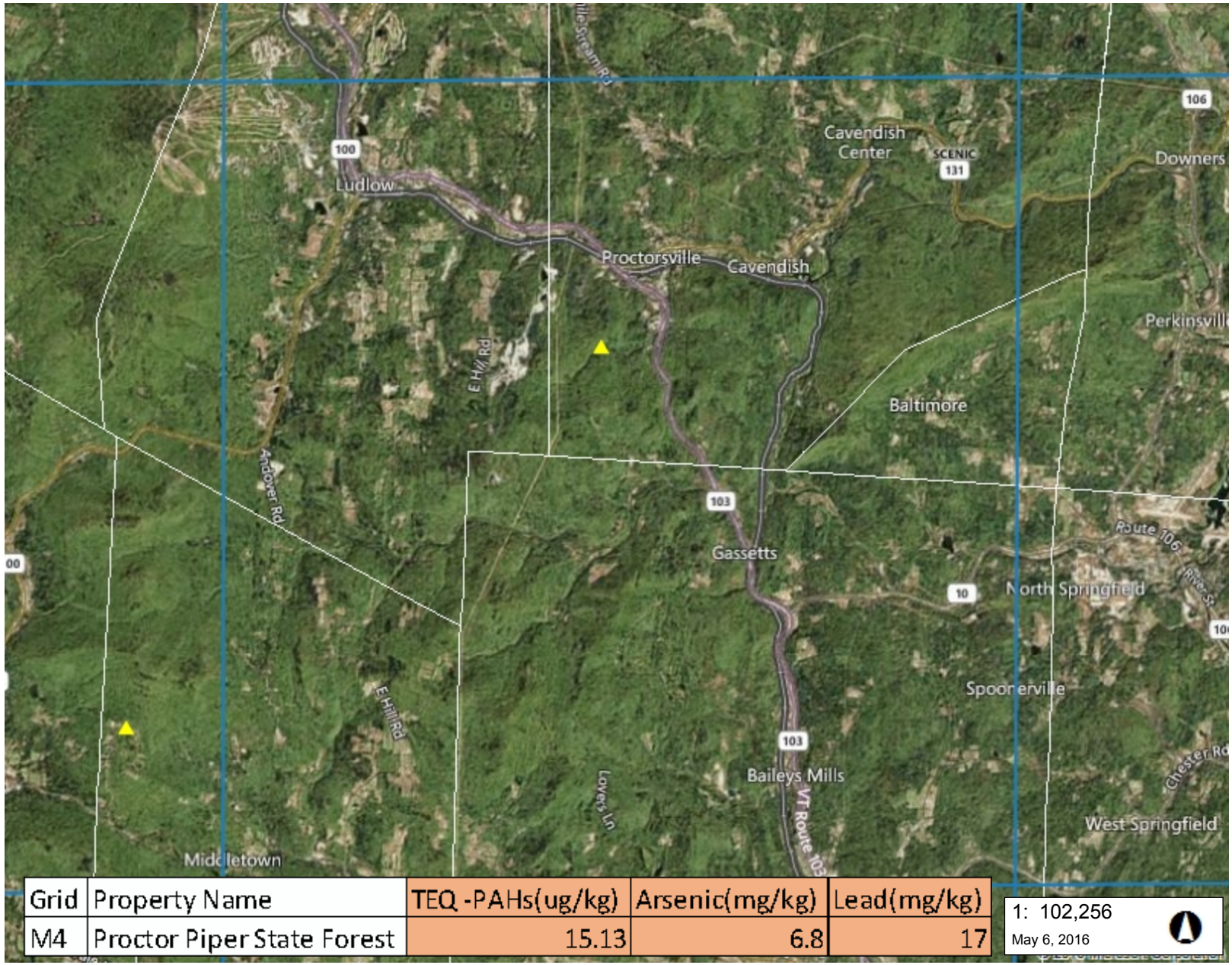

Grid	Property Name	TEQ -PAHs(ug/kg)	Arsenic(mg/kg)	Lead(mg/kg)
M4	Proctor Piper State Forest	15.13	6.8	17

1: 102,256

May 6, 2016

LEGEND

Town Boundary

Sampling Location

NOTES

Location M4 is considered a Non Urban Sample Point

5,195.0 0 2,598.00 5,195.0 Meters

WGS_1984_Web_Mercator_Auxiliary_Sphere 1" = 8521 Ft. 1cm = 1023 Meters

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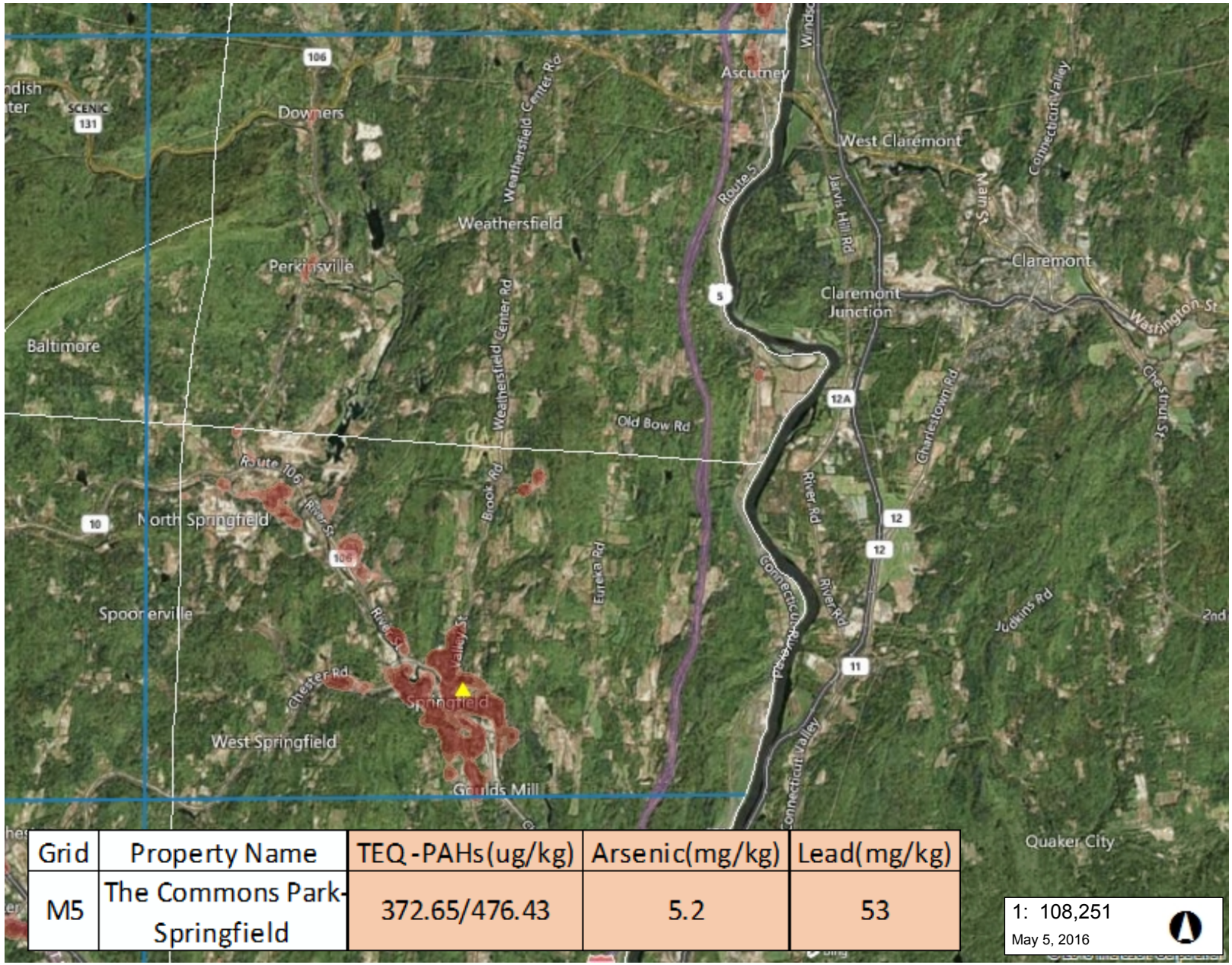
2015 Surface Soil Survey - Grid M5

Vermont Agency of Natural Resources

vermont.gov



Grid	Property Name	TEQ-PAHs(ug/kg)	Arsenic(mg/kg)	Lead(mg/kg)
M5	The Commons Park-Springfield	372.65/476.43	5.2	53

1: 108,251

May 5, 2016

LEGEND

Town Boundary

Density of Habitable Buildings

- Low
- Medium
- High
- Highest

Sampling Location

NOTES

Location M5 is considered an Urban Sample Point.

5,499.0 0 2,750.00 5,499.0 Meters

WGS_1984_Web_Mercator_Auxiliary_Sphere 1" = 9021 Ft. 1cm = 1083 Meters

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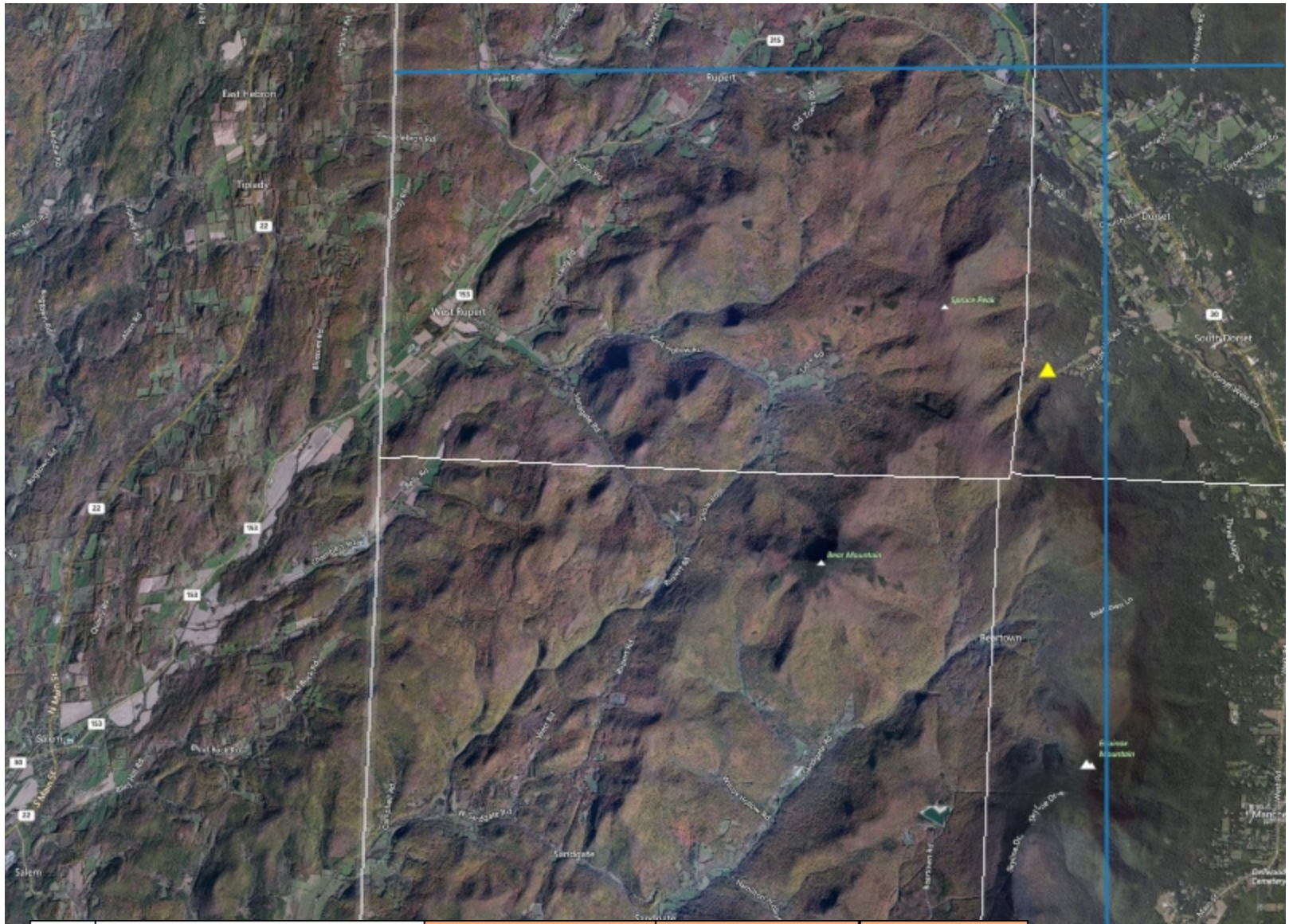
2015 Surface Soil Survey - Grid N1

Vermont Agency of Natural Resources

vermont.gov



Grid	Property Name	TEQ -PAHs(ug/kg)	Arsenic(mg/kg)	Lead(mg/kg)
N1	Rupert State Forest	3.03	11	21

1: 97,655

May 6, 2016

LEGEND

Town Boundary

Sampling Location

NOTES

Location N1 is considered a Non Urban Sample Point

4,961.0 0 2,480.00 4,961.0 Meters

WGS_1984_Web_Mercator_Auxiliary_Sphere 1" = 8138 Ft. 1cm = 977 Meters

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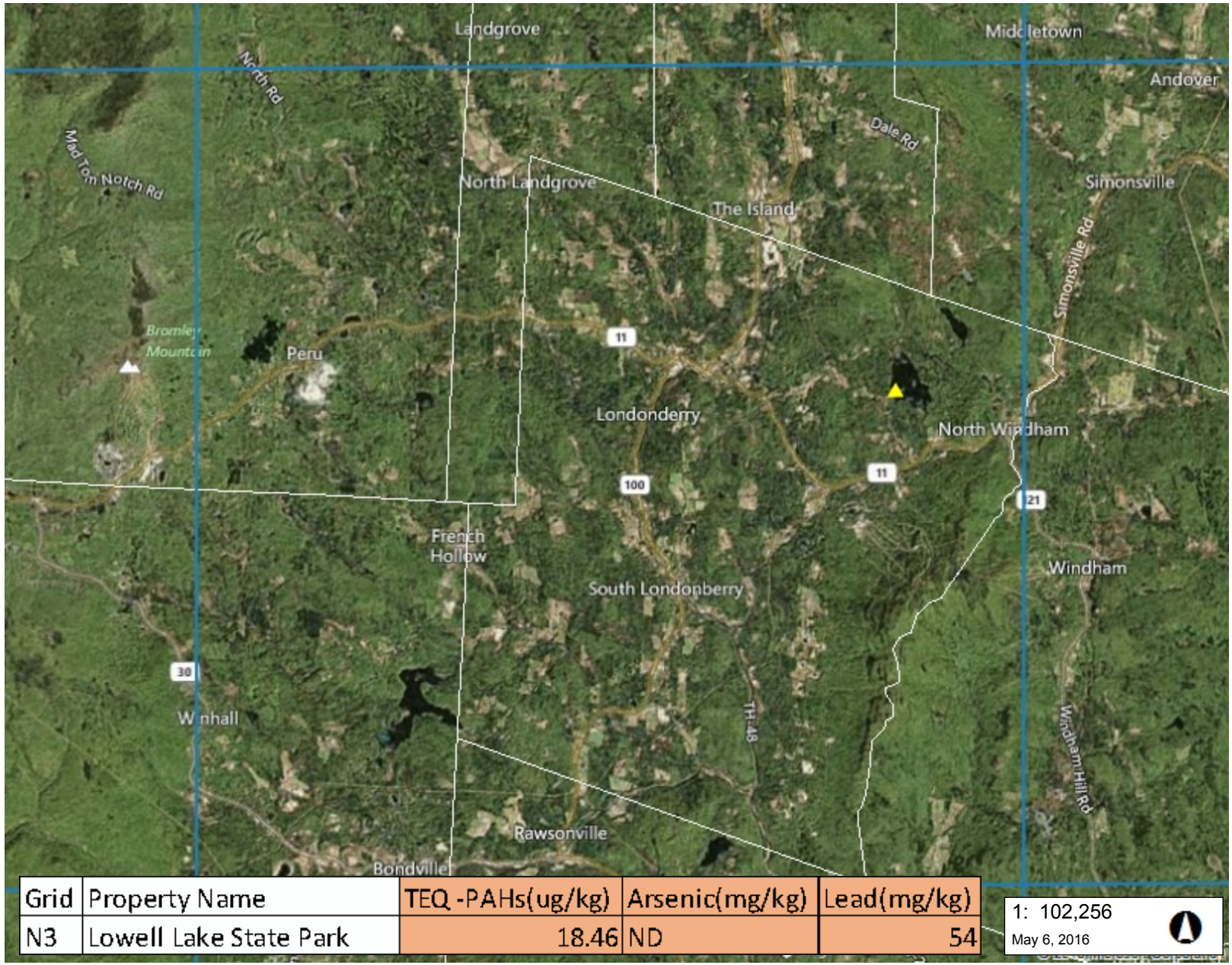
2015 Surface Soil Survey - Grid N3

Vermont Agency of Natural Resources

vermont.gov



Grid	Property Name	TEQ -PAHs(ug/kg)	Arsenic(mg/kg)	Lead(mg/kg)
N3	Lowell Lake State Park	18.46	ND	54

1: 102,256

May 6, 2016

LEGEND

Town Boundary

Sampling Location

NOTES

Location N3 is considered a Non Urban Sample Point

5,195.0 0 2,598.00 5,195.0 Meters

WGS_1984_Web_Mercator_Auxiliary_Sphere 1" = 8521 Ft. 1cm = 1023 Meters

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2015 Surface Soil Survey - Grid N4

Vermont Agency of Natural Resources

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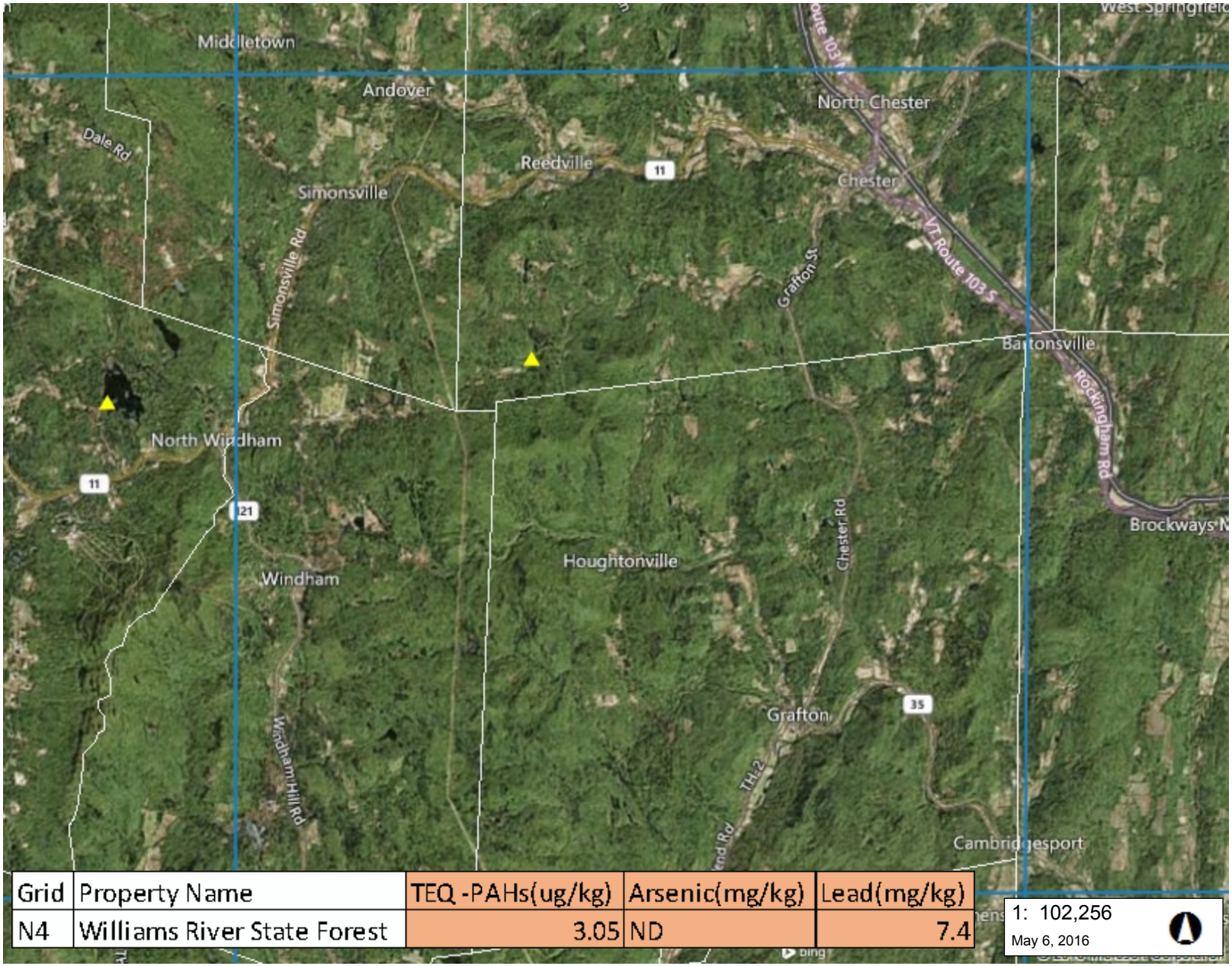

Grid	Property Name	TEQ -PAHs(ug/kg)	Arsenic(mg/kg)	Lead(mg/kg)
N4	Williams River State Forest	3.05	ND	7.4

1: 102,256

May 6, 2016

LEGEND

Town Boundary

Sampling Location

NOTES

Location N4 is considered a Non Urban Sample Point

5,195.0 0 2,598.00 5,195.0 Meters

WGS_1984_Web_Mercator_Auxiliary_Sphere 1" = 8521 Ft. 1cm = 1023 Meters

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2015 Surface Soil Survey - Grid N5

Vermont Agency of Natural Resources

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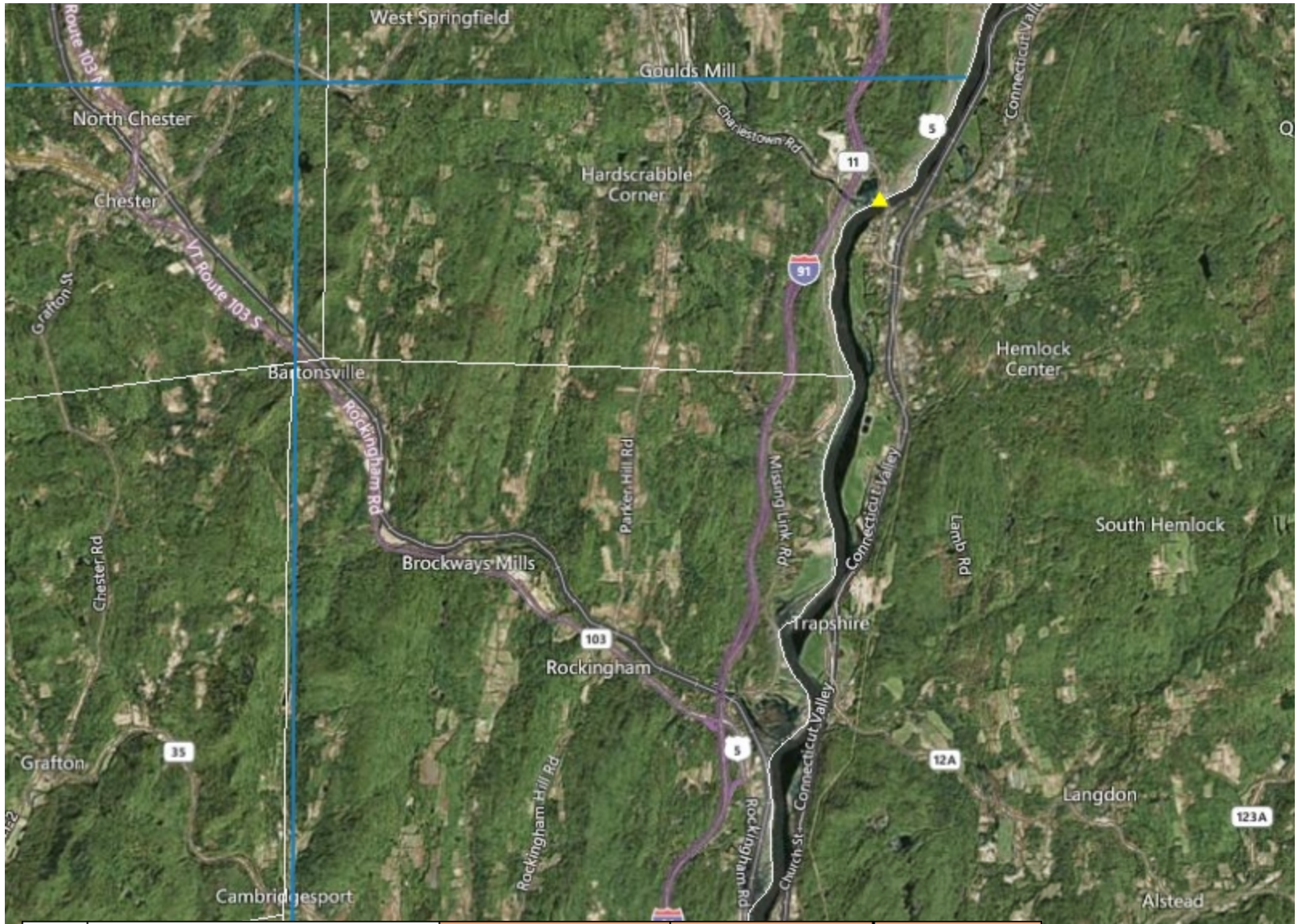

Grid	Property Name	TEQ -PAHs(ug/kg)	Arsenic(mg/kg)	Lead(mg/kg)
N5	Hoyts Landing	137.24	6.5	21

1: 102,256

May 6, 2016

LEGEND

Town Boundary

Sampling Location

NOTES

Location N5 is considered a Non Urban Sample Point

5,195.0 0 2,598.00 5,195.0 Meters

WGS_1984_Web_Mercator_Auxiliary_Sphere 1" = 8521 Ft. 1cm = 1023 Meters

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2015 Surface Soil Survey - Grid O1

Vermont Agency of Natural Resources

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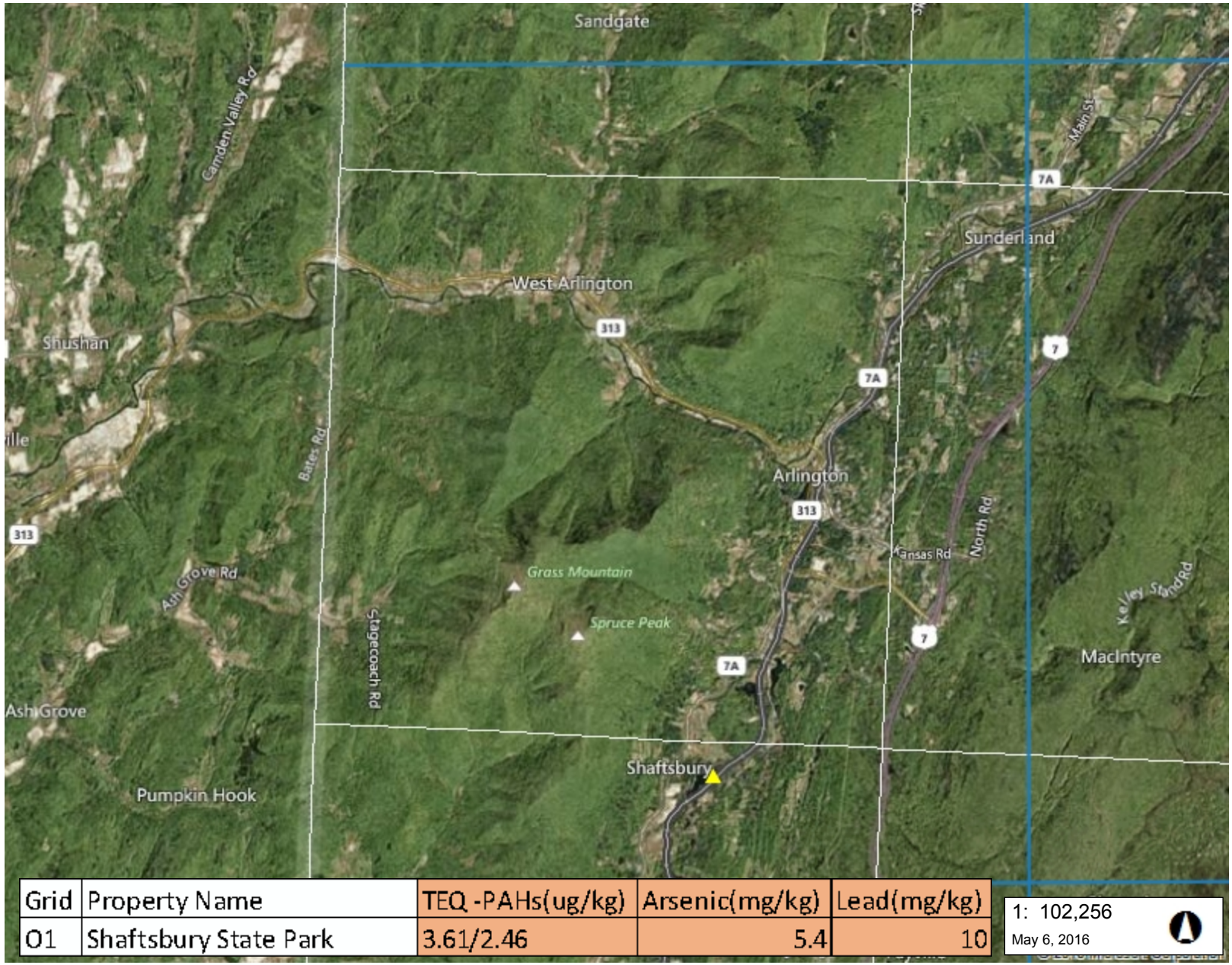

Grid	Property Name	TEQ -PAHs(ug/kg)	Arsenic(mg/kg)	Lead(mg/kg)
O1	Shaftsbury State Park	3.61/2.46	5.4	10

1: 102,256

May 6, 2016

LEGEND

Town Boundary

Sampling Location

NOTES

Location O1 is considered a Non Urban Sample Point

5,195.0 0 2,598.00 5,195.0 Meters

WGS_1984_Web_Mercator_Auxiliary_Sphere 1" = 8521 Ft. 1cm = 1023 Meters

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2015 Surface Soil Survey - Grid O2

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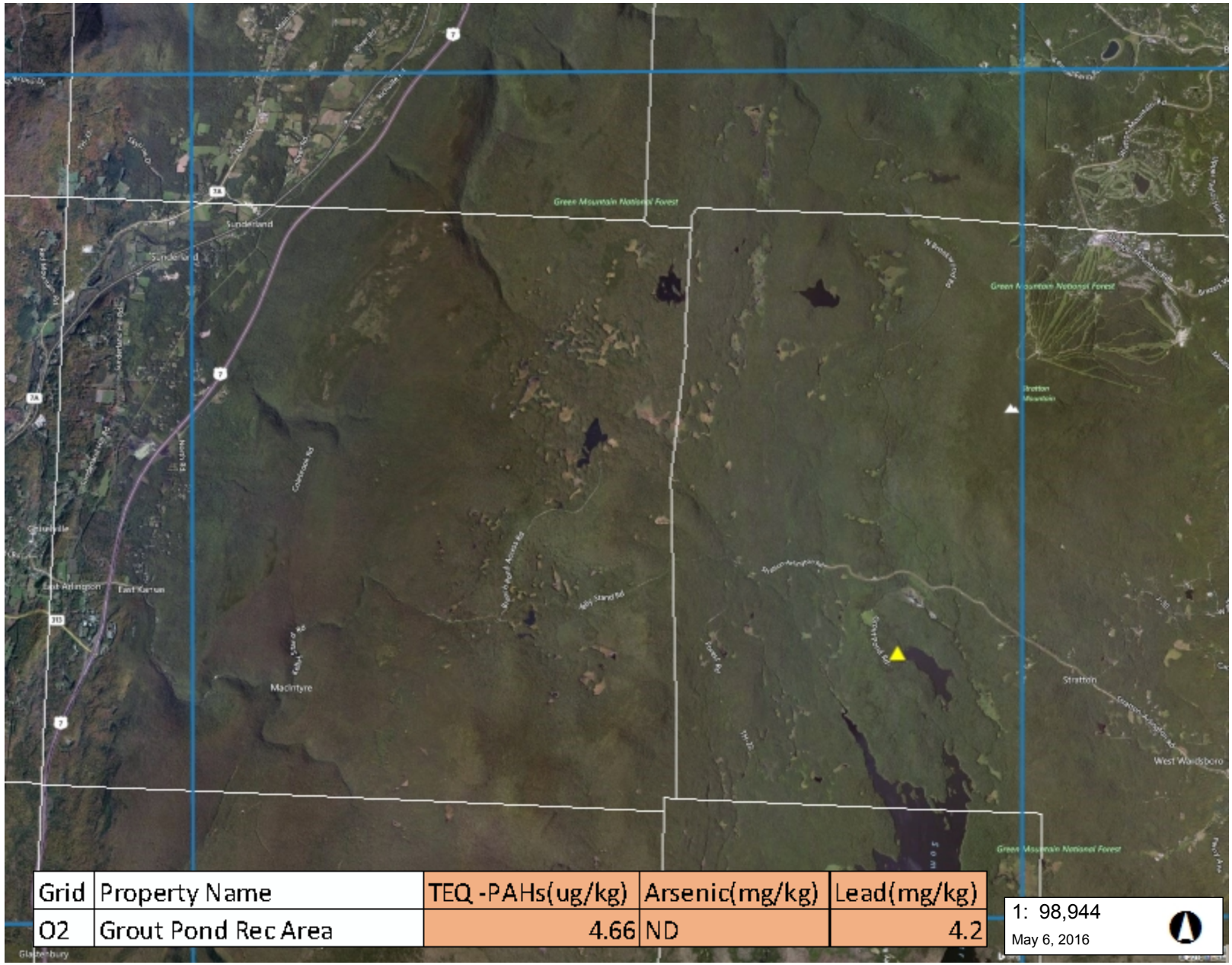

Grid	Property Name	TEQ -PAHs(ug/kg)	Arsenic(mg/kg)	Lead(mg/kg)
O2	Grout Pond Rec Area	4.66	ND	4.2

1: 98,944

May 6, 2016

LEGEND

Town Boundary

Sampling Location

NOTES

Location O2 is considered a Non Urban Sample Point

5,026.0 0 2,513.00 5,026.0 Meters

WGS_1984_Web_Mercator_Auxiliary_Sphere 1" = 8245 Ft. 1cm = 989 Meters

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2015 Surface Soil Survey - Grid O3

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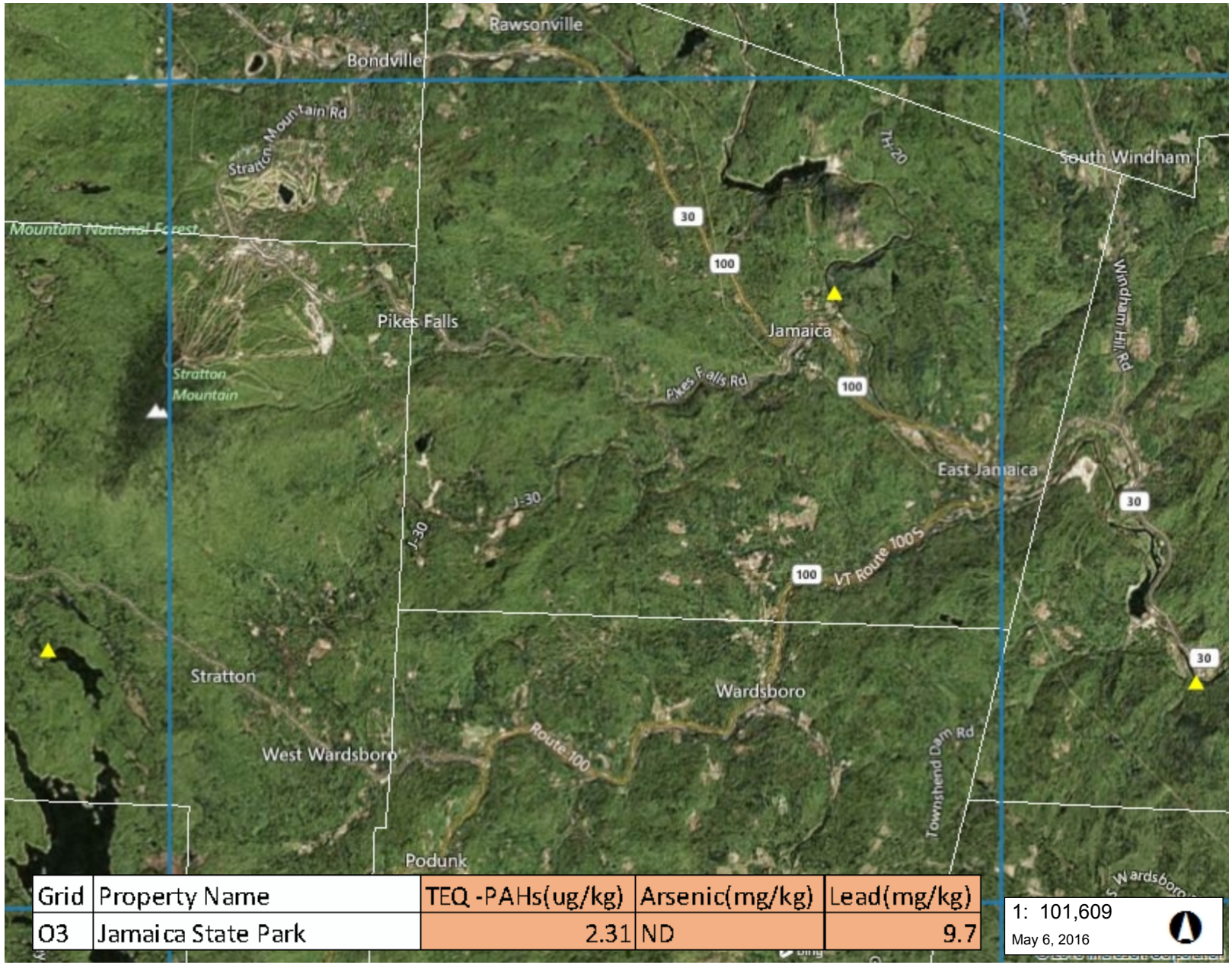

Grid	Property Name	TEQ -PAHs(ug/kg)	Arsenic(mg/kg)	Lead(mg/kg)
O3	Jamaica State Park	2.31	ND	9.7

1: 101,609

May 6, 2016

LEGEND

Town Boundary

Sampling Location

NOTES

Location O3 is considered a Non Urban Sample Point

5,162.0 0 2,581.00 5,162.0 Meters

WGS_1984_Web_Mercator_Auxiliary_Sphere 1" = 8467 Ft. 1cm = 1016 Meters

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2015 Surface Soil Survey - Grid O4

Vermont Agency of Natural Resources

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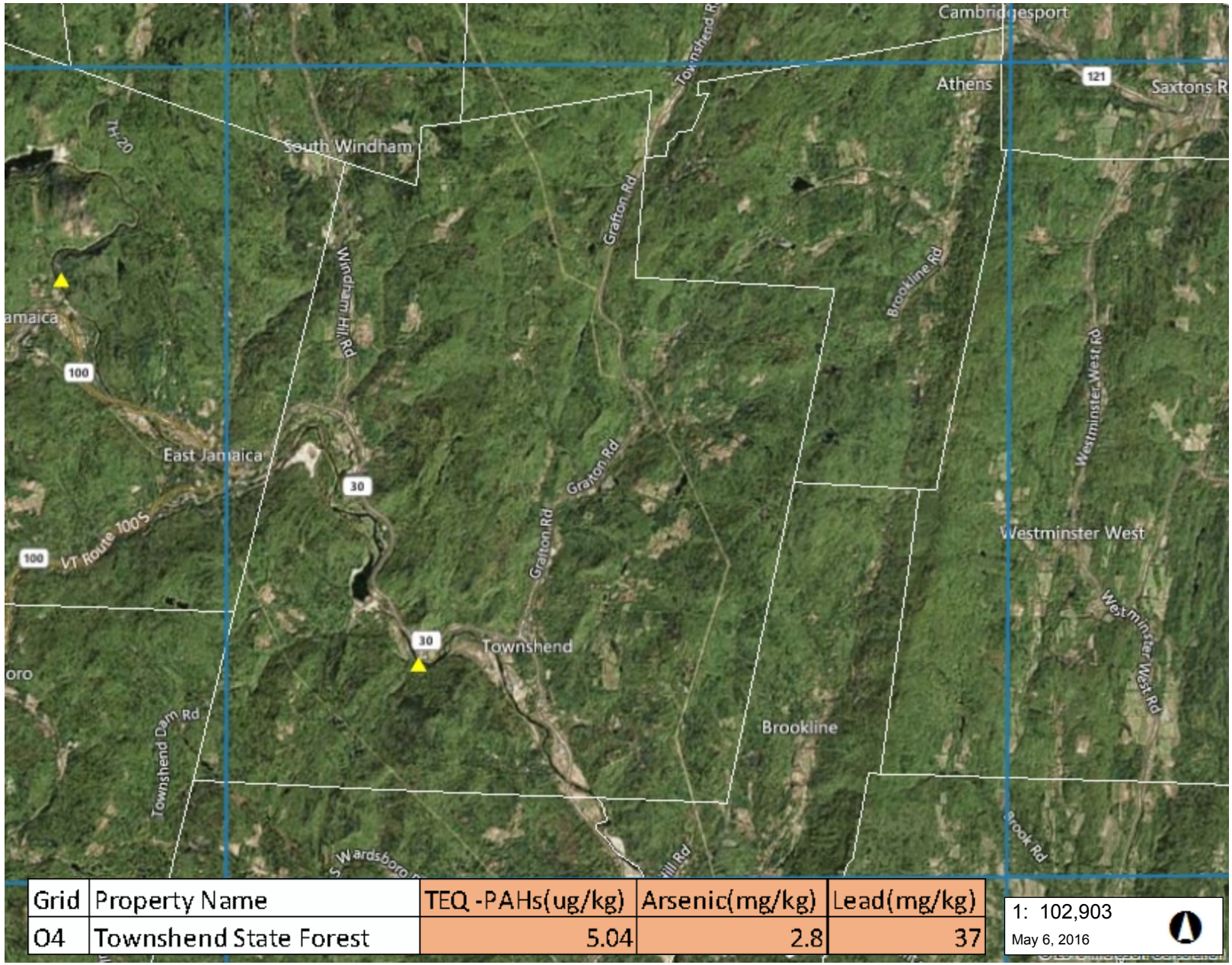

Grid	Property Name	TEQ -PAHs(ug/kg)	Arsenic(mg/kg)	Lead(mg/kg)
O4	Townshend State Forest	5.04	2.8	37

1: 102,903

May 6, 2016

LEGEND

Town Boundary

Sampling Location

NOTES

Location O4 is considered a Non Urban Sample Point

5,227.0 0 2,614.00 5,227.0 Meters

WGS_1984_Web_Mercator_Auxiliary_Sphere 1" = 8575 Ft. 1cm = 1029 Meters

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2015 Surface Soil Survey - Grid O5

Vermont Agency of Natural Resources

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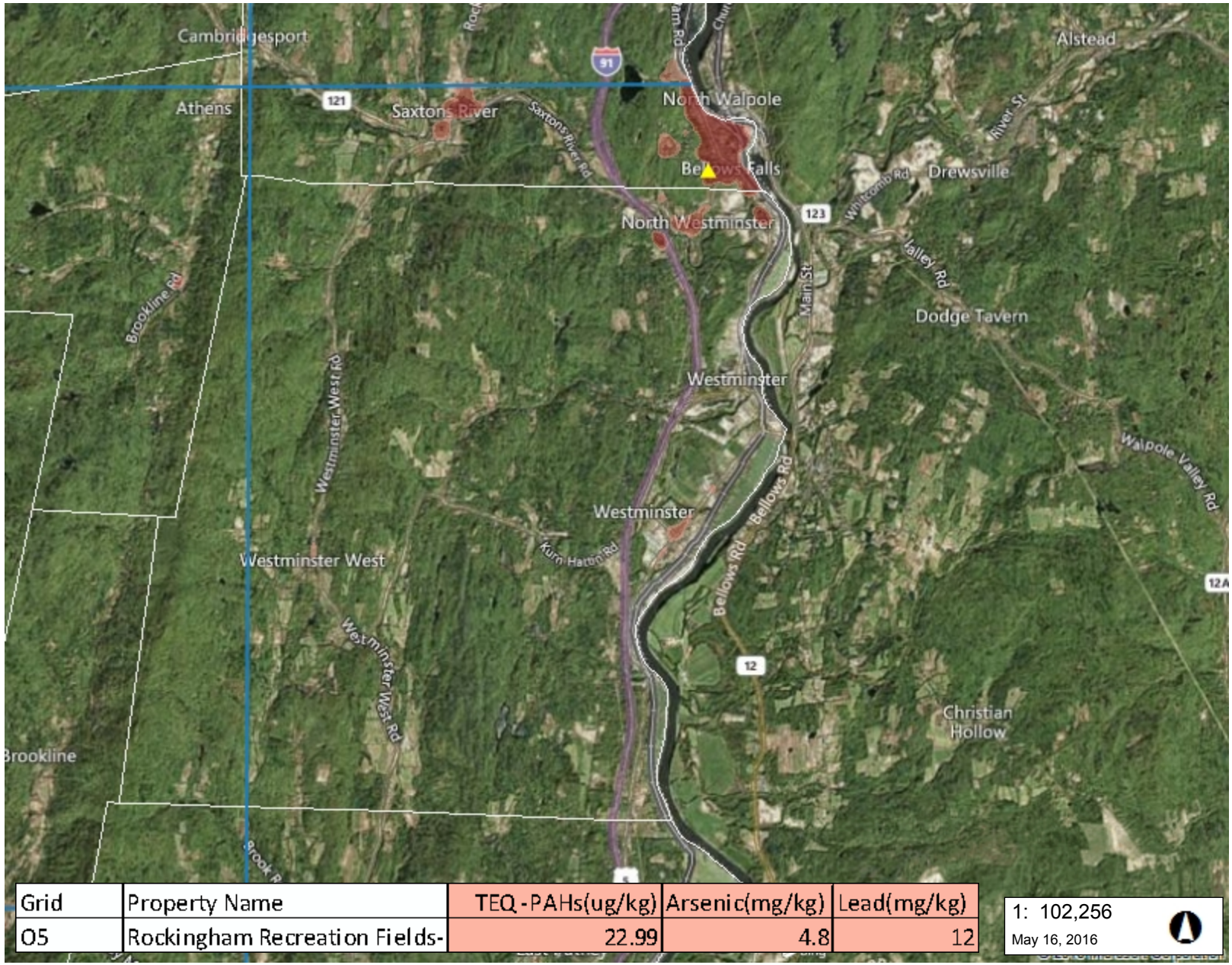

Grid	Property Name	TEQ-PAHs(ug/kg)	Arsenic(mg/kg)	Lead(mg/kg)
O5	Rockingham Recreation Fields-	22.99	4.8	12

1: 102,256

May 16, 2016

LEGEND

Town Boundary

Density of Habitable Buildings

- Low
- Medium
- High
- Highest

Sampling Location

NOTES

Location O5 is considered an Urban Sample Point

5,195.0 0 2,598.00 5,195.0 Meters

WGS_1984_Web_Mercator_Auxiliary_Sphere 1" = 8521 Ft. 1cm = 1023 Meters

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2015 Surface Soil Survey - Grid P1

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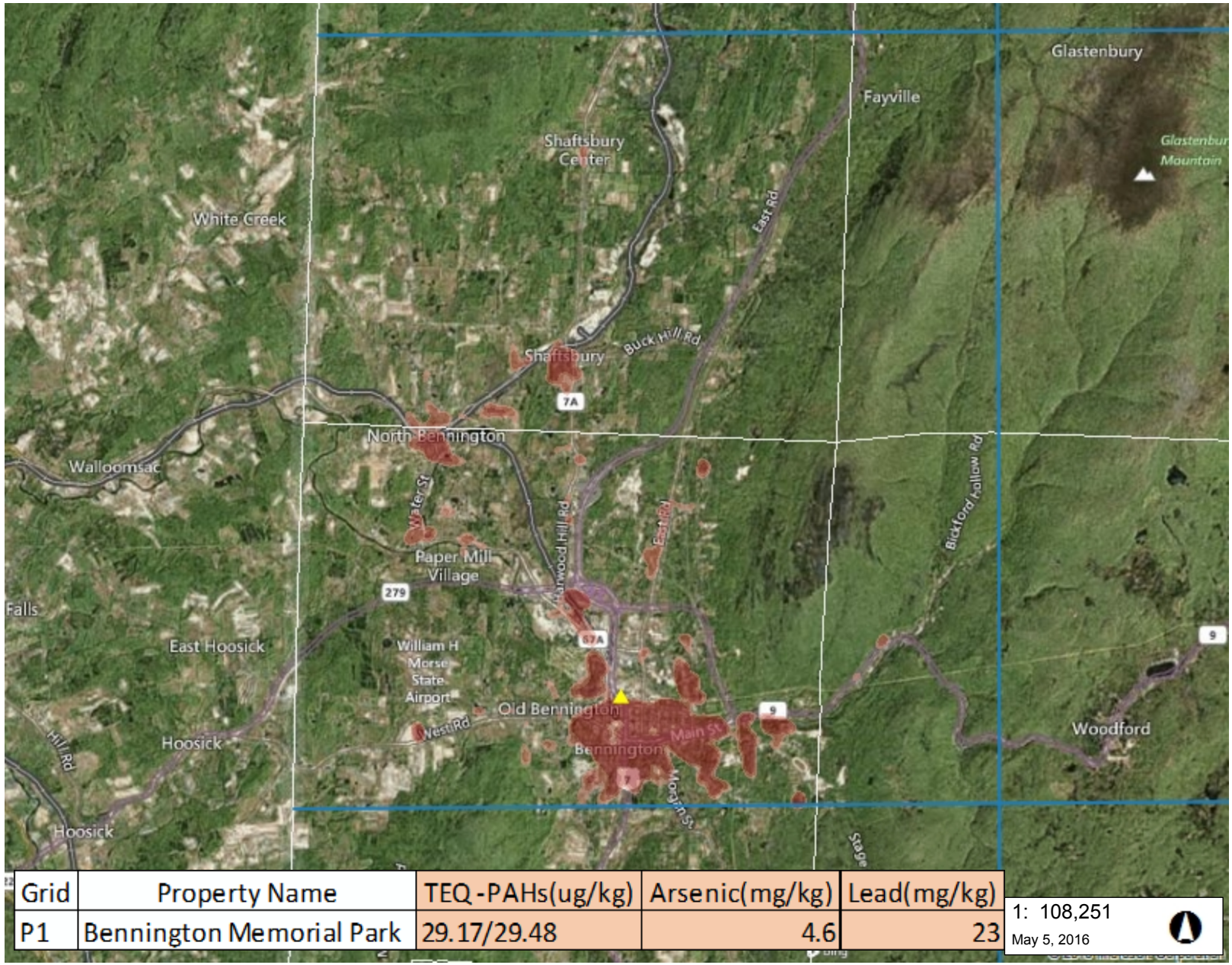

Grid	Property Name	TEQ-PAHs(ug/kg)	Arsenic(mg/kg)	Lead(mg/kg)
P1	Bennington Memorial Park	29.17/29.48	4.6	23

1: 108,251

May 5, 2016

LEGEND

Town Boundary

Density of Habitable Buildings

- Low
- Medium
- High
- Highest

Sampling Location

NOTES

Location P1 is considered an Urban Sample Point.

5,499.0 0 2,750.00 5,499.0 Meters

WGS_1984_Web_Mercator_Auxiliary_Sphere 1" = 9021 Ft. 1cm = 1083 Meters

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2015 Surface Soil Survey - Grid P2

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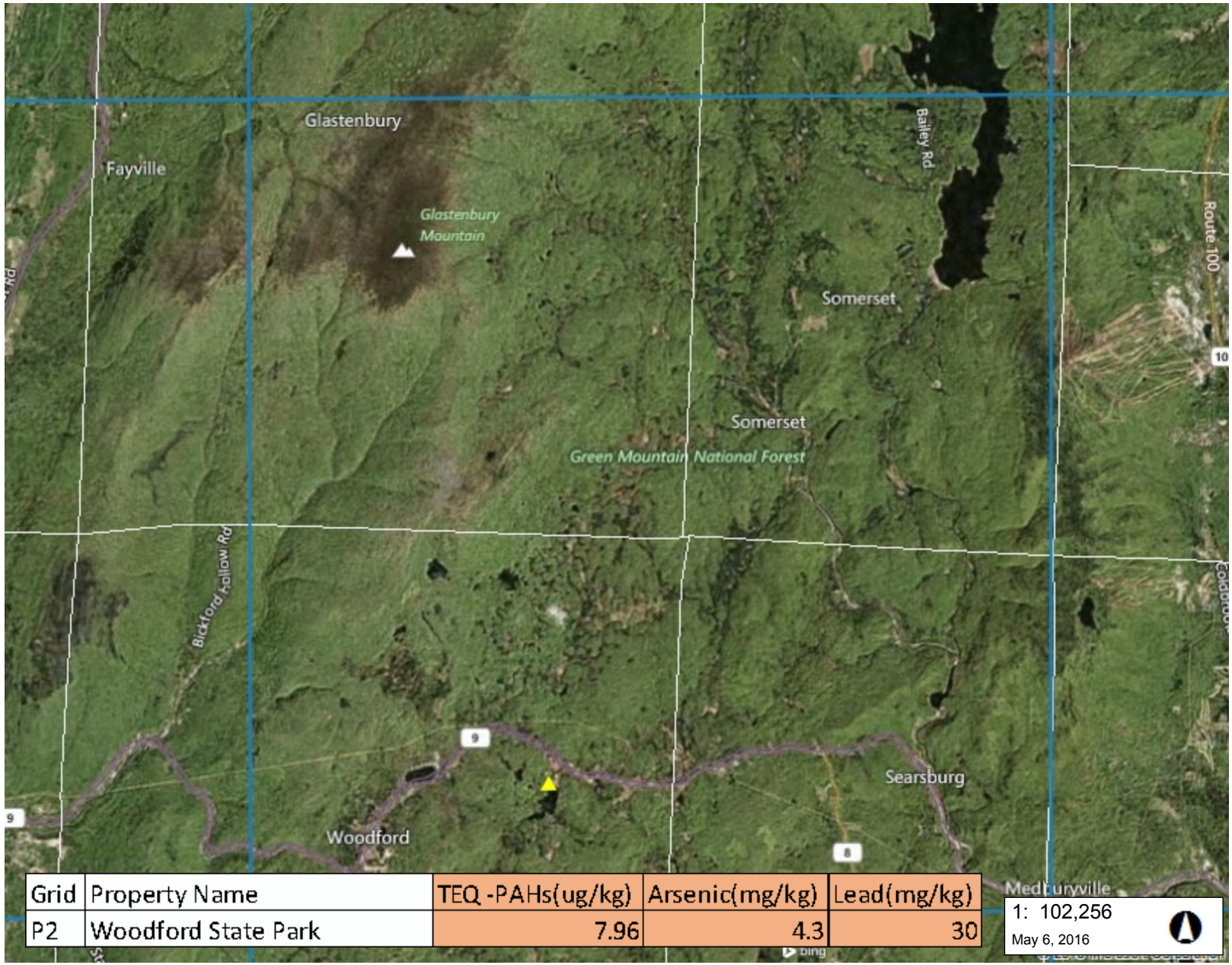

Grid	Property Name	TEQ -PAHs(ug/kg)	Arsenic(mg/kg)	Lead(mg/kg)
P2	Woodford State Park	7.96	4.3	30

1: 102,256

May 6, 2016

LEGEND

Town Boundary

Sampling Location

NOTES

Location P2 is considered a Non Urban Sample Point

5,195.0 0 2,598.00 5,195.0 Meters

WGS_1984_Web_Mercator_Auxiliary_Sphere 1" = 8521 Ft. 1cm = 1023 Meters

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2015 Surface Soil Survey - Grid P3

Vermont Agency of Natural Resources

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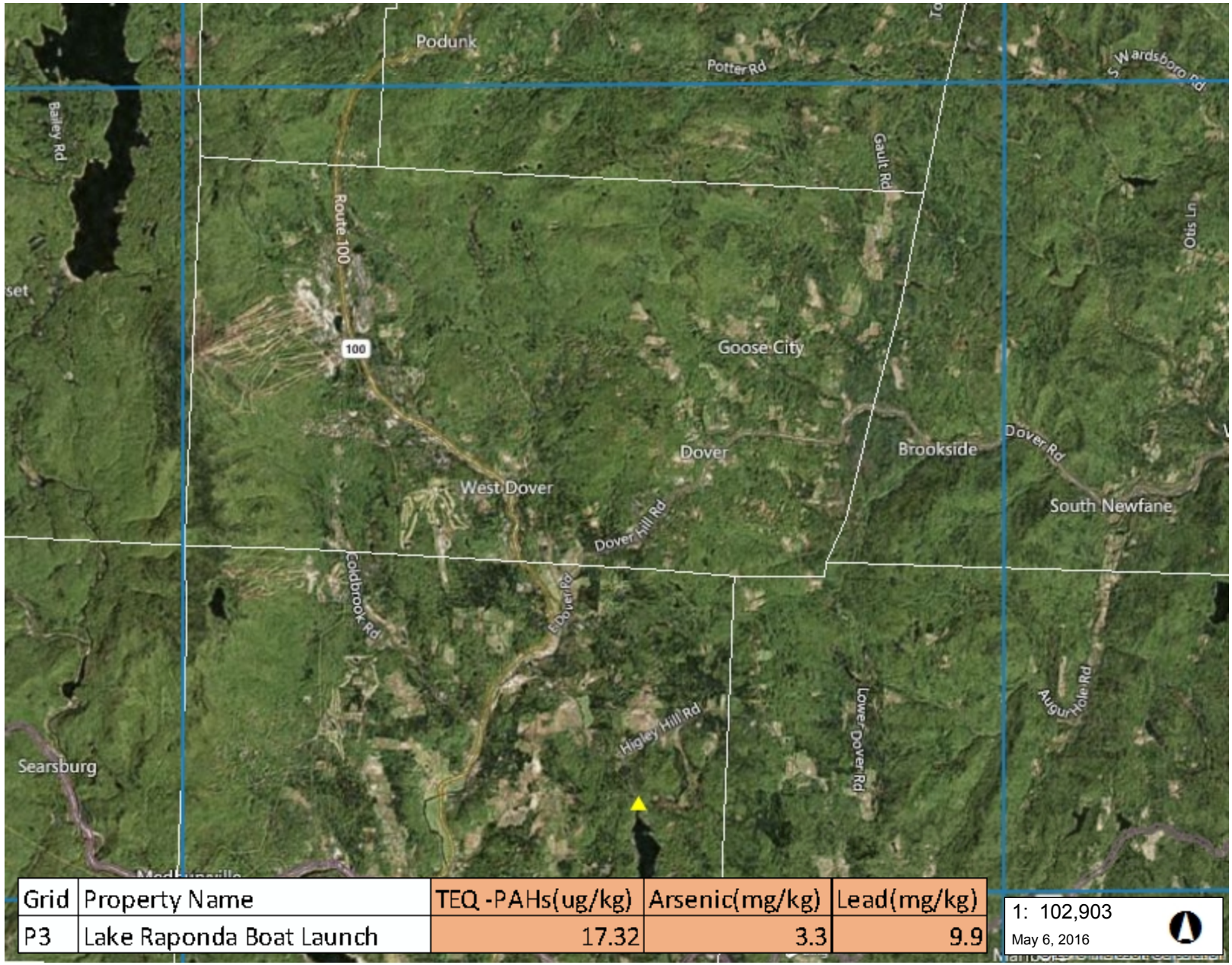

Grid	Property Name	TEQ -PAHs(ug/kg)	Arsenic(mg/kg)	Lead(mg/kg)
P3	Lake Raponda Boat Launch	17.32	3.3	9.9

1: 102,903

May 6, 2016

LEGEND

Town Boundary

Sampling Location

NOTES

Location P3 is considered a Non Urban Sample Point

5,227.0 0 2,614.00 5,227.0 Meters

WGS_1984_Web_Mercator_Auxiliary_Sphere 1" = 8575 Ft. 1cm = 1029 Meters

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2015 Surface Soil Survey - Grid P4

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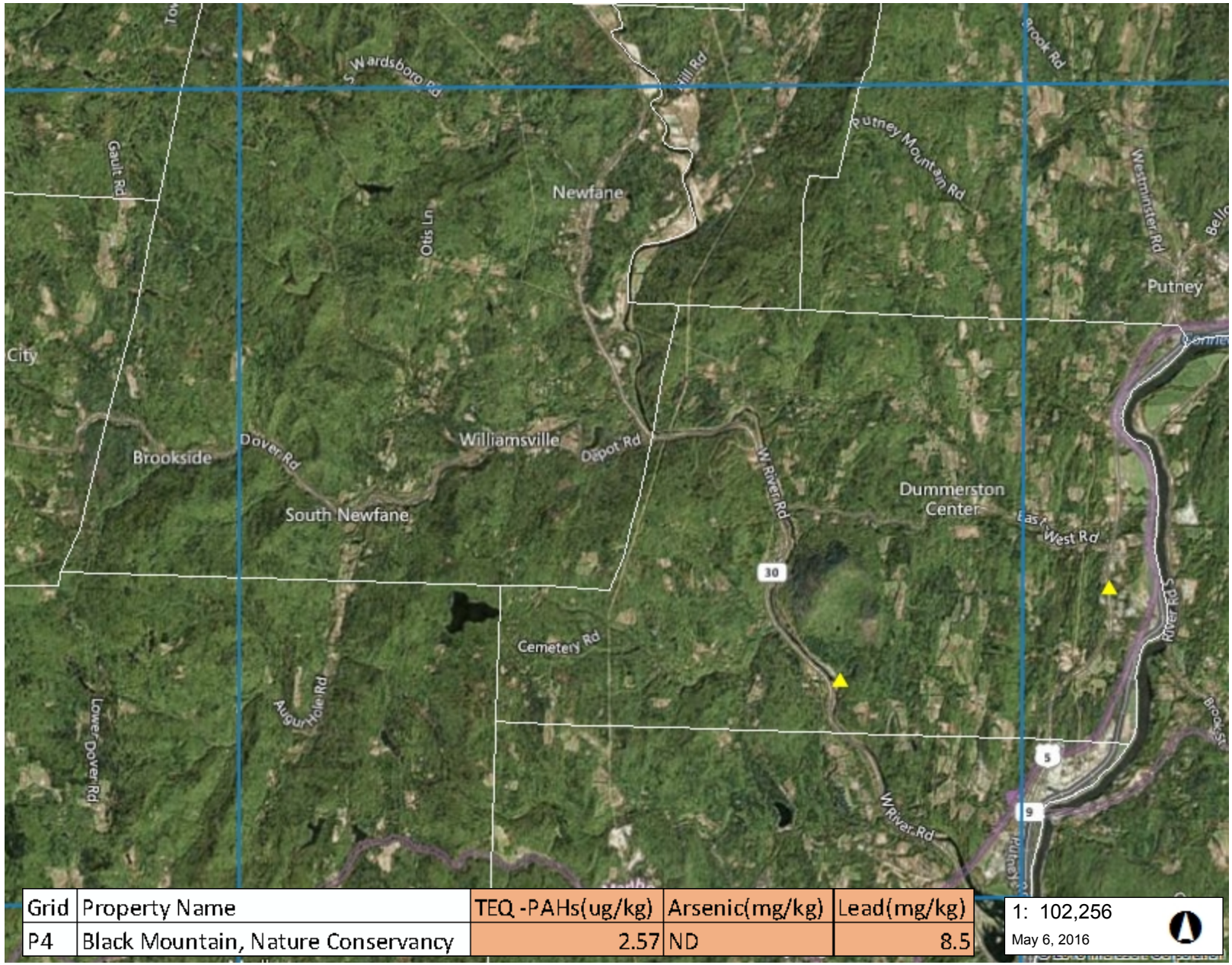

Grid	Property Name	TEQ -PAHs(ug/kg)	Arsenic(mg/kg)	Lead(mg/kg)
P4	Black Mountain, Nature Conservancy	2.57	ND	8.5

1: 102,256

May 6, 2016

LEGEND

Town Boundary

Sampling Location

NOTES

Location P4 is considered a Non Urban Sample Point

5,195.0 0 2,598.00 5,195.0 Meters

WGS_1984_Web_Mercator_Auxiliary_Sphere 1" = 8521 Ft. 1cm = 1023 Meters

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2015 Surface Soil Survey - Grid P5

Vermont Agency of Natural Resources

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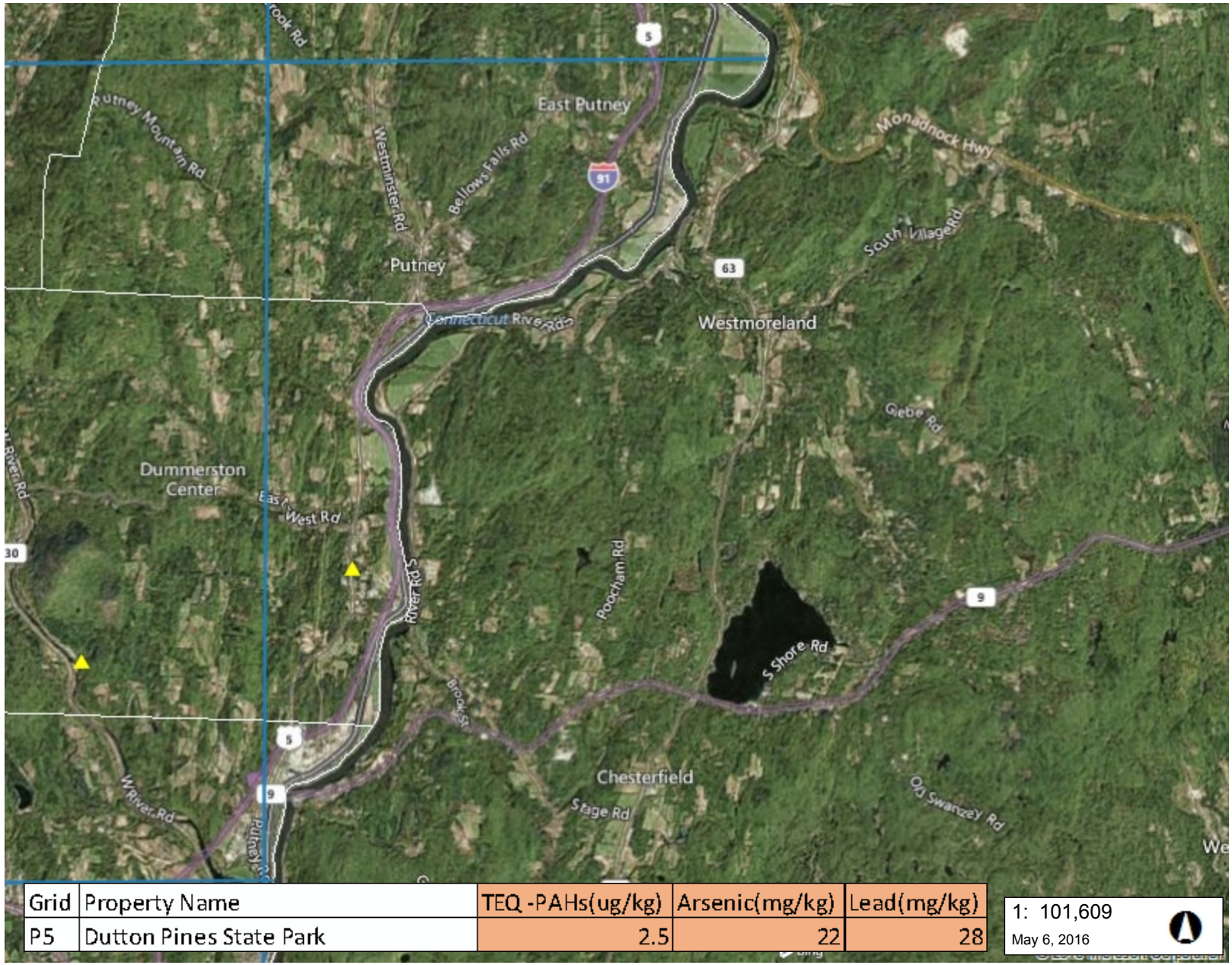

Grid	Property Name	TEQ -PAHs(ug/kg)	Arsenic(mg/kg)	Lead(mg/kg)
P5	Dutton Pines State Park	2.5	22	28

1: 101,609

May 6, 2016

LEGEND

Town Boundary

Sampling Location

NOTES

Location P5 is considered a Non Urban Sample Point

5,162.0 0 2,581.00 5,162.0 Meters

WGS_1984_Web_Mercator_Auxiliary_Sphere 1" = 8467 Ft. 1cm = 1016 Meters

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2015 Surface Soil Survey - Grid Q1

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Grid	Property Name	TEQ -PAHs(ug/kg)	Arsenic(mg/kg)	Lead(mg/kg)
Q1	South Stream Boat Launch	2.88	4.8	21

1: 88,188

May 6, 2016

LEGEND

Town Boundary

Sampling Location

NOTES

Location Q1 is considered a Non Urban Sample Point

4,480.0 0 2,240.00 4,480.0 Meters

WGS_1984_Web_Mercator_Auxiliary_Sphere 1" = 7349 Ft. 1cm = 882 Meters

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2015 Surface Soil Survey - Grid Q2

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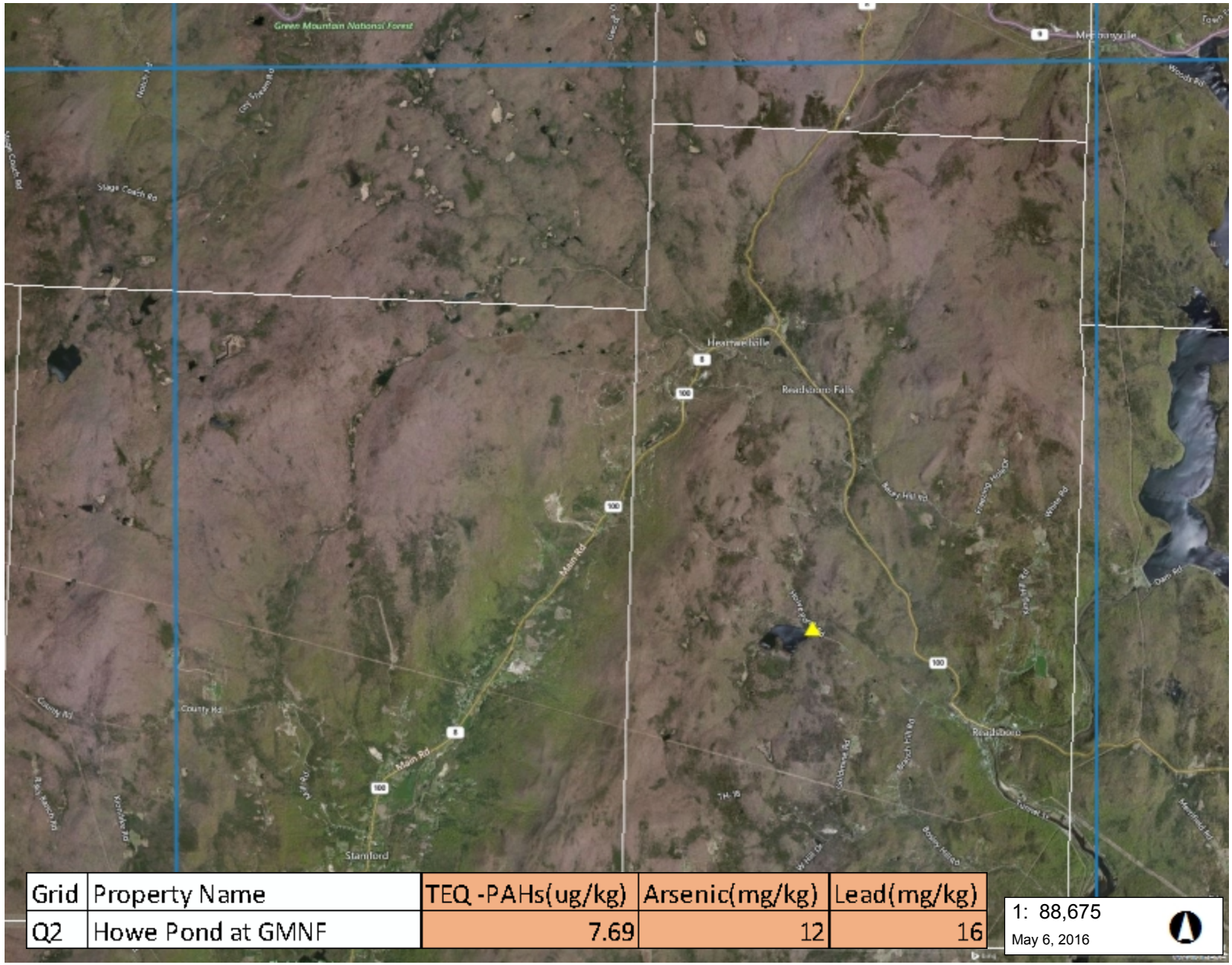

Grid	Property Name	TEQ -PAHs(ug/kg)	Arsenic(mg/kg)	Lead(mg/kg)
Q2	Howe Pond at GMNF	7.69	12	16

1: 88,675

May 6, 2016

LEGEND

Town Boundary

Sampling Location

NOTES

Location Q2 is considered a Non Urban Sample Point

4,505.0 0 2,252.00 4,505.0 Meters

WGS_1984_Web_Mercator_Auxiliary_Sphere 1" = 7390 Ft. 1cm = 887 Meters

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2015 Surface Soil Survey - Grid Q3

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Grid	Property Name	TEQ -PAHs(ug/kg)	Arsenic(mg/kg)	Lead(mg/kg)
Q3	Molly Stark State Park	3	ND	8.2

1: 102,256

May 6, 2016

LEGEND

Town Boundary

Sampling Location

NOTES

Location Q3 is considered a Non Urban Sample Point

5,195.0 0 2,598.00 5,195.0 Meters

WGS_1984_Web_Mercator_Auxiliary_Sphere 1" = 8521 Ft. 1cm = 1023 Meters

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2015 Surface Soil Survey - Grid Q4

Vermont Agency of Natural Resources

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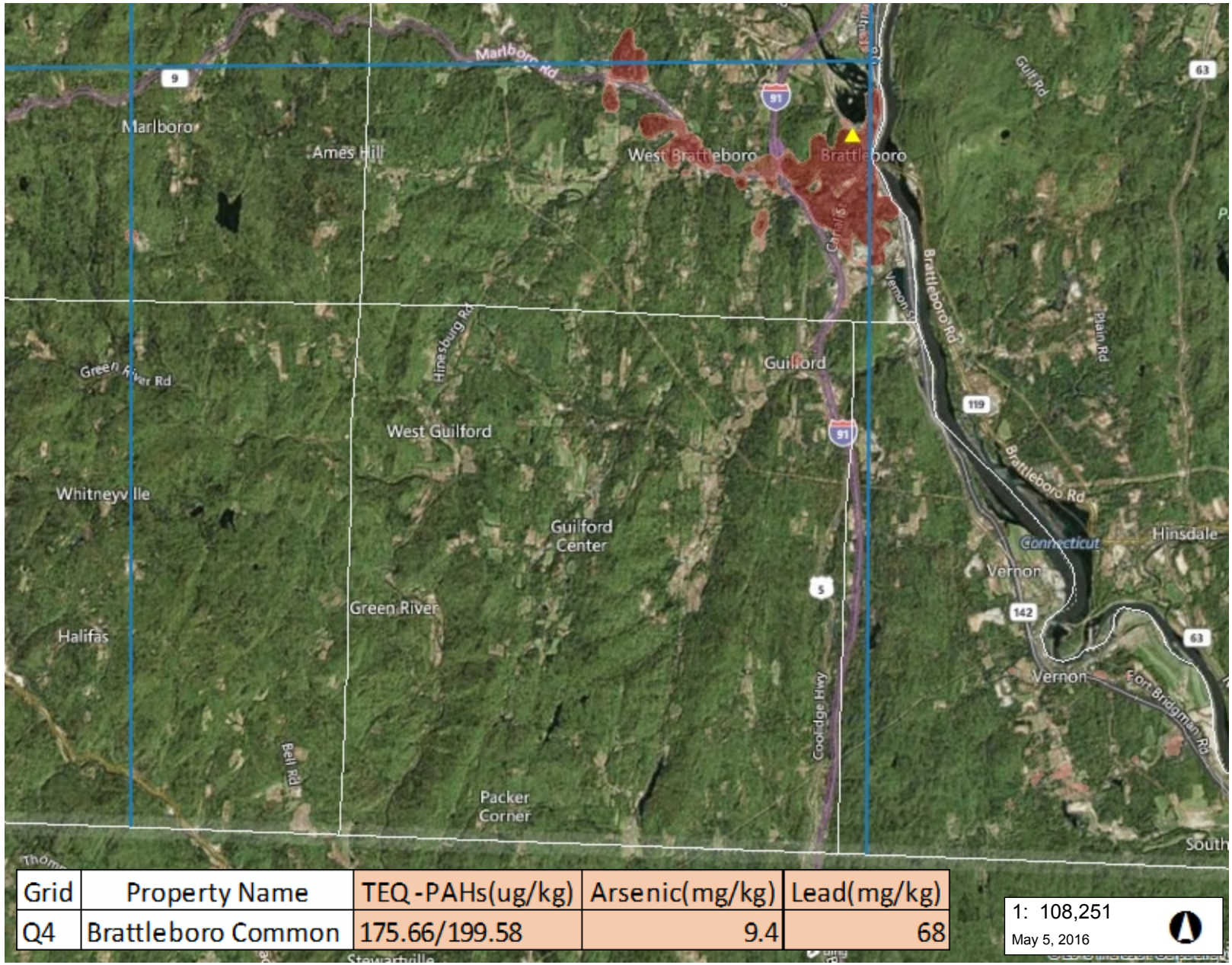

Grid	Property Name	TEQ-PAHs(ug/kg)	Arsenic(mg/kg)	Lead(mg/kg)
Q4	Brattleboro Common	175.66/199.58	9.4	68

1: 108,251

May 5, 2016

LEGEND

Town Boundary

Density of Habitable Buildings

- Low
- Medium
- High
- Highest

Sampling Location

NOTES

Location Q4 is considered an Urban Sample Point.

5,499.0 0 2,750.00 5,499.0 Meters

WGS_1984_Web_Mercator_Auxiliary_Sphere 1" = 9021 Ft. 1cm = 1083 Meters

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2015 Surface Soil Survey - Grid Q5

Vermont Agency of Natural Resources

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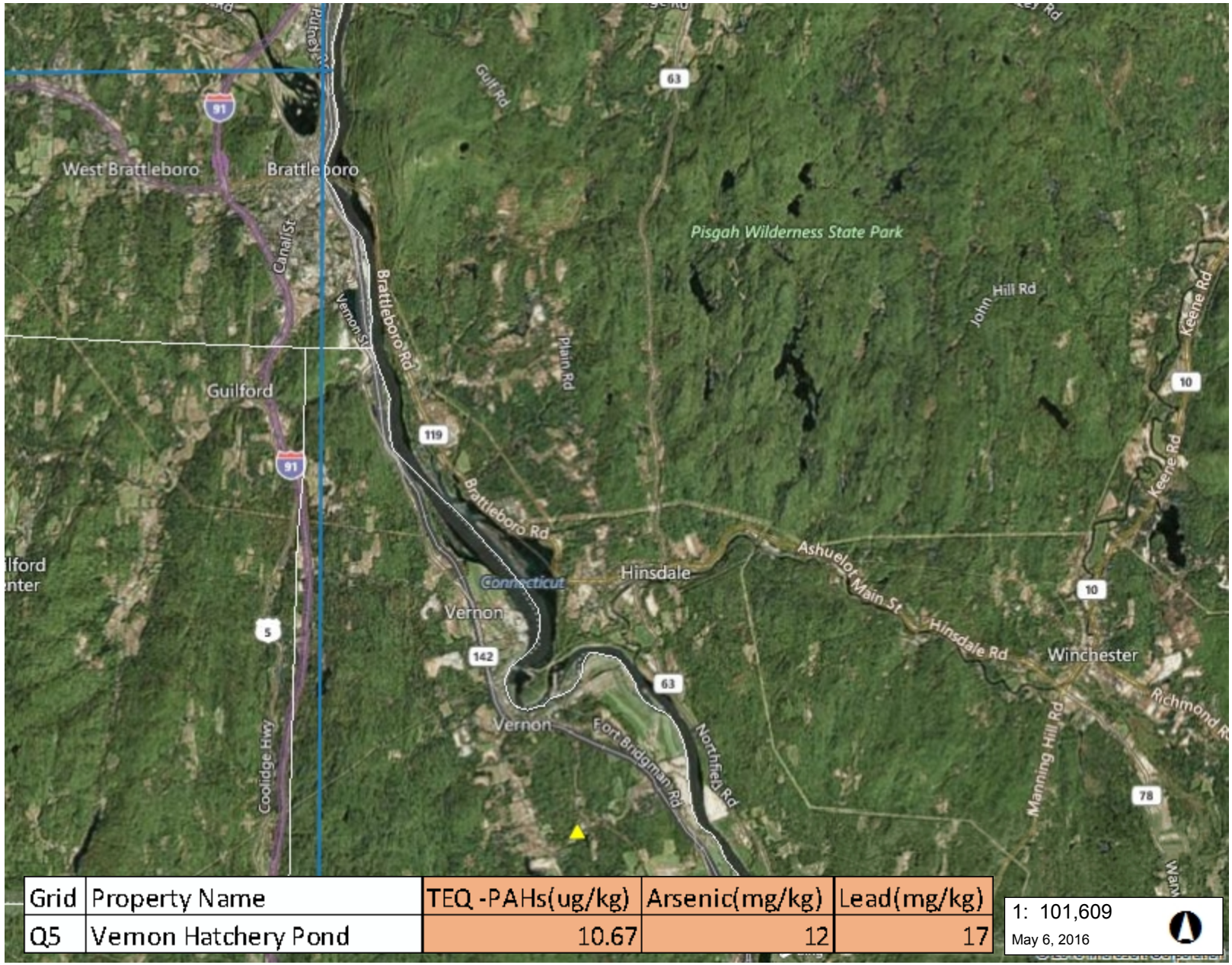

Grid	Property Name	TEQ -PAHs(ug/kg)	Arsenic(mg/kg)	Lead(mg/kg)
Q5	Vernon Hatchery Pond	10.67	12	17

1: 101,609

May 6, 2016

LEGEND

Town Boundary

Sampling Location

NOTES

Location Q5 is considered a Non Urban Sample Point

5,162.0 0 2,581.00 5,162.0 Meters

WGS_1984_Web_Mercator_Auxiliary_Sphere 1" = 8467 Ft. 1cm = 1016 Meters

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United States Environmental Protection Agency
Office of Environmental Measurement & Evaluation
11 Technology Drive
North Chelmsford, MA 01863-2431

Laboratory Report

October 20, 2015

Jim Byrne - Mail Code OSRR07-2
US EPA New England R1

Project Number: 15090011
Project: VT Urban Soils
Analysis: Metals in Soil Medium Level by ICP
EPA Chemist: Janet Paquin

Date Samples Received by the Laboratory: 09/09/2015

Analytical Procedure:

All samples were received and logged in by the laboratory according to the USEPA New England Laboratory SOP for Sample Log-in.

Sample preparation and analysis was done following the EPA Region I SOP, EIASOP-OPTIMASO1.

Samples were prepared following the EPA Region I SOP, EIASOP-INGMETALSPREP8

Preparation and analysis SOP's are based on "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846, 3rd Edition, Revision 2, Final Update III, Methods 3050B and 6010B," respectively. Samples were analyzed using a Perkin Elmer Dual View Inductively Coupled Plasma - Optical Emission Spectrometer.

Data were reviewed in accordance with the internal verification procedures described in the EPA New England Quality Manual for NERL.

Results relate only to the items tested or to the samples as received by the Laboratory. This analytical report shall not be reproduced except in full, without written approval of the laboratory.

If you have any questions please call me at 617-918-8340 .

Sincerely,

Qualifiers:

RL = Reporting limit
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NA = Not Applicable due to high sample dilutions or sample interferences
NC = Not calculated since analyte concentration is ND.
J = Estimated value
J1 = Estimated value due to MS recovery outside accceptance criteria
J2 = Estimated value due to LFB result outside acceptance criteria
J3 = Estimated value due to RPD result outside acceptance criteria
J4 = Estimated value due to LCS result outside acceptance criteria
E = Estimated value exceeds the calibration range
L = Estimated value is below the calibration range
B = Analyte is associated with the lab blank or trip blank contamination. Values are qualified when the observed concentration of the contamination in the sample extract is less than 10 times the concentration in the blank.
R = No recovery was calculated since the analyte concentration is greater than four times the spike level.
P = The confirmation value exceeded 35% difference and is less than 100%. The lower value is reported.
C = The identification has been confirmed by GC/MS.
A = Suspected Aldol condensation product.
N = Tentatively identified compound.

Sample results are in mg/Kg dry weight.

VT Urban Soils

Metals in Soil Medium Level by ICP

Client Sample ID:	E-5	Lab Sample ID:	AB58281
Date of Collection:	8/31/2015	Matrix:	Soil
Date of Preparation:	10/05/2015	Amount Prepared:	N/A
Date of Analysis:	10/08/2015	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-38-2	Arsenic	**10**	2.0	
7439-92-1	Lead	**6.4**	2.0	

VT Urban Soils

Metals in Soil Medium Level by ICP

Client Sample ID:	D-6	Lab Sample ID:	AB58282
Date of Collection:	8/31/2015	Matrix:	Soil
Date of Preparation:	10/05/2015	Amount Prepared:	N/A
Date of Analysis:	10/08/2015	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-38-2	Arsenic	**11**	2.0	
7439-92-1	Lead	**33**	2.0	

VT Urban Soils

Metals in Soil Medium Level by ICP

Client Sample ID:	C-6	Lab Sample ID:	AB58283
Date of Collection:	8/31/2015	Matrix:	Soil
Date of Preparation:	10/05/2015	Amount Prepared:	N/A
Date of Analysis:	10/08/2015	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-38-2	Arsenic	**14**	2.0	
7439-92-1	Lead	**17**	2.0	

VT Urban Soils

Metals in Soil Medium Level by ICP

Client Sample ID:	A-7	Lab Sample ID:	AB58284
Date of Collection:	8/31/2015	Matrix:	Soil
Date of Preparation:	10/05/2015	Amount Prepared:	N/A
Date of Analysis:	10/08/2015	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-38-2	Arsenic	**25**	2.0	
7439-92-1	Lead	**19**	2.0	

VT Urban Soils

Metals in Soil Medium Level by ICP

Client Sample ID:	A-8	Lab Sample ID:	AB58285
Date of Collection:	8/31/2015	Matrix:	Soil
Date of Preparation:	10/05/2015	Amount Prepared:	N/A
Date of Analysis:	10/08/2015	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-38-2	Arsenic	**5.3**	2.0	
7439-92-1	Lead	**12**	2.0	

VT Urban Soils

Metals in Soil Medium Level by ICP

Client Sample ID:	A-9	Lab Sample ID:	AB58286
Date of Collection:	8/31/2015	Matrix:	Soil
Date of Preparation:	10/05/2015	Amount Prepared:	N/A
Date of Analysis:	10/08/2015	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-38-2	Arsenic	**9.5**	2.0	
7439-92-1	Lead	**6.4**	2.0	

VT Urban Soils

Metals in Soil Medium Level by ICP

Client Sample ID:	B-7	Lab Sample ID:	AB58287
Date of Collection:	8/31/2015	Matrix:	Soil
Date of Preparation:	10/05/2015	Amount Prepared:	N/A
Date of Analysis:	10/08/2015	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-38-2	Arsenic	**2.3**	2.0	
7439-92-1	Lead	**9.6**	2.0	

VT Urban Soils

Metals in Soil Medium Level by ICP

Client Sample ID:	B-8	Lab Sample ID:	AB58288
Date of Collection:	8/31/2015	Matrix:	Soil
Date of Preparation:	10/05/2015	Amount Prepared:	N/A
Date of Analysis:	10/08/2015	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-38-2	Arsenic	**2.8**	2.0	
7439-92-1	Lead	**6.0**	2.0	

VT Urban Soils

Metals in Soil Medium Level by ICP

Client Sample ID:	B-9	Lab Sample ID:	AB58289
Date of Collection:	8/31/2015	Matrix:	Soil
Date of Preparation:	10/05/2015	Amount Prepared:	N/A
Date of Analysis:	10/08/2015	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-38-2	Arsenic	**2.8**	2.0	
7439-92-1	Lead	**7.0**	2.0	

VT Urban Soils

Metals in Soil Medium Level by ICP

Client Sample ID:	C-4	Lab Sample ID:	AB58290
Date of Collection:	9/01/2015	Matrix:	Soil
Date of Preparation:	10/05/2015	Amount Prepared:	N/A
Date of Analysis:	10/08/2015	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-38-2	Arsenic	**6.8**	2.0	
7439-92-1	Lead	**5.1**	2.0	

VT Urban Soils

Metals in Soil Medium Level by ICP

Client Sample ID:	DUP-3	Lab Sample ID:	AB58291
Date of Collection:	9/01/2015	Matrix:	Soil
Date of Preparation:	10/05/2015	Amount Prepared:	N/A
Date of Analysis:	10/08/2015	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-38-2	Arsenic	**7.3**	2.0	
7439-92-1	Lead	**5.4**	2.0	

VT Urban Soils

Metals in Soil Medium Level by ICP

Client Sample ID:	E-3	Lab Sample ID:	AB58292
Date of Collection:	9/01/2015	Matrix:	Soil
Date of Preparation:	10/05/2015	Amount Prepared:	N/A
Date of Analysis:	10/08/2015	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-38-2	Arsenic	**11**	2.0	
7439-92-1	Lead	**9.4**	2.0	

VT Urban Soils

Laboratory Reagent Blank

Client Sample ID:	N/A	Lab Sample ID:	N/A
Date of Collection:	N/A	Matrix:	Soil
Date of Preparation:	10/05/2015	Amount Prepared:	N/A
Date of Analysis:	10/08/2015	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration ug/L	RL ug/L	Qualifier
7440-38-2	Arsenic	ND	20	
7439-92-1	Lead	ND	20	

VT Urban Soils

MATRIX SPIKE (MS) RECOVERY

Sample ID: AB58285

PARAMETER	SPIKE ADDED mg/Kg	SAMPLE CONCENTRATION mg/Kg	MS CONCENTRATION mg/Kg	MS % REC	QC LIMITS (% REC)
Arsenic	98.0	5.3	102	99	75 - 125
Lead	98.0	12.0	101	91	75 - 125

VT Urban Soils

Laboratory Duplicate Results

Sample ID: AB58281

PARAMETER	SAMPLE RESULT mg/Kg	SAMPLE DUPLICATE RESULT mg/Kg	PRECISION RPD %	QC LIMITS
Arsenic	10.0	13	26	30
Lead	6.4	6.9	7.5	30

VT Urban Soils

Laboratory Fortified Blank (LFB) Results

PARAMETER	LFB AMOUNT SPIKED ug/L	LFB RESULT ug/L	LFB RECOVERY %	QC LIMITS %
Arsenic	1000	998	100	85 - 115
Lead	1000	993	99	85 - 115

Comments:

VT Urban Soils

Solid Laboratory Control Sample (LCS) Results

PARAMETER	LCS RESULTS mg/Kg	CONTROL LIMITS mg/Kg
Arsenic	98.4	67.5 - 142
Lead	92.2	68.4 - 125

Comments:

Samples in Batch: AB58281, AB58282, AB58283, AB58284, AB58285, AB58286, AB58287, AB58288, AB58289, AB58290, AB58291, AB58292

ENVIRONMENTAL PROTECTION AGENCY

REGION 1

CHAIN OF CUSTODY RECORD

PROJ. NO.: 150900 < 11 12

PROJECT NAME: Soil Background Study

SAMPLERS: (Signature) VT DEC

STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS	PAHs	Arsenic	Lead				REMARKS
													Pg 1 of 2
	8/31	10 am	X		E-5	2	X	X	X				
	8/31	11:30	X		D-6	2	X	X	X				
	8/31	1:30	X		C-6	2	X	X	X				* SEE REPORTING LIMITS
	8/31	0800	X		A-7	2	X	X	X				ON FORM K ATTACHED.
	8/31	1240	X		A-8	2	X	X	X				
	8/31	1330	X		A-9	2	X	X	X				
	8/31	0900	X		B-7	2	X	X	X				
	8/31	1230	X		B-8	2	X	X	X				
	8/31	1440	X		B-9	2	X	X	X				
	9/1	1230	X		C-4	2	X	X	X				
	9/1		X		DUP-3	2	X	X	X				
	9/1	3:00			E-3	2	X	X	X				
	9/1				DUP-5	2	X	X	X				
	9/2	815	X		A-2	2	X	X	X				
	9/2	1015	X		B-1	2	X	X	X				

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
[signature]	9/8/15 0900				
Relinquished by: (Signature) FEDEX # 774453514040	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature) [signature]	Date / Time 9/9/15 10:30	Remarks	

Distribution: Original Accompanies Shipment; Copy to Coordinator Field Files

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United States Environmental Protection Agency
Office of Environmental Measurement & Evaluation
11 Technology Drive
North Chelmsford, MA 01863-2431

Laboratory Report

January 11, 2016

Jim Byrne - Mail Code OSRR07-2
US EPA New England R1

Project Number: 15090029
Project: VT Urban Soils
Analysis: Metals in Soil Medium Level by ICP
EPA Chemist: Janet Paquin

Date Samples Received by the Laboratory: 09/22/2015

Analytical Procedure:

All samples were received and logged in by the laboratory according to the USEPA New England Laboratory SOP for Sample Log-in.

Sample preparation and analysis was done following the EPA Region I SOP, EIASOP-OPTIMAS0.

Samples were prepared following the EPA Region I SOP, EIASOP-INGMETALSPREP8

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J3 = Estimated value due to RPD result outside acceptance criteria
J4 = Estimated value due to LCS result outside acceptance criteria
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P = The confirmation value exceeded 35% difference and is less than 100%. The lower value is reported.
C = The identification has been confirmed by GC/MS.
A = Suspected Aldol condensation product.
N = Tentatively identified compound.

Sample results are in mg/Kg dry weight.

VT Urban Soils

Metals in Soil Medium Level by ICP

Client Sample ID:	G3	Lab Sample ID:	AB58502
Date of Collection:	9/15/2015	Matrix:	Soil
Date of Preparation:	10/27/2015	Amount Prepared:	N/A
Date of Analysis:	12/21/2015	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-38-2	Arsenic	**6.6**	1.9	
7439-92-1	Lead	**89**	1.9	

VT Urban Soils

Metals in Soil Medium Level by ICP

Client Sample ID:	DUP 7	Lab Sample ID:	AB58503
Date of Collection:	9/15/2015	Matrix:	Soil
Date of Preparation:	10/27/2015	Amount Prepared:	N/A
Date of Analysis:	12/21/2015	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-38-2	Arsenic	**7.2**	2.0	
7439-92-1	Lead	**96**	2.0	

VT Urban Soils

Metals in Soil Medium Level by ICP

Client Sample ID:	H2	Lab Sample ID:	AB58504
Date of Collection:	9/15/2015	Matrix:	Soil
Date of Preparation:	10/27/2015	Amount Prepared:	N/A
Date of Analysis:	12/21/2015	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-38-2	Arsenic	**5.5**	2.0	
7439-92-1	Lead	**16**	2.0	

VT Urban Soils

Metals in Soil Medium Level by ICP

Client Sample ID:	G2	Lab Sample ID:	AB58505
Date of Collection:	9/15/2015	Matrix:	Soil
Date of Preparation:	10/27/2015	Amount Prepared:	N/A
Date of Analysis:	12/21/2015	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-38-2	Arsenic	**6.5**	2.0	
7439-92-1	Lead	**56**	2.0	

VT Urban Soils

Metals in Soil Medium Level by ICP

Client Sample ID:	G7	Lab Sample ID:	AB58506
Date of Collection:	9/15/2015	Matrix:	Soil
Date of Preparation:	10/27/2015	Amount Prepared:	N/A
Date of Analysis:	12/21/2015	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-38-2	Arsenic	ND	2.0	
7439-92-1	Lead	**6.1**	2.0	

VT Urban Soils

Metals in Soil Medium Level by ICP

Client Sample ID:	F6	Lab Sample ID:	AB58507
Date of Collection:	9/15/2015	Matrix:	Soil
Date of Preparation:	10/27/2015	Amount Prepared:	N/A
Date of Analysis:	12/21/2015	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-38-2	Arsenic	ND	2.0	
7439-92-1	Lead	**3.8**	2.0	

VT Urban Soils

Metals in Soil Medium Level by ICP

Client Sample ID:	G6	Lab Sample ID:	AB58508
Date of Collection:	9/15/2015	Matrix:	Soil
Date of Preparation:	10/27/2015	Amount Prepared:	N/A
Date of Analysis:	12/21/2015	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-38-2	Arsenic	**3.5**	2.0	
7439-92-1	Lead	**14**	2.0	

VT Urban Soils

Metals in Soil Medium Level by ICP

Client Sample ID:	G5	Lab Sample ID:	AB58509
Date of Collection:	9/15/2015	Matrix:	Soil
Date of Preparation:	10/27/2015	Amount Prepared:	N/A
Date of Analysis:	12/21/2015	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-38-2	Arsenic	**7.9**	2.0	
7439-92-1	Lead	**20**	2.0	

VT Urban Soils

Metals in Soil Medium Level by ICP

Client Sample ID:	N5	Lab Sample ID:	AB58510
Date of Collection:	9/17/2015	Matrix:	Soil
Date of Preparation:	10/27/2015	Amount Prepared:	N/A
Date of Analysis:	12/21/2015	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-38-2	Arsenic	**6.5**	2.0	
7439-92-1	Lead	**21**	2.0	

VT Urban Soils

Metals in Soil Medium Level by ICP

Client Sample ID:	J6	Lab Sample ID:	AB58511
Date of Collection:	9/17/2015	Matrix:	Soil
Date of Preparation:	10/27/2015	Amount Prepared:	N/A
Date of Analysis:	12/21/2015	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-38-2	Arsenic	**3.8**	2.0	
7439-92-1	Lead	**73**	2.0	

VT Urban Soils

Metals in Soil Medium Level by ICP

Client Sample ID:	C-5	Lab Sample ID:	AB58512
Date of Collection:	9/18/2015	Matrix:	Soil
Date of Preparation:	10/27/2015	Amount Prepared:	N/A
Date of Analysis:	12/21/2015	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-38-2	Arsenic	**6.0**	2.0	
7439-92-1	Lead	**27**	2.0	

VT Urban Soils

Metals in Soil Medium Level by ICP

Client Sample ID:	C-7	Lab Sample ID:	AB58513
Date of Collection:	9/18/2015	Matrix:	Soil
Date of Preparation:	10/27/2015	Amount Prepared:	N/A
Date of Analysis:	12/21/2015	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-38-2	Arsenic	**2.7**	2.0	
7439-92-1	Lead	**18**	2.0	

VT Urban Soils

Metals in Soil Medium Level by ICP

Client Sample ID:	C-8	Lab Sample ID:	AB58514
Date of Collection:	9/18/2015	Matrix:	Soil
Date of Preparation:	10/27/2015	Amount Prepared:	N/A
Date of Analysis:	12/21/2015	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-38-2	Arsenic	**2.2**	2.0	
7439-92-1	Lead	**6.4**	2.0	

VT Urban Soils

Metals in Soil Medium Level by ICP

Client Sample ID:	C-9	Lab Sample ID:	AB58515
Date of Collection:	9/18/2015	Matrix:	Soil
Date of Preparation:	10/27/2015	Amount Prepared:	N/A
Date of Analysis:	12/21/2015	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-38-2	Arsenic	**6.7**	2.0	
7439-92-1	Lead	**35**	2.0	

VT Urban Soils

Metals in Soil Medium Level by ICP

Client Sample ID:	F-1	Lab Sample ID:	AB58516
Date of Collection:	9/18/2015	Matrix:	Soil
Date of Preparation:	10/27/2015	Amount Prepared:	N/A
Date of Analysis:	12/21/2015	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-38-2	Arsenic	**7.1**	2.0	
7439-92-1	Lead	**51**	2.0	

Comments: The sample consisted mostly of small pebbles.

VT Urban Soils

Metals in Soil Medium Level by ICP

Client Sample ID:	DUP-6	Lab Sample ID:	AB58517
Date of Collection:	9/18/2015	Matrix:	Soil
Date of Preparation:	10/27/2015	Amount Prepared:	N/A
Date of Analysis:	12/21/2015	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	20
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-38-2	Arsenic	ND	39	
7439-92-1	Lead	**76**	39	

Comments: The sample was diluted due to high level of iron. The sample consisted mostly of small stones.

VT Urban Soils

Metals in Soil Medium Level by ICP

Client Sample ID:	J-2	Lab Sample ID:	AB58518
Date of Collection:	9/18/2015	Matrix:	Soil
Date of Preparation:	10/27/2015	Amount Prepared:	N/A
Date of Analysis:	12/21/2015	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-38-2	Arsenic	**13**	2.0	
7439-92-1	Lead	**68**	2.0	

VT Urban Soils

Metals in Soil Medium Level by ICP

Client Sample ID:	DUP-10	Lab Sample ID:	AB58519
Date of Collection:	9/18/2015	Matrix:	Soil
Date of Preparation:	10/27/2015	Amount Prepared:	N/A
Date of Analysis:	12/21/2015	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-38-2	Arsenic	**14**	2.0	
7439-92-1	Lead	**78**	2.0	

VT Urban Soils

Metals in Soil Medium Level by ICP

Client Sample ID:	J-1	Lab Sample ID:	AB58520
Date of Collection:	9/18/2015	Matrix:	Soil
Date of Preparation:	10/27/2015	Amount Prepared:	N/A
Date of Analysis:	12/21/2015	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-38-2	Arsenic	**5.4**	2.0	
7439-92-1	Lead	**20**	2.0	

VT Urban Soils

Metals in Soil Medium Level by ICP

Client Sample ID:	I-1	Lab Sample ID:	AB58521
Date of Collection:	9/18/2015	Matrix:	Soil
Date of Preparation:	10/27/2015	Amount Prepared:	N/A
Date of Analysis:	12/28/2015	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	2
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-38-2	Arsenic	**6.0**	4.0	
7439-92-1	Lead	**16**	4.0	

Comments: The sample was diluted due to the presence of a high level of iron. The sample consisted mostly of small stones and pebbles.

VT Urban Soils

Laboratory Reagent Blank

Client Sample ID:	N/A	Lab Sample ID:	N/A
Date of Collection:	N/A	Matrix:	Soil
Date of Preparation:	10/27/2015	Amount Prepared:	N/A
Date of Analysis:	12/21/2015	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration ug/L	RL ug/L	Qualifier
7440-38-2	Arsenic	ND	20	
7439-92-1	Lead	ND	20	

VT Urban Soils

MATRIX SPIKE (MS) RECOVERY

Sample ID: AB58504

PARAMETER	SPIKE ADDED mg/Kg	SAMPLE CONCENTRATION mg/Kg	MS CONCENTRATION mg/Kg	MS % REC	QC LIMITS (% REC)
Arsenic	100	5.5	106	100	75 - 125
Lead	100	16.0	113	97	75 - 125

VT Urban Soils

Laboratory Duplicate Results

Sample ID: AB58503

PARAMETER	SAMPLE RESULT mg/Kg	SAMPLE DUPLICATE RESULT mg/Kg	PRECISION RPD %	QC LIMITS
Arsenic	7.2	6.1	17	30
Lead	96.0	82	16	30

VT Urban Soils

Laboratory Fortified Blank (LFB) Results

PARAMETER	LFB AMOUNT SPIKED ug/L	LFB RESULT ug/L	LFB RECOVERY %	QC LIMITS %
Arsenic	1000	1010	101	85 - 115
Lead	1000	1010	101	85 - 115

Comments:

VT Urban Soils

Solid Laboratory Control Sample (LCS) Results

PARAMETER	LCS RESULTS mg/Kg	CONTROL LIMITS mg/Kg
Arsenic	97.5	67.5 - 142
Lead	92.4	68.4 - 125

Comments:

Samples in Batch: AB58502, AB58503, AB58504, AB58505, AB58506, AB58507, AB58508, AB58509, AB58510, AB58511, AB58512, AB58513, AB58514, AB58515, AB58516, AB58517, AB58518, AB58519, AB58520, AB58521

15090029 $PAHS
15090029 $METMS_PE

ENVIRONMENTAL PROTECTION AGENCY

REGION 1

CHAIN OF CUSTODY RECORD

PROJ. NO. 15090029

PROJECT NAME Soil Background Study

SAMPLERS: (Signature) VT DEC

STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS	PAHs	ARSENIC	LEAD				REMARKS
	9/15/15	9:15	X		G3	2	X	X	X				Pg 1 of 2
	9/15/15	[redacted]	X		DUP 7	2	X	X	X				
	9/15/15	10:45	X		H2	2	X	X	X				
	9/15/15	11:45	X		G2	2	X	X	X				
	9/15/15	10:15	X		G7	2	X	X	X				
	9/15/15	1130	X		F6	2	X	X	X				
	9/15/15	1300	X		G6	2	X	X	X				
	9/15/15	1430	X		G5	2	X	X	X				
	9/17/15	0900	X		N5	2	X	X	X				
	9/17/15	1030	X		J6	2	X	X	X				
	9/18	2:00	X		C-5	2	X	X	X				
	9/18	12:45	X		C-7	2	X	X	X				
	9/18	11:30	X		C-8	2	X	X	X				
	9/18	8:30	X		C-9	2	X	X	X				
	9/18	10:30	X		F-1								

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
[signature]	9/21/15 15:00	FEDEX 7745564935 10			
Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature)	Date / Time	Remarks	
		[signature] ESAT	9/22/15 09:35		

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15090029 $PAHS
15090029 $METMS_PE

ENVIRONMENTAL PROTECTION AGENCY
REGION 1

CHAIN OF CUSTODY RECORD

PROJ. NO.: 15090029
PROJECT NAME:
SAMPLERS: (Signature) VT DEC

STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS	PAHs	ARSENIC	LEAD				REMARKS
	9/18		X		DUP-6	2	X	X	X				Pg 2 of 2
	9/18	4:00	X		J-2	2	X	X	X				
	9/18		X		DUP-10	2	X	X	X				
	9/18	3:00	X		J-1	2	X	X	X				
	9/18	2:00	X		I-1	2	X	X	X				

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
		FEDEX 7745 5649 4804			
Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature)	Date / Time	Remarks	
		ESAT	9/22/15 09.35		

Distribution: Original Accompanies Shipment; Copy to Coordinator Field Files

1- 19381

United States Environmental Protection Agency
Office of Environmental Measurement & Evaluation
11 Technology Drive
North Chelmsford, MA 01863-2431

Laboratory Report

January 11, 2016

Jim Byrne - Mail Code OSRR07-2
US EPA New England R1

Project Number: 15090036
Project: VT Urban Soils
Analysis: Metals in Soil Medium Level by ICP
EPA Chemist: Janet Paquin

Date Samples Received by the Laboratory: 09/29/2015

Analytical Procedure:

All samples were received and logged in by the laboratory according to the USEPA New England Laboratory SOP for Sample Log-in.

Sample preparation and analysis was done following the EPA Region I SOP, EIASOP-OPTIMAS0.

Samples were prepared following the EPA Region I SOP, EIASOP-INGMETALSPREP8

Preparation and analysis SOP's are based on "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846, 3rd Edition, Revision 2, Final Update III, Methods 3050B and 6010B," respectively. Samples were analyzed using a Perkin Elmer Dual View Inductively Coupled Plasma - Optical Emission Spectrometer.

Data were reviewed in accordance with the internal verification procedures described in the EPA New England Quality Manual for NERL.

Results relate only to the items tested or to the samples as received by the Laboratory. This analytical report shall not be reproduced except in full, without written approval of the laboratory.

If you have any questions please call me at 617-918-8340 .

Sincerely,

Qualifiers:

RL = Reporting limit
ND = Not Detected above Reporting limit
NA = Not Applicable due to high sample dilutions or sample interferences
NC = Not calculated since analyte concentration is ND.
J = Estimated value
J1 = Estimated value due to MS recovery outside accceptance criteria
J2 = Estimated value due to LFB result outside acceptance criteria
J3 = Estimated value due to RPD result outside acceptance criteria
J4 = Estimated value due to LCS result outside acceptance criteria
E = Estimated value exceeds the calibration range
L = Estimated value is below the calibration range
B = Analyte is associated with the lab blank or trip blank contamination. Values are qualified when the observed concentration of the contamination in the sample extract is less than 10 times the concentration in the blank.
R = No recovery was calculated since the analyte concentration is greater than four times the spike level.
P = The confirmation value exceeded 35% difference and is less than 100%. The lower value is reported.
C = The identification has been confirmed by GC/MS.
A = Suspected Aldol condensation product.
N = Tentatively identified compound.

Sample results are in mg/Kg dry weight.

VT Urban Soils

Metals in Soil Medium Level by ICP

Client Sample ID:	E6	Lab Sample ID:	AB58617
Date of Collection:	9/21/2015	Matrix:	Soil
Date of Preparation:	10/27/2015	Amount Prepared:	N/A
Date of Analysis:	12/22/2015	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	2
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-38-2	Arsenic	ND	3.9	
7439-92-1	Lead	**34**	3.9	

Comments: The sample was diluted due to high level of titanium.

VT Urban Soils

Metals in Soil Medium Level by ICP

Client Sample ID:	E8	Lab Sample ID:	AB58618
Date of Collection:	9/24/2015	Matrix:	Soil
Date of Preparation:	10/27/2015	Amount Prepared:	N/A
Date of Analysis:	12/22/2015	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-38-2	Arsenic	**2.9**	2.0	
7439-92-1	Lead	**21**	2.0	

VT Urban Soils

Metals in Soil Medium Level by ICP

Client Sample ID:	D9	Lab Sample ID:	AB58619
Date of Collection:	9/24/2015	Matrix:	Soil
Date of Preparation:	10/27/2015	Amount Prepared:	N/A
Date of Analysis:	12/22/2015	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-38-2	Arsenic	**5.5**	2.0	
7439-92-1	Lead	**12**	2.0	

VT Urban Soils

Metals in Soil Medium Level by ICP

Client Sample ID:	F5	Lab Sample ID:	AB58620
Date of Collection:	9/28/2015	Matrix:	Soil
Date of Preparation:	10/27/2015	Amount Prepared:	N/A
Date of Analysis:	12/22/2015	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-38-2	Arsenic	**5.5**	2.0	
7439-92-1	Lead	**12**	2.0	

VT Urban Soils

Metals in Soil Medium Level by ICP

Client Sample ID:	F4	Lab Sample ID:	AB58621
Date of Collection:	9/28/2015	Matrix:	Soil
Date of Preparation:	10/27/2015	Amount Prepared:	N/A
Date of Analysis:	12/22/2015	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-38-2	Arsenic	**11**	2.0	
7439-92-1	Lead	**140**	2.0	

VT Urban Soils

Laboratory Reagent Blank

Client Sample ID:	N/A	Lab Sample ID:	N/A
Date of Collection:	N/A	Matrix:	Soil
Date of Preparation:	10/27/2015	Amount Prepared:	N/A
Date of Analysis:	12/22/2015	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration ug/L	RL ug/L	Qualifier
7440-38-2	Arsenic	ND	20	
7439-92-1	Lead	ND	20	

VT Urban Soils

MATRIX SPIKE (MS) RECOVERY

Sample ID: AB58621

PARAMETER	SPIKE ADDED mg/Kg	SAMPLE CONCENTRATION mg/Kg	MS CONCENTRATION mg/Kg	MS % REC	QC LIMITS (% REC)
Arsenic	100	11.0	111	100	75 - 125
Lead	100	140	233	93	75 - 125

VT Urban Soils

Laboratory Duplicate Results

Sample ID: AB58619

PARAMETER	SAMPLE RESULT mg/Kg	SAMPLE DUPLICATE RESULT mg/Kg	PRECISION RPD %	QC LIMITS
Arsenic	5.5	5.9	7.0	30
Lead	12.0	12	0.0	30

VT Urban Soils

Laboratory Fortified Blank (LFB) Results

PARAMETER	LFB AMOUNT SPIKED ug/L	LFB RESULT ug/L	LFB RECOVERY %	QC LIMITS %
Arsenic	1000	1010	101	85 - 115
Lead	1000	994	99	85 - 115

Comments:

VT Urban Soils

Solid Laboratory Control Sample (LCS) Results

PARAMETER	LCS RESULTS mg/Kg	CONTROL LIMITS mg/Kg
Arsenic	99.9	67.5 - 142
Lead	92.6	68.4 - 125

Comments:

Samples in Batch: AB58617, AB58618, AB58619, AB58620, AB58621

15090036 $PAHS
15090036 $METMS_PE

ENVIRONMENTAL PROTECTION AGENCY

REGION 1

CHAIN OF CUSTODY RECORD

PROJ. NO.: 15090036

PROJECT NAME: Soil Background Study

SAMPLERS: (Signature) VT DEC

STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS	PAHS	ARSENIC	LEAD				REMARKS
	9/21/15	12:45	X		E6	2	X	X	X				Pg 1 of 1
	9/24/15	1000	X		E8	2	X	X	X				
	9/24/15	1200	X		D9	2	X	X	X				
	9/28/15	1000	X		F5	2	X	X	X				
	9/28/15	1130	X		F4	2	X	X	X				

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
[signature]	9/28/15 15:00	FEDEX 774609452460			
Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature) ESA	Date / Time	Remarks	
		[signature]	9/29/15		

Distribution: Original Accompanies Shipment; Copy to Coordinator Field Files

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Region 1, New England

United States Environmental Protection Agency
Office of Environmental Measurement & Evaluation
11 Technology Drive
North Chelmsford, MA 01863-2431

Laboratory Report

January 07, 2016

Jim Byrne - Mail Code OSRR07-2
US EPA New England R1

Project Number: 15100005
Project: VT Urban Soils
Analysis: Metals in Soil Medium Level by ICP
EPA Chemist: Janet Paquin
JP 1/7/16

Date Samples Received by the Laboratory: 10/06/2015

Analytical Procedure:

All samples were received and logged in by the laboratory according to the USEPA New England Laboratory SOP for Sample Log-in.

Sample preparation and analysis was done following the EPA Region I SOP, EIASOP-OPTIMAS0.

Samples were prepared following the EPA Region I SOP, EIASOP-INGMETALSPREP8

Preparation and analysis SOP's are based on "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846, 3rd Edition, Revision 2, Final Update III, Methods 3050B and 6010B," respectively. Samples were analyzed using a Perkin Elmer Dual View Inductively Coupled Plasma - Optical Emission Spectrometer.

Data were reviewed in accordance with the internal verification procedures described in the EPA New England Quality Manual for NERL.

Results relate only to the items tested or to the samples as received by the Laboratory. This analytical report shall not be reproduced except in full, without written approval of the laboratory.

If you have any questions please call me at 617-918-8340 .

Sincerely,

Qualifiers:

RL = Reporting limit
ND = Not Detected above Reporting limit
NA = Not Applicable due to high sample dilutions or sample interferences
NC = Not calculated since analyte concentration is ND.
J = Estimated value
J1 = Estimated value due to MS recovery outside accceptance criteria
J2 = Estimated value due to LFB result outside acceptance criteria
J3 = Estimated value due to RPD result outside acceptance criteria
J4 = Estimated value due to LCS result outside acceptance criteria
E = Estimated value exceeds the calibration range
L = Estimated value is below the calibration range
B = Analyte is associated with the lab blank or trip blank contamination. Values are qualified when the observed concentration of the contamination in the sample extract is less than 10 times the concentration in the blank.
R = No recovery was calculated since the analyte concentration is greater than four times the spike level.
P = The confirmation value exceeded 35% difference and is less than 100%. The lower value is reported.
C = The identification has been confirmed by GC/MS.
A = Suspected Aldol condensation product.
N = Tentatively identified compound.

Sample results are in mg/Kg dry weight.

VT Urban Soils

Metals in Soil Medium Level by ICP

Client Sample ID:	H4	Lab Sample ID:	AB58729
Date of Collection:	9/29/2015	Matrix:	Soil
Date of Preparation:	12/31/2015	Amount Prepared:	N/A
Date of Analysis:	1/06/2016	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-38-2	Arsenic	**5.6**	2.0	
7439-92-1	Lead	**100**	2.0	

VT Urban Soils

Metals in Soil Medium Level by ICP

Client Sample ID:	J3	Lab Sample ID:	AB58730
Date of Collection:	9/29/2015	Matrix:	Soil
Date of Preparation:	12/31/2015	Amount Prepared:	N/A
Date of Analysis:	1/06/2016	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-38-2	Arsenic	**5.0**	2.0	
7439-92-1	Lead	**83**	2.0	

VT Urban Soils

Metals in Soil Medium Level by ICP

Client Sample ID:	P2	Lab Sample ID:	AB58731
Date of Collection:	10/01/2015	Matrix:	Soil
Date of Preparation:	12/31/2015	Amount Prepared:	N/A
Date of Analysis:	1/06/2016	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	2
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-38-2	Arsenic	**4.3**	3.8	
7439-92-1	Lead	**30**	3.8	

Comments: The sample was run at a dilution factor of 2 due to the presence of a high level of titanium.

VT Urban Soils

Metals in Soil Medium Level by ICP

Client Sample ID:	P1	Lab Sample ID:	AB58732
Date of Collection:	10/01/2015	Matrix:	Soil
Date of Preparation:	12/31/2015	Amount Prepared:	N/A
Date of Analysis:	1/06/2016	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-38-2	Arsenic	**4.6**	1.9	
7439-92-1	Lead	**23**	1.9	

VT Urban Soils

Metals in Soil Medium Level by ICP

Client Sample ID:	DUP 16	Lab Sample ID:	AB58733
Date of Collection:	10/01/2015	Matrix:	Soil
Date of Preparation:	12/31/2015	Amount Prepared:	N/A
Date of Analysis:	1/06/2016	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-38-2	Arsenic	**4.4**	2.0	
7439-92-1	Lead	**22**	2.0	

VT Urban Soils

Metals in Soil Medium Level by ICP

Client Sample ID:	L2	Lab Sample ID:	AB58734
Date of Collection:	10/01/2015	Matrix:	Soil
Date of Preparation:	12/31/2015	Amount Prepared:	N/A
Date of Analysis:	1/06/2016	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-38-2	Arsenic	**3.1**	2.0	
7439-92-1	Lead	**7.1**	2.0	

VT Urban Soils

Metals in Soil Medium Level by ICP

Client Sample ID:	D8	Lab Sample ID:	AB58735
Date of Collection:	10/01/2015	Matrix:	Soil
Date of Preparation:	12/31/2015	Amount Prepared:	N/A
Date of Analysis:	1/06/2016	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-38-2	Arsenic	**2.3**	2.0	
7439-92-1	Lead	**19**	2.0	

VT Urban Soils

Metals in Soil Medium Level by ICP

Client Sample ID:	DUP-13	Lab Sample ID:	AB58736
Date of Collection:	10/01/2015	Matrix:	Soil
Date of Preparation:	12/31/2015	Amount Prepared:	N/A
Date of Analysis:	1/06/2016	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-38-2	Arsenic	**6.5**	2.0	
7439-92-1	Lead	**57**	2.0	

VT Urban Soils

Metals in Soil Medium Level by ICP

Client Sample ID:	L5	Lab Sample ID:	AB58737
Date of Collection:	10/01/2015	Matrix:	Soil
Date of Preparation:	12/31/2015	Amount Prepared:	N/A
Date of Analysis:	1/06/2016	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-38-2	Arsenic	**6.0**	2.0	
7439-92-1	Lead	**70**	2.0	

VT Urban Soils

Metals in Soil Medium Level by ICP

Client Sample ID:	M5	Lab Sample ID:	AB58738
Date of Collection:	10/01/2015	Matrix:	Soil
Date of Preparation:	12/31/2015	Amount Prepared:	N/A
Date of Analysis:	1/06/2016	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-38-2	Arsenic	**5.2**	2.0	
7439-92-1	Lead	**53**	2.0	

VT Urban Soils

Metals in Soil Medium Level by ICP

Client Sample ID:	K6	Lab Sample ID:	AB58739
Date of Collection:	10/01/2015	Matrix:	Soil
Date of Preparation:	12/31/2015	Amount Prepared:	N/A
Date of Analysis:	1/06/2016	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-38-2	Arsenic	**12**	2.0	
7439-92-1	Lead	**30**	2.0	

VT Urban Soils

Metals in Soil Medium Level by ICP

Client Sample ID:	K6a	Lab Sample ID:	AB58740
Date of Collection:	10/01/2015	Matrix:	Soil
Date of Preparation:	12/31/2015	Amount Prepared:	N/A
Date of Analysis:	1/06/2016	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-38-2	Arsenic	**9.2**	2.0	
7439-92-1	Lead	**14**	2.0	

VT Urban Soils

Metals in Soil Medium Level by ICP

Client Sample ID:	K6b	Lab Sample ID:	AB58741
Date of Collection:	10/05/2015	Matrix:	Soil
Date of Preparation:	12/31/2015	Amount Prepared:	N/A
Date of Analysis:	1/06/2016	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-38-2	Arsenic	**3.2**	2.0	
7439-92-1	Lead	**14**	2.0	

VT Urban Soils

Metals in Soil Medium Level by ICP

Client Sample ID:	K6c	Lab Sample ID:	AB58742
Date of Collection:	10/01/2015	Matrix:	Soil
Date of Preparation:	12/31/2015	Amount Prepared:	N/A
Date of Analysis:	1/06/2016	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-38-2	Arsenic	**2.5**	2.0	
7439-92-1	Lead	**260**	2.0	

VT Urban Soils

Metals in Soil Medium Level by ICP

Client Sample ID:	K6d	Lab Sample ID:	AB58743
Date of Collection:	10/01/2015	Matrix:	Soil
Date of Preparation:	12/31/2015	Amount Prepared:	N/A
Date of Analysis:	1/06/2016	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-38-2	Arsenic	**5.8**	2.0	
7439-92-1	Lead	**13**	2.0	

VT Urban Soils

Laboratory Reagent Blank

Client Sample ID:	N/A	Lab Sample ID:	N/A
Date of Collection:	N/A	Matrix:	Water
Date of Preparation:	12/31/2015	Amount Prepared:	N/A
Date of Analysis:	1/06/2016	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration ug/L	RL ug/L	Qualifier
7440-38-2	Arsenic	ND	20	
7439-92-1	Lead	ND	20	

VT Urban Soils

MATRIX SPIKE (MS) RECOVERY

Sample ID: AB58734

PARAMETER	SPIKE ADDED mg/Kg	SAMPLE CONCENTRATION mg/Kg	MS CONCENTRATION mg/Kg	MS % REC	QC LIMITS (% REC)
Arsenic	100	3.1	103	100	75 - 125
Lead	100	7.1	103	96	75 - 125

Laboratory Duplicate Results

Sample ID: AB58733

PARAMETER	SAMPLE RESULT mg/Kg	SAMPLE DUPLICATE RESULT mg/Kg	PRECISION RPD %	QC LIMITS
Arsenic	4.4	4.6	4.4	30
Lead	22.0	22	0.0	30

VT Urban Soils

Laboratory Fortified Blank (LFB) Results

PARAMETER	LFB AMOUNT SPIKED ug/L	LFB RESULT ug/L	LFB RECOVERY %	QC LIMITS %
Arsenic	1000	980	98	85 - 115
Lead	1000	985	99	85 - 115

Comments:

VT Urban Soils

Solid Laboratory Control Sample (LCS) Results

PARAMETER	LCS RESULTS mg/Kg	CONTROL LIMITS mg/Kg
Arsenic	980	67.5 - 142
Lead	985	68.4 - 125

Comments:

Samples in Batch: AB58729, AB58730, AB58731, AB58732, AB58733, AB58734, AB58735, AB58736, AB58737, AB58738, AB58739, AB58740, AB58741, AB58742, AB58743

15100005 $PAHS
15100005 $METMS_PE

ENVIRONMENTAL PROTECTION AGENCY

REGION 1

CHAIN OF CUSTODY RECORD

PROJ. NO.: 15100005

PROJECT NAME: Soil Background Study

SAMPLERS: (Signature) VT DEC

STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS	PAHS	ARSENIC	LEAD				REMARKS
	9/29/15	0730	X		H4	2	X	X	X				
	9/29/15	0900	X		J3	2	X	X	X				
	10.1.15	1145	X		P2	2	X	X	X				
	10.1.15	1330	X		P1	2	X	X	X				
	10 1 15	[redacted]	X		DUP 16	2	X	X	X				
	10/1/15	1425	X		L2	2	X	X	X				
	10/2/15	1030	X		D8	2	X	X	X				
	10/1/15		X		DUP-13	2	X	X	X				
	10/1/15	130	X		L5	2	X	X	X				
	10/1/15	1230	X		M5	2	X	X	X				
	10/1/15	300	X		K6	2	X	X	X				
	10/1/15	200	X		K6a	2	X	X	X				
	10/1/15	245	X		K6b	2	X	X	X				
	10/1/15	230	X		K6c	2	X	X	X				
	10/1/15	315	X		K6d	2	X	X	X				

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
[signature]	10/5/15 1500	FEDEX# 7746 65001490			
Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature) [signature] ESMT	Date / Time 10/6/15 9:00	Remarks	

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1- 19381

United States Environmental Protection Agency
Office of Environmental Measurement & Evaluation
11 Technology Drive
North Chelmsford, MA 01863-2431

Laboratory Report

January 21, 2016

Jim Byrne - Mail Code OSRR07-2
US EPA New England R1

Project Number: 15100015
Project: VT Urban Soils
Analysis: Metals in Soil Medium Level by ICP
EPA Chemist: Janet Paquin

Date Samples Received by the Laboratory: 10/13/2015

Analytical Procedure:

All samples were received and logged in by the laboratory according to the USEPA New England Laboratory SOP for Sample Log-in.

Sample preparation and analysis was done following the EPA Region I SOP, EIASOP-OPTIMAS0.

Samples were prepared following the EPA Region I SOP, EIASOP-INGMETALSPREP8

Preparation and analysis SOP's are based on "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846, 3rd Edition, Revision 2, Final Update III, Methods 3050B and 6010B," respectively. Samples were analyzed using a Perkin Elmer Dual View Inductively Coupled Plasma - Optical Emission Spectrometer.

Data were reviewed in accordance with the internal verification procedures described in the EPA New England Quality Manual for NERL.

Results relate only to the items tested or to the samples as received by the Laboratory. This analytical report shall not be reproduced except in full, without written approval of the laboratory.

If you have any questions please call me at 617-918-8340 .

Sincerely,

Qualifiers:

RL = Reporting limit
ND = Not Detected above Reporting limit
NA = Not Applicable due to high sample dilutions or sample interferences
NC = Not calculated since analyte concentration is ND.
J = Estimated value
J1 = Estimated value due to MS recovery outside accceptance criteria
J2 = Estimated value due to LFB result outside acceptance criteria
J3 = Estimated value due to RPD result outside acceptance criteria
J4 = Estimated value due to LCS result outside acceptance criteria
E = Estimated value exceeds the calibration range
L = Estimated value is below the calibration range
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R = No recovery was calculated since the analyte concentration is greater than four times the spike level.
P = The confirmation value exceeded 35% difference and is less than 100%. The lower value is reported.
C = The identification has been confirmed by GC/MS.
A = Suspected Aldol condensation product.
N = Tentatively identified compound.

Sample results are in mg/Kg dry weight.

The samples from this project were prepared and analyzed with the samples from project number 15100039. Please see the report for that project for the laboratory blank, laboratory fortified blank, laboratory control sample, duplicate sample analysis, and matrix spike results for the batch.

VT Urban Soils

Metals in Soil Medium Level by ICP

Client Sample ID:	E7	Lab Sample ID:	AB58847
Date of Collection:	10/06/2015	Matrix:	Soil
Date of Preparation:	1/11/2016	Amount Prepared:	N/A
Date of Analysis:	1/19/2016	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-38-2	Arsenic	**4.0**	2.0	
7439-92-1	Lead	**16**	2.0	

VT Urban Soils

Metals in Soil Medium Level by ICP

Client Sample ID:	F2	Lab Sample ID:	AB58848
Date of Collection:	10/09/2015	Matrix:	Soil
Date of Preparation:	1/11/2016	Amount Prepared:	N/A
Date of Analysis:	1/19/2016	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-38-2	Arsenic	**3.0**	2.0	
7439-92-1	Lead	**13**	2.0	

VT Urban Soils

Metals in Soil Medium Level by ICP

Client Sample ID:	E2	Lab Sample ID:	AB58849
Date of Collection:	10/09/2015	Matrix:	Soil
Date of Preparation:	1/11/2016	Amount Prepared:	N/A
Date of Analysis:	1/19/2016	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-38-2	Arsenic	**6.2**	2.0	
7439-92-1	Lead	**15**	2.0	

Samples in Batch:

ENVIRONMENTAL PROTECTION AGENCY

REGION 1

CHAIN OF CUSTODY RECORD

PROJ. NO.: 15100015

PROJECT NAME: Soil Background Study

SAMPLERS: (Signature) VT DEC

STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS	PAHS	ARSENIC	LEAD				REMARKS
	10/6/15	1325	X		E7	2	X	X	X				
	10/9/15	1015	X		F2	2	X	X	X				
	10/9/15	1115	X		E2	2	X	X	X				

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
[signature]	10/12/15 1500	FEDEX # 7747 1478 4763			
Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature)	Date / Time	Remarks	
		[signature] ESAT	10/13/15 08:30		

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1- 19381

United States Environmental Protection Agency
Office of Environmental Measurement & Evaluation
11 Technology Drive
North Chelmsford, MA 01863-2431

Laboratory Report

February 09, 2016

Jim Byrne - Mail Code OSRR07-2
US EPA New England R1

Project Number: 15100025
Project: VT Urban Soils
Analysis: Metals in Soil Medium Level by ICP
EPA Chemist: Janet Paquin

Date Samples Received by the Laboratory: 10/20/2015

Analytical Procedure:

All samples were received and logged in by the laboratory according to the USEPA New England Laboratory SOP for Sample Log-in.

Sample preparation and analysis was done following the EPA Region I SOP, EIASOP-OPTIMAS0.

Samples were prepared following the EPA Region I SOP, EIASOP-INGMETALSPREP8

Preparation and analysis SOP's are based on "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846, 3rd Edition, Revision 2, Final Update III, Methods 3050B and 6010B," respectively. Samples were analyzed using a Perkin Elmer Dual View Inductively Coupled Plasma - Optical Emission Spectrometer.

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J = Estimated value
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R = No recovery was calculated since the analyte concentration is greater than four times the spike level.
P = The confirmation value exceeded 35% difference and is less than 100%. The lower value is reported.
C = The identification has been confirmed by GC/MS.
A = Suspected Aldol condensation product.
N = Tentatively identified compound.

Sample results are in mg/Kg dry weight.

VT Urban Soils

Metals in Soil Medium Level by ICP

Client Sample ID:	A1	Lab Sample ID:	AB59043
Date of Collection:	10/13/2015	Matrix:	Soil
Date of Preparation:	1/21/2016	Amount Prepared:	N/A
Date of Analysis:	1/28/2016	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-38-2	Arsenic	**3.2**	2.0	
7439-92-1	Lead	**23**	2.0	

VT Urban Soils

Metals in Soil Medium Level by ICP

Client Sample ID:	A5	Lab Sample ID:	AB59044
Date of Collection:	10/13/2015	Matrix:	Soil
Date of Preparation:	1/21/2016	Amount Prepared:	N/A
Date of Analysis:	1/28/2016	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-38-2	Arsenic	**13**	2.0	
7439-92-1	Lead	**18**	2.0	

VT Urban Soils

Metals in Soil Medium Level by ICP

Client Sample ID:	B2	Lab Sample ID:	AB59045
Date of Collection:	10/13/2015	Matrix:	Soil
Date of Preparation:	1/21/2016	Amount Prepared:	N/A
Date of Analysis:	1/28/2016	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-38-2	Arsenic	**5.8**	2.0	
7439-92-1	Lead	**47**	2.0	

VT Urban Soils

Metals in Soil Medium Level by ICP

Client Sample ID:	C3	Lab Sample ID:	AB59046
Date of Collection:	10/13/2015	Matrix:	Soil
Date of Preparation:	1/21/2016	Amount Prepared:	N/A
Date of Analysis:	1/28/2016	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-38-2	Arsenic	**3.9**	2.0	
7439-92-1	Lead	**9.7**	2.0	

VT Urban Soils

Metals in Soil Medium Level by ICP

Client Sample ID:	O2	Lab Sample ID:	AB59047
Date of Collection:	10/13/2015	Matrix:	Soil
Date of Preparation:	1/21/2016	Amount Prepared:	N/A
Date of Analysis:	1/28/2016	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-38-2	Arsenic	ND	2.0	
7439-92-1	Lead	**4.2**	2.0	

VT Urban Soils

Metals in Soil Medium Level by ICP

Client Sample ID:	E4a	Lab Sample ID:	AB59048
Date of Collection:	10/15/2015	Matrix:	Soil
Date of Preparation:	1/21/2016	Amount Prepared:	N/A
Date of Analysis:	1/28/2016	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-38-2	Arsenic	**17**	2.0	
7439-92-1	Lead	**8.9**	2.0	

VT Urban Soils

Metals in Soil Medium Level by ICP

Client Sample ID:	E4	Lab Sample ID:	AB59049
Date of Collection:	10/15/2015	Matrix:	Soil
Date of Preparation:	1/21/2016	Amount Prepared:	N/A
Date of Analysis:	1/28/2016	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-38-2	Arsenic	**14**	2.0	
7439-92-1	Lead	**55**	2.0	

VT Urban Soils

Metals in Soil Medium Level by ICP

Client Sample ID:	D5	Lab Sample ID:	AB59050
Date of Collection:	10/16/2015	Matrix:	Soil
Date of Preparation:	1/21/2016	Amount Prepared:	N/A
Date of Analysis:	1/28/2016	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-38-2	Arsenic	**13**	2.0	
7439-92-1	Lead	**12**	2.0	

VT Urban Soils

Metals in Soil Medium Level by ICP

Client Sample ID:	D4	Lab Sample ID:	AB59051
Date of Collection:	10/16/2015	Matrix:	Soil
Date of Preparation:	1/21/2016	Amount Prepared:	N/A
Date of Analysis:	1/28/2016	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-38-2	Arsenic	**21**	2.0	
7439-92-1	Lead	**26**	2.0	

VT Urban Soils

Laboratory Reagent Blank

Client Sample ID:	N/A	Lab Sample ID:	N/A
Date of Collection:	N/A	Matrix:	Soil
Date of Preparation:	1/21/2016	Amount Prepared:	N/A
Date of Analysis:	1/28/2016	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration ug/L	RL ug/L	Qualifier
7440-38-2	Arsenic	ND	20	
7439-92-1	Lead	ND	20	

VT Urban Soils

MATRIX SPIKE (MS) RECOVERY

Sample ID: AB59048

PARAMETER	SPIKE ADDED mg/Kg	SAMPLE CONCENTRATION mg/Kg	MS CONCENTRATION mg/Kg	MS % REC	QC LIMITS (% REC)
Arsenic	100	17.0	113	96	75 - 125
Lead	100	8.9	103	94	75 - 125

VT Urban Soils

Laboratory Duplicate Results

Sample ID: AB59046

PARAMETER	SAMPLE RESULT mg/Kg	SAMPLE DUPLICATE RESULT mg/Kg	PRECISION RPD %	QC LIMITS
Arsenic	3.9	4.0	2.5	30
Lead	9.7	10	3.0	30

VT Urban Soils

Laboratory Fortified Blank (LFB) Results

PARAMETER	LFB AMOUNT SPIKED ug/L	LFB RESULT ug/L	LFB RECOVERY %	QC LIMITS %
Arsenic	1000	964	96	85 - 115
Lead	1000	976	98	85 - 115

Comments:

VT Urban Soils

Solid Laboratory Control Sample (LCS) Results

PARAMETER	LCS RESULTS mg/Kg	CONTROL LIMITS mg/Kg
Arsenic	94.9	67.5 - 142
Lead	90.0	68.4 - 125

Comments:

Samples in Batch: AB59043, AB59044, AB59045, AB59046, AB59047, AB59048, AB59049, AB59050, AB59051

ENVIRONMENTAL PROTECTION AGENCY

REGION 1

CHAIN OF CUSTODY RECORD

PROJ. NO.: 15100025

PROJECT NAME: Soil Background Study

SAMPLERS: (Signature) VT DEC

STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS	PAHs	ARSENIC	LEAD				REMARKS
	10.13.15	1035	X		A1	2	X	X	X				
	10.13.15	1215	X		A5	2	X	X	X				
	10.13.15	930	X		B2	2	X	X	X				
	10.13.15	1430	X		C3	2	X	X	X				
	10.13.15	1440	X		O2	2	X	X	X				
	10/15/15	0900	X		E4a	2	X	X	X				
	10/15/15	1000	X		E4	2	X	X	X				
	10/16/15	1115	X		D5	2	X	X	X				
	10/16/15	1300	X		D4	2	X	X	X				

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
[signature]	10/19/15 1500	FEDEX# 774770606218			
Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature) ESAT	Date / Time	Remarks	
		[signature]	10/20/15 08:30		

Distribution: Original Accompanies Shipment; Copy to Coordinator Field Files

15100025 $PAHS
15100025 $METMS_PE

1- 19381

United States Environmental Protection Agency
Office of Environmental Measurement & Evaluation
11 Technology Drive
North Chelmsford, MA 01863-2431

Laboratory Report

January 21, 2016

Jim Byrne - Mail Code OSRR07-2
US EPA New England R1

Project Number: 15100039
Project: VT Urban Soils
Analysis: Metals in Soil Medium Level by ICP
EPA Chemist: Janet Paquin

Date Samples Received by the Laboratory: 10/27/2015

Analytical Procedure:

All samples were received and logged in by the laboratory according to the USEPA New England Laboratory SOP for Sample Log-in.

Sample preparation and analysis was done following the EPA Region I SOP, EIASOP-OPTIMAS0.

Samples were prepared following the EPA Region I SOP, EIASOP-INGMETALSPREP8

Preparation and analysis SOP's are based on "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846, 3rd Edition, Revision 2, Final Update III, Methods 3050B and 6010B," respectively. Samples were analyzed using a Perkin Elmer Dual View Inductively Coupled Plasma - Optical Emission Spectrometer.

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NC = Not calculated since analyte concentration is ND.
J = Estimated value
J1 = Estimated value due to MS recovery outside accceptance criteria
J2 = Estimated value due to LFB result outside acceptance criteria
J3 = Estimated value due to RPD result outside acceptance criteria
J4 = Estimated value due to LCS result outside acceptance criteria
E = Estimated value exceeds the calibration range
L = Estimated value is below the calibration range
B = Analyte is associated with the lab blank or trip blank contamination. Values are qualified when the observed concentration of the contamination in the sample extract is less than 10 times the concentration in the blank.
R = No recovery was calculated since the analyte concentration is greater than four times the spike level.
P = The confirmation value exceeded 35% difference and is less than 100%. The lower value is reported.
C = The identification has been confirmed by GC/MS.
A = Suspected Aldol condensation product.
N = Tentatively identified compound.

Sample results are in mg/Kg dry weight.

VT Urban Soils

Metals in Soil Medium Level by ICP

Client Sample ID:	E1	Lab Sample ID:	AB59206
Date of Collection:	10/19/2015	Matrix:	Soil
Date of Preparation:	1/11/2016	Amount Prepared:	N/A
Date of Analysis:	1/19/2016	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-38-2	Arsenic	**8.9**	2.0	
7439-92-1	Lead	**32**	2.0	

VT Urban Soils

Metals in Soil Medium Level by ICP

Client Sample ID:	E1A	Lab Sample ID:	AB59207
Date of Collection:	10/19/2015	Matrix:	Soil
Date of Preparation:	1/11/2016	Amount Prepared:	N/A
Date of Analysis:	1/19/2016	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-38-2	Arsenic	**8.8**	2.0	
7439-92-1	Lead	**20**	2.0	
7440-66-6	Zinc	**53**	2.0	

VT Urban Soils

Metals in Soil Medium Level by ICP

Client Sample ID:	E1B	Lab Sample ID:	AB59208
Date of Collection:	10/19/2015	Matrix:	Soil
Date of Preparation:	1/11/2016	Amount Prepared:	N/A
Date of Analysis:	1/19/2016	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-38-2	Arsenic	**6.4**	2.0	
7439-92-1	Lead	**67**	2.0	

VT Urban Soils

Metals in Soil Medium Level by ICP

Client Sample ID:	E1C	Lab Sample ID:	AB59209
Date of Collection:	10/19/2015	Matrix:	Soil
Date of Preparation:	1/11/2016	Amount Prepared:	N/A
Date of Analysis:	1/19/2016	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-38-2	Arsenic	**6.2**	2.0	
7439-92-1	Lead	**42**	2.0	

VT Urban Soils

Metals in Soil Medium Level by ICP

Client Sample ID:	E1D	Lab Sample ID:	AB59210
Date of Collection:	10/19/2015	Matrix:	Soil
Date of Preparation:	1/11/2016	Amount Prepared:	N/A
Date of Analysis:	1/19/2016	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-38-2	Arsenic	**6.7**	2.0	
7439-92-1	Lead	**26**	2.0	

VT Urban Soils

Metals in Soil Medium Level by ICP

Client Sample ID:	E1E	Lab Sample ID:	AB59211
Date of Collection:	10/19/2015	Matrix:	Soil
Date of Preparation:	1/11/2016	Amount Prepared:	N/A
Date of Analysis:	1/19/2016	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-38-2	Arsenic	**4.6**	2.0	
7439-92-1	Lead	**42**	2.0	

VT Urban Soils

Metals in Soil Medium Level by ICP

Client Sample ID:	E1F	Lab Sample ID:	AB59212
Date of Collection:	10/19/2015	Matrix:	Soil
Date of Preparation:	1/11/2016	Amount Prepared:	N/A
Date of Analysis:	1/19/2016	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-38-2	Arsenic	**5.6**	2.0	
7439-92-1	Lead	**30**	2.0	

VT Urban Soils

Metals in Soil Medium Level by ICP

Client Sample ID:	D7	Lab Sample ID:	AB59213
Date of Collection:	10/23/2015	Matrix:	Soil
Date of Preparation:	1/11/2016	Amount Prepared:	N/A
Date of Analysis:	1/19/2016	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-38-2	Arsenic	ND	2.0	
7439-92-1	Lead	**3.7**	2.0	

VT Urban Soils

Metals in Soil Medium Level by ICP

Client Sample ID:	E9	Lab Sample ID:	AB59214
Date of Collection:	10/23/2015	Matrix:	Soil
Date of Preparation:	1/11/2016	Amount Prepared:	N/A
Date of Analysis:	1/19/2016	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-38-2	Arsenic	**3.6**	2.0	
7439-92-1	Lead	**11**	2.0	

VT Urban Soils

Metals in Soil Medium Level by ICP

Client Sample ID:	DUP-4	Lab Sample ID:	AB59215
Date of Collection:	10/23/2015	Matrix:	Soil
Date of Preparation:	1/11/2016	Amount Prepared:	N/A
Date of Analysis:	1/19/2016	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-38-2	Arsenic	ND	2.0	
7439-92-1	Lead	**3.8**	2.0	

VT Urban Soils

Metals in Soil Medium Level by ICP

Client Sample ID:	L-3	Lab Sample ID:	AB59216
Date of Collection:	10/23/2015	Matrix:	Soil
Date of Preparation:	1/11/2016	Amount Prepared:	N/A
Date of Analysis:	1/19/2016	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	2
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-38-2	Arsenic	ND	4.0	
7439-92-1	Lead	**15**	4.0	

Comments: The sample was diluted due to high level of titanium.

VT Urban Soils

Metals in Soil Medium Level by ICP

Client Sample ID:	DUP-12	Lab Sample ID:	AB59217
Date of Collection:	10/23/2015	Matrix:	Soil
Date of Preparation:	1/11/2016	Amount Prepared:	N/A
Date of Analysis:	1/19/2016	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	2
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-38-2	Arsenic	ND	3.9	
7439-92-1	Lead	**14**	3.9	

Comments: The sample was diluted due to high level of titanium.

VT Urban Soils

Metals in Soil Medium Level by ICP

Client Sample ID:	M-3	Lab Sample ID:	AB59218
Date of Collection:	10/23/2015	Matrix:	Soil
Date of Preparation:	1/11/2016	Amount Prepared:	N/A
Date of Analysis:	1/19/2016	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-38-2	Arsenic	**2.2**	2.0	
7439-92-1	Lead	**52**	2.0	

VT Urban Soils

Metals in Soil Medium Level by ICP

Client Sample ID:	N-3	Lab Sample ID:	AB59219
Date of Collection:	10/23/2015	Matrix:	Soil
Date of Preparation:	1/11/2016	Amount Prepared:	N/A
Date of Analysis:	1/19/2016	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-38-2	Arsenic	ND	2.0	
7439-92-1	Lead	**54**	2.0	

VT Urban Soils

Metals in Soil Medium Level by ICP

Client Sample ID:	N-4	Lab Sample ID:	AB59220
Date of Collection:	10/23/2015	Matrix:	Soil
Date of Preparation:	1/11/2016	Amount Prepared:	N/A
Date of Analysis:	1/19/2016	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-38-2	Arsenic	ND	2.0	
7439-92-1	Lead	**7.4**	2.0	

VT Urban Soils

Metals in Soil Medium Level by ICP

Client Sample ID:	M-4	Lab Sample ID:	AB59221
Date of Collection:	10/23/2015	Matrix:	Soil
Date of Preparation:	1/11/2016	Amount Prepared:	N/A
Date of Analysis:	1/19/2016	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-38-2	Arsenic	**6.8**	2.0	
7439-92-1	Lead	**17**	2.0	

VT Urban Soils

Laboratory Reagent Blank

Client Sample ID:	N/A	Lab Sample ID:	N/A
Date of Collection:	N/A	Matrix:	Soil
Date of Preparation:	1/11/2016	Amount Prepared:	N/A
Date of Analysis:	1/19/2016	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration ug/L	RL ug/L	Qualifier
7440-38-2	Arsenic	ND	20	
7439-92-1	Lead	ND	20	

VT Urban Soils

MATRIX SPIKE (MS) RECOVERY

Sample ID: AB59212

PARAMETER	SPIKE ADDED mg/Kg	SAMPLE CONCENTRATION mg/Kg	MS CONCENTRATION mg/Kg	MS % REC	QC LIMITS (% REC)
Arsenic	100	5.6	109	103	75 - 125
Lead	100	30.0	128	98	75 - 125

VT Urban Soils

Laboratory Duplicate Results

Sample ID: AB59208

PARAMETER	SAMPLE RESULT mg/Kg	SAMPLE DUPLICATE RESULT mg/Kg	PRECISION RPD %	QC LIMITS
Arsenic	6.4	5.1	23	30
Lead	67.0	61	9.4	30

VT Urban Soils

Laboratory Fortified Blank (LFB) Results

PARAMETER	LFB AMOUNT SPIKED ug/L	LFB RESULT ug/L	LFB RECOVERY %	QC LIMITS %
Arsenic	1000	1020	102	85 - 115
Lead	1000	989	99	85 - 115

Comments:

VT Urban Soils

Solid Laboratory Control Sample (LCS) Results

PARAMETER	LCS RESULTS mg/Kg	CONTROL LIMITS mg/Kg
Arsenic	99.2	67.5 - 142
Lead	87.6	68.4 - 125

Comments:

Samples in Batch: AB59206, AB59207, AB59208, AB59209, AB59210, AB59211, AB59212, AB59213, AB59214, AB59215, AB59216, AB59217, AB59218, AB59219, AB59220, AB59221

ENVIRONMENTAL PROTECTION AGENCY

REGION 1

CHAIN OF CUSTODY RECORD

PROJ. NO.: 15100039

PROJECT NAME: Soil Background Study

SAMPLERS: (Signature) VT DEC

STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS	PAHs	ARSENIC	LEAD				REMARKS
													PG 1 of 2
	10/19	14:25	X		E1	2	X	X	X				
	10/19	12:15	X		E1 A	2	X	X	X				
	10/19	12:40	X		E1 B	2	X	X	X				
	10/19	10:50	X		E1 C	2	X	X	X				
	10/19	10:30	X		E1 D	2	X	X	X				
	10/19	15:00	X		E1 E	2	X	X	X				
	10/19	11:30	X		E1 F	2	X	X	X				
	10/23	1000	X		D7	2	X	X	X				
	10/23	1145	X		E9	2	X	X	X				
	10/23		X		DUP-4	2	X	X	X				
	10/23	9:50	X		L-3	2	X	X	X				
	10/23	[redacted]	X		Dup-12	2	X	X	X				
	10/23	11:00	X		M-3	2	X	X	X				
	10/23	11:40	X		N-3	2	X	X	X				
	10/23	12:30	X		N-4	2	X	X	X				

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
[signature]	10/26/15 1500	FEDEX 774820532254			

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)

Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature)	Date / Time	Remarks
		ESAT [signature]	10/27/15 09:00	

Distribution: Original Accompanies Shipment; Copy to Coordinator Field Files

1- 19381

ENVIRONMENTAL PROTECTION AGENCY

REGION 1

CHAIN OF CUSTODY RECORD

PROJ. NO.: 15100039

PROJECT NAME: Soil Background Study

SAMPLERS: (Signature) VT DEC

STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS	PAHs	ARSENIC	LEAD				REMARKS
	10/23/15	14:10	X		M-4	2							pg. 2 of 2

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
[signature]	10/26/15 1500	FEDEX 774820532254			
Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature) ESAT	Date / Time	Remarks	
		[signature]	10/27/15 09:00		

Distribution: Original Accompanies Shipment; Copy to Coordinator Field Files

1- 19381

United States Environmental Protection Agency
Office of Environmental Measurement & Evaluation
11 Technology Drive
North Chelmsford, MA 01863-2431

Laboratory Report

March 01, 2016

Jim Byrne - Mail Code OSRR07-2
US EPA New England R1

Project Number: 15110003
Project: VT Urban Soils
Analysis: Metals in Soil Medium Level by ICP
EPA Chemist: Janet Paquin

Date Samples Received by the Laboratory: 11/03/2015

Analytical Procedure:

All samples were received and logged in by the laboratory according to the USEPA New England Laboratory SOP for Sample Log-in.

Sample preparation and analysis was done following the EPA Region I SOP, EIASOP-OPTIMAS0.

Samples were prepared following the EPA Region I SOP, EIASOP-INGMETALSPREP8

Preparation and analysis SOP's are based on "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846, 3rd Edition, Revision 2, Final Update III, Methods 3050B and 6010B," respectively. Samples were analyzed using a Perkin Elmer Dual View Inductively Coupled Plasma - Optical Emission Spectrometer.

Data were reviewed in accordance with the internal verification procedures described in the EPA New England Quality Manual for NERL.

Results relate only to the items tested or to the samples as received by the Laboratory. This analytical report shall not be reproduced except in full, without written approval of the laboratory.

If you have any questions please call me at 617-918-8340 .

Sincerely,

Qualifiers:

RL = Reporting limit
ND = Not Detected above Reporting limit
NA = Not Applicable due to high sample dilutions or sample interferences
NC = Not calculated since analyte concentration is ND.
J = Estimated value
J1 = Estimated value due to MS recovery outside accceptance criteria
J2 = Estimated value due to LFB result outside acceptance criteria
J3 = Estimated value due to RPD result outside acceptance criteria
J4 = Estimated value due to LCS result outside acceptance criteria
E = Estimated value exceeds the calibration range
L = Estimated value is below the calibration range
B = Analyte is associated with the lab blank or trip blank contamination. Values are qualified when the observed concentration of the contamination in the sample extract is less than 10 times the concentration in the blank.
R = No recovery was calculated since the analyte concentration is greater than four times the spike level.
P = The confirmation value exceeded 35% difference and is less than 100%. The lower value is reported.
C = The identification has been confirmed by GC/MS.
A = Suspected Aldol condensation product.
N = Tentatively identified compound.

Sample results are in mg/Kg dry weight.

VT Urban Soils

Metals in Soil Medium Level by ICP

Client Sample ID:	G-4	Lab Sample ID:	AB59331
Date of Collection:	10/26/2015	Matrix:	Soil
Date of Preparation:	2/02/2016	Amount Prepared:	N/A
Date of Analysis:	2/22/2016	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	2
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-38-2	Arsenic	**6.3**	4.0	
7439-92-1	Lead	**25**	4.0	

Comments: Sample AB59331 was diluted due to the presence of a high level of manganese.

VT Urban Soils

Metals in Soil Medium Level by ICP

Client Sample ID:	F-3	Lab Sample ID:	AB59332
Date of Collection:	10/26/2015	Matrix:	Soil
Date of Preparation:	2/02/2016	Amount Prepared:	N/A
Date of Analysis:	2/22/2016	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-38-2	Arsenic	**11**	2.0	
7439-92-1	Lead	**38**	2.0	

VT Urban Soils

Metals in Soil Medium Level by ICP

Client Sample ID:	G-1	Lab Sample ID:	AB59333
Date of Collection:	10/27/2015	Matrix:	Soil
Date of Preparation:	2/02/2016	Amount Prepared:	N/A
Date of Analysis:	2/22/2016	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-38-2	Arsenic	**6.9**	2.0	
7439-92-1	Lead	**37**	2.0	

VT Urban Soils

Metals in Soil Medium Level by ICP

Client Sample ID:	H-1	Lab Sample ID:	AB59334
Date of Collection:	10/27/2015	Matrix:	Soil
Date of Preparation:	2/02/2016	Amount Prepared:	N/A
Date of Analysis:	2/22/2016	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-38-2	Arsenic	**6.5**	2.0	
7439-92-1	Lead	**66**	2.0	

VT Urban Soils

Metals in Soil Medium Level by ICP

Client Sample ID:	DUP-8	Lab Sample ID:	AB59335
Date of Collection:	10/27/2015	Matrix:	Soil
Date of Preparation:	2/02/2016	Amount Prepared:	N/A
Date of Analysis:	2/23/2016	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	2
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-38-2	Arsenic	**6.8**	3.9	
7439-92-1	Lead	**70**	3.9	

Comments: Sample AB59335 was diluted due to the presence of a high level of iron.

VT Urban Soils

Metals in Soil Medium Level by ICP

Client Sample ID:	DUP-14	Lab Sample ID:	AB59336
Date of Collection:	10/27/2015	Matrix:	Soil
Date of Preparation:	2/02/2016	Amount Prepared:	N/A
Date of Analysis:	2/22/2016	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-38-2	Arsenic	**6.1**	2.0	
7439-92-1	Lead	**20**	2.0	

VT Urban Soils

Metals in Soil Medium Level by ICP

Client Sample ID:	L1	Lab Sample ID:	AB59337
Date of Collection:	10/27/2015	Matrix:	Soil
Date of Preparation:	2/02/2016	Amount Prepared:	N/A
Date of Analysis:	2/22/2016	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-38-2	Arsenic	**7.9**	2.0	
7439-92-1	Lead	**31**	2.0	

VT Urban Soils

Metals in Soil Medium Level by ICP

Client Sample ID:	K1	Lab Sample ID:	AB59338
Date of Collection:	10/27/2015	Matrix:	Soil
Date of Preparation:	2/02/2016	Amount Prepared:	N/A
Date of Analysis:	2/22/2016	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-38-2	Arsenic	**3.6**	2.0	
7439-92-1	Lead	**42**	2.0	

VT Urban Soils

Metals in Soil Medium Level by ICP

Client Sample ID:	M1	Lab Sample ID:	AB59339
Date of Collection:	10/27/2015	Matrix:	Soil
Date of Preparation:	2/02/2016	Amount Prepared:	N/A
Date of Analysis:	2/23/2016	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	2
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-38-2	Arsenic	**5.6**	4.0	
7439-92-1	Lead	**17**	4.0	

Comments: Sample AB59339 was diluted due to the presence of a high level of calcium.

VT Urban Soils

Metals in Soil Medium Level by ICP

Client Sample ID:	N2	Lab Sample ID:	AB59340
Date of Collection:	10/27/2015	Matrix:	Soil
Date of Preparation:	2/02/2016	Amount Prepared:	N/A
Date of Analysis:	2/22/2016	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-38-2	Arsenic	**5.5**	2.0	
7439-92-1	Lead	**17**	2.0	

VT Urban Soils

Metals in Soil Medium Level by ICP

Client Sample ID:	M2	Lab Sample ID:	AB59341
Date of Collection:	10/27/2015	Matrix:	Soil
Date of Preparation:	2/02/2016	Amount Prepared:	N/A
Date of Analysis:	2/22/2016	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-38-2	Arsenic	**5.6**	2.0	
7439-92-1	Lead	**29**	2.0	

VT Urban Soils

Metals in Soil Medium Level by ICP

Client Sample ID:	N1	Lab Sample ID:	AB59342
Date of Collection:	10/27/2015	Matrix:	Soil
Date of Preparation:	2/02/2016	Amount Prepared:	N/A
Date of Analysis:	2/23/2016	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	2
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-38-2	Arsenic	**11**	4.1	
7439-92-1	Lead	**21**	4.1	

Comments: Sample AB59342 was diluted due to the presence of a high level of iron.

VT Urban Soils

Metals in Soil Medium Level by ICP

Client Sample ID:	F7	Lab Sample ID:	AB59343
Date of Collection:	10/28/2015	Matrix:	Soil
Date of Preparation:	2/02/2016	Amount Prepared:	N/A
Date of Analysis:	2/22/2016	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-38-2	Arsenic	**2.7**	2.0	
7439-92-1	Lead	**11**	2.0	

VT Urban Soils

Metals in Soil Medium Level by ICP

Client Sample ID:	I5	Lab Sample ID:	AB59344
Date of Collection:	10/29/2015	Matrix:	Soil
Date of Preparation:	2/02/2016	Amount Prepared:	N/A
Date of Analysis:	2/22/2016	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-38-2	Arsenic	ND	2.0	
7439-92-1	Lead	**14**	2.0	

VT Urban Soils

Metals in Soil Medium Level by ICP

Client Sample ID:	J5	Lab Sample ID:	AB59345
Date of Collection:	10/29/2015	Matrix:	Soil
Date of Preparation:	2/02/2016	Amount Prepared:	N/A
Date of Analysis:	2/22/2016	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-38-2	Arsenic	ND	2.0	
7439-92-1	Lead	**14**	2.0	

VT Urban Soils

Laboratory Reagent Blank

Client Sample ID:	N/A	Lab Sample ID:	N/A
Date of Collection:	N/A	Matrix:	Soil
Date of Preparation:	2/02/2016	Amount Prepared:	N/A
Date of Analysis:	2/22/2016	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration ug/L	RL ug/L	Qualifier
7440-38-2	Arsenic	ND	20	
7439-92-1	Lead	ND	20	

VT Urban Soils

MATRIX SPIKE (MS) RECOVERY

Sample ID: AB59338

PARAMETER	SPIKE ADDED mg/Kg	SAMPLE CONCENTRATION mg/Kg	MS CONCENTRATION mg/Kg	MS % REC	QC LIMITS (% REC)
Arsenic	100	3.6	106	102	75 - 125
Lead	100	42.0	143	101	75 - 125

VT Urban Soils

Laboratory Duplicate Results

Sample ID: AB59336

PARAMETER	SAMPLE RESULT mg/Kg	SAMPLE DUPLICATE RESULT mg/Kg	PRECISION RPD %	QC LIMITS
Arsenic	6.1	5.7	6.8	30
Lead	20.0	16	22	30

VT Urban Soils

Laboratory Fortified Blank (LFB) Results

PARAMETER	LFB AMOUNT SPIKED ug/L	LFB RESULT ug/L	LFB RECOVERY %	QC LIMITS %
Arsenic	1000	976	98	85 - 115
Lead	1000	960	96	85 - 115

Comments:

VT Urban Soils

Solid Laboratory Control Sample (LCS) Results

PARAMETER	LCS RESULTS mg/Kg	CONTROL LIMITS mg/Kg
Arsenic	107	67.5 - 142
Lead	115	68.4 - 125

Comments:

Samples in Batch: AB59331, AB59332, AB59333, AB59334, AB59335, AB59336, AB59337, AB59338, AB59339, AB59340, AB59341, AB59342, AB59343, AB59344, AB59345

ENVIRONMENTAL PROTECTION AGENCY

REGION 1

CHAIN OF CUSTODY RECORD

PROJ. NO.: 15110003

PROJECT NAME: Soil Background Study

SAMPLERS: (Signature) VT DEC

STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS	PAHs	ARSENIC	LEAD				REMARKS
	10/26/15	1100	X		G-4	2	X	X	X				PG 1 of 2
	10/26/15	1300	X		F-3	2	X	X	X				
	10/27/15	1100	X		G-1	2	X	X	X				
	10/27/15	1230	X		H-1	2	X	X	X				
	10/27/15	[redacted]	X		DUP-8	2	X	X	X				
	10/27	[redacted]	X		DUP-14	2	X	X	X				
	10/27/15	1050	X		L1	2	X	X	X				
	10/27/15	1000	X		K1	2	X	X	X				
	10/27/15	1130	X		M1	2	X	X	X				
	10/27/15	1410	X		N2	2	X	X	X				
	10/27/15	1445	X		M2	2	X	X	X				
	10/27/15	1230	X		N1	2	X	X	X				
	10/28/15	1000	X		F7	2	X	X	X				
	10/29/15	0930	X		I5	2	X	X	X				
	10/29/15	1100	X		J5	2	X	X	X				

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
[signature]	11/2/15 1500	FEDEX 774875875310			
Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature) [signature] ESAT	Date / Time 11/3/15 09:30	Remarks	

Distribution: Original Accompanies Shipment; Copy to Coordinator Field Files

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United States Environmental Protection Agency
Office of Environmental Measurement & Evaluation
11 Technology Drive
North Chelmsford, MA 01863-2431

Laboratory Report

February 09, 2016

Jim Byrne - Mail Code OSRR07-2
US EPA New England R1

Project Number: 15110004
Project: VT Urban Soils
Analysis: Metals in Soil Medium Level by ICP
EPA Chemist: Janet Paquin

Date Samples Received by the Laboratory: 11/03/2015

Analytical Procedure:

All samples were received and logged in by the laboratory according to the USEPA New England Laboratory SOP for Sample Log-in.

Sample preparation and analysis was done following the EPA Region I SOP, EIASOP-OPTIMAS0.

Samples were prepared following the EPA Region I SOP, EIASOP-INGMETALSPREP8

Preparation and analysis SOP's are based on "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846, 3rd Edition, Revision 2, Final Update III, Methods 3050B and 6010B," respectively. Samples were analyzed using a Perkin Elmer Dual View Inductively Coupled Plasma - Optical Emission Spectrometer.

Data were reviewed in accordance with the internal verification procedures described in the EPA New England Quality Manual for NERL.

Results relate only to the items tested or to the samples as received by the Laboratory. This analytical report shall not be reproduced except in full, without written approval of the laboratory.

If you have any questions please call me at 617-918-8340 .

Sincerely,

Qualifiers:

RL = Reporting limit
ND = Not Detected above Reporting limit
NA = Not Applicable due to high sample dilutions or sample interferences
NC = Not calculated since analyte concentration is ND.
J = Estimated value
J1 = Estimated value due to MS recovery outside accceptance criteria
J2 = Estimated value due to LFB result outside acceptance criteria
J3 = Estimated value due to RPD result outside acceptance criteria
J4 = Estimated value due to LCS result outside acceptance criteria
E = Estimated value exceeds the calibration range
L = Estimated value is below the calibration range
B = Analyte is associated with the lab blank or trip blank contamination. Values are qualified when the observed concentration of the contamination in the sample extract is less than 10 times the concentration in the blank.
R = No recovery was calculated since the analyte concentration is greater than four times the spike level.
P = The confirmation value exceeded 35% difference and is less than 100%. The lower value is reported.
C = The identification has been confirmed by GC/MS.
A = Suspected Aldol condensation product.
N = Tentatively identified compound.

Sample results are in mg/Kg dry weight.

VT Urban Soils

Metals in Soil Medium Level by ICP

Client Sample ID:	B6	Lab Sample ID:	AB59346
Date of Collection:	10/30/2015	Matrix:	Soil
Date of Preparation:	1/21/2016	Amount Prepared:	N/A
Date of Analysis:	1/28/2016	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-38-2	Arsenic	**12**	2.0	
7439-92-1	Lead	**13**	2.0	

VT Urban Soils

Metals in Soil Medium Level by ICP

Client Sample ID:	B4	Lab Sample ID:	AB59347
Date of Collection:	10/30/2015	Matrix:	Soil
Date of Preparation:	1/21/2016	Amount Prepared:	N/A
Date of Analysis:	1/28/2016	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-38-2	Arsenic	**5.3**	2.0	
7439-92-1	Lead	**9.2**	2.0	

VT Urban Soils

Metals in Soil Medium Level by ICP

Client Sample ID:	A3	Lab Sample ID:	AB59348
Date of Collection:	10/30/2015	Matrix:	Soil
Date of Preparation:	1/21/2016	Amount Prepared:	N/A
Date of Analysis:	1/28/2016	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-38-2	Arsenic	**5.5**	2.0	
7439-92-1	Lead	**13**	2.0	

VT Urban Soils

Metals in Soil Medium Level by ICP

Client Sample ID:	B5	Lab Sample ID:	AB59349
Date of Collection:	10/30/2015	Matrix:	Soil
Date of Preparation:	1/21/2016	Amount Prepared:	N/A
Date of Analysis:	1/28/2016	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-38-2	Arsenic	**15**	2.0	
7439-92-1	Lead	**7.7**	2.0	

VT Urban Soils

Metals in Soil Medium Level by ICP

Client Sample ID:	Q4	Lab Sample ID:	AB59350
Date of Collection:	10/30/2015	Matrix:	Soil
Date of Preparation:	1/21/2016	Amount Prepared:	N/A
Date of Analysis:	1/28/2016	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-38-2	Arsenic	**9.4**	2.0	
7439-92-1	Lead	**68**	2.0	

VT Urban Soils

Metals in Soil Medium Level by ICP

Client Sample ID:	Q3	Lab Sample ID:	AB59351
Date of Collection:	10/30/2015	Matrix:	Soil
Date of Preparation:	1/21/2016	Amount Prepared:	N/A
Date of Analysis:	1/28/2016	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-38-2	Arsenic	ND	2.0	
7439-92-1	Lead	**8.2**	2.0	

VT Urban Soils

Metals in Soil Medium Level by ICP

Client Sample ID:	DUP-17	Lab Sample ID:	AB59352
Date of Collection:	10/30/2015	Matrix:	Soil
Date of Preparation:	1/21/2016	Amount Prepared:	N/A
Date of Analysis:	1/28/2016	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-38-2	Arsenic	**9.2**	2.0	
7439-92-1	Lead	**68**	2.0	

VT Urban Soils

Metals in Soil Medium Level by ICP

Client Sample ID:	O4	Lab Sample ID:	AB59353
Date of Collection:	10/30/2015	Matrix:	Soil
Date of Preparation:	1/21/2016	Amount Prepared:	N/A
Date of Analysis:	1/28/2016	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-38-2	Arsenic	**2.8**	2.0	
7439-92-1	Lead	**37**	2.0	

VT Urban Soils

Metals in Soil Medium Level by ICP

Client Sample ID:	P5	Lab Sample ID:	AB59354
Date of Collection:	10/30/2015	Matrix:	Soil
Date of Preparation:	1/21/2016	Amount Prepared:	N/A
Date of Analysis:	1/28/2016	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	2
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-38-2	Arsenic	**22**	4.0	
7439-92-1	Lead	**28**	4.0	

Comments: Sample AB59354 was diluted due to the presence of a high level of iron.

VT Urban Soils

Metals in Soil Medium Level by ICP

Client Sample ID:	O3	Lab Sample ID:	AB59355
Date of Collection:	10/30/2015	Matrix:	Soil
Date of Preparation:	1/21/2016	Amount Prepared:	N/A
Date of Analysis:	1/28/2016	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-38-2	Arsenic	ND	2.0	
7439-92-1	Lead	**9.7**	2.0	

VT Urban Soils

Metals in Soil Medium Level by ICP

Client Sample ID:	P3	Lab Sample ID:	AB59356
Date of Collection:	10/30/2015	Matrix:	Soil
Date of Preparation:	1/21/2016	Amount Prepared:	N/A
Date of Analysis:	1/28/2016	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-38-2	Arsenic	**3.3**	2.0	
7439-92-1	Lead	**9.9**	2.0	

VT Urban Soils

Metals in Soil Medium Level by ICP

Client Sample ID:	P4	Lab Sample ID:	AB59357
Date of Collection:	10/30/2015	Matrix:	Soil
Date of Preparation:	1/21/2016	Amount Prepared:	N/A
Date of Analysis:	1/28/2016	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-38-2	Arsenic	ND	2.0	
7439-92-1	Lead	**8.5**	2.0	

VT Urban Soils

Laboratory Reagent Blank

Client Sample ID:	N/A	Lab Sample ID:	N/A
Date of Collection:	N/A	Matrix:	Soil
Date of Preparation:	1/21/2016	Amount Prepared:	N/A
Date of Analysis:	1/28/2016	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration ug/L	RL ug/L	Qualifier
7440-38-2	Arsenic	ND	20	
7439-92-1	Lead	ND	20	

VT Urban Soils

MATRIX SPIKE (MS) RECOVERY

Sample ID: AB59355

PARAMETER	SPIKE ADDED mg/Kg	SAMPLE CONCENTRATION mg/Kg	MS CONCENTRATION mg/Kg	MS % REC	QC LIMITS (% REC)
Arsenic	100	ND	94.7	95	75 - 125
Lead	100	9.7	104	94	75 - 125

VT Urban Soils

Laboratory Duplicate Results

Sample ID: AB59349

PARAMETER	SAMPLE RESULT mg/Kg	SAMPLE DUPLICATE RESULT mg/Kg	PRECISION RPD %	QC LIMITS
Arsenic	15.0	12	22	30
Lead	7.7	7.2	6.7	30

VT Urban Soils

Laboratory Fortified Blank (LFB) Results

PARAMETER	LFB AMOUNT SPIKED ug/L	LFB RESULT ug/L	LFB RECOVERY %	QC LIMITS %
Arsenic	1000	945	95	85 - 115
Lead	1000	977	98	85 - 115

Comments:

VT Urban Soils

Solid Laboratory Control Sample (LCS) Results

PARAMETER	LCS RESULTS mg/Kg	CONTROL LIMITS mg/Kg
Arsenic	97.0	67.5 - 142
Lead	92.5	68.4 - 125

Comments:

Samples in Batch: AB59346, AB59347, AB59348, AB59349, AB59350, AB59351, AB59352, AB59353, AB59354, AB59355, AB59356, AB59357

ENVIRONMENTAL PROTECTION AGENCY

REGION 1

CHAIN OF CUSTODY RECORD

PROJ. NO.: 15110004

PROJECT NAME: Soil Background Study

SAMPLERS: (Signature) VT DEC

STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS	PAHS	ARSENIC	LEAD				REMARKS
	10/30/15	1302	X		B6	2	X	X	X				pg 2 of 2
		1040	X		B4	2	X	X	X				
		0952	X		A3	2	X	X	X				
		1130	X		B5	2	X	X	X				
		1500	X		Q4	2	X	X	X				
		1400	X		Q3	2	X	X	X				
			X		DUP-17	2	X	X	X				
		1100	X		O4	2	X	X	X				
		0915	X		P5	2	X	X	X				
		1215	X		O3	2	X	X	X				
		1330	X		P3	2	X	X	X				
		1000	X		P4	2	X	X	X				

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[signature]	11/2/15 1500	Fedex 774875875310			
Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature) ESAT	Date / Time	Remarks	
		[signature]	11/3/15 09:30		

Distribution: Original Accompanies Shipment; Copy to Coordinator Field Files

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United States Environmental Protection Agency
Office of Environmental Measurement & Evaluation
11 Technology Drive
North Chelmsford, MA 01863-2431

Laboratory Report

March 01, 2016

Jim Byrne - Mail Code OSRR07-2
US EPA New England R1

Project Number: 15110018
Project: VT Urban Soils
Analysis: Metals in Soil Medium Level by ICP
EPA Chemist: Janet Paquin

Date Samples Received by the Laboratory: 11/10/2015

Analytical Procedure:

All samples were received and logged in by the laboratory according to the USEPA New England Laboratory SOP for Sample Log-in.

Sample preparation and analysis was done following the EPA Region I SOP, EIASOP-OPTIMAS0.

Samples were prepared following the EPA Region I SOP, EIASOP-INGMETALSPREP8

Preparation and analysis SOP's are based on "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846, 3rd Edition, Revision 2, Final Update III, Methods 3050B and 6010B," respectively. Samples were analyzed using a Perkin Elmer Dual View Inductively Coupled Plasma - Optical Emission Spectrometer.

Data were reviewed in accordance with the internal verification procedures described in the EPA New England Quality Manual for NERL.

Results relate only to the items tested or to the samples as received by the Laboratory. This analytical report shall not be reproduced except in full, without written approval of the laboratory.

If you have any questions please call me at 617-918-8340 .

Sincerely,

Qualifiers:

RL = Reporting limit
ND = Not Detected above Reporting limit
NA = Not Applicable due to high sample dilutions or sample interferences
NC = Not calculated since analyte concentration is ND.
J = Estimated value
J1 = Estimated value due to MS recovery outside accceptance criteria
J2 = Estimated value due to LFB result outside acceptance criteria
J3 = Estimated value due to RPD result outside acceptance criteria
J4 = Estimated value due to LCS result outside acceptance criteria
E = Estimated value exceeds the calibration range
L = Estimated value is below the calibration range
B = Analyte is associated with the lab blank or trip blank contamination. Values are qualified when the observed concentration of the contamination in the sample extract is less than 10 times the concentration in the blank.
R = No recovery was calculated since the analyte concentration is greater than four times the spike level.
P = The confirmation value exceeded 35% difference and is less than 100%. The lower value is reported.
C = The identification has been confirmed by GC/MS.
A = Suspected Aldol condensation product.
N = Tentatively identified compound.

Sample results are in mg/Kg dry weight.
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VT Urban Soils

Metals in Soil Medium Level by ICP

Client Sample ID:	H3	Lab Sample ID:	AB59708
Date of Collection:	11/04/2015	Matrix:	Soil
Date of Preparation:	2/04/2016	Amount Prepared:	N/A
Date of Analysis:	2/23/2016	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-38-2	Arsenic	**16**	2.0	
7439-92-1	Lead	**27**	2.0	

VT Urban Soils

Metals in Soil Medium Level by ICP

Client Sample ID:	O1	Lab Sample ID:	AB59709
Date of Collection:	11/04/2015	Matrix:	Soil
Date of Preparation:	2/04/2016	Amount Prepared:	N/A
Date of Analysis:	2/23/2016	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-38-2	Arsenic	**5.4**	2.0	
7439-92-1	Lead	**10**	2.0	

VT Urban Soils

Metals in Soil Medium Level by ICP

Client Sample ID:	Q1	Lab Sample ID:	AB59710
Date of Collection:	11/04/2015	Matrix:	Soil
Date of Preparation:	2/04/2016	Amount Prepared:	N/A
Date of Analysis:	2/23/2016	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-38-2	Arsenic	**4.8**	2.0	
7439-92-1	Lead	**21**	2.0	

VT Urban Soils

Metals in Soil Medium Level by ICP

Client Sample ID:	Q2	Lab Sample ID:	AB59711
Date of Collection:	11/04/2015	Matrix:	Soil
Date of Preparation:	2/04/2016	Amount Prepared:	N/A
Date of Analysis:	2/23/2016	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-38-2	Arsenic	**12**	2.0	
7439-92-1	Lead	**16**	2.0	

VT Urban Soils

Metals in Soil Medium Level by ICP

Client Sample ID:	Q5	Lab Sample ID:	AB59712
Date of Collection:	11/04/2015	Matrix:	Soil
Date of Preparation:	2/04/2016	Amount Prepared:	N/A
Date of Analysis:	2/23/2016	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-38-2	Arsenic	**12**	2.0	
7439-92-1	Lead	**17**	2.0	

VT Urban Soils

Metals in Soil Medium Level by ICP

Client Sample ID:	DUP 15	Lab Sample ID:	AB59713
Date of Collection:	11/04/2015	Matrix:	Soil
Date of Preparation:	2/04/2016	Amount Prepared:	N/A
Date of Analysis:	2/23/2016	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-38-2	Arsenic	**5.8**	2.0	
7439-92-1	Lead	**11**	2.0	

VT Urban Soils

Metals in Soil Medium Level by ICP

Client Sample ID:	K5	Lab Sample ID:	AB59714
Date of Collection:	11/05/2015	Matrix:	Soil
Date of Preparation:	2/04/2016	Amount Prepared:	N/A
Date of Analysis:	2/23/2016	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-38-2	Arsenic	**7.4**	2.0	
7439-92-1	Lead	**15**	2.0	

VT Urban Soils

Metals in Soil Medium Level by ICP

Client Sample ID:	K4	Lab Sample ID:	AB59715
Date of Collection:	11/05/2015	Matrix:	Soil
Date of Preparation:	2/04/2016	Amount Prepared:	N/A
Date of Analysis:	2/23/2016	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-38-2	Arsenic	ND	2.0	
7439-92-1	Lead	**8.6**	2.0	

VT Urban Soils

Metals in Soil Medium Level by ICP

Client Sample ID:	I2	Lab Sample ID:	AB59716
Date of Collection:	11/06/2015	Matrix:	Soil
Date of Preparation:	2/04/2016	Amount Prepared:	N/A
Date of Analysis:	2/23/2016	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-38-2	Arsenic	ND	2.0	
7439-92-1	Lead	**9.1**	2.0	

VT Urban Soils

Metals in Soil Medium Level by ICP

Client Sample ID:	K2	Lab Sample ID:	AB59717
Date of Collection:	11/06/2015	Matrix:	Soil
Date of Preparation:	2/04/2016	Amount Prepared:	N/A
Date of Analysis:	2/23/2016	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-38-2	Arsenic	**5.1**	2.0	
7439-92-1	Lead	**75**	2.0	

VT Urban Soils

Metals in Soil Medium Level by ICP

Client Sample ID:	K2a	Lab Sample ID:	AB59718
Date of Collection:	11/06/2015	Matrix:	Soil
Date of Preparation:	2/04/2016	Amount Prepared:	N/A
Date of Analysis:	2/23/2016	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-38-2	Arsenic	**2.8**	2.0	
7439-92-1	Lead	**17**	2.0	

VT Urban Soils

Metals in Soil Medium Level by ICP

Client Sample ID:	K2b	Lab Sample ID:	AB59719
Date of Collection:	11/06/2015	Matrix:	Soil
Date of Preparation:	2/04/2016	Amount Prepared:	N/A
Date of Analysis:	2/23/2016	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-38-2	Arsenic	**3.4**	2.0	
7439-92-1	Lead	**50**	2.0	

VT Urban Soils

Metals in Soil Medium Level by ICP

Client Sample ID:	K2c	Lab Sample ID:	AB59720
Date of Collection:	11/06/2015	Matrix:	Soil
Date of Preparation:	2/04/2016	Amount Prepared:	N/A
Date of Analysis:	2/23/2016	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-38-2	Arsenic	**2.8**	2.0	
7439-92-1	Lead	**13**	2.0	

VT Urban Soils

Metals in Soil Medium Level by ICP

Client Sample ID:	K2d	Lab Sample ID:	AB59721
Date of Collection:	11/06/2015	Matrix:	Soil
Date of Preparation:	2/04/2016	Amount Prepared:	N/A
Date of Analysis:	2/23/2016	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-38-2	Arsenic	**2.4**	2.0	
7439-92-1	Lead	**14**	2.0	

VT Urban Soils

Metals in Soil Medium Level by ICP

Client Sample ID:	DUP 11	Lab Sample ID:	AB59722
Date of Collection:	11/06/2015	Matrix:	Soil
Date of Preparation:	2/04/2016	Amount Prepared:	N/A
Date of Analysis:	2/23/2016	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-38-2	Arsenic	**5.1**	2.0	
7439-92-1	Lead	**80**	2.0	

VT Urban Soils

Laboratory Reagent Blank

Client Sample ID:	N/A	Lab Sample ID:	N/A
Date of Collection:	N/A	Matrix:	Soil
Date of Preparation:	2/04/2016	Amount Prepared:	N/A
Date of Analysis:	2/23/2016	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration ug/L	RL ug/L	Qualifier
7440-38-2	Arsenic	ND	20	
7439-92-1	Lead	ND	20	

VT Urban Soils

MATRIX SPIKE (MS) RECOVERY

Sample ID: AB59712

PARAMETER	SPIKE ADDED mg/Kg	SAMPLE CONCENTRATION mg/Kg	MS CONCENTRATION mg/Kg	MS % REC	QC LIMITS (% REC)
Arsenic	100	12.0	110	98	75 - 125
Lead	100	17.0	110	93	75 - 125

VT Urban Soils

Laboratory Duplicate Results

Sample ID: AB59709

PARAMETER	SAMPLE RESULT mg/Kg	SAMPLE DUPLICATE RESULT mg/Kg	PRECISION RPD %	QC LIMITS
Arsenic	5.4	5.3	1.9	30
Lead	10.0	10	0	30

VT Urban Soils

Laboratory Fortified Blank (LFB) Results

PARAMETER	LFB AMOUNT SPIKED ug/L	LFB RESULT ug/L	LFB RECOVERY %	QC LIMITS %
Arsenic	1000	996	100	85 - 115
Lead	1000	984	98	85 - 115

Comments:

VT Urban Soils

Solid Laboratory Control Sample (LCS) Results

PARAMETER	LCS RESULTS mg/Kg	CONTROL LIMITS mg/Kg
Arsenic	102	67.5 - 142
Lead	95.2	68.4 - 125

Comments:

Samples in Batch: AB59708, AB59709, AB59710, AB59711, AB59712, AB59713, AB59714, AB59715, AB59716, AB59717, AB59718, AB59719, AB59720, AB59721, AB59722

ENVIRONMENTAL PROTECTION AGENCY

REGION 1

CHAIN OF CUSTODY RECORD

PROJ. NO.: 15110018

PROJECT NAME: Soil Background Study

SAMPLERS: (Signature) VT DEC

STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS	PAHS	ARSENIC	LEAD				REMARKS
	11/4/15	0:00	X		H3	2	X	X	X				
	11/4/15	1530	X		Q1	2	X	X	X				
	11/4/15	1400	X		Q1	2	X	X	X				
	11/4/15	1130	X		Q7	2	X	X	X				
	11/4	1000	X		Q5	2	X	X	X				
	11/4	[redacted]	X		DUP 15	2	X	X	X				
	11/5/15	0830	X		K5	2	X	X	X				
	11/5/15	1000	X		K4	2	X	X	X				
	11/6/15	0900	X		I2	2	X	X	X				
	11/6/15	1000	X		K2	2	X	X	X				
	11/6/15	1045	X		K2a	2	X	X	X				
	11/6/15	1200	X		K2b	2	X	X	X				
	11/6/15	1300	X		K2c	2	X	X	X				
	11/6/15	1345	X		K2d	2	X	X	X				
	11/6/15		X		DUP 11	2	X	X	X				

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
[signature]	11/9/15 1500	FEDEX #774931442789			
Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature) ESAT	Date / Time	Remarks	
		[signature]	11/10/15 08.48		

Distribution: Original Accompanies Shipment; Copy to Coordinator Field Files

2°C

15110018 $PAHS
15110018 $METMS_PE

1- 19191

United States Environmental Protection Agency
Office of Environmental Measurement & Evaluation
11 Technology Drive
North Chelmsford, MA 01863-2431

Laboratory Report

March 01, 2016

Jim Byrne - Mail Code OSRR07-2
US EPA New England R1

Project Number: 15110027
Project: VT Urban Soils
Analysis: Metals in Soil Medium Level by ICP
EPA Chemist: Janet Paquin

Date Samples Received by the Laboratory: 11/17/2015

Analytical Procedure:

All samples were received and logged in by the laboratory according to the USEPA New England Laboratory SOP for Sample Log-in.

Sample preparation and analysis was done following the EPA Region I SOP, EIASOP-OPTIMAS0.

Samples were prepared following the EPA Region I SOP, EIASOP-INGMETALSPREP8

Preparation and analysis SOP's are based on "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846, 3rd Edition, Revision 2, Final Update III, Methods 3050B and 6010B," respectively. Samples were analyzed using a Perkin Elmer Dual View Inductively Coupled Plasma - Optical Emission Spectrometer.

Data were reviewed in accordance with the internal verification procedures described in the EPA New England Quality Manual for NERL.

Results relate only to the items tested or to the samples as received by the Laboratory. This analytical report shall not be reproduced except in full, without written approval of the laboratory.

If you have any questions please call me at 617-918-8340 .

Sincerely,

Qualifiers:

RL = Reporting limit
ND = Not Detected above Reporting limit
NA = Not Applicable due to high sample dilutions or sample interferences
NC = Not calculated since analyte concentration is ND.
J = Estimated value
J1 = Estimated value due to MS recovery outside accceptance criteria
J2 = Estimated value due to LFB result outside acceptance criteria
J3 = Estimated value due to RPD result outside acceptance criteria
J4 = Estimated value due to LCS result outside acceptance criteria
E = Estimated value exceeds the calibration range
L = Estimated value is below the calibration range
B = Analyte is associated with the lab blank or trip blank contamination. Values are qualified when the observed concentration of the contamination in the sample extract is less than 10 times the concentration in the blank.
R = No recovery was calculated since the analyte concentration is greater than four times the spike level.
P = The confirmation value exceeded 35% difference and is less than 100%. The lower value is reported.
C = The identification has been confirmed by GC/MS.
A = Suspected Aldol condensation product.
N = Tentatively identified compound.

VT Urban Soils

Metals in Soil Medium Level by ICP

Client Sample ID:	H7	Lab Sample ID:	AB59990
Date of Collection:	11/13/2015	Matrix:	Soil
Date of Preparation:	2/04/2016	Amount Prepared:	N/A
Date of Analysis:	2/23/2016	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-38-2	Arsenic	**3.7**	2.0	
7439-92-1	Lead	**18**	2.0	

Comments: Sample results are in mg/Kg dry weight.

The sample for this project was prepared and analyzed with the samples for project number 15110018. Please see the report for that project for the results for the laboratory blank, laboratory fortified blank, matrix spike, sample duplicate analysis, and laboratory control sample analysis for the batch.

ENVIRONMENTAL PROTECTION AGENCY

REGION 1

CHAIN OF CUSTODY RECORD

PROJ. NO.: 15110027

PROJECT NAME: Soil Background Study

SAMPLERS: (Signature) VT DEC

STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS	PAHs	ARSENIC	LEAD				REMARKS
	11/13/15	1015	X		H7	2	X	X	X				

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
[signature]	11/16/15 1500	FEDEX 774985430969			
Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature)	Date / Time	Remarks	
		[signature] ESAT	11-17-15 08:00		

Distribution: Original Accompanies Shipment; Copy to Coordinator Field Files

3-C

15110027 $PAHS
15110027 $METMS_PE

1- 19381

United States Environmental Protection Agency
Office of Environmental Measurement & Evaluation
11 Technology Drive
North Chelmsford, MA 01863-2431

Laboratory Report

March 01, 2016

Jim Byrne - Mail Code OSRR07-2
US EPA New England R1

Project Number: 15110039
Project: VT Urban Soils
Analysis: Metals in Soil Medium Level by ICP
EPA Chemist: Janet Paquin

Date Samples Received by the Laboratory: 11/24/2015

Analytical Procedure:

All samples were received and logged in by the laboratory according to the USEPA New England Laboratory SOP for Sample Log-in.

Sample preparation and analysis was done following the EPA Region I SOP, EIASOP-OPTIMAS0.

Samples were prepared following the EPA Region I SOP, EIASOP-INGMETALSPREP8

Preparation and analysis SOP's are based on "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846, 3rd Edition, Revision 2, Final Update III, Methods 3050B and 6010B," respectively. Samples were analyzed using a Perkin Elmer Dual View Inductively Coupled Plasma - Optical Emission Spectrometer.

Data were reviewed in accordance with the internal verification procedures described in the EPA New England Quality Manual for NERL.

Results relate only to the items tested or to the samples as received by the Laboratory. This analytical report shall not be reproduced except in full, without written approval of the laboratory.

If you have any questions please call me at 617-918-8340 .

Sincerely,

Qualifiers:

RL = Reporting limit
ND = Not Detected above Reporting limit
NA = Not Applicable due to high sample dilutions or sample interferences
NC = Not calculated since analyte concentration is ND.
J = Estimated value
J1 = Estimated value due to MS recovery outside accceptance criteria
J2 = Estimated value due to LFB result outside acceptance criteria
J3 = Estimated value due to RPD result outside acceptance criteria
J4 = Estimated value due to LCS result outside acceptance criteria
E = Estimated value exceeds the calibration range
L = Estimated value is below the calibration range
B = Analyte is associated with the lab blank or trip blank contamination. Values are qualified when the observed concentration of the contamination in the sample extract is less than 10 times the concentration in the blank.
R = No recovery was calculated since the analyte concentration is greater than four times the spike level.
P = The confirmation value exceeded 35% difference and is less than 100%. The lower value is reported.
C = The identification has been confirmed by GC/MS.
A = Suspected Aldol condensation product.
N = Tentatively identified compound.

VT Urban Soils

Metals in Soil Medium Level by ICP

Client Sample ID:	O5	Lab Sample ID:	AB60351
Date of Collection:	11/17/2015	Matrix:	Soil
Date of Preparation:	2/04/2016	Amount Prepared:	N/A
Date of Analysis:	2/23/2016	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-38-2	Arsenic	**4.8**	2.0	
7439-92-1	Lead	**12**	2.0	

Comments: Sample results are in mg/Kg dry weight.

The sample for this project was prepared and analyzed with the samples for project number 15110018. Please see the report for that project for the results for the laboratory blank, laboratory fortified blank, matrix spike, sample duplicate analysis, and laboratory control sample analysis for the batch.

ENVIRONMENTAL PROTECTION AGENCY

REGION 1

CHAIN OF CUSTODY RECORD

15110039 $PAHS
15110039 $METMS_PE

PROJ. NO.: 15110039

PROJECT NAME: Soil Background Study

SAMPLERS: (Signature) VT DEC

STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS	PAHS	ARSENIC	LEAD				REMARKS
	11/17/15	0900	X		05	2	X	X	X				

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
[signature]	11/23/15 1500	FEDEX 775036941698			
Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature)	Date / Time	Remarks	
		[signature] ESAT	11/24/15 09:00		

Distribution: Original Accompanies Shipment; Copy to Coordinator Field Files

2°C

1- 19381

United States Environmental Protection Agency
Office of Environmental Measurement & Evaluation
11 Technology Drive
North Chelmsford, MA 01863-2431

Laboratory Report

November 12, 2015

Jim Byrne - Mail Code OSRR07-2
US EPA New England R1

Project Number: 15090012
Project: VT Urban Soils
Analysis: Metals in Soil Medium Level by ICP
EPA Chemist: Janet Paquin

Date Samples Received by the Laboratory: 09/09/2015

Analytical Procedure:

All samples were received and logged in by the laboratory according to the USEPA New England Laboratory SOP for Sample Log-in.

Sample preparation and analysis was done following the EPA Region I SOP, EIASOP-OPTIMAS0.

Samples were prepared following the EPA Region I SOP, EIASOP-INGMETALSPREP8

Preparation and analysis SOP's are based on "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846, 3rd Edition, Revision 2, Final Update III, Methods 3050B and 6010B," respectively. Samples were analyzed using a Perkin Elmer Dual View Inductively Coupled Plasma - Optical Emission Spectrometer.

Data were reviewed in accordance with the internal verification procedures described in the EPA New England Quality Manual for NERL.

Results relate only to the items tested or to the samples as received by the Laboratory. This analytical report shall not be reproduced except in full, without written approval of the laboratory.

If you have any questions please call me at 617-918-8340 .

Sincerely,

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RL = Reporting limit
ND = Not Detected above Reporting limit
NA = Not Applicable due to high sample dilutions or sample interferences
NC = Not calculated since analyte concentration is ND.
J = Estimated value
J1 = Estimated value due to MS recovery outside accceptance criteria
J2 = Estimated value due to LFB result outside acceptance criteria
J3 = Estimated value due to RPD result outside acceptance criteria
J4 = Estimated value due to LCS result outside acceptance criteria
E = Estimated value exceeds the calibration range
L = Estimated value is below the calibration range
B = Analyte is associated with the lab blank or trip blank contamination. Values are qualified when the observed concentration of the contamination in the sample extract is less than 10 times the concentration in the blank.
R = No recovery was calculated since the analyte concentration is greater than four times the spike level.
P = The confirmation value exceeded 35% difference and is less than 100%. The lower value is reported.
C = The identification has been confirmed by GC/MS.
A = Suspected Aldol condensation product.
N = Tentatively identified compound.

Sample results are in mg/Kg dry weight.

The samples for this project were prepared and analyzed with project number 15090018. Please see the report for that project for the matrix spike results.

VT Urban Soils

Metals in Soil Medium Level by ICP

Client Sample ID:	DUP-5	Lab Sample ID:	AB58293
Date of Collection:	9/01/2015	Matrix:	Soil
Date of Preparation:	10/14/2015	Amount Prepared:	N/A
Date of Analysis:	10/20/2015	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-38-2	Arsenic	**9.9**	2.0	
7439-92-1	Lead	**8.6**	2.0	

VT Urban Soils

Metals in Soil Medium Level by ICP

Client Sample ID:	A-2	Lab Sample ID:	AB58294
Date of Collection:	9/02/2015	Matrix:	Soil
Date of Preparation:	10/14/2015	Amount Prepared:	N/A
Date of Analysis:	10/20/2015	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-38-2	Arsenic	**4.4**	2.0	
7439-92-1	Lead	**18**	2.0	

VT Urban Soils

Metals in Soil Medium Level by ICP

Client Sample ID:	B-1	Lab Sample ID:	AB58295
Date of Collection:	9/02/2015	Matrix:	Soil
Date of Preparation:	10/14/2015	Amount Prepared:	N/A
Date of Analysis:	10/20/2015	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	2
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-38-2	Arsenic	**8.5**	4.0	
7439-92-1	Lead	**24**	4.0	

Comments:
This sample was run at a dilution factor of 2 due to the presence of a high level of iron.

VT Urban Soils

Metals in Soil Medium Level by ICP

Client Sample ID:	C-1	Lab Sample ID:	AB58296
Date of Collection:	9/02/2015	Matrix:	Soil
Date of Preparation:	10/14/2015	Amount Prepared:	N/A
Date of Analysis:	10/20/2015	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-38-2	Arsenic	**9.6**	2.0	
7439-92-1	Lead	**24**	2.0	

VT Urban Soils

Metals in Soil Medium Level by ICP

Client Sample ID:	D-1	Lab Sample ID:	AB58297
Date of Collection:	9/02/2015	Matrix:	Soil
Date of Preparation:	10/14/2015	Amount Prepared:	N/A
Date of Analysis:	10/20/2015	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-38-2	Arsenic	**5.5**	2.0	
7439-92-1	Lead	**14**	2.0	

VT Urban Soils

Metals in Soil Medium Level by ICP

Client Sample ID:	D-3	Lab Sample ID:	AB58298
Date of Collection:	9/03/2015	Matrix:	Soil
Date of Preparation:	10/14/2015	Amount Prepared:	N/A
Date of Analysis:	10/20/2015	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-38-2	Arsenic	**4.3**	2.0	
7439-92-1	Lead	**19**	2.0	

VT Urban Soils

Metals in Soil Medium Level by ICP

Client Sample ID:	B-3	Lab Sample ID:	AB58299
Date of Collection:	9/03/2015	Matrix:	Soil
Date of Preparation:	10/14/2015	Amount Prepared:	N/A
Date of Analysis:	10/20/2015	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-38-2	Arsenic	**4.1**	2.0	
7439-92-1	Lead	**11**	2.0	

VT Urban Soils

Metals in Soil Medium Level by ICP

Client Sample ID:	DUP-2	Lab Sample ID:	AB58300
Date of Collection:	9/03/2015	Matrix:	Soil
Date of Preparation:	10/14/2015	Amount Prepared:	N/A
Date of Analysis:	10/20/2015	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-38-2	Arsenic	**3.9**	2.0	
7439-92-1	Lead	**11**	2.0	

VT Urban Soils

Metals in Soil Medium Level by ICP

Client Sample ID:	H-5	Lab Sample ID:	AB58301
Date of Collection:	9/04/2015	Matrix:	Soil
Date of Preparation:	10/14/2015	Amount Prepared:	N/A
Date of Analysis:	10/20/2015	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-38-2	Arsenic	**3.6**	2.0	
7439-92-1	Lead	**74**	2.0	

VT Urban Soils

Metals in Soil Medium Level by ICP

Client Sample ID:	I-4	Lab Sample ID:	AB58302
Date of Collection:	9/04/2015	Matrix:	Soil
Date of Preparation:	10/14/2015	Amount Prepared:	N/A
Date of Analysis:	10/20/2015	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-38-2	Arsenic	**5.7**	2.0	
7439-92-1	Lead	**25**	2.0	

VT Urban Soils

Metals in Soil Medium Level by ICP

Client Sample ID:	J-4	Lab Sample ID:	AB58303
Date of Collection:	9/04/2015	Matrix:	Soil
Date of Preparation:	10/14/2015	Amount Prepared:	N/A
Date of Analysis:	10/20/2015	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-38-2	Arsenic	**3.5**	2.0	
7439-92-1	Lead	**7.6**	2.0	

VT Urban Soils

Metals in Soil Medium Level by ICP

Client Sample ID:	DUP-9	Lab Sample ID:	AB58304
Date of Collection:	9/04/2015	Matrix:	Soil
Date of Preparation:	10/14/2015	Amount Prepared:	N/A
Date of Analysis:	10/20/2015	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-38-2	Arsenic	**6.1**	2.0	
7439-92-1	Lead	**27**	2.0	

VT Urban Soils

Laboratory Reagent Blank

Client Sample ID:	N/A	Lab Sample ID:	N/A
Date of Collection:	N/A	Matrix:	Soil
Date of Preparation:	10/14/2015	Amount Prepared:	N/A
Date of Analysis:	10/20/2015	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration ug/L	RL ug/L	Qualifier
7440-38-2	Arsenic	ND	20	
7439-92-1	Lead	ND	20	

Laboratory Duplicate Results

Sample ID: AB58299

PARAMETER	SAMPLE RESULT mg/Kg	SAMPLE DUPLICATE RESULT mg/Kg	PRECISION RPD %	QC LIMITS
Arsenic	4.1	4.3	4.8	30
Lead	11.0	11	0.0	30

VT Urban Soils

Laboratory Fortified Blank (LFB) Results

PARAMETER	LFB AMOUNT SPIKED ug/L	LFB RESULT ug/L	LFB RECOVERY %	QC LIMITS %
Arsenic	1000	1010	101	85 - 115
Lead	1000	1000	100	85 - 115

Comments:

VT Urban Soils

Solid Laboratory Control Sample (LCS) Results

PARAMETER	LCS RESULTS mg/Kg	CONTROL LIMITS mg/Kg
Arsenic	102	67.5 - 142
Lead	92.9	68.4 - 125

Comments:

Samples in Batch: AB58293, AB58294, AB58295, AB58296, AB58297, AB58298, AB58299, AB58300, AB58301, AB58302, AB58303, AB58304

ENVIRONMENTAL PROTECTION AGENCY

REGION 1

CHAIN OF CUSTODY RECORD

PROJ. NO.: 150900 11 12

PROJECT NAME: Soil Background Study

SAMPLERS: (Signature) VT DEC

STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS	PAHs	Arsenic	Lead				REMARKS
													Pg 1 of 2
	8/31	10 am	X		E-5	2	X	X	X				
	8/31	11:30	X		D-6	2	X	X	X				
	8/31	1:30	X		C-6	2	X	X	X				* SEE REPORTING LIMITS
	8/31	0800	X		A-7	2	X	X	X				ON FORM K ATTACHED.
	8/31	1240	X		A-8	2	X	X	X				
	8/31	1330	X		A-9	2	X	X	X				
	8/31	0900	X		B-7	2	X	X	X				
	8/31	1230	X		B-8	2	X	X	X				
	8/31	1440	X		B-9	2	X	X	X				
	9/1	1230	X		C-4	2	X	X	X				
	9/1		X		DUP-3	2	X	X	X				
	9/1	3:00			E-3	2	X	X	X				
	9/1				DUP-5	2	X	X	X				
	9/2	815	X		A-2	2	X	X	X				
	9/2	1015	X		B-1	2	X	X	X				

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
[signature]	9/8/15 0900				
Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
FEDEX # 774453514040					
Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature)	Date / Time	Remarks	
		[signature]	9/9/15 10:30		

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ENVIRONMENTAL PROTECTION AGENCY

REGION 1

CHAIN OF CUSTODY RECORD

PROJ. NO.: 15090012

PROJECT NAME: Soil Background Study

SAMPLERS: (Signature) VT DEC

STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS	PAHs	Arsenic	Lead				REMARKS
		1200											pg 2 of 2
	9/2	10:00	X		C-1	2	X	X	X				
	9/2	2:00	X		D-1	2	X	X	X				
	9/3	11:00	X		D-3	2	X	X	X				
	9/3	1:00	X		B-3	2	X	X	X				
	9/3		X		DUP-2	2	X	X	X				
	9/4	8:00	X		H-5	2	X	X	X				
	9/4	1000	X		I-4	2	X	X	X				
	9/4	1100	X		J-4	2	X	X	X				
	9/4		X		DUP-9	2	X	X	X				

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
[signature]	9/8/15 0900				

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
FEDEX #7744 5351 4040					

Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature)	Date / Time	Remarks
		ESAT [signature]	9/9/15 10:30	

Distribution: Original Accompanies Shipment; Copy to Coordinator Field Files

1- 19381

United States Environmental Protection Agency
Office of Environmental Measurement & Evaluation
11 Technology Drive
North Chelmsford, MA 01863-2431

Laboratory Report

November 12, 2015

Jim Byrne - Mail Code OSRR07-2
US EPA New England R1

Project Number: 15090018
Project: VT Urban Soils
Analysis: Metals in Soil Medium Level by ICP
EPA Chemist: Janet Paquin

Date Samples Received by the Laboratory: 09/15/2015

Analytical Procedure:

All samples were received and logged in by the laboratory according to the USEPA New England Laboratory SOP for Sample Log-in.

Sample preparation and analysis was done following the EPA Region I SOP, EIASOP-OPTIMAS0.

Samples were prepared following the EPA Region I SOP, EIASOP-INGMETALSPREP8

Preparation and analysis SOP's are based on "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846, 3rd Edition, Revision 2, Final Update III, Methods 3050B and 6010B," respectively. Samples were analyzed using a Perkin Elmer Dual View Inductively Coupled Plasma - Optical Emission Spectrometer.

Data were reviewed in accordance with the internal verification procedures described in the EPA New England Quality Manual for NERL.

Results relate only to the items tested or to the samples as received by the Laboratory. This analytical report shall not be reproduced except in full, without written approval of the laboratory.

If you have any questions please call me at 617-918-8340 .

Sincerely,

Qualifiers:

RL = Reporting limit
ND = Not Detected above Reporting limit
NA = Not Applicable due to high sample dilutions or sample interferences
NC = Not calculated since analyte concentration is ND.
J = Estimated value
J1 = Estimated value due to MS recovery outside accceptance criteria
J2 = Estimated value due to LFB result outside acceptance criteria
J3 = Estimated value due to RPD result outside acceptance criteria
J4 = Estimated value due to LCS result outside acceptance criteria
E = Estimated value exceeds the calibration range
L = Estimated value is below the calibration range
B = Analyte is associated with the lab blank or trip blank contamination. Values are qualified when the observed concentration of the contamination in the sample extract is less than 10 times the concentration in the blank.
R = No recovery was calculated since the analyte concentration is greater than four times the spike level.
P = The confirmation value exceeded 35% difference and is less than 100%. The lower value is reported.
C = The identification has been confirmed by GC/MS.
A = Suspected Aldol condensation product.
N = Tentatively identified compound.

Sample results are in mg/Kg dry weight.

The samples for this project were prepared and analyzed with project number 15090012. See the report for that project for the results for the laboratory reagent blank, laboratory fortified blank, laboratory control sample, and duplicate analysis for the batch.

VT Urban Soils

Metals in Soil Medium Level by ICP

Client Sample ID:	K-3	Lab Sample ID:	AB58341
Date of Collection:	9/08/2015	Matrix:	Soil
Date of Preparation:	10/14/2015	Amount Prepared:	N/A
Date of Analysis:	10/20/2015	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-38-2	Arsenic	**3.5**	2.0	
7439-92-1	Lead	**74**	2.0	

VT Urban Soils

Metals in Soil Medium Level by ICP

Client Sample ID:	I-3	Lab Sample ID:	AB58342
Date of Collection:	9/08/2015	Matrix:	Soil
Date of Preparation:	10/14/2015	Amount Prepared:	N/A
Date of Analysis:	10/20/2015	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-38-2	Arsenic	**9.3**	2.0	
7439-92-1	Lead	**34**	2.0	

VT Urban Soils

Metals in Soil Medium Level by ICP

Client Sample ID:	L-4	Lab Sample ID:	AB58343
Date of Collection:	9/09/2015	Matrix:	Soil
Date of Preparation:	10/14/2015	Amount Prepared:	N/A
Date of Analysis:	10/20/2015	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-38-2	Arsenic	**31**	2.0	
7439-92-1	Lead	**13**	2.0	

VT Urban Soils

Metals in Soil Medium Level by ICP

Client Sample ID:	A-6	Lab Sample ID:	AB58344
Date of Collection:	9/09/2015	Matrix:	Soil
Date of Preparation:	10/14/2015	Amount Prepared:	N/A
Date of Analysis:	10/20/2015	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-38-2	Arsenic	**15**	2.0	
7439-92-1	Lead	**13**	2.0	

VT Urban Soils

Metals in Soil Medium Level by ICP

Client Sample ID:	DUP-1	Lab Sample ID:	AB58345
Date of Collection:	9/09/2015	Matrix:	Soil
Date of Preparation:	10/14/2015	Amount Prepared:	N/A
Date of Analysis:	10/20/2015	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-38-2	Arsenic	**12**	2.0	
7439-92-1	Lead	**12**	2.0	

VT Urban Soils

Metals in Soil Medium Level by ICP

Client Sample ID:	I-6	Lab Sample ID:	AB58346
Date of Collection:	9/11/2015	Matrix:	Soil
Date of Preparation:	10/14/2015	Amount Prepared:	N/A
Date of Analysis:	10/20/2015	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-38-2	Arsenic	ND	2.0	
7439-92-1	Lead	**22**	2.0	

VT Urban Soils

Metals in Soil Medium Level by ICP

Client Sample ID:	I-7	Lab Sample ID:	AB58347
Date of Collection:	9/11/2015	Matrix:	Soil
Date of Preparation:	10/14/2015	Amount Prepared:	N/A
Date of Analysis:	10/20/2015	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	N/A

CAS Number	Compound	Concentration mg/Kg	RL mg/Kg	Qualifier
7440-38-2	Arsenic	**22**	2.0	
7439-92-1	Lead	**18**	2.0	

VT Urban Soils

MATRIX SPIKE (MS) RECOVERY

Sample ID: AB58342

PARAMETER	SPIKE ADDED mg/Kg	SAMPLE CONCENTRATION mg/Kg	MS CONCENTRATION mg/Kg	MS % REC	QC LIMITS (% REC)
Arsenic	100	9.3	121	112	75 - 125
Lead	100	34.0	135	101	75 - 125

Samples in Batch: AB58341, AB58342, AB58343, AB58344, AB58345, AB58346, AB58347

15090018 $PAHS
15090018 $METMS_PE

ENVIRONMENTAL PROTECTION AGENCY

REGION 1

CHAIN OF CUSTODY RECORD

PROJ. NO.: 15090018

PROJECT NAME: Soil Background Study

SAMPLERS: (Signature) VT DEC

STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS	PAHs	ARSENIC	LEAD				REMARKS
	9/8/15	14:00	X		K-3	2	X	X	X				
	9/8/15	15:00	X		I-3	2	X	X	X				
	9/9	0930	X		L-4	2	X	X	X				
	9/9	11AM	X		A-6	2	X	X	X				
	9/9	[redacted]	X		[redacted] DUP-1	2	X	X	X				[redacted]
	9/11	0830	X		I-6	2	X	X	X				
	9/11	1030	X		I-7	2	X	X	X				

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
[signature]	9/14/15 15:00	FEDEX 774498793019			
Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature) [signature]	Date / Time 9/15/15 10:30	Remarks	

Distribution: Original Accompanies Shipment; Copy to Coordinator Field Files

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United States Environmental Protection Agency
Office of Environmental Measurement & Evaluation
11 Technology Drive
North Chelmsford, MA 01863-2431

Laboratory Report

September 30, 2015

Jim Byrne - Mail Code OSRR07-2
US EPA New England R1

Project Number: 15090029
Project: VT Urban Soils
Analysis: PAHs in Soil - SIM
EPA Chemist: Bhavita Patel

Date Samples Received by the Laboratory: 09/22/2015

Analytical Procedure:

All samples were received and logged in by the laboratory according to the USEPA New England Laboratory SOP for Sample Log-in.

Sample preparation and analysis was done following the EPA Region I SOP, EIASOP-PAHSOLL6.

Samples were analyzed by a quadrapole GC/MS operating in the Selective Ion Monitoring (SIM) mode.. The extraction and analysis SOPs are based on SW-846 methods 3545A, 3630C,8270C, and EIASOP-BNAGCMS9.

Data were reviewed in accordance with the internal verification procedures described in the EPA New England Quality Manual for NERL.

Results relate only to the items tested or to the samples as received by the Laboratory. This analytical report shall not be reproduced except in full, without written approval of the laboratory.

If you have any questions please call me at 617-918-8340 .

Sincerely,

Qualifiers:

RL = Reporting limit
ND = Not Detected above Reporting limit
NA = Not Applicable due to high sample dilutions or sample interferences
NC = Not calculated since analyte concentration is ND.
J = Estimated value
J1 = Estimated value due to MS recovery outside accceptance criteria
J2 = Estimated value due to LFB result outside acceptance criteria
J3 = Estimated value due to RPD result outside acceptance criteria
J4 = Estimated value due to LCS result outside acceptance criteria
E = Estimated value exceeds the calibration range
L = Estimated value is below the calibration range
B = Analyte is associated with the lab blank or trip blank contamination. Values are qualified when the observed concentration of the contamination in the sample extract is less than 10 times the concentration in the blank.
R = No recovery was calculated since the analyte concentration is greater than four times the spike level.
P = The confirmation value exceeded 35% difference and is less than 100%. The lower value is reported.
C = The identification has been confirmed by GC/MS.
A = Suspected Aldol condensation product.
N = Tentatively identified compound.

VT Urban Soils

PAHs in Soil - SIM

Client Sample ID:	G3	Lab Sample ID:	AB58502
Date of Collection:	9/15/2015	Matrix:	Soil
Date of Preparation:	9/22/2015	Amount Prepared:	N/A
Date of Analysis:	9/23/2015	Percent Solids:	82%
Dry Weight Prepared:	24.714 grams	Extract Dilution:	1
Wet Weight Prepared:	30.084 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	ND	8.1	
91-57-6	2-Methylnaphthalene	ND	8.1	
90-12-0	1-Methylnaphthalene	ND	8.1	
208-96-8	Acenaphthylene	**12**	8.1	
83-32-9	Acenaphthene	ND	8.1	
86-73-7	Fluorene	ND	8.1	
85-01-8	Phenanthrene	**23**	8.1	
120-12-7	Anthracene	ND	8.1	
206-44-0	Fluoranthene	**41**	8.1	
129-00-0	Pyrene	**50**	8.1	
56-55-3	Benzo(a)anthracene	**26**	8.1	
218-01-9	Chrysene	**36**	8.1	
205-99-2	Benzo(b)fluoranthene	**32**	8.1	
207-08-9	Benzo(k)fluoranthene	**24**	8.1	
50-32-8	Benzo(a)pyrene	**31**	8.1	
193-39-5	Indeno(1,2,3-cd)pyrene	**15**	8.1	
53-70-3	Dibenz(a,h)anthracene	ND	8.1	
191-24-2	Benzo(g,h,i)perylene	**16**	8.1	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	65	32 - 102
p-Terphenyl-d14 (SS2)	58	41 - 106

VT Urban Soils

PAHs in Soil - SIM

Client Sample ID:	DUP 7	Lab Sample ID:	AB58503
Date of Collection:	9/15/2015	Matrix:	Soil
Date of Preparation:	9/22/2015	Amount Prepared:	N/A
Date of Analysis:	9/23/2015	Percent Solids:	81%
Dry Weight Prepared:	24.387 grams	Extract Dilution:	1
Wet Weight Prepared:	30.016 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	ND	8.2	
91-57-6	2-Methylnaphthalene	ND	8.2	
90-12-0	1-Methylnaphthalene	ND	8.2	
208-96-8	Acenaphthylene	**13**	8.2	
83-32-9	Acenaphthene	ND	8.2	
86-73-7	Fluorene	ND	8.2	
85-01-8	Phenanthrene	**27**	8.2	
120-12-7	Anthracene	ND	8.2	
206-44-0	Fluoranthene	**46**	8.2	
129-00-0	Pyrene	**56**	8.2	
56-55-3	Benzo(a)anthracene	**30**	8.2	
218-01-9	Chrysene	**43**	8.2	
205-99-2	Benzo(b)fluoranthene	**44**	8.2	
207-08-9	Benzo(k)fluoranthene	**32**	8.2	
50-32-8	Benzo(a)pyrene	**37**	8.2	
193-39-5	Indeno(1,2,3-cd)pyrene	**16**	8.2	
53-70-3	Dibenz(a,h)anthracene	ND	8.2	
191-24-2	Benzo(g,h,i)perylene	**17**	8.2	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	75	32 - 102
p-Terphenyl-d14 (SS2)	65	41 - 106

VT Urban Soils

PAHs in Soil - SIM

Client Sample ID:	H2	Lab Sample ID:	AB58504
Date of Collection:	9/15/2015	Matrix:	Soil
Date of Preparation:	9/22/2015	Amount Prepared:	N/A
Date of Analysis:	9/24/2015	Percent Solids:	94%
Dry Weight Prepared:	28.316 grams	Extract Dilution:	1
Wet Weight Prepared:	30.228 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	ND	7.1	
91-57-6	2-Methylnaphthalene	ND	7.1	
90-12-0	1-Methylnaphthalene	ND	7.1	
208-96-8	Acenaphthylene	ND	7.1	
83-32-9	Acenaphthene	ND	7.1	
86-73-7	Fluorene	ND	7.1	
85-01-8	Phenanthrene	ND	7.1	
120-12-7	Anthracene	ND	7.1	
206-44-0	Fluoranthene	**9.0**	7.1	
129-00-0	Pyrene	**7.6**	7.1	
56-55-3	Benzo(a)anthracene	ND	7.1	
218-01-9	Chrysene	**7.6**	7.1	
205-99-2	Benzo(b)fluoranthene	**12**	7.1	
207-08-9	Benzo(k)fluoranthene	**7.9**	7.1	
50-32-8	Benzo(a)pyrene	ND	7.1	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	7.1	
53-70-3	Dibenz(a,h)anthracene	ND	7.1	
191-24-2	Benzo(g,h,i)perylene	ND	7.1	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	68	32 - 102
p-Terphenyl-d14 (SS2)	60	41 - 106

VT Urban Soils

Laboratory Blank (PAHs)

Client Sample ID:	N/A	Lab Sample ID:	N/A
Date of Collection:	N/A	Matrix:	Soil
Date of Preparation:	9/22/2015	Amount Prepared:	N/A
Date of Analysis:	9/23/2015	Percent Solids:	100%
Dry Weight Prepared:	30.084 grams	Extract Dilution:	1
Wet Weight Prepared:	30.124 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	ND	6.7	
91-57-6	2-Methylnapthalene	ND	6.7	
90-12-0	1-Methylnapthalene	ND	6.7	
208-96-8	Acenaphthylene	ND	6.7	
83-32-9	Acenaphthene	ND	6.7	
86-73-7	Fluorene	ND	6.7	
85-01-8	Phenanthrene	ND	6.7	
120-12-7	Anthracene	ND	6.7	
206-44-0	Fluoranthene	ND	6.7	
129-00-0	Pyrene	ND	6.7	
56-55-3	Benzo(a)anthracene	ND	6.7	
218-01-9	Chrysene	ND	6.7	
205-99-2	Benzo(b)fluoranthene	ND	6.7	
207-08-9	Benzo(k)fluoranthene	ND	6.7	
50-32-8	Benzo(a)pyrene	ND	6.7	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	6.7	
53-70-3	Dibenz(a,h)anthracene	ND	6.7	
191-24-2	Benzo(g,h,i)perylene	ND	6.7	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	90	32 - 102
p-Terphenyl-d14 (SS2)	92	41 - 106

VT Urban Soils

PAHs in Soil - SIM

Client Sample ID:	G2	Lab Sample ID:	AB58505
Date of Collection:	9/15/2015	Matrix:	Soil
Date of Preparation:	9/22/2015	Amount Prepared:	N/A
Date of Analysis:	9/24/2015	Percent Solids:	87%
Dry Weight Prepared:	25.99 grams	Extract Dilution:	1
Wet Weight Prepared:	30.003 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	**18**	7.7	
91-57-6	2-Methylnaphthalene	ND	7.7	
90-12-0	1-Methylnaphthalene	ND	7.7	
208-96-8	Acenaphthylene	**120**	38	
83-32-9	Acenaphthene	**12**	7.7	
86-73-7	Fluorene	**21**	7.7	
85-01-8	Phenanthrene	**520**	38	
120-12-7	Anthracene	**110**	7.7	
206-44-0	Fluoranthene	**1200**	38	
129-00-0	Pyrene	**1000**	38	
56-55-3	Benzo(a)anthracene	**490**	38	
218-01-9	Chrysene	**670**	38	
205-99-2	Benzo(b)fluoranthene	**620**	38	
207-08-9	Benzo(k)fluoranthene	**540**	38	
50-32-8	Benzo(a)pyrene	**560**	38	
193-39-5	Indeno(1,2,3-cd)pyrene	**390**	38	
53-70-3	Dibenz(a,h)anthracene	**32**	7.7	
191-24-2	Benzo(g,h,i)perylene	**430**	38	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	72	32 - 102
p-Terphenyl-d14 (SS2)	78	41 - 106

Comments: Acenaphthylene, phenanthrene, fluoranthene, pyrene, benzo(a)anthracene, chrysene, benzo(b)fluoranthene, benzo(k)fluoranthenme, indeno(1,2,3-cd)pyrene, and benzo(g,h,i)perylene are reported from a 5x dilution.

VT Urban Soils

PAHs in Soil - SIM

Client Sample ID:	G7	Lab Sample ID:	AB58506
Date of Collection:	9/15/2015	Matrix:	Soil
Date of Preparation:	9/22/2015	Amount Prepared:	N/A
Date of Analysis:	9/23/2015	Percent Solids:	87%
Dry Weight Prepared:	26.197 grams	Extract Dilution:	1
Wet Weight Prepared:	30.037 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	ND	7.6	
91-57-6	2-Methylnaphthalene	ND	7.6	
90-12-0	1-Methylnaphthalene	ND	7.6	
208-96-8	Acenaphthylene	ND	7.6	
83-32-9	Acenaphthene	ND	7.6	
86-73-7	Fluorene	ND	7.6	
85-01-8	Phenanthrene	ND	7.6	
120-12-7	Anthracene	ND	7.6	
206-44-0	Fluoranthene	ND	7.6	
129-00-0	Pyrene	ND	7.6	
56-55-3	Benzo(a)anthracene	ND	7.6	
218-01-9	Chrysene	ND	7.6	
205-99-2	Benzo(b)fluoranthene	ND	7.6	
207-08-9	Benzo(k)fluoranthene	ND	7.6	
50-32-8	Benzo(a)pyrene	ND	7.6	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	7.6	
53-70-3	Dibenz(a,h)anthracene	ND	7.6	
191-24-2	Benzo(g,h,i)perylene	ND	7.6	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	78	32 - 102
p-Terphenyl-d14 (SS2)	68	41 - 106

VT Urban Soils

PAHs in Soil - SIM

Client Sample ID:	F6	Lab Sample ID:	AB58507
Date of Collection:	9/15/2015	Matrix:	Soil
Date of Preparation:	9/22/2015	Amount Prepared:	N/A
Date of Analysis:	9/23/2015	Percent Solids:	89%
Dry Weight Prepared:	26.820 grams	Extract Dilution:	1
Wet Weight Prepared:	30.096 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	ND	7.5	
91-57-6	2-Methylnaphthalene	ND	7.5	
90-12-0	1-Methylnaphthalene	ND	7.5	
208-96-8	Acenaphthylene	ND	7.5	
83-32-9	Acenaphthene	ND	7.5	
86-73-7	Fluorene	ND	7.5	
85-01-8	Phenanthrene	**12**	7.5	
120-12-7	Anthracene	ND	7.5	
206-44-0	Fluoranthene	**12**	7.5	
129-00-0	Pyrene	**12**	7.5	
56-55-3	Benzo(a)anthracene	ND	7.5	
218-01-9	Chrysene	**8.7**	7.5	
205-99-2	Benzo(b)fluoranthene	**8.4**	7.5	
207-08-9	Benzo(k)fluoranthene	**7.6**	7.5	
50-32-8	Benzo(a)pyrene	ND	7.5	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	7.5	
53-70-3	Dibenz(a,h)anthracene	ND	7.5	
191-24-2	Benzo(g,h,i)perylene	ND	7.5	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	82	32 - 102
p-Terphenyl-d14 (SS2)	72	41 - 106

VT Urban Soils

PAHs in Soil - SIM

Client Sample ID:	G6	Lab Sample ID:	AB58508
Date of Collection:	9/15/2015	Matrix:	Soil
Date of Preparation:	9/22/2015	Amount Prepared:	N/A
Date of Analysis:	9/23/2015	Percent Solids:	72%
Dry Weight Prepared:	21.947 grams	Extract Dilution:	1
Wet Weight Prepared:	30.357 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	ND	9.1	
91-57-6	2-Methylnaphthalene	ND	9.1	
90-12-0	1-Methylnaphthalene	ND	9.1	
208-96-8	Acenaphthylene	ND	9.1	
83-32-9	Acenaphthene	ND	9.1	
86-73-7	Fluorene	ND	9.1	
85-01-8	Phenanthrene	ND	9.1	
120-12-7	Anthracene	ND	9.1	
206-44-0	Fluoranthene	ND	9.1	
129-00-0	Pyrene	ND	9.1	
56-55-3	Benzo(a)anthracene	ND	9.1	
218-01-9	Chrysene	ND	9.1	
205-99-2	Benzo(b)fluoranthene	ND	9.1	
207-08-9	Benzo(k)fluoranthene	ND	9.1	
50-32-8	Benzo(a)pyrene	ND	9.1	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	9.1	
53-70-3	Dibenz(a,h)anthracene	ND	9.1	
191-24-2	Benzo(g,h,i)perylene	ND	9.1	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	78	32 - 102
p-Terphenyl-d14 (SS2)	65	41 - 106

VT Urban Soils

PAHs in Soil - SIM

Client Sample ID:	G5	Lab Sample ID:	AB58509
Date of Collection:	9/15/2015	Matrix:	Soil
Date of Preparation:	9/22/2015	Amount Prepared:	N/A
Date of Analysis:	9/23/2015	Percent Solids:	77%
Dry Weight Prepared:	23.049 grams	Extract Dilution:	1
Wet Weight Prepared:	30.052 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	ND	8.7	
91-57-6	2-Methylnaphthalene	ND	8.7	
90-12-0	1-Methylnaphthalene	ND	8.7	
208-96-8	Acenaphthylene	ND	8.7	
83-32-9	Acenaphthene	ND	8.7	
86-73-7	Fluorene	ND	8.7	
85-01-8	Phenanthrene	**11**	8.7	
120-12-7	Anthracene	ND	8.7	
206-44-0	Fluoranthene	**35**	8.7	
129-00-0	Pyrene	**31**	8.7	
56-55-3	Benzo(a)anthracene	**19**	8.7	
218-01-9	Chrysene	**26**	8.7	
205-99-2	Benzo(b)fluoranthene	**29**	8.7	
207-08-9	Benzo(k)fluoranthene	**24**	8.7	
50-32-8	Benzo(a)pyrene	**24**	8.7	
193-39-5	Indeno(1,2,3-cd)pyrene	**14**	8.7	
53-70-3	Dibenz(a,h)anthracene	ND	8.7	
191-24-2	Benzo(g,h,i)perylene	**14**	8.7	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	72	32 - 102
p-Terphenyl-d14 (SS2)	65	41 - 106

VT Urban Soils

PAHs in Soil - SIM

Client Sample ID:	N5	Lab Sample ID:	AB58510
Date of Collection:	9/17/2015	Matrix:	Soil
Date of Preparation:	9/22/2015	Amount Prepared:	N/A
Date of Analysis:	9/23/2015	Percent Solids:	74%
Dry Weight Prepared:	22.434 grams	Extract Dilution:	1
Wet Weight Prepared:	30.271 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	ND	8.9	
91-57-6	2-Methylnaphthalene	ND	8.9	
90-12-0	1-Methylnaphthalene	ND	8.9	
208-96-8	Acenaphthylene	**15**	8.9	
83-32-9	Acenaphthene	ND	8.9	
86-73-7	Fluorene	ND	8.9	
85-01-8	Phenanthrene	**61**	8.9	
120-12-7	Anthracene	**12**	8.9	
206-44-0	Fluoranthene	**140**	8.9	
129-00-0	Pyrene	**130**	8.9	
56-55-3	Benzo(a)anthracene	**85**	8.9	
218-01-9	Chrysene	**97**	8.9	
205-99-2	Benzo(b)fluoranthene	**110**	8.9	
207-08-9	Benzo(k)fluoranthene	**84**	8.9	
50-32-8	Benzo(a)pyrene	**95**	8.9	
193-39-5	Indeno(1,2,3-cd)pyrene	**48**	8.9	
53-70-3	Dibenz(a,h)anthracene	**17**	8.9	
191-24-2	Benzo(g,h,i)perylene	**50**	8.9	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	80	32 - 102
p-Terphenyl-d14 (SS2)	70	41 - 106

VT Urban Soils

PAHs in Soil - SIM

Client Sample ID:	J6	Lab Sample ID:	AB58511
Date of Collection:	9/17/2015	Matrix:	Soil
Date of Preparation:	9/22/2015	Amount Prepared:	N/A
Date of Analysis:	9/23/2015	Percent Solids:	79%
Dry Weight Prepared:	24.195 grams	Extract Dilution:	1
Wet Weight Prepared:	30.459 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	**17**	8.3	
91-57-6	2-Methylnaphthalene	**8.7**	8.3	
90-12-0	1-Methylnaphthalene	ND	8.3	
208-96-8	Acenaphthylene	**72**	8.3	
83-32-9	Acenaphthene	ND	8.3	
86-73-7	Fluorene	**12**	8.3	
85-01-8	Phenanthrene	**180**	8.3	
120-12-7	Anthracene	**32**	8.3	
206-44-0	Fluoranthene	**440**	8.3	
129-00-0	Pyrene	**420**	8.3	
56-55-3	Benzo(a)anthracene	**210**	8.3	
218-01-9	Chrysene	**290**	8.3	
205-99-2	Benzo(b)fluoranthene	**370**	8.3	
207-08-9	Benzo(k)fluoranthene	**340**	8.3	
50-32-8	Benzo(a)pyrene	**280**	8.3	
193-39-5	Indeno(1,2,3-cd)pyrene	**120**	8.3	
53-70-3	Dibenz(a,h)anthracene	**40**	8.3	
191-24-2	Benzo(g,h,i)perylene	**120**	8.3	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	85	32 - 102
p-Terphenyl-d14 (SS2)	72	41 - 106

VT Urban Soils

PAHs in Soil - SIM

Client Sample ID:	C-5	Lab Sample ID:	AB58512
Date of Collection:	9/18/2015	Matrix:	Soil
Date of Preparation:	9/22/2015	Amount Prepared:	N/A
Date of Analysis:	9/23/2015	Percent Solids:	79%
Dry Weight Prepared:	23.838 grams	Extract Dilution:	1
Wet Weight Prepared:	30.143 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	ND	8.4	
91-57-6	2-Methylnaphthalene	ND	8.4	
90-12-0	1-Methylnaphthalene	ND	8.4	
208-96-8	Acenaphthylene	ND	8.4	
83-32-9	Acenaphthene	ND	8.4	
86-73-7	Fluorene	ND	8.4	
85-01-8	Phenanthrene	**9.1**	8.4	
120-12-7	Anthracene	ND	8.4	
206-44-0	Fluoranthene	**13**	8.4	
129-00-0	Pyrene	**11**	8.4	
56-55-3	Benzo(a)anthracene	ND	8.4	
218-01-9	Chrysene	**9.0**	8.4	
205-99-2	Benzo(b)fluoranthene	**15**	8.4	
207-08-9	Benzo(k)fluoranthene	**12**	8.4	
50-32-8	Benzo(a)pyrene	ND	8.4	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	8.4	
53-70-3	Dibenz(a,h)anthracene	ND	8.4	
191-24-2	Benzo(g,h,i)perylene	ND	8.4	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	20	32 - 102
p-Terphenyl-d14 (SS2)	18	41 - 106

Comments: Recoveries for both surrogates are below spec.

VT Urban Soils

PAHs in Soil - SIM

Client Sample ID:	C-7	Lab Sample ID:	AB58513
Date of Collection:	9/18/2015	Matrix:	Soil
Date of Preparation:	9/22/2015	Amount Prepared:	N/A
Date of Analysis:	9/24/2015	Percent Solids:	75%
Dry Weight Prepared:	22.600 grams	Extract Dilution:	1
Wet Weight Prepared:	30.143 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	**9.7**	8.9	
91-57-6	2-Methylnaphthalene	ND	8.9	
90-12-0	1-Methylnaphthalene	**11**	8.9	
208-96-8	Acenaphthylene	**27**	8.9	
83-32-9	Acenaphthene	ND	8.9	
86-73-7	Fluorene	ND	8.9	
85-01-8	Phenanthrene	**96**	8.9	
120-12-7	Anthracene	**13**	8.9	
206-44-0	Fluoranthene	**74**	8.9	
129-00-0	Pyrene	**98**	8.9	
56-55-3	Benzo(a)anthracene	**27**	8.9	
218-01-9	Chrysene	**66**	8.9	
205-99-2	Benzo(b)fluoranthene	**48**	8.9	
207-08-9	Benzo(k)fluoranthene	**33**	8.9	
50-32-8	Benzo(a)pyrene	**33**	8.9	
193-39-5	Indeno(1,2,3-cd)pyrene	**27**	8.9	
53-70-3	Dibenz(a,h)anthracene	**9.7**	8.9	
191-24-2	Benzo(g,h,i)perylene	**30**	8.9	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	62	32 - 102
p-Terphenyl-d14 (SS2)	68	41 - 106

VT Urban Soils

PAHs in Soil - SIM

Client Sample ID:	C-8	Lab Sample ID:	AB58514
Date of Collection:	9/18/2015	Matrix:	Soil
Date of Preparation:	9/22/2015	Amount Prepared:	N/A
Date of Analysis:	9/23/2015	Percent Solids:	89%
Dry Weight Prepared:	26.987 grams	Extract Dilution:	1
Wet Weight Prepared:	30.272 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	ND	7.4	
91-57-6	2-Methylnaphthalene	ND	7.4	
90-12-0	1-Methylnaphthalene	ND	7.4	
208-96-8	Acenaphthylene	ND	7.4	
83-32-9	Acenaphthene	ND	7.4	
86-73-7	Fluorene	ND	7.4	
85-01-8	Phenanthrene	ND	7.4	
120-12-7	Anthracene	ND	7.4	
206-44-0	Fluoranthene	ND	7.4	
129-00-0	Pyrene	ND	7.4	
56-55-3	Benzo(a)anthracene	ND	7.4	
218-01-9	Chrysene	ND	7.4	
205-99-2	Benzo(b)fluoranthene	ND	7.4	
207-08-9	Benzo(k)fluoranthene	ND	7.4	
50-32-8	Benzo(a)pyrene	ND	7.4	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	7.4	
53-70-3	Dibenz(a,h)anthracene	ND	7.4	
191-24-2	Benzo(g,h,i)perylene	ND	7.4	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	70	32 - 102
p-Terphenyl-d14 (SS2)	62	41 - 106

VT Urban Soils

PAHs in Soil - SIM

Client Sample ID:	C-9	Lab Sample ID:	AB58515
Date of Collection:	9/18/2015	Matrix:	Soil
Date of Preparation:	9/22/2015	Amount Prepared:	N/A
Date of Analysis:	9/24/2015	Percent Solids:	86%
Dry Weight Prepared:	25.975 grams	Extract Dilution:	1
Wet Weight Prepared:	30.185 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	ND	7.7	
91-57-6	2-Methylnaphthalene	ND	7.7	
90-12-0	1-Methylnaphthalene	ND	7.7	
208-96-8	Acenaphthylene	ND	7.7	
83-32-9	Acenaphthene	ND	7.7	
86-73-7	Fluorene	ND	7.7	
85-01-8	Phenanthrene	**8.6**	7.7	
120-12-7	Anthracene	ND	7.7	
206-44-0	Fluoranthene	**17**	7.7	
129-00-0	Pyrene	**13**	7.7	
56-55-3	Benzo(a)anthracene	**8.3**	7.7	
218-01-9	Chrysene	**14**	7.7	
205-99-2	Benzo(b)fluoranthene	**17**	7.7	
207-08-9	Benzo(k)fluoranthene	**8.8**	7.7	
50-32-8	Benzo(a)pyrene	**8.6**	7.7	
193-39-5	Indeno(1,2,3-cd)pyrene	**8.9**	7.7	
53-70-3	Dibenz(a,h)anthracene	ND	7.7	
191-24-2	Benzo(g,h,i)perylene	**9.2**	7.7	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	75	32 - 102
p-Terphenyl-d14 (SS2)	82	41 - 106

VT Urban Soils

PAHs in Soil - SIM

Client Sample ID:	F-1	Lab Sample ID:	AB58516
Date of Collection:	9/18/2015	Matrix:	Soil
Date of Preparation:	9/22/2015	Amount Prepared:	N/A
Date of Analysis:	9/24/2015	Percent Solids:	79%
Dry Weight Prepared:	23.944 grams	Extract Dilution:	1
Wet Weight Prepared:	30.411 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	ND	8.4	
91-57-6	2-Methylnaphthalene	ND	8.4	
90-12-0	1-Methylnaphthalene	ND	8.4	
208-96-8	Acenaphthylene	ND	8.4	
83-32-9	Acenaphthene	ND	8.4	
86-73-7	Fluorene	ND	8.4	
85-01-8	Phenanthrene	**26**	8.4	
120-12-7	Anthracene	ND	8.4	
206-44-0	Fluoranthene	**60**	8.4	
129-00-0	Pyrene	**47**	8.4	
56-55-3	Benzo(a)anthracene	**25**	8.4	
218-01-9	Chrysene	**34**	8.4	
205-99-2	Benzo(b)fluoranthene	**30**	8.4	
207-08-9	Benzo(k)fluoranthene	**24**	8.4	
50-32-8	Benzo(a)pyrene	**26**	8.4	
193-39-5	Indeno(1,2,3-cd)pyrene	**20**	8.4	
53-70-3	Dibenz(a,h)anthracene	ND	8.4	
191-24-2	Benzo(g,h,i)perylene	**21**	8.4	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	64	32 - 102
p-Terphenyl-d14 (SS2)	69	41 - 106

VT Urban Soils

PAHs in Soil - SIM

Client Sample ID:	DUP-6	Lab Sample ID:	AB58517
Date of Collection:	9/18/2015	Matrix:	Soil
Date of Preparation:	9/22/2015	Amount Prepared:	N/A
Date of Analysis:	9/24/2015	Percent Solids:	78%
Dry Weight Prepared:	23.687 grams	Extract Dilution:	1
Wet Weight Prepared:	30.429 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	ND	8.4	
91-57-6	2-Methylnaphthalene	ND	8.4	
90-12-0	1-Methylnaphthalene	ND	8.4	
208-96-8	Acenaphthylene	**9.2**	8.4	
83-32-9	Acenaphthene	ND	8.4	
86-73-7	Fluorene	ND	8.4	
85-01-8	Phenanthrene	**37**	8.4	
120-12-7	Anthracene	ND	8.4	
206-44-0	Fluoranthene	**84**	8.4	
129-00-0	Pyrene	**62**	8.4	
56-55-3	Benzo(a)anthracene	**31**	8.4	
218-01-9	Chrysene	**42**	8.4	
205-99-2	Benzo(b)fluoranthene	**38**	8.4	
207-08-9	Benzo(k)fluoranthene	**29**	8.4	
50-32-8	Benzo(a)pyrene	**32**	8.4	
193-39-5	Indeno(1,2,3-cd)pyrene	**24**	8.4	
53-70-3	Dibenz(a,h)anthracene	ND	8.4	
191-24-2	Benzo(g,h,i)perylene	**26**	8.4	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	72	32 - 102
p-Terphenyl-d14 (SS2)	78	41 - 106

VT Urban Soils

PAHs in Soil - SIM

Client Sample ID:	J-2	Lab Sample ID:	AB58518
Date of Collection:	9/18/2015	Matrix:	Soil
Date of Preparation:	9/22/2015	Amount Prepared:	N/A
Date of Analysis:	9/24/2015	Percent Solids:	94%
Dry Weight Prepared:	28.868 grams	Extract Dilution:	1
Wet Weight Prepared:	30.704 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	**35**	6.9	
91-57-6	2-Methylnaphthalene	**11**	6.9	
90-12-0	1-Methylnaphthalene	**8.1**	6.9	
208-96-8	Acenaphthylene	**210**	6.9	
83-32-9	Acenaphthene	**23**	6.9	
86-73-7	Fluorene	**54**	6.9	
85-01-8	Phenanthrene	**740**	69	
120-12-7	Anthracene	**170**	6.9	
206-44-0	Fluoranthene	**1900**	69	
129-00-0	Pyrene	**1700**	69	
56-55-3	Benzo(a)anthracene	**960**	69	
218-01-9	Chrysene	**1100**	69	
205-99-2	Benzo(b)fluoranthene	**1000**	69	
207-08-9	Benzo(k)fluoranthene	**850**	69	
50-32-8	Benzo(a)pyrene	**1000**	69	
193-39-5	Indeno(1,2,3-cd)pyrene	**520**	6.9	
53-70-3	Dibenz(a,h)anthracene	**160**	6.9	
191-24-2	Benzo(g,h,i)perylene	**600**	6.9	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	78	32 - 102
p-Terphenyl-d14 (SS2)	75	41 - 106

Comments: Phenanthrene, fluoranthene, pyrene, benzo(a)anthracene, chrysene, benzo(b)fluoranthene, benzo(k)fluoranthene, and benzo(a)pyrene are reported from a 10x dilution.

VT Urban Soils

PAHs in Soil - SIM

Client Sample ID:	DUP-10	Lab Sample ID:	AB58519
Date of Collection:	9/18/2015	Matrix:	Soil
Date of Preparation:	9/22/2015	Amount Prepared:	N/A
Date of Analysis:	9/24/2015	Percent Solids:	94%
Dry Weight Prepared:	28.541 grams	Extract Dilution:	1
Wet Weight Prepared:	30.324 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	**36**	7.0	
91-57-6	2-Methylnaphthalene	**10**	7.0	
90-12-0	1-Methylnaphthalene	ND	7.0	
208-96-8	Acenaphthylene	**180**	7.0	
83-32-9	Acenaphthene	**16**	7.0	
86-73-7	Fluorene	**42**	7.0	
85-01-8	Phenanthrene	**590**	70	
120-12-7	Anthracene	**130**	7.0	
206-44-0	Fluoranthene	**1700**	70	
129-00-0	Pyrene	**1400**	70	
56-55-3	Benzo(a)anthracene	**830**	70	
218-01-9	Chrysene	**940**	70	
205-99-2	Benzo(b)fluoranthene	**930**	70	
207-08-9	Benzo(k)fluoranthene	**770**	70	
50-32-8	Benzo(a)pyrene	**900**	70	
193-39-5	Indeno(1,2,3-cd)pyrene	**550**	7.0	
53-70-3	Dibenz(a,h)anthracene	**170**	7.0	
191-24-2	Benzo(g,h,i)perylene	**640**	7.0	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	80	32 - 102
p-Terphenyl-d14 (SS2)	70	41 - 106

Comments: Phenanthrene, fluoranthene, pyrene, benzo(a)anthracene, chrysene, benzo(b)fluoranthene, benzo(k)fluoranthene, and benzo(a)pyrene are reported from a 10x dilution.

VT Urban Soils

PAHs in Soil - SIM

Client Sample ID:	J-1	Lab Sample ID:	AB58520
Date of Collection:	9/18/2015	Matrix:	Soil
Date of Preparation:	9/22/2015	Amount Prepared:	N/A
Date of Analysis:	9/24/2015	Percent Solids:	89%
Dry Weight Prepared:	26.762 grams	Extract Dilution:	1
Wet Weight Prepared:	30.200 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	ND	7.5	
91-57-6	2-Methylnaphthalene	ND	7.5	
90-12-0	1-Methylnaphthalene	ND	7.5	
208-96-8	Acenaphthylene	ND	7.5	
83-32-9	Acenaphthene	ND	7.5	
86-73-7	Fluorene	ND	7.5	
85-01-8	Phenanthrene	ND	7.5	
120-12-7	Anthracene	ND	7.5	
206-44-0	Fluoranthene	**9.6**	7.5	
129-00-0	Pyrene	**7.6**	7.5	
56-55-3	Benzo(a)anthracene	ND	7.5	
218-01-9	Chrysene	ND	7.5	
205-99-2	Benzo(b)fluoranthene	**9.2**	7.5	
207-08-9	Benzo(k)fluoranthene	**8.2**	7.5	
50-32-8	Benzo(a)pyrene	ND	7.5	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	7.5	
53-70-3	Dibenz(a,h)anthracene	ND	7.5	
191-24-2	Benzo(g,h,i)perylene	ND	7.5	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	80	32 - 102
p-Terphenyl-d14 (SS2)	70	41 - 106

VT Urban Soils

PAHs in Soil - SIM

Client Sample ID:	I-1	Lab Sample ID:	AB58521
Date of Collection:	9/18/2015	Matrix:	Soil
Date of Preparation:	9/22/2015	Amount Prepared:	N/A
Date of Analysis:	9/24/2015	Percent Solids:	79%
Dry Weight Prepared:	23.787 grams	Extract Dilution:	1
Wet Weight Prepared:	29.931 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	ND	8.4	
91-57-6	2-Methylnaphthalene	ND	8.4	
90-12-0	1-Methylnaphthalene	ND	8.4	
208-96-8	Acenaphthylene	ND	8.4	
83-32-9	Acenaphthene	ND	8.4	
86-73-7	Fluorene	ND	8.4	
85-01-8	Phenanthrene	ND	8.4	
120-12-7	Anthracene	ND	8.4	
206-44-0	Fluoranthene	ND	8.4	
129-00-0	Pyrene	ND	8.4	
56-55-3	Benzo(a)anthracene	ND	8.4	
218-01-9	Chrysene	ND	8.4	
205-99-2	Benzo(b)fluoranthene	ND	8.4	
207-08-9	Benzo(k)fluoranthene	ND	8.4	
50-32-8	Benzo(a)pyrene	ND	8.4	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	8.4	
53-70-3	Dibenz(a,h)anthracene	ND	8.4	
191-24-2	Benzo(g,h,i)perylene	ND	8.4	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	62	32 - 102
p-Terphenyl-d14 (SS2)	72	41 - 106

VT Urban Soils

MATRIX SPIKE (MS) RECOVERY

Sample ID: AB58504

PARAMETER	SPIKE ADDED ug/Kg	SAMPLE CONCENTRATION ug/Kg	MS CONCENTRATION ug/Kg	MS % REC	QC LIMITS (% REC)
1-Methylnaphthalene	141	ND	112	79	49 - 99
2-Methylnaphthalene	141	ND	113	80	43 - 101
Acenaphthene	141	ND	115	82	31 - 119
Acenaphthylene	141	ND	114	81	32 - 116
Anthracene	141	ND	118	84	17 - 151
Benzo(a)anthracene	141	ND	134	95	18 - 136
Benzo(a)pyrene	141	ND	128	91	26 - 115
Benzo(b)fluoranthene	141	12.0	170	112	13 - 144
Benzo(g,h,i)perylene	141	ND	103	73	21 - 137
Benzo(k)fluoranthene	141	7.9	174	118	27 - 139
Chrysene	141	7.6	129	86	20 - 130
Dibenz(a,h)anthracene	141	ND	111	79	24 - 137
Fluoranthene	141	9.0	122	80	17 - 149
Fluorene	141	ND	120	85	34 - 121
Indeno(1,2,3-cd)pyrene	141	ND	105	75	18 - 148
Naphthalene	141	ND	111	79	22 - 112
Phenanthrene	141	ND	128	91	18 - 134
Pyrene	141	7.6	116	77	19 - 133

VT Urban Soils

Laboratory Duplicate Results

Sample ID: AB58504

PARAMETER	SAMPLE RESULT ug/Kg	SAMPLE DUPLICATE RESULT ug/Kg	PRECISION RPD %	QC LIMITS
1-Methylnaphthalene	ND	ND	NC	40
2-Methylnaphthalene	ND	ND	NC	40
Acenaphthene	ND	ND	NC	40
Acenaphthylene	ND	ND	NC	40
Anthracene	ND	ND	NC	40
Benzo(a)anthracene	ND	ND	NC	40
Benzo(a)pyrene	ND	ND	NC	40
Benzo(b)fluoranthene	12.0	13.3	10.3	40
Benzo(g,h,i)perylene	ND	ND	NC	40
Benzo(k)fluoranthene	7.9	10.2	25.4	40
Chrysene	7.6	8.44	10.5	40
Dibenz(a,h)anthracene	ND	ND	NC	40
Fluoranthene	9.0	10.2	12.5	40
Fluorene	ND	ND	NC	40
Indeno(1,2,3-cd)pyrene	ND	ND	NC	40
Naphthalene	ND	ND	NC	40
Phenanthrene	ND	ND	NC	40
Pyrene	7.6	8.65	12.9	40

VT Urban Soils

Laboratory Fortified Blank (LFB) Results

PARAMETER	LFB AMOUNT SPIKED ppb	LFB RESULT ppb	LFB RECOVERY %	QC LIMITS %
1-Methylnaphthalene	132.8	114	86	41 - 117
2-Methylnaphthalene	132.8	114	86	35 - 120
Acenaphthene	132.8	118	89	40 - 110
Acenaphthylene	132.8	115	87	41 - 108
Anthracene	132.8	127	96	46 - 122
Benzo(a)anthracene	132.8	140	105	49 - 120
Benzo(a)pyrene	132.8	135	102	44 - 124
Benzo(b)fluoranthene	132.8	158	119	45 - 123
Benzo(g,h,i)perylene	132.8	111	84	48 - 120
Benzo(k)fluoranthene	132.8	140	105	40 - 127
Chrysene	132.8	131	99	44 - 117
Dibenz(a,h)anthracene	132.8	126	95	49 - 124
Fluoranthene	132.8	128	96	47 - 124
Fluorene	132.8	120	90	42 - 112
Indeno(1,2,3-cd)pyrene	132.8	119	90	48 - 121
Naphthalene	132.8	113	85	38 - 104
Phenanthrene	132.8	128	96	41 - 116
Pyrene	132.8	122	92	43 - 117

Comments:

Samples in Batch: AB58502, AB58503, AB58504, AB58505, AB58506, AB58507, AB58508, AB58509, AB58510, AB58511, AB58512, AB58513, AB58514, AB58515, AB58516, AB58517, AB58518, AB58519, AB58520, AB58521

ENVIRONMENTAL PROTECTION AGENCY

REGION 1

CHAIN OF CUSTODY RECORD

15090029 $PAHS
15090029 $METMS_PE

PROJ. NO.: 15090029

PROJECT NAME: Soil Background Study

SAMPLERS: (Signature) VT DEC

STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS	PAHs	ARSENIC	LEAD				REMARKS
	9/15/15	9:15	X		G3	2	X	X	X				Pg 1 of 2
	9/15/15	[redacted]	X		DUP 7	2	X	X	X				
	9/15/15	10:45	X		H2	2	X	X	X				
	9/15/15	11:45	X		G2	2	X	X	X				
	9/15/15	10:15	X		G7	2	X	X	X				
	9/15/15	1130	X		F6	2	X	X	X				
	9/15/15	1300	X		G6	2	X	X	X				
	9/15/15	1430	X		G5	2	X	X	X				
	9/17/15	0900	X		N5	2	X	X	X				
	9/17/15	1030	X		J6	2	X	X	X				
	9/18	2:00	X		C-5	2	X	X	X				
	9/18	12:45	X		C-7	2	X	X	X				
	9/18	11:30	X		C-8	2	X	X	X				
	9/18	8:30	X		C-9	2	X	X	X				
	9/18	10:30	X		F-1								

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
[signature]	9/21/15 15:00	FEDEX 7745564935 10			
Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature)	Date / Time	Remarks	
		[signature] ESAT	9/22/15 09:35		

Distribution: Original Accompanies Shipment; Copy to Coordinator Field Files

1- 19381

ENVIRONMENTAL PROTECTION AGENCY
REGION 1

CHAIN OF CUSTODY RECORD

PROJ. NO.: 15090029
PROJECT NAME:
SAMPLERS: (Signature) VT DEC

STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS	PAHs	ARSENIC	LEAD				REMARKS
	9/18		X		DUP-6	2	X	X	X				Pg 2 of 2
	9/18	4:00	X		J-2	2	X	X	X				
	9/18		X		DUP-10	2	X	X	X				
	9/18	3:00	X		J-1	2	X	X	X				
	9/18	2:00	X		I-1	2	X	X	X				

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
		FEDEX 7745 5649 4804			
Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature)	Date / Time	Remarks	
		ESAT	9/22/15 09.35		

Distribution: Original Accompanies Shipment; Copy to Coordinator Field Files

15090029 $PAHS
15090029 $METMS_PE

1- 19381

United States Environmental Protection Agency
Office of Environmental Measurement & Evaluation
11 Technology Drive
North Chelmsford, MA 01863-2431

Laboratory Report

October 01, 2015

Jim Byrne - Mail Code OSRR07-2
US EPA New England R1

Project Number: 15090036
Project: VT Urban Soils
Analysis: PAHs in Soil - SIM
EPA Chemist: Dan Boudreau

Date Samples Received by the Laboratory: 09/29/2015

Analytical Procedure:

All samples were received and logged in by the laboratory according to the USEPA New England Laboratory SOP for Sample Log-in.

Sample preparation and analysis was done following the EPA Region I SOP, EIASOP-PAHSOLL6.

Samples were analyzed by a quadrapole GC/MS operating in the Selective Ion Monitoring (SIM) mode.. The extraction and analysis SOPs are based on SW-846 methods 3545A, 3630C,8270C, and EIASOP-BNAGCMS9.

Data were reviewed in accordance with the internal verification procedures described in the EPA New England Quality Manual for NERL.

Results relate only to the items tested or to the samples as received by the Laboratory. This analytical report shall not be reproduced except in full, without written approval of the laboratory.

If you have any questions please call me at 617-918-8340 .

Sincerely,

Qualifiers:

RL = Reporting limit
ND = Not Detected above Reporting limit
NA = Not Applicable due to high sample dilutions or sample interferences
NC = Not calculated since analyte concentration is ND.
J = Estimated value
J1 = Estimated value due to MS recovery outside accceptance criteria
J2 = Estimated value due to LFB result outside acceptance criteria
J3 = Estimated value due to RPD result outside acceptance criteria
J4 = Estimated value due to LCS result outside acceptance criteria
E = Estimated value exceeds the calibration range
L = Estimated value is below the calibration range
B = Analyte is associated with the lab blank or trip blank contamination. Values are qualified when the observed concentration of the contamination in the sample extract is less than 10 times the concentration in the blank.
R = No recovery was calculated since the analyte concentration is greater than four times the spike level.
P = The confirmation value exceeded 35% difference and is less than 100%. The lower value is reported.
C = The identification has been confirmed by GC/MS.
A = Suspected Aldol condensation product.
N = Tentatively identified compound.

VT Urban Soils

PAHs in Soil - SIM

Client Sample ID:	E6	Lab Sample ID:	AB58617
Date of Collection:	9/21/2015	Matrix:	Soil
Date of Preparation:	9/29/2015	Amount Prepared:	N/A
Date of Analysis:	9/29/2015	Percent Solids:	76%
Dry Weight Prepared:	23.279 grams	Extract Dilution:	1
Wet Weight Prepared:	30.447 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	ND	8.6	
91-57-6	2-Methylnaphthalene	ND	8.6	
90-12-0	1-Methylnaphthalene	ND	8.6	
208-96-8	Acenaphthylene	ND	8.6	
83-32-9	Acenaphthene	ND	8.6	
86-73-7	Fluorene	ND	8.6	
85-01-8	Phenanthrene	**20**	8.6	
120-12-7	Anthracene	ND	8.6	
206-44-0	Fluoranthene	**51**	8.6	
129-00-0	Pyrene	**41**	8.6	
56-55-3	Benzo(a)anthracene	**26**	8.6	
218-01-9	Chrysene	**29**	8.6	
205-99-2	Benzo(b)fluoranthene	**29**	8.6	
207-08-9	Benzo(k)fluoranthene	**24**	8.6	
50-32-8	Benzo(a)pyrene	**26**	8.6	
193-39-5	Indeno(1,2,3-cd)pyrene	**21**	8.6	
53-70-3	Dibenz(a,h)anthracene	**9.3**	8.6	
191-24-2	Benzo(g,h,i)perylene	**22**	8.6	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	62	32 - 102
p-Terphenyl-d14 (SS2)	66	41 - 106

VT Urban Soils

PAHs in Soil - SIM

Client Sample ID:	E8	Lab Sample ID:	AB58618
Date of Collection:	9/24/2015	Matrix:	Soil
Date of Preparation:	9/29/2015	Amount Prepared:	N/A
Date of Analysis:	9/29/2015	Percent Solids:	78%
Dry Weight Prepared:	22.889 grams	Extract Dilution:	1
Wet Weight Prepared:	29.387 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	ND	8.7	
91-57-6	2-Methylnaphthalene	ND	8.7	
90-12-0	1-Methylnaphthalene	ND	8.7	
208-96-8	Acenaphthylene	ND	8.7	
83-32-9	Acenaphthene	ND	8.7	
86-73-7	Fluorene	ND	8.7	
85-01-8	Phenanthrene	**13**	8.7	
120-12-7	Anthracene	ND	8.7	
206-44-0	Fluoranthene	**23**	8.7	
129-00-0	Pyrene	**21**	8.7	
56-55-3	Benzo(a)anthracene	**13**	8.7	
218-01-9	Chrysene	**16**	8.7	
205-99-2	Benzo(b)fluoranthene	**15**	8.7	
207-08-9	Benzo(k)fluoranthene	**12**	8.7	
50-32-8	Benzo(a)pyrene	**13**	8.7	
193-39-5	Indeno(1,2,3-cd)pyrene	**12**	8.7	
53-70-3	Dibenz(a,h)anthracene	ND	8.7	
191-24-2	Benzo(g,h,i)perylene	**12**	8.7	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	50	32 - 102
p-Terphenyl-d14 (SS2)	55	41 - 106

VT Urban Soils

PAHs in Soil - SIM

Client Sample ID:	D9	Lab Sample ID:	AB58619
Date of Collection:	9/24/2015	Matrix:	Soil
Date of Preparation:	9/29/2015	Amount Prepared:	N/A
Date of Analysis:	9/29/2015	Percent Solids:	81%
Dry Weight Prepared:	24.840 grams	Extract Dilution:	1
Wet Weight Prepared:	30.614 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	ND	8.1	
91-57-6	2-Methylnaphthalene	ND	8.1	
90-12-0	1-Methylnaphthalene	ND	8.1	
208-96-8	Acenaphthylene	ND	8.1	
83-32-9	Acenaphthene	ND	8.1	
86-73-7	Fluorene	ND	8.1	
85-01-8	Phenanthrene	ND	8.1	
120-12-7	Anthracene	ND	8.1	
206-44-0	Fluoranthene	ND	8.1	
129-00-0	Pyrene	ND	8.1	
56-55-3	Benzo(a)anthracene	ND	8.1	
218-01-9	Chrysene	ND	8.1	
205-99-2	Benzo(b)fluoranthene	ND	8.1	
207-08-9	Benzo(k)fluoranthene	ND	8.1	
50-32-8	Benzo(a)pyrene	ND	8.1	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	8.1	
53-70-3	Dibenz(a,h)anthracene	ND	8.1	
191-24-2	Benzo(g,h,i)perylene	ND	8.1	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	50	32 - 102
p-Terphenyl-d14 (SS2)	55	41 - 106

VT Urban Soils

PAHs in Soil - SIM

Client Sample ID:	F5	Lab Sample ID:	AB58620
Date of Collection:	9/28/2015	Matrix:	Soil
Date of Preparation:	9/29/2015	Amount Prepared:	N/A
Date of Analysis:	9/29/2015	Percent Solids:	81%
Dry Weight Prepared:	23.556 grams	Extract Dilution:	1
Wet Weight Prepared:	29.107 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	ND	8.5	
91-57-6	2-Methylnaphthalene	ND	8.5	
90-12-0	1-Methylnaphthalene	ND	8.5	
208-96-8	Acenaphthylene	ND	8.5	
83-32-9	Acenaphthene	ND	8.5	
86-73-7	Fluorene	ND	8.5	
85-01-8	Phenanthrene	ND	8.5	
120-12-7	Anthracene	ND	8.5	
206-44-0	Fluoranthene	**18**	8.5	
129-00-0	Pyrene	**16**	8.5	
56-55-3	Benzo(a)anthracene	**12**	8.5	
218-01-9	Chrysene	**14**	8.5	
205-99-2	Benzo(b)fluoranthene	**13**	8.5	
207-08-9	Benzo(k)fluoranthene	**12**	8.5	
50-32-8	Benzo(a)pyrene	**12**	8.5	
193-39-5	Indeno(1,2,3-cd)pyrene	**10**	8.5	
53-70-3	Dibenz(a,h)anthracene	ND	8.5	
191-24-2	Benzo(g,h,i)perylene	**10**	8.5	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	70	32 - 102
p-Terphenyl-d14 (SS2)	75	41 - 106

VT Urban Soils

Laboratory Blank (PAHs)

Client Sample ID:	N/A	Lab Sample ID:	N/A
Date of Collection:	N/A	Matrix:	Soil
Date of Preparation:	9/30/2015	Amount Prepared:	N/A
Date of Analysis:	9/30/2015	Percent Solids:	100%
Dry Weight Prepared:	30.058 grams	Extract Dilution:	1
Wet Weight Prepared:	30.085 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	ND	6.7	
91-57-6	2-Methylnapthalene	ND	6.7	
90-12-0	1-Methylnapthalene	ND	6.7	
208-96-8	Acenaphthylene	ND	6.7	
83-32-9	Acenaphthene	ND	6.7	
86-73-7	Fluorene	ND	6.7	
85-01-8	Phenanthrene	ND	6.7	
120-12-7	Anthracene	ND	6.7	
206-44-0	Fluoranthene	ND	6.7	
129-00-0	Pyrene	ND	6.7	
56-55-3	Benzo(a)anthracene	ND	6.7	
218-01-9	Chrysene	ND	6.7	
205-99-2	Benzo(b)fluoranthene	ND	6.7	
207-08-9	Benzo(k)fluoranthene	ND	6.7	
50-32-8	Benzo(a)pyrene	ND	6.7	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	6.7	
53-70-3	Dibenz(a,h)anthracene	ND	6.7	
191-24-2	Benzo(g,h,i)perylene	ND	6.7	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	80	32 - 102
p-Terphenyl-d14 (SS2)	94	41 - 106

Comments: Method blank for extractions done on 9/30/2015; AB58620 MS, AB58621, and AB58621 DUP.

VT Urban Soils

PAHs in Soil - SIM

Client Sample ID:	F4	Lab Sample ID:	AB58621
Date of Collection:	9/28/2015	Matrix:	Soil
Date of Preparation:	9/30/2015	Amount Prepared:	N/A
Date of Analysis:	9/30/2015	Percent Solids:	85%
Dry Weight Prepared:	25.278 grams	Extract Dilution:	1
Wet Weight Prepared:	29.828 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	**240**	7.9	
91-57-6	2-Methylnaphthalene	**140**	7.9	
90-12-0	1-Methylnaphthalene	**110**	7.9	
208-96-8	Acenaphthylene	**86**	7.9	
83-32-9	Acenaphthene	**250**	7.9	
86-73-7	Fluorene	**240**	7.9	
85-01-8	Phenanthrene	**2400**	39	
120-12-7	Anthracene	**590**	7.9	
206-44-0	Fluoranthene	**2600**	39	
129-00-0	Pyrene	**2000**	39	
56-55-3	Benzo(a)anthracene	**1100**	39	
218-01-9	Chrysene	**1000**	39	
205-99-2	Benzo(b)fluoranthene	**750**	7.9	
207-08-9	Benzo(k)fluoranthene	**660**	7.9	
50-32-8	Benzo(a)pyrene	**860**	39	
193-39-5	Indeno(1,2,3-cd)pyrene	**490**	7.9	
53-70-3	Dibenz(a,h)anthracene	**48**	7.9	
191-24-2	Benzo(g,h,i)perylene	**520**	7.9	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	78	32 - 102
p-Terphenyl-d14 (SS2)	78	41 - 106

Comments: Phenanthrene, fluoranthene, pyrene, benzo(a)anthracene, and benzo(a)pyrene are reported from a 5x dilution.

VT Urban Soils

Laboratory Blank (PAHs)

Client Sample ID:	N/A	Lab Sample ID:	N/A
Date of Collection:	N/A	Matrix:	Soil
Date of Preparation:	9/29/2015	Amount Prepared:	N/A
Date of Analysis:	9/30/2015	Percent Solids:	100%
Dry Weight Prepared:	30.033 grams	Extract Dilution:	1
Wet Weight Prepared:	30.061 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	ND	6.7	
91-57-6	2-Methylnapthalene	ND	6.7	
90-12-0	1-Methylnapthalene	ND	6.7	
208-96-8	Acenaphthylene	ND	6.7	
83-32-9	Acenaphthene	ND	6.7	
86-73-7	Fluorene	ND	6.7	
85-01-8	Phenanthrene	ND	6.7	
120-12-7	Anthracene	ND	6.7	
206-44-0	Fluoranthene	ND	6.7	
129-00-0	Pyrene	ND	6.7	
56-55-3	Benzo(a)anthracene	ND	6.7	
218-01-9	Chrysene	ND	6.7	
205-99-2	Benzo(b)fluoranthene	ND	6.7	
207-08-9	Benzo(k)fluoranthene	ND	6.7	
50-32-8	Benzo(a)pyrene	ND	6.7	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	6.7	
53-70-3	Dibenz(a,h)anthracene	ND	6.7	
191-24-2	Benzo(g,h,i)perylene	ND	6.7	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	81	32 - 102
p-Terphenyl-d14 (SS2)	94	41 - 106

Comments: Method blank for AB58617 - AB58620.

VT Urban Soils

MATRIX SPIKE (MS) RECOVERY

Sample ID: AB58620

PARAMETER	SPIKE ADDED ug/Kg	SAMPLE CONCENTRATION ug/Kg	MS CONCENTRATION ug/Kg	MS % REC	QC LIMITS (% REC)
1-Methylnaphthalene	168	ND	129	76	49 - 99
2-Methylnaphthalene	168	ND	129	76	43 - 101
Acenaphthene	168	ND	137	81	31 - 119
Acenaphthylene	168	ND	149	88	32 - 116
Anthracene	168	ND	154	91	17 - 151
Benzo(a)anthracene	168	12.0	176	97	18 - 136
Benzo(a)pyrene	168	12.0	160	88	26 - 115
Benzo(b)fluoranthene	168	13.0	167	91	13 - 144
Benzo(g,h,i)perylene	168	10.0	166	92	21 - 137
Benzo(k)fluoranthene	168	12.0	144	78	27 - 139
Chrysene	168	14.0	170	92	20 - 130
Dibenz(a,h)anthracene	168	ND	159	94	24 - 137
Fluoranthene	168	18.0	178	95	17 - 149
Fluorene	168	ND	136	81	34 - 121
Indeno(1,2,3-cd)pyrene	168	10.0	165	92	18 - 148
Naphthalene	168	ND	130	77	22 - 112
Phenanthrene	168	ND	155	92	18 - 134
Pyrene	168	16.0	170	91	19 - 133

VT Urban Soils

Laboratory Duplicate Results

Sample ID: AB58621

PARAMETER	SAMPLE RESULT ug/Kg	SAMPLE DUPLICATE RESULT ug/Kg	PRECISION RPD %	QC LIMITS
1-Methylnaphthalene	110	116	5.31	40
2-Methylnaphthalene	140	151	7.56	40
Acenaphthene	250	261	4.31	40
Acenaphthylene	86.0	86.7	0.811	40
Anthracene	590	635	7.35	40
Benzo(a)anthracene	1100	1300	16.7	40
Benzo(a)pyrene	860	990	14.1	40
Benzo(b)fluoranthene	750	778	3.66	40
Benzo(g,h,i)perylene	520	529	1.72	40
Benzo(k)fluoranthene	660	671	1.65	40
Chrysene	1000	1200	18.2	40
Dibenz(a,h)anthracene	48.0	46.7	2.75	40
Fluoranthene	2600	3000	14.3	40
Fluorene	240	262	8.76	40
Indeno(1,2,3-cd)pyrene	490	500	2.02	40
Naphthalene	240	264	9.52	40
Phenanthrene	2400	2900	18.9	40
Pyrene	2000	2300	14.0	40

VT Urban Soils

Laboratory Fortified Blank (LFB) Results

PARAMETER	LFB AMOUNT SPIKED ppb	LFB RESULT ppb	LFB RECOVERY %	QC LIMITS %
1-Methylnaphthalene	132.8	112	84	41 - 117
2-Methylnaphthalene	132.8	113	85	35 - 120
Acenaphthene	132.8	116	87	40 - 110
Acenaphthylene	132.8	120	90	41 - 108
Anthracene	132.8	131	99	46 - 122
Benzo(a)anthracene	132.8	139	105	49 - 120
Benzo(a)pyrene	132.8	130	98	44 - 124
Benzo(b)fluoranthene	132.8	134	101	45 - 123
Benzo(g,h,i)perylene	132.8	140	105	48 - 120
Benzo(k)fluoranthene	132.8	127	96	40 - 127
Chrysene	132.8	129	97	44 - 117
Dibenz(a,h)anthracene	132.8	143	108	49 - 124
Fluoranthene	132.8	127	96	47 - 124
Fluorene	132.8	115	87	42 - 112
Indeno(1,2,3-cd)pyrene	132.8	141	106	48 - 121
Naphthalene	132.8	112	84	38 - 104
Phenanthrene	132.8	122	92	41 - 116
Pyrene	132.8	125	94	43 - 117

Comments:

Samples in Batch: AB58617, AB58618, AB58619, AB58620, AB58621

15090036 $PAHS
15090036 $METMS_PE

ENVIRONMENTAL PROTECTION AGENCY

REGION 1

CHAIN OF CUSTODY RECORD

PROJ. NO.: 15090036

PROJECT NAME: Soil Background Study

SAMPLERS: (Signature) VT DEC

STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS	PAHS	ARSENIC	LEAD				REMARKS
	9/21/15	12:45	X		E6	2	X	X	X				Pg 1 of 1
	9/24/15	1000	X		E8	2	X	X	X				
	9/24/15	1200	X		D9	2	X	X	X				
	9/28/15	1000	X		F5	2	X	X	X				
	9/28/15	1130	X		F4	2	X	X	X				

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
[signature]	9/28/15 15:00	FEDEX 774609452460			
Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature) ESA	Date / Time	Remarks	
		[signature]	9/29/15		

Distribution: Original Accompanies Shipment; Copy to Coordinator Field Files

3°C

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United States Environmental Protection Agency
Office of Environmental Measurement & Evaluation
11 Technology Drive
North Chelmsford, MA 01863-2431

Laboratory Report

September 17, 2015

Jim Byrne - Mail Code OSRR07-2
US EPA New England R1

Project Number: 15090011
Project: VT Urban Soils
Analysis: PAHs in Soil - SIM
EPA Chemist: Dan Boudreau

Date Samples Received by the Laboratory: 09/09/2015

Analytical Procedure:

All samples were received and logged in by the laboratory according to the USEPA New England Laboratory SOP for Sample Log-in.

Sample preparation and analysis was done following the EPA Region I SOP, EIASOP-PAHSOLL6.

Samples were analyzed by a quadrapole GC/MS operating in theselected ion monitoring (SIM) mode. The extraction and analysis SOPs are based on SW-846 methods 3545A, 3630C,8270C, and EIASOP-BNAGCMS9.

Data were reviewed in accordance with the internal verification procedures described in the EPA New England Quality Manual for NERL.

Results relate only to the items tested or to the samples as received by the Laboratory. This analytical report shall not be reproduced except in full, without written approval of the laboratory.

If you have any questions please call me at 617-918-8340 .

Sincerely,

Qualifiers:

RL = Reporting limit
ND = Not Detected above Reporting limit
NA = Not Applicable due to high sample dilutions or sample interferences
NC = Not calculated since analyte concentration is ND.
J = Estimated value
J1 = Estimated value due to MS recovery outside accceptance criteria
J2 = Estimated value due to LFB result outside acceptance criteria
J3 = Estimated value due to RPD result outside acceptance criteria
J4 = Estimated value due to LCS result outside acceptance criteria
E = Estimated value exceeds the calibration range
L = Estimated value is below the calibration range
B = Analyte is associated with the lab blank or trip blank contamination. Values are qualified when the observed concentration of the contamination in the sample extract is less than 10 times the concentration in the blank.
R = No recovery was calculated since the analyte concentration is greater than four times the spike level.
P = The confirmation value exceeded 35% difference and is less than 100%. The lower value is reported.
C = The identification has been confirmed by GC/MS.
A = Suspected Aldol condensation product.
N = Tentatively identified compound.

VT Urban Soils

PAHs in Soil - SIM

Client Sample ID:	E-5	Lab Sample ID:	AB58281
Date of Collection:	8/31/2015	Matrix:	Soil
Date of Preparation:	9/09/2015	Amount Prepared:	N/A
Date of Analysis:	9/10/2015	Percent Solids:	84%
Dry Weight Prepared:	26.098 grams	Extract Dilution:	1
Wet Weight Prepared:	30.976 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	ND	7.7	
91-57-6	2-Methylnapthalene	ND	7.7	
90-12-0	1-Methylnapthalene	ND	7.7	
208-96-8	Acenaphthylene	ND	7.7	
83-32-9	Acenaphthene	ND	7.7	
86-73-7	Fluorene	ND	7.7	
85-01-8	Phenanthrene	ND	7.7	
120-12-7	Anthracene	ND	7.7	
206-44-0	Fluoranthene	ND	7.7	
129-00-0	Pyrene	ND	7.7	
56-55-3	Benzo(a)anthracene	ND	7.7	
218-01-9	Chrysene	ND	7.7	
205-99-2	Benzo(b)fluoranthene	ND	7.7	
207-08-9	Benzo(k)fluoranthene	ND	7.7	
50-32-8	Benzo(a)pyrene	ND	7.7	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	7.7	
53-70-3	Dibenz(a,h)anthracene	ND	7.7	
191-24-2	Benzo(g,h,i)perylene	ND	7.7	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	74	32 - 102
p-Terphenyl-d14 (SS2)	69	41 - 106

VT Urban Soils

PAHs in Soil - SIM

Client Sample ID:	D-6	Lab Sample ID:	AB58282
Date of Collection:	8/31/2015	Matrix:	Soil
Date of Preparation:	9/09/2015	Amount Prepared:	N/A
Date of Analysis:	9/10/2015	Percent Solids:	50%
Dry Weight Prepared:	15.293 grams	Extract Dilution:	1
Wet Weight Prepared:	30.425 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	ND	13	
91-57-6	2-Methylnapthalene	ND	13	
90-12-0	1-Methylnapthalene	ND	13	
208-96-8	Acenaphthylene	ND	13	
83-32-9	Acenaphthene	ND	13	
86-73-7	Fluorene	ND	13	
85-01-8	Phenanthrene	**15**	13	
120-12-7	Anthracene	ND	13	
206-44-0	Fluoranthene	**23**	13	
129-00-0	Pyrene	**32**	13	
56-55-3	Benzo(a)anthracene	**20**	13	
218-01-9	Chrysene	**16**	13	
205-99-2	Benzo(b)fluoranthene	**26**	13	
207-08-9	Benzo(k)fluoranthene	**17**	13	
50-32-8	Benzo(a)pyrene	ND	13	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	13	
53-70-3	Dibenz(a,h)anthracene	ND	13	
191-24-2	Benzo(g,h,i)perylene	ND	13	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	72	32 - 102
p-Terphenyl-d14 (SS2)	77	41 - 106

VT Urban Soils

PAHs in Soil - SIM

Client Sample ID:	C-6	Lab Sample ID:	AB58283
Date of Collection:	8/31/2015	Matrix:	Soil
Date of Preparation:	9/09/2015	Amount Prepared:	N/A
Date of Analysis:	9/10/2015	Percent Solids:	62%
Dry Weight Prepared:	19.056 grams	Extract Dilution:	1
Wet Weight Prepared:	30.532 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	ND	10	
91-57-6	2-Methylnapthalene	ND	10	
90-12-0	1-Methylnapthalene	ND	10	
208-96-8	Acenaphthylene	ND	10	
83-32-9	Acenaphthene	ND	10	
86-73-7	Fluorene	ND	10	
85-01-8	Phenanthrene	**27**	10	
120-12-7	Anthracene	ND	10	
206-44-0	Fluoranthene	**37**	10	
129-00-0	Pyrene	**33**	10	
56-55-3	Benzo(a)anthracene	**18**	10	
218-01-9	Chrysene	**26**	10	
205-99-2	Benzo(b)fluoranthene	**37**	10	
207-08-9	Benzo(k)fluoranthene	**25**	10	
50-32-8	Benzo(a)pyrene	**31**	10	
193-39-5	Indeno(1,2,3-cd)pyrene	**22**	10	
53-70-3	Dibenz(a,h)anthracene	ND	10	
191-24-2	Benzo(g,h,i)perylene	**32**	10	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	77	32 - 102
p-Terphenyl-d14 (SS2)	79	41 - 106

VT Urban Soils

PAHs in Soil - SIM

Client Sample ID:	A-7	Lab Sample ID:	AB58284
Date of Collection:	8/31/2015	Matrix:	Soil
Date of Preparation:	9/09/2015	Amount Prepared:	N/A
Date of Analysis:	9/10/2015	Percent Solids:	84%
Dry Weight Prepared:	25.947 grams	Extract Dilution:	1
Wet Weight Prepared:	30.966 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	ND	7.7	
91-57-6	2-Methylnapthalene	ND	7.7	
90-12-0	1-Methylnapthalene	ND	7.7	
208-96-8	Acenaphthylene	**26**	7.7	
83-32-9	Acenaphthene	**15**	7.7	
86-73-7	Fluorene	**33**	7.7	
85-01-8	Phenanthrene	**320**	7.7	
120-12-7	Anthracene	**73**	7.7	
206-44-0	Fluoranthene	**460**	7.7	
129-00-0	Pyrene	**340**	7.7	
56-55-3	Benzo(a)anthracene	**220**	7.7	
218-01-9	Chrysene	**190**	7.7	
205-99-2	Benzo(b)fluoranthene	**190**	7.7	
207-08-9	Benzo(k)fluoranthene	**150**	7.7	
50-32-8	Benzo(a)pyrene	**160**	7.7	
193-39-5	Indeno(1,2,3-cd)pyrene	**67**	7.7	
53-70-3	Dibenz(a,h)anthracene	**8.2**	7.7	
191-24-2	Benzo(g,h,i)perylene	**59**	7.7	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	68	32 - 102
p-Terphenyl-d14 (SS2)	70	41 - 106

VT Urban Soils

PAHs in Soil - SIM

Client Sample ID:	A-8	Lab Sample ID:	AB58285
Date of Collection:	8/31/2015	Matrix:	Soil
Date of Preparation:	9/09/2015	Amount Prepared:	N/A
Date of Analysis:	9/10/2015	Percent Solids:	91%
Dry Weight Prepared:	28.253 grams	Extract Dilution:	1
Wet Weight Prepared:	30.958 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	ND	7.1	
91-57-6	2-Methylnapthalene	ND	7.1	
90-12-0	1-Methylnapthalene	ND	7.1	
208-96-8	Acenaphthylene	ND	7.1	
83-32-9	Acenaphthene	ND	7.1	
86-73-7	Fluorene	ND	7.1	
85-01-8	Phenanthrene	ND	7.1	
120-12-7	Anthracene	ND	7.1	
206-44-0	Fluoranthene	ND	7.1	
129-00-0	Pyrene	ND	7.1	
56-55-3	Benzo(a)anthracene	ND	7.1	
218-01-9	Chrysene	ND	7.1	
205-99-2	Benzo(b)fluoranthene	ND	7.1	
207-08-9	Benzo(k)fluoranthene	ND	7.1	
50-32-8	Benzo(a)pyrene	ND	7.1	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	7.1	
53-70-3	Dibenz(a,h)anthracene	ND	7.1	
191-24-2	Benzo(g,h,i)perylene	ND	7.1	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	70	32 - 102
p-Terphenyl-d14 (SS2)	69	41 - 106

VT Urban Soils

Laboratory Blank (PAHs)

Client Sample ID:	N/A	Lab Sample ID:	N/A
Date of Collection:	N/A	Matrix:	Soil
Date of Preparation:	9/09/2015	Amount Prepared:	N/A
Date of Analysis:	9/10/2015	Percent Solids:	100%
Dry Weight Prepared:	30.400 grams	Extract Dilution:	1
Wet Weight Prepared:	30.420 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	ND	6.6	
91-57-6	2-Methylnapthalene	ND	6.6	
90-12-0	1-Methylnapthalene	ND	6.6	
208-96-8	Acenaphthylene	ND	6.6	
83-32-9	Acenaphthene	ND	6.6	
86-73-7	Fluorene	ND	6.6	
85-01-8	Phenanthrene	ND	6.6	
120-12-7	Anthracene	ND	6.6	
206-44-0	Fluoranthene	ND	6.6	
129-00-0	Pyrene	ND	6.6	
56-55-3	Benzo(a)anthracene	ND	6.6	
218-01-9	Chrysene	ND	6.6	
205-99-2	Benzo(b)fluoranthene	ND	6.6	
207-08-9	Benzo(k)fluoranthene	ND	6.6	
50-32-8	Benzo(a)pyrene	ND	6.6	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	6.6	
53-70-3	Dibenz(a,h)anthracene	ND	6.6	
191-24-2	Benzo(g,h,i)perylene	ND	6.6	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	87	32 - 102
p-Terphenyl-d14 (SS2)	97	41 - 106

VT Urban Soils

PAHs in Soil - SIM

Client Sample ID:	A-9	Lab Sample ID:	AB58286
Date of Collection:	8/31/2015	Matrix:	Soil
Date of Preparation:	9/09/2015	Amount Prepared:	N/A
Date of Analysis:	9/10/2015	Percent Solids:	83%
Dry Weight Prepared:	25.051 grams	Extract Dilution:	1
Wet Weight Prepared:	30.055 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	ND	8.0	
91-57-6	2-Methylnapthalene	ND	8.0	
90-12-0	1-Methylnapthalene	ND	8.0	
208-96-8	Acenaphthylene	ND	8.0	
83-32-9	Acenaphthene	ND	8.0	
86-73-7	Fluorene	ND	8.0	
85-01-8	Phenanthrene	ND	8.0	
120-12-7	Anthracene	ND	8.0	
206-44-0	Fluoranthene	**8.2**	8.0	
129-00-0	Pyrene	ND	8.0	
56-55-3	Benzo(a)anthracene	**9.7**	8.0	
218-01-9	Chrysene	**8.7**	8.0	
205-99-2	Benzo(b)fluoranthene	**11**	8.0	
207-08-9	Benzo(k)fluoranthene	ND	8.0	
50-32-8	Benzo(a)pyrene	**8.2**	8.0	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	8.0	
53-70-3	Dibenz(a,h)anthracene	ND	8.0	
191-24-2	Benzo(g,h,i)perylene	ND	8.0	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	78	32 - 102
p-Terphenyl-d14 (SS2)	76	41 - 106

VT Urban Soils

PAHs in Soil - SIM

Client Sample ID:	B-7	Lab Sample ID:	AB58287
Date of Collection:	8/31/2015	Matrix:	Soil
Date of Preparation:	9/09/2015	Amount Prepared:	N/A
Date of Analysis:	9/10/2015	Percent Solids:	86%
Dry Weight Prepared:	25.878 grams	Extract Dilution:	1
Wet Weight Prepared:	30.050 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	ND	7.7	
91-57-6	2-Methylnapthalene	ND	7.7	
90-12-0	1-Methylnapthalene	ND	7.7	
208-96-8	Acenaphthylene	ND	7.7	
83-32-9	Acenaphthene	ND	7.7	
86-73-7	Fluorene	ND	7.7	
85-01-8	Phenanthrene	**14**	7.7	
120-12-7	Anthracene	ND	7.7	
206-44-0	Fluoranthene	**73**	7.7	
129-00-0	Pyrene	**56**	7.7	
56-55-3	Benzo(a)anthracene	**45**	7.7	
218-01-9	Chrysene	**41**	7.7	
205-99-2	Benzo(b)fluoranthene	**51**	7.7	
207-08-9	Benzo(k)fluoranthene	**36**	7.7	
50-32-8	Benzo(a)pyrene	**39**	7.7	
193-39-5	Indeno(1,2,3-cd)pyrene	**23**	7.7	
53-70-3	Dibenz(a,h)anthracene	ND	7.7	
191-24-2	Benzo(g,h,i)perylene	**22**	7.7	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	67	32 - 102
p-Terphenyl-d14 (SS2)	63	41 - 106

VT Urban Soils

PAHs in Soil - SIM

Client Sample ID:	B-8	Lab Sample ID:	AB58288
Date of Collection:	8/31/2015	Matrix:	Soil
Date of Preparation:	9/09/2015	Amount Prepared:	N/A
Date of Analysis:	9/10/2015	Percent Solids:	89%
Dry Weight Prepared:	26.721 grams	Extract Dilution:	1
Wet Weight Prepared:	30.163 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	ND	7.5	
91-57-6	2-Methylnapthalene	ND	7.5	
90-12-0	1-Methylnapthalene	ND	7.5	
208-96-8	Acenaphthylene	ND	7.5	
83-32-9	Acenaphthene	ND	7.5	
86-73-7	Fluorene	ND	7.5	
85-01-8	Phenanthrene	ND	7.5	
120-12-7	Anthracene	ND	7.5	
206-44-0	Fluoranthene	ND	7.5	
129-00-0	Pyrene	ND	7.5	
56-55-3	Benzo(a)anthracene	ND	7.5	
218-01-9	Chrysene	ND	7.5	
205-99-2	Benzo(b)fluoranthene	ND	7.5	
207-08-9	Benzo(k)fluoranthene	ND	7.5	
50-32-8	Benzo(a)pyrene	ND	7.5	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	7.5	
53-70-3	Dibenz(a,h)anthracene	ND	7.5	
191-24-2	Benzo(g,h,i)perylene	ND	7.5	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	78	32 - 102
p-Terphenyl-d14 (SS2)	73	41 - 106

VT Urban Soils

PAHs in Soil - SIM

Client Sample ID:	B-9	Lab Sample ID:	AB58289
Date of Collection:	8/31/2015	Matrix:	Soil
Date of Preparation:	9/09/2015	Amount Prepared:	N/A
Date of Analysis:	9/10/2015	Percent Solids:	70%
Dry Weight Prepared:	21.371 grams	Extract Dilution:	1
Wet Weight Prepared:	30.458 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	ND	9.4	
91-57-6	2-Methylnapthalene	ND	9.4	
90-12-0	1-Methylnapthalene	ND	9.4	
208-96-8	Acenaphthylene	ND	9.4	
83-32-9	Acenaphthene	ND	9.4	
86-73-7	Fluorene	ND	9.4	
85-01-8	Phenanthrene	ND	9.4	
120-12-7	Anthracene	ND	9.4	
206-44-0	Fluoranthene	**12**	9.4	
129-00-0	Pyrene	**11**	9.4	
56-55-3	Benzo(a)anthracene	ND	9.4	
218-01-9	Chrysene	**10**	9.4	
205-99-2	Benzo(b)fluoranthene	**13**	9.4	
207-08-9	Benzo(k)fluoranthene	ND	9.4	
50-32-8	Benzo(a)pyrene	ND	9.4	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	9.4	
53-70-3	Dibenz(a,h)anthracene	ND	9.4	
191-24-2	Benzo(g,h,i)perylene	ND	9.4	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	80	32 - 102
p-Terphenyl-d14 (SS2)	91	41 - 106

VT Urban Soils

PAHs in Soil - SIM

Client Sample ID:	C-4	Lab Sample ID:	AB58290
Date of Collection:	9/01/2015	Matrix:	Soil
Date of Preparation:	9/09/2015	Amount Prepared:	N/A
Date of Analysis:	9/10/2015	Percent Solids:	72%
Dry Weight Prepared:	21.75 grams	Extract Dilution:	1
Wet Weight Prepared:	30.354 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	ND	9.2	
91-57-6	2-Methylnapthalene	ND	9.2	
90-12-0	1-Methylnapthalene	ND	9.2	
208-96-8	Acenaphthylene	ND	9.2	
83-32-9	Acenaphthene	ND	9.2	
86-73-7	Fluorene	ND	9.2	
85-01-8	Phenanthrene	ND	9.2	
120-12-7	Anthracene	ND	9.2	
206-44-0	Fluoranthene	ND	9.2	
129-00-0	Pyrene	ND	9.2	
56-55-3	Benzo(a)anthracene	ND	9.2	
218-01-9	Chrysene	ND	9.2	
205-99-2	Benzo(b)fluoranthene	ND	9.2	
207-08-9	Benzo(k)fluoranthene	ND	9.2	
50-32-8	Benzo(a)pyrene	ND	9.2	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	9.2	
53-70-3	Dibenz(a,h)anthracene	ND	9.2	
191-24-2	Benzo(g,h,i)perylene	ND	9.2	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	73	32 - 102
p-Terphenyl-d14 (SS2)	72	41 - 106

VT Urban Soils

PAHs in Soil - SIM

Client Sample ID:	DUP-3	Lab Sample ID:	AB58291
Date of Collection:	9/01/2015	Matrix:	Soil
Date of Preparation:	9/09/2015	Amount Prepared:	N/A
Date of Analysis:	9/14/2015	Percent Solids:	73%
Dry Weight Prepared:	22.013 grams	Extract Dilution:	1
Wet Weight Prepared:	30.174 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	ND	9.1	
91-57-6	2-Methylnapthalene	ND	9.1	
90-12-0	1-Methylnapthalene	ND	9.1	
208-96-8	Acenaphthylene	ND	9.1	
83-32-9	Acenaphthene	ND	9.1	
86-73-7	Fluorene	ND	9.1	
85-01-8	Phenanthrene	ND	9.1	
120-12-7	Anthracene	ND	9.1	
206-44-0	Fluoranthene	ND	9.1	
129-00-0	Pyrene	ND	9.1	
56-55-3	Benzo(a)anthracene	ND	9.1	
218-01-9	Chrysene	ND	9.1	
205-99-2	Benzo(b)fluoranthene	ND	9.1	
207-08-9	Benzo(k)fluoranthene	ND	9.1	
50-32-8	Benzo(a)pyrene	ND	9.1	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	9.1	
53-70-3	Dibenz(a,h)anthracene	ND	9.1	
191-24-2	Benzo(g,h,i)perylene	ND	9.1	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	76	32 - 102
p-Terphenyl-d14 (SS2)	77	41 - 106

VT Urban Soils

PAHs in Soil - SIM

Client Sample ID:	E-3	Lab Sample ID:	AB58292
Date of Collection:	9/01/2015	Matrix:	Soil
Date of Preparation:	9/09/2015	Amount Prepared:	N/A
Date of Analysis:	9/14/2015	Percent Solids:	96%
Dry Weight Prepared:	29.053 grams	Extract Dilution:	1
Wet Weight Prepared:	30.133 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	ND	6.9	
91-57-6	2-Methylnapthalene	ND	6.9	
90-12-0	1-Methylnapthalene	ND	6.9	
208-96-8	Acenaphthylene	ND	6.9	
83-32-9	Acenaphthene	ND	6.9	
86-73-7	Fluorene	ND	6.9	
85-01-8	Phenanthrene	ND	6.9	
120-12-7	Anthracene	ND	6.9	
206-44-0	Fluoranthene	**16**	6.9	
129-00-0	Pyrene	**16**	6.9	
56-55-3	Benzo(a)anthracene	**12**	6.9	
218-01-9	Chrysene	**13**	6.9	
205-99-2	Benzo(b)fluoranthene	**20**	6.9	
207-08-9	Benzo(k)fluoranthene	**13**	6.9	
50-32-8	Benzo(a)pyrene	**11**	6.9	
193-39-5	Indeno(1,2,3-cd)pyrene	**8.6**	6.9	
53-70-3	Dibenz(a,h)anthracene	ND	6.9	
191-24-2	Benzo(g,h,i)perylene	**8.7**	6.9	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	73	32 - 102
p-Terphenyl-d14 (SS2)	72	41 - 106

VT Urban Soils

MATRIX SPIKE (MS) RECOVERY

Sample ID: AB58285

PARAMETER	SPIKE ADDED ug/Kg	SAMPLE CONCENTRATION ug/Kg	MS CONCENTRATION ug/Kg	MS % REC	QC LIMITS (% REC)
1-Methylnapthalene	145	ND	104	72	49 - 99
2-Methylnapthalene	145	ND	108	74	43 - 101
Acenaphthene	145	ND	113	78	31 - 119
Acenaphthylene	145	ND	111	76	32 - 116
Anthracene	145	ND	118	81	17 - 151
Benzo(a)anthracene	145	ND	138	95	18 - 136
Benzo(a)pyrene	145	ND	129	89	26 - 115
Benzo(b)fluoranthene	145	ND	155	107	13 - 144
Benzo(g,h,i)perylene	145	ND	102	70	21 - 137
Benzo(k)fluoranthene	145	ND	139	96	27 - 139
Chrysene	145	ND	118	81	20 - 130
Dibenz(a,h)anthracene	145	ND	108	74	24 - 137
Fluoranthene	145	ND	116	80	17 - 149
Fluorene	145	ND	112	77	34 - 121
Indeno(1,2,3-cd)pyrene	145	ND	103	71	18 - 148
Naphthalene	145	ND	109	75	22 - 112
Phenanthrene	145	ND	120	83	18 - 134
Pyrene	145	ND	110	76	19 - 133

VT Urban Soils

Laboratory Duplicate Results

Sample ID: AB58285

PARAMETER	SAMPLE RESULT ug/Kg	SAMPLE DUPLICATE RESULT ug/Kg	PRECISION RPD %	QC LIMITS
1-Methylnapthalene	ND	ND	NC	40
2-Methylnapthalene	ND	ND	NC	40
Acenaphthene	ND	ND	NC	40
Acenaphthylene	ND	ND	NC	40
Anthracene	ND	ND	NC	40
Benzo(a)anthracene	ND	ND	NC	40
Benzo(a)pyrene	ND	ND	NC	40
Benzo(b)fluoranthene	ND	ND	NC	40
Benzo(g,h,i)perylene	ND	ND	NC	40
Benzo(k)fluoranthene	ND	ND	NC	40
Chrysene	ND	ND	NC	40
Dibenz(a,h)anthracene	ND	ND	NC	40
Fluoranthene	ND	ND	NC	40
Fluorene	ND	ND	NC	40
Indeno(1,2,3-cd)pyrene	ND	ND	NC	40
Naphthalene	ND	ND	NC	40
Phenanthrene	ND	ND	NC	40
Pyrene	ND	ND	NC	40

VT Urban Soils

Laboratory Fortified Blank (LFB) Results

PARAMETER	LFB AMOUNT SPIKED ppb	LFB RESULT ppb	LFB RECOVERY %	QC LIMITS %
1-Methylnapthalene	131.5	98.9	75	41 - 117
2-Methylnapthalene	131.5	101	77	35 - 120
Acenaphthene	131.5	114	87	40 - 110
Acenaphthylene	131.5	112	85	41 - 108
Anthracene	131.5	114	87	46 - 122
Benzo(a)anthracene	131.5	140	106	49 - 120
Benzo(a)pyrene	131.5	136	103	44 - 124
Benzo(b)fluoranthene	131.5	149	113	45 - 123
Benzo(g,h,i)perylene	131.5	123	94	48 - 120
Benzo(k)fluoranthene	131.5	139	106	40 - 127
Chrysene	131.5	124	94	44 - 117
Dibenz(a,h)anthracene	131.5	125	95	49 - 124
Fluoranthene	131.5	124	94	47 - 124
Fluorene	131.5	117	89	42 - 112
Indeno(1,2,3-cd)pyrene	131.5	123	94	48 - 121
Naphthalene	131.5	107	81	38 - 104
Phenanthrene	131.5	130	99	41 - 116
Pyrene	131.5	119	91	43 - 117

Comments:

Samples in Batch: AB58281, AB58282, AB58283, AB58284, AB58285, AB58286, AB58287, AB58288, AB58289, AB58290, AB58291, AB58292

ENVIRONMENTAL PROTECTION AGENCY

REGION 1

CHAIN OF CUSTODY RECORD

PROJ. NO.: 150900 < 11 12

PROJECT NAME: Soil Background Study

SAMPLERS: (Signature) VT DEC

STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS	PAHs	Arsenic	Lead				REMARKS
													Pg 1 of 2
	8/31	10 am	X		E-5	2	X	X	X				
	8/31	11:30	X		D-6	2	X	X	X				
	8/31	1:30	X		C-6	2	X	X	X				* SEE REPORTING LIMITS
	8/31	0800	X		A-7	2	X	X	X				ON FORM K ATTACHED.
	8/31	1240	X		A-8	2	X	X	X				
	8/31	1330	X		A-9	2	X	X	X				
	8/31	0900	X		B-7	2	X	X	X				
	8/31	1230	X		B-8	2	X	X	X				
	8/31	1440	X		B-9	2	X	X	X				
	9/1	1230	X		C-4	2	X	X	X				
	9/1		X		DUP-3	2	X	X	X				
	9/1	3:00			E-3	2	X	X	X				
	9/1				DUP-5	2	X	X	X				
	9/2	815	X		A-2	2	X	X	X				
	9/2	1015	X		B-1	2	X	X	X				

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
[signature]	9/8/15 0900				
Relinquished by: (Signature) FEDEX # 774453514040	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature) [signature]	Date / Time 9/9/15 10:30	Remarks	

Distribution: Original Accompanies Shipment; Copy to Coordinator Field Files

15090011 $PAHS
15090011 $METMS_PE

1- 19381

United States Environmental Protection Agency
Office of Environmental Measurement & Evaluation
11 Technology Drive
North Chelmsford, MA 01863-2431

Laboratory Report

September 17, 2015

Jim Byrne - Mail Code OSRR07-2
US EPA New England R1

Project Number: 15090012
Project: VT Urban Soils
Analysis: PAHs in Soil - SIM
EPA Chemist: Dan Boudreau

Date Samples Received by the Laboratory: 09/09/2015

Analytical Procedure:

All samples were received and logged in by the laboratory according to the USEPA New England Laboratory SOP for Sample Log-in.

Sample preparation and analysis was done following the EPA Region I SOP, EIASOP-PAHSOLL6.

Samples were analyzed by a quadrapole GC/MS operating in theselected ion monitoring (SIM) mode. The extraction and analysis SOPs are based on SW-846 methods 3545A, 3630C,8270C, and EIASOP-BNAGCMS9.

Data were reviewed in accordance with the internal verification procedures described in the EPA New England Quality Manual for NERL.

Results relate only to the items tested or to the samples as received by the Laboratory. This analytical report shall not be reproduced except in full, without written approval of the laboratory.

If you have any questions please call me at 617-918-8340 .

Sincerely,

Qualifiers:

RL = Reporting limit
ND = Not Detected above Reporting limit
NA = Not Applicable due to high sample dilutions or sample interferences
NC = Not calculated since analyte concentration is ND.
J = Estimated value
J1 = Estimated value due to MS recovery outside accceptance criteria
J2 = Estimated value due to LFB result outside acceptance criteria
J3 = Estimated value due to RPD result outside acceptance criteria
J4 = Estimated value due to LCS result outside acceptance criteria
E = Estimated value exceeds the calibration range
L = Estimated value is below the calibration range
B = Analyte is associated with the lab blank or trip blank contamination. Values are qualified when the observed concentration of the contamination in the sample extract is less than 10 times the concentration in the blank.
R = No recovery was calculated since the analyte concentration is greater than four times the spike level.
P = The confirmation value exceeded 35% difference and is less than 100%. The lower value is reported.
C = The identification has been confirmed by GC/MS.
A = Suspected Aldol condensation product.
N = Tentatively identified compound.

VT Urban Soils

PAHs in Soil - SIM

Client Sample ID:	DUP-5	Lab Sample ID:	AB58293
Date of Collection:	9/01/2015	Matrix:	Soil
Date of Preparation:	9/10/2015	Amount Prepared:	N/A
Date of Analysis:	9/15/2015	Percent Solids:	97%
Dry Weight Prepared:	29.063 grams	Extract Dilution:	1
Wet Weight Prepared:	30.003 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	ND	6.9	
91-57-6	2-Methylnapthalene	ND	6.9	
90-12-0	1-Methylnapthalene	ND	6.9	
208-96-8	Acenaphthylene	ND	6.9	
83-32-9	Acenaphthene	ND	6.9	
86-73-7	Fluorene	ND	6.9	
85-01-8	Phenanthrene	ND	6.9	
120-12-7	Anthracene	ND	6.9	
206-44-0	Fluoranthene	**16**	6.9	
129-00-0	Pyrene	**16**	6.9	
56-55-3	Benzo(a)anthracene	**11**	6.9	
218-01-9	Chrysene	**13**	6.9	
205-99-2	Benzo(b)fluoranthene	**18**	6.9	
207-08-9	Benzo(k)fluoranthene	**13**	6.9	
50-32-8	Benzo(a)pyrene	**11**	6.9	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	6.9	
53-70-3	Dibenz(a,h)anthracene	ND	6.9	
191-24-2	Benzo(g,h,i)perylene	ND	6.9	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	72	32 - 102
p-Terphenyl-d14 (SS2)	68	41 - 106

VT Urban Soils

PAHs in Soil - SIM

Client Sample ID:	A-2	Lab Sample ID:	AB58294
Date of Collection:	9/02/2015	Matrix:	Soil
Date of Preparation:	9/10/2015	Amount Prepared:	N/A
Date of Analysis:	9/15/2015	Percent Solids:	91%
Dry Weight Prepared:	27.496 grams	Extract Dilution:	1
Wet Weight Prepared:	30.175 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	ND	7.3	
91-57-6	2-Methylnapthalene	ND	7.3	
90-12-0	1-Methylnapthalene	ND	7.3	
208-96-8	Acenaphthylene	ND	7.3	
83-32-9	Acenaphthene	ND	7.3	
86-73-7	Fluorene	ND	7.3	
85-01-8	Phenanthrene	**23**	7.3	
120-12-7	Anthracene	ND	7.3	
206-44-0	Fluoranthene	**44**	7.3	
129-00-0	Pyrene	**32**	7.3	
56-55-3	Benzo(a)anthracene	**20**	7.3	
218-01-9	Chrysene	**33**	7.3	
205-99-2	Benzo(b)fluoranthene	**38**	7.3	
207-08-9	Benzo(k)fluoranthene	**31**	7.3	
50-32-8	Benzo(a)pyrene	**24**	7.3	
193-39-5	Indeno(1,2,3-cd)pyrene	**12**	7.3	
53-70-3	Dibenz(a,h)anthracene	ND	7.3	
191-24-2	Benzo(g,h,i)perylene	**11**	7.3	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	70	32 - 102
p-Terphenyl-d14 (SS2)	60	41 - 106

VT Urban Soils

PAHs in Soil - SIM

Client Sample ID:	B-1	Lab Sample ID:	AB58295
Date of Collection:	9/02/2015	Matrix:	Soil
Date of Preparation:	9/10/2015	Amount Prepared:	N/A
Date of Analysis:	9/15/2015	Percent Solids:	85%
Dry Weight Prepared:	25.616 grams	Extract Dilution:	1
Wet Weight Prepared:	30.039 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	ND	7.8	
91-57-6	2-Methylnapthalene	ND	7.8	
90-12-0	1-Methylnapthalene	ND	7.8	
208-96-8	Acenaphthylene	ND	7.8	
83-32-9	Acenaphthene	ND	7.8	
86-73-7	Fluorene	ND	7.8	
85-01-8	Phenanthrene	**12**	7.8	
120-12-7	Anthracene	ND	7.8	
206-44-0	Fluoranthene	**22**	7.8	
129-00-0	Pyrene	**19**	7.8	
56-55-3	Benzo(a)anthracene	**15**	7.8	
218-01-9	Chrysene	**22**	7.8	
205-99-2	Benzo(b)fluoranthene	**30**	7.8	
207-08-9	Benzo(k)fluoranthene	**19**	7.8	
50-32-8	Benzo(a)pyrene	**16**	7.8	
193-39-5	Indeno(1,2,3-cd)pyrene	**9.1**	7.8	
53-70-3	Dibenz(a,h)anthracene	ND	7.8	
191-24-2	Benzo(g,h,i)perylene	**9.6**	7.8	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	70	32 - 102
p-Terphenyl-d14 (SS2)	60	41 - 106

VT Urban Soils

PAHs in Soil - SIM

Client Sample ID:	C-1	Lab Sample ID:	AB58296
Date of Collection:	9/02/2015	Matrix:	Soil
Date of Preparation:	9/10/2015	Amount Prepared:	N/A
Date of Analysis:	9/15/2015	Percent Solids:	76%
Dry Weight Prepared:	23.006 grams	Extract Dilution:	1
Wet Weight Prepared:	30.142 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	ND	8.7	
91-57-6	2-Methylnapthalene	ND	8.7	
90-12-0	1-Methylnapthalene	ND	8.7	
208-96-8	Acenaphthylene	ND	8.7	
83-32-9	Acenaphthene	ND	8.7	
86-73-7	Fluorene	ND	8.7	
85-01-8	Phenanthrene	ND	8.7	
120-12-7	Anthracene	ND	8.7	
206-44-0	Fluoranthene	ND	8.7	
129-00-0	Pyrene	ND	8.7	
56-55-3	Benzo(a)anthracene	ND	8.7	
218-01-9	Chrysene	ND	8.7	
205-99-2	Benzo(b)fluoranthene	ND	8.7	
207-08-9	Benzo(k)fluoranthene	ND	8.7	
50-32-8	Benzo(a)pyrene	ND	8.7	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	8.7	
53-70-3	Dibenz(a,h)anthracene	ND	8.7	
191-24-2	Benzo(g,h,i)perylene	ND	8.7	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	64	32 - 102
p-Terphenyl-d14 (SS2)	50	41 - 106

VT Urban Soils

PAHs in Soil - SIM

Client Sample ID:	D-1	Lab Sample ID:	AB58297
Date of Collection:	9/02/2015	Matrix:	Soil
Date of Preparation:	9/10/2015	Amount Prepared:	N/A
Date of Analysis:	9/15/2015	Percent Solids:	89%
Dry Weight Prepared:	26.951 grams	Extract Dilution:	1
Wet Weight Prepared:	30.328 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	ND	7.4	
91-57-6	2-Methylnapthalene	ND	7.4	
90-12-0	1-Methylnapthalene	ND	7.4	
208-96-8	Acenaphthylene	ND	7.4	
83-32-9	Acenaphthene	ND	7.4	
86-73-7	Fluorene	ND	7.4	
85-01-8	Phenanthrene	**13**	7.4	
120-12-7	Anthracene	ND	7.4	
206-44-0	Fluoranthene	**27**	7.4	
129-00-0	Pyrene	**22**	7.4	
56-55-3	Benzo(a)anthracene	**14**	7.4	
218-01-9	Chrysene	**20**	7.4	
205-99-2	Benzo(b)fluoranthene	**25**	7.4	
207-08-9	Benzo(k)fluoranthene	**17**	7.4	
50-32-8	Benzo(a)pyrene	**17**	7.4	
193-39-5	Indeno(1,2,3-cd)pyrene	**7.8**	7.4	
53-70-3	Dibenz(a,h)anthracene	ND	7.4	
191-24-2	Benzo(g,h,i)perylene	**8.7**	7.4	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	72	32 - 102
p-Terphenyl-d14 (SS2)	62	41 - 106

VT Urban Soils

PAHs in Soil - SIM

Client Sample ID:	D-3	Lab Sample ID:	AB58298
Date of Collection:	9/03/2015	Matrix:	Soil
Date of Preparation:	9/10/2015	Amount Prepared:	N/A
Date of Analysis:	9/15/2015	Percent Solids:	70%
Dry Weight Prepared:	21.171 grams	Extract Dilution:	1
Wet Weight Prepared:	30.394 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	ND	9.4	
91-57-6	2-Methylnapthalene	ND	9.4	
90-12-0	1-Methylnapthalene	ND	9.4	
208-96-8	Acenaphthylene	ND	9.4	
83-32-9	Acenaphthene	ND	9.4	
86-73-7	Fluorene	ND	9.4	
85-01-8	Phenanthrene	ND	9.4	
120-12-7	Anthracene	ND	9.4	
206-44-0	Fluoranthene	ND	9.4	
129-00-0	Pyrene	ND	9.4	
56-55-3	Benzo(a)anthracene	ND	9.4	
218-01-9	Chrysene	ND	9.4	
205-99-2	Benzo(b)fluoranthene	ND	9.4	
207-08-9	Benzo(k)fluoranthene	ND	9.4	
50-32-8	Benzo(a)pyrene	ND	9.4	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	9.4	
53-70-3	Dibenz(a,h)anthracene	ND	9.4	
191-24-2	Benzo(g,h,i)perylene	ND	9.4	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	65	32 - 102
p-Terphenyl-d14 (SS2)	45	41 - 106

VT Urban Soils

PAHs in Soil - SIM

Client Sample ID:	B-3	Lab Sample ID:	AB58299
Date of Collection:	9/03/2015	Matrix:	Soil
Date of Preparation:	9/10/2015	Amount Prepared:	N/A
Date of Analysis:	9/16/2015	Percent Solids:	86%
Dry Weight Prepared:	26.132 grams	Extract Dilution:	1
Wet Weight Prepared:	30.223 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	ND	7.7	
91-57-6	2-Methylnapthalene	ND	7.7	
90-12-0	1-Methylnapthalene	ND	7.7	
208-96-8	Acenaphthylene	ND	7.7	
83-32-9	Acenaphthene	ND	7.7	
86-73-7	Fluorene	ND	7.7	
85-01-8	Phenanthrene	ND	7.7	
120-12-7	Anthracene	ND	7.7	
206-44-0	Fluoranthene	ND	7.7	
129-00-0	Pyrene	ND	7.7	
56-55-3	Benzo(a)anthracene	ND	7.7	
218-01-9	Chrysene	ND	7.7	
205-99-2	Benzo(b)fluoranthene	ND	7.7	
207-08-9	Benzo(k)fluoranthene	ND	7.7	
50-32-8	Benzo(a)pyrene	ND	7.7	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	7.7	
53-70-3	Dibenz(a,h)anthracene	ND	7.7	
191-24-2	Benzo(g,h,i)perylene	ND	7.7	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	82	32 - 102
p-Terphenyl-d14 (SS2)	72	41 - 106

VT Urban Soils

PAHs in Soil - SIM

Client Sample ID:	DUP-2	Lab Sample ID:	AB58300
Date of Collection:	9/03/2015	Matrix:	Soil
Date of Preparation:	9/10/2015	Amount Prepared:	N/A
Date of Analysis:	9/16/2015	Percent Solids:	86%
Dry Weight Prepared:	25.915 grams	Extract Dilution:	1
Wet Weight Prepared:	30.072 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	ND	7.7	
91-57-6	2-Methylnapthalene	ND	7.7	
90-12-0	1-Methylnapthalene	ND	7.7	
208-96-8	Acenaphthylene	ND	7.7	
83-32-9	Acenaphthene	ND	7.7	
86-73-7	Fluorene	ND	7.7	
85-01-8	Phenanthrene	ND	7.7	
120-12-7	Anthracene	ND	7.7	
206-44-0	Fluoranthene	**10**	7.7	
129-00-0	Pyrene	**8.1**	7.7	
56-55-3	Benzo(a)anthracene	ND	7.7	
218-01-9	Chrysene	**8.0**	7.7	
205-99-2	Benzo(b)fluoranthene	**8.7**	7.7	
207-08-9	Benzo(k)fluoranthene	**8.0**	7.7	
50-32-8	Benzo(a)pyrene	ND	7.7	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	7.7	
53-70-3	Dibenz(a,h)anthracene	ND	7.7	
191-24-2	Benzo(g,h,i)perylene	ND	7.7	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	88	32 - 102
p-Terphenyl-d14 (SS2)	75	41 - 106

VT Urban Soils

PAHs in Soil - SIM

Client Sample ID:	H-5	Lab Sample ID:	AB58301
Date of Collection:	9/04/2015	Matrix:	Soil
Date of Preparation:	9/10/2015	Amount Prepared:	N/A
Date of Analysis:	9/16/2015	Percent Solids:	80%
Dry Weight Prepared:	24.180 grams	Extract Dilution:	1
Wet Weight Prepared:	30.395 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	ND	8.3	
91-57-6	2-Methylnapthalene	ND	8.3	
90-12-0	1-Methylnapthalene	ND	8.3	
208-96-8	Acenaphthylene	**13**	8.3	
83-32-9	Acenaphthene	ND	8.3	
86-73-7	Fluorene	ND	8.3	
85-01-8	Phenanthrene	**68**	8.3	
120-12-7	Anthracene	ND	8.3	
206-44-0	Fluoranthene	**120**	8.3	
129-00-0	Pyrene	**110**	8.3	
56-55-3	Benzo(a)anthracene	**49**	8.3	
218-01-9	Chrysene	**77**	8.3	
205-99-2	Benzo(b)fluoranthene	**79**	8.3	
207-08-9	Benzo(k)fluoranthene	**71**	8.3	
50-32-8	Benzo(a)pyrene	**61**	8.3	
193-39-5	Indeno(1,2,3-cd)pyrene	**28**	8.3	
53-70-3	Dibenz(a,h)anthracene	ND	8.3	
191-24-2	Benzo(g,h,i)perylene	**28**	8.3	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	80	32 - 102
p-Terphenyl-d14 (SS2)	65	41 - 106

VT Urban Soils

PAHs in Soil - SIM

Client Sample ID:	I-4	Lab Sample ID:	AB58302
Date of Collection:	9/04/2015	Matrix:	Soil
Date of Preparation:	9/10/2015	Amount Prepared:	N/A
Date of Analysis:	9/16/2015	Percent Solids:	90%
Dry Weight Prepared:	26.762 grams	Extract Dilution:	1
Wet Weight Prepared:	29.715 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	ND	7.5	
91-57-6	2-Methylnapthalene	ND	7.5	
90-12-0	1-Methylnapthalene	ND	7.5	
208-96-8	Acenaphthylene	ND	7.5	
83-32-9	Acenaphthene	ND	7.5	
86-73-7	Fluorene	ND	7.5	
85-01-8	Phenanthrene	**9.5**	7.5	
120-12-7	Anthracene	ND	7.5	
206-44-0	Fluoranthene	**24**	7.5	
129-00-0	Pyrene	**20**	7.5	
56-55-3	Benzo(a)anthracene	**15**	7.5	
218-01-9	Chrysene	**22**	7.5	
205-99-2	Benzo(b)fluoranthene	**29**	7.5	
207-08-9	Benzo(k)fluoranthene	**24**	7.5	
50-32-8	Benzo(a)pyrene	**19**	7.5	
193-39-5	Indeno(1,2,3-cd)pyrene	**10**	7.5	
53-70-3	Dibenz(a,h)anthracene	ND	7.5	
191-24-2	Benzo(g,h,i)perylene	**9.1**	7.5	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	78	32 - 102
p-Terphenyl-d14 (SS2)	68	41 - 106

VT Urban Soils

Laboratory Blank (PAHs)

Client Sample ID:	N/A	Lab Sample ID:	N/A
Date of Collection:	N/A	Matrix:	Soil
Date of Preparation:	9/10/2015	Amount Prepared:	N/A
Date of Analysis:	9/15/2015	Percent Solids:	100%
Dry Weight Prepared:	30.404 grams	Extract Dilution:	1
Wet Weight Prepared:	30.398 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	ND	6.1	
91-57-6	2-Methylnapthalene	ND	6.1	
90-12-0	1-Methylnapthalene	ND	6.1	
208-96-8	Acenaphthylene	ND	6.1	
83-32-9	Acenaphthene	ND	6.1	
86-73-7	Fluorene	ND	6.1	
85-01-8	Phenanthrene	ND	6.1	
120-12-7	Anthracene	ND	6.1	
206-44-0	Fluoranthene	ND	6.1	
129-00-0	Pyrene	ND	6.1	
56-55-3	Benzo(a)anthracene	ND	6.1	
218-01-9	Chrysene	ND	6.1	
205-99-2	Benzo(b)fluoranthene	ND	6.1	
207-08-9	Benzo(k)fluoranthene	ND	6.1	
50-32-8	Benzo(a)pyrene	ND	6.1	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	6.1	
53-70-3	Dibenz(a,h)anthracene	ND	6.1	
191-24-2	Benzo(g,h,i)perylene	ND	6.1	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	83	32 - 102
p-Terphenyl-d14 (SS2)	92	41 - 106

VT Urban Soils

PAHs in Soil - SIM

Client Sample ID:	J-4	Lab Sample ID:	AB58303
Date of Collection:	9/04/2015	Matrix:	Soil
Date of Preparation:	9/10/2015	Amount Prepared:	N/A
Date of Analysis:	9/16/2015	Percent Solids:	88%
Dry Weight Prepared:	26.616 grams	Extract Dilution:	1
Wet Weight Prepared:	30.103 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	ND	7.5	
91-57-6	2-Methylnapthalene	ND	7.5	
90-12-0	1-Methylnapthalene	ND	7.5	
208-96-8	Acenaphthylene	ND	7.5	
83-32-9	Acenaphthene	ND	7.5	
86-73-7	Fluorene	ND	7.5	
85-01-8	Phenanthrene	ND	7.5	
120-12-7	Anthracene	ND	7.5	
206-44-0	Fluoranthene	**14**	7.5	
129-00-0	Pyrene	**12**	7.5	
56-55-3	Benzo(a)anthracene	**8.8**	7.5	
218-01-9	Chrysene	**11**	7.5	
205-99-2	Benzo(b)fluoranthene	**12**	7.5	
207-08-9	Benzo(k)fluoranthene	**11**	7.5	
50-32-8	Benzo(a)pyrene	**9.6**	7.5	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	7.5	
53-70-3	Dibenz(a,h)anthracene	ND	7.5	
191-24-2	Benzo(g,h,i)perylene	ND	7.5	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	78	32 - 102
p-Terphenyl-d14 (SS2)	72	41 - 106

VT Urban Soils

PAHs in Soil - SIM

Client Sample ID:	DUP-9	Lab Sample ID:	AB58304
Date of Collection:	9/04/2015	Matrix:	Soil
Date of Preparation:	9/10/2015	Amount Prepared:	N/A
Date of Analysis:	9/16/2015	Percent Solids:	90%
Dry Weight Prepared:	27.725 grams	Extract Dilution:	1
Wet Weight Prepared:	30.927 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	ND	7.2	
91-57-6	2-Methylnapthalene	ND	7.2	
90-12-0	1-Methylnapthalene	ND	7.2	
208-96-8	Acenaphthylene	ND	7.2	
83-32-9	Acenaphthene	ND	7.2	
86-73-7	Fluorene	ND	7.2	
85-01-8	Phenanthrene	**9.2**	7.2	
120-12-7	Anthracene	ND	7.2	
206-44-0	Fluoranthene	**25**	7.2	
129-00-0	Pyrene	**21**	7.2	
56-55-3	Benzo(a)anthracene	**15**	7.2	
218-01-9	Chrysene	**21**	7.2	
205-99-2	Benzo(b)fluoranthene	**28**	7.2	
207-08-9	Benzo(k)fluoranthene	**23**	7.2	
50-32-8	Benzo(a)pyrene	**18**	7.2	
193-39-5	Indeno(1,2,3-cd)pyrene	**9.9**	7.2	
53-70-3	Dibenz(a,h)anthracene	ND	7.2	
191-24-2	Benzo(g,h,i)perylene	**9.0**	7.2	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	72	32 - 102
p-Terphenyl-d14 (SS2)	68	41 - 106

VT Urban Soils

MATRIX SPIKE (MS) RECOVERY

Sample ID: AB58302

PARAMETER	SPIKE ADDED ug/Kg	SAMPLE CONCENTRATION ug/Kg	MS CONCENTRATION ug/Kg	MS % REC	QC LIMITS (% REC)
1-Methylnapthalene	151	ND	94.7	63	49 - 99
2-Methylnapthalene	151	ND	105	69	43 - 101
Acenaphthene	151	ND	110	73	31 - 119
Acenaphthylene	151	ND	110	73	32 - 116
Anthracene	151	ND	114	75	17 - 151
Benzo(a)anthracene	151	15.0	137	81	18 - 136
Benzo(a)pyrene	151	19.0	132	75	26 - 115
Benzo(b)fluoranthene	151	29.0	166	90	13 - 144
Benzo(g,h,i)perylene	151	9.1	70.7	41	21 - 137
Benzo(k)fluoranthene	151	24.0	166	94	27 - 139
Chrysene	151	22.0	138	77	20 - 130
Dibenz(a,h)anthracene	151	ND	70.3	46	24 - 137
Fluoranthene	151	24.0	133	72	17 - 149
Fluorene	151	ND	111	73	34 - 121
Indeno(1,2,3-cd)pyrene	151	10.0	77.0	44	18 - 148
Naphthalene	151	ND	107	71	22 - 112
Phenanthrene	151	9.5	131	80	18 - 134
Pyrene	151	20.0	122	67	19 - 133

VT Urban Soils

Laboratory Duplicate Results

Sample ID: AB58302

PARAMETER	SAMPLE RESULT ug/Kg	SAMPLE DUPLICATE RESULT ug/Kg	PRECISION RPD %	QC LIMITS
1-Methylnapthalene	ND	ND	NC	40
2-Methylnapthalene	ND	ND	NC	40
Acenaphthene	ND	ND	NC	40
Acenaphthylene	ND	ND	NC	40
Anthracene	ND	ND	NC	40
Benzo(a)anthracene	15.0	15.0	0.00	40
Benzo(a)pyrene	19.0	18.4	3.21	40
Benzo(b)fluoranthene	29.0	28.0	3.51	40
Benzo(g,h,i)perylene	9.1	9.77	7.10	40
Benzo(k)fluoranthene	24.0	24.5	2.06	40
Chrysene	22.0	21.8	0.913	40
Dibenz(a,h)anthracene	ND	ND	NC	40
Fluoranthene	24.0	25.1	4.48	40
Fluorene	ND	ND	NC	40
Indeno(1,2,3-cd)pyrene	10.0	10.6	5.83	40
Naphthalene	ND	ND	NC	40
Phenanthrene	9.5	10.7	11.9	40
Pyrene	20.0	21.5	7.23	40

VT Urban Soils

Laboratory Fortified Blank (LFB) Results

PARAMETER	LFB AMOUNT SPIKED ppb	LFB RESULT ppb	LFB RECOVERY %	QC LIMITS %
1-Methylnapthalene	132	103	78	41 - 117
2-Methylnapthalene	132	104	79	35 - 120
Acenaphthene	132	110	83	40 - 110
Acenaphthylene	132	107	81	41 - 108
Anthracene	132	120	91	46 - 122
Benzo(a)anthracene	132	125	95	49 - 120
Benzo(a)pyrene	132	124	94	44 - 124
Benzo(b)fluoranthene	132	137	104	45 - 123
Benzo(g,h,i)perylene	132	120	91	48 - 120
Benzo(k)fluoranthene	132	132	100	40 - 127
Chrysene	132	122	92	44 - 117
Dibenz(a,h)anthracene	132	111	84	49 - 124
Fluoranthene	132	116	88	47 - 124
Fluorene	132	112	85	42 - 112
Indeno(1,2,3-cd)pyrene	132	117	89	48 - 121
Naphthalene	132	104	79	38 - 104
Phenanthrene	132	118	89	41 - 116
Pyrene	132	112	85	43 - 117

Comments:

Samples in Batch: AB58293, AB58294, AB58295, AB58296, AB58297, AB58298, AB58299, AB58300, AB58301, AB58302, AB58303, AB58304

15090012 $PAHS
15090012 $METMS_PE

ENVIRONMENTAL PROTECTION AGENCY

REGION 1

CHAIN OF CUSTODY RECORD

PROJ. NO.: 150900 11 12

PROJECT NAME: Soil Background Study

SAMPLERS: (Signature) VT DEC

STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS	PAHs	Arsenic	Lead				REMARKS
													Pg 1 of 2
	8/31	10 pm	X		E-5	2	X	X	X				
	8/31	11:30	X		D-6	2	X	X	X				
	8/31	1:30	X		C-6	2	X	X	X				* SEE REPORTING LIMITS
	8/31	0800	X		A-7	2	X	X	X				ON FORM K ATTACHED.
	8/31	1240	X		A-8	2	X	X	X				
	8/31	1330	X		A-9	2	X	X	X				
	8/31	0900	X		B-7	2	X	X	X				
	8/31	1230	X		B-8	2	X	X	X				
	8/31	1440	X		B-9	2	X	X	X				
	9/1	1230	X		C-4	2	X	X	X				
	9/1		X		DUP-3	2	X	X	X				
	9/1	3:00			E-3	2	X	X	X				
	9/1				DUP-5	2	X	X	X				
	9/2	815	X		A-2	2	X	X	X				
	9/2	1015	X		B-1	2	X	X	X				

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
[signature]	9/8/15 0900				
Relinquished by: (Signature) FEDEX # 774453514040	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature) [signature]	Date / Time 9/9/15 10:30	Remarks	

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ENVIRONMENTAL PROTECTION AGENCY

REGION 1

CHAIN OF CUSTODY RECORD

PROJ. NO.: 15090012

PROJECT NAME: Soil Background Study

SAMPLERS: (Signature) VT DEC

STA. NO.	DATE	TIME 1200	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS	PAHs	Arsenic	Lead				REMARKS pg 2 of 2
	9/2	1000	X		C-1	2	X	X	X				
	9/2	2:00	X		D-1	2	X	X	X				
	9/3	11:00	X		D-3	2	X	X	X				
	9/3	1:00	X		B-3	2	X	X	X				
	9/3		X		DUP-2	2	X	X	X				
	9/4	8:00	X		H-5	2	X	X	X				
	9/4	1000	X		I-4	2	X	X	X				
	9/4	1100	X		J-4	2	X	X	X				
	9/4		X		DUP-9	2	X	X	X				

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
[signature]	9/8/15 0900				
Relinquished by: (Signature) FEDEX #7744 5351 4040	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature) ESAT [signature]	Date / Time 9/9/15 10:30	Remarks	

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United States Environmental Protection Agency
Office of Environmental Measurement & Evaluation
11 Technology Drive
North Chelmsford, MA 01863-2431

Laboratory Report

September 17, 2015

Jim Byrne - Mail Code OSRR07-2
US EPA New England R1

Project Number: 15090018
Project: VT Urban Soils
Analysis: PAHs in Soil - SIM
EPA Chemist: Dan Boudreau

Date Samples Received by the Laboratory: 09/15/2015

Analytical Procedure:

All samples were received and logged in by the laboratory according to the USEPA New England Laboratory SOP for Sample Log-in.

Sample preparation and analysis was done following the EPA Region I SOP, EIASOP-PAHSOLL6.

Samples were analyzed by a quadrapole GC/MS operating in theselected ion monitoring (SIM) mode. The extraction and analysis SOPs are based on SW-846 methods 3545A, 3630C,8270C, and EIASOP-BNAGCMS9.

Data were reviewed in accordance with the internal verification procedures described in the EPA New England Quality Manual for NERL.

Results relate only to the items tested or to the samples as received by the Laboratory. This analytical report shall not be reproduced except in full, without written approval of the laboratory.

If you have any questions please call me at 617-918-8340 .

Sincerely,

Qualifiers:

RL = Reporting limit
ND = Not Detected above Reporting limit
NA = Not Applicable due to high sample dilutions or sample interferences
NC = Not calculated since analyte concentration is ND.
J = Estimated value
J1 = Estimated value due to MS recovery outside accceptance criteria
J2 = Estimated value due to LFB result outside acceptance criteria
J3 = Estimated value due to RPD result outside acceptance criteria
J4 = Estimated value due to LCS result outside acceptance criteria
E = Estimated value exceeds the calibration range
L = Estimated value is below the calibration range
B = Analyte is associated with the lab blank or trip blank contamination. Values are qualified when the observed concentration of the contamination in the sample extract is less than 10 times the concentration in the blank.
R = No recovery was calculated since the analyte concentration is greater than four times the spike level.
P = The confirmation value exceeded 35% difference and is less than 100%. The lower value is reported.
C = The identification has been confirmed by GC/MS.
A = Suspected Aldol condensation product.
N = Tentatively identified compound.

VT Urban Soils

PAHs in Soil - SIM

Client Sample ID:	K-3	Lab Sample ID:	AB58341
Date of Collection:	9/08/2015	Matrix:	Soil
Date of Preparation:	9/16/2015	Amount Prepared:	N/A
Date of Analysis:	9/16/2015	Percent Solids:	65%
Dry Weight Prepared:	19.844 grams	Extract Dilution:	1
Wet Weight Prepared:	30.592 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	ND	10	
91-57-6	2-Methylnapthalene	ND	10	
90-12-0	1-Methylnapthalene	ND	10	
208-96-8	Acenaphthylene	ND	10	
83-32-9	Acenaphthene	ND	10	
86-73-7	Fluorene	ND	10	
85-01-8	Phenanthrene	**16**	10	
120-12-7	Anthracene	ND	10	
206-44-0	Fluoranthene	**28**	10	
129-00-0	Pyrene	**23**	10	
56-55-3	Benzo(a)anthracene	**14**	10	
218-01-9	Chrysene	**20**	10	
205-99-2	Benzo(b)fluoranthene	**23**	10	
207-08-9	Benzo(k)fluoranthene	**16**	10	
50-32-8	Benzo(a)pyrene	**16**	10	
193-39-5	Indeno(1,2,3-cd)pyrene	**13**	10	
53-70-3	Dibenz(a,h)anthracene	ND	10	
191-24-2	Benzo(g,h,i)perylene	**14**	10	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	80	32 - 102
p-Terphenyl-d14 (SS2)	72	41 - 106

VT Urban Soils

PAHs in Soil - SIM

Client Sample ID:	I-3	Lab Sample ID:	AB58342
Date of Collection:	9/08/2015	Matrix:	Soil
Date of Preparation:	9/16/2015	Amount Prepared:	N/A
Date of Analysis:	9/16/2015	Percent Solids:	93%
Dry Weight Prepared:	27.922 grams	Extract Dilution:	1
Wet Weight Prepared:	30.037 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	**11**	7.2	
91-57-6	2-Methylnapthalene	ND	7.2	
90-12-0	1-Methylnapthalene	ND	7.2	
208-96-8	Acenaphthylene	**46**	7.2	
83-32-9	Acenaphthene	ND	7.2	
86-73-7	Fluorene	**17**	7.2	
85-01-8	Phenanthrene	**200**	7.2	
120-12-7	Anthracene	**27**	7.2	
206-44-0	Fluoranthene	**390**	7.2	
129-00-0	Pyrene	**350**	7.2	
56-55-3	Benzo(a)anthracene	**170**	7.2	
218-01-9	Chrysene	**250**	7.2	
205-99-2	Benzo(b)fluoranthene	**260**	7.2	
207-08-9	Benzo(k)fluoranthene	**240**	7.2	
50-32-8	Benzo(a)pyrene	**210**	7.2	
193-39-5	Indeno(1,2,3-cd)pyrene	**87**	7.2	
53-70-3	Dibenz(a,h)anthracene	ND	7.2	
191-24-2	Benzo(g,h,i)perylene	**96**	7.2	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	90	32 - 102
p-Terphenyl-d14 (SS2)	90	41 - 106

VT Urban Soils

Laboratory Blank (PAHs)

Client Sample ID:	N/A	Lab Sample ID:	N/A
Date of Collection:	N/A	Matrix:	Soil
Date of Preparation:	9/16/2015	Amount Prepared:	N/A
Date of Analysis:	9/16/2015	Percent Solids:	100%
Dry Weight Prepared:	30.587 grams	Extract Dilution:	1
Wet Weight Prepared:	30.556 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	ND	6.5	
91-57-6	2-Methylnapthalene	ND	6.5	
90-12-0	1-Methylnapthalene	ND	6.5	
208-96-8	Acenaphthylene	ND	6.5	
83-32-9	Acenaphthene	ND	6.5	
86-73-7	Fluorene	ND	6.5	
85-01-8	Phenanthrene	ND	6.5	
120-12-7	Anthracene	ND	6.5	
206-44-0	Fluoranthene	ND	6.5	
129-00-0	Pyrene	ND	6.5	
56-55-3	Benzo(a)anthracene	ND	6.5	
218-01-9	Chrysene	ND	6.5	
205-99-2	Benzo(b)fluoranthene	ND	6.5	
207-08-9	Benzo(k)fluoranthene	ND	6.5	
50-32-8	Benzo(a)pyrene	ND	6.5	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	6.5	
53-70-3	Dibenz(a,h)anthracene	ND	6.5	
191-24-2	Benzo(g,h,i)perylene	ND	6.5	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	82	32 - 102
p-Terphenyl-d14 (SS2)	92	41 - 106

VT Urban Soils

PAHs in Soil - SIM

Client Sample ID:	L-4	Lab Sample ID:	AB58343
Date of Collection:	9/09/2015	Matrix:	Soil
Date of Preparation:	9/16/2015	Amount Prepared:	N/A
Date of Analysis:	9/16/2015	Percent Solids:	72%
Dry Weight Prepared:	21.364 grams	Extract Dilution:	1
Wet Weight Prepared:	29.755 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	**13**	9.4	
91-57-6	2-Methylnapthalene	ND	9.4	
90-12-0	1-Methylnapthalene	ND	9.4	
208-96-8	Acenaphthylene	ND	9.4	
83-32-9	Acenaphthene	ND	9.4	
86-73-7	Fluorene	ND	9.4	
85-01-8	Phenanthrene	ND	9.4	
120-12-7	Anthracene	ND	9.4	
206-44-0	Fluoranthene	ND	9.4	
129-00-0	Pyrene	ND	9.4	
56-55-3	Benzo(a)anthracene	ND	9.4	
218-01-9	Chrysene	ND	9.4	
205-99-2	Benzo(b)fluoranthene	**9.9**	9.4	
207-08-9	Benzo(k)fluoranthene	ND	9.4	
50-32-8	Benzo(a)pyrene	ND	9.4	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	9.4	
53-70-3	Dibenz(a,h)anthracene	ND	9.4	
191-24-2	Benzo(g,h,i)perylene	ND	9.4	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	70	32 - 102
p-Terphenyl-d14 (SS2)	82	41 - 106

VT Urban Soils

PAHs in Soil - SIM

Client Sample ID:	A-6	Lab Sample ID:	AB58344
Date of Collection:	9/09/2015	Matrix:	Soil
Date of Preparation:	9/16/2015	Amount Prepared:	N/A
Date of Analysis:	9/16/2015	Percent Solids:	90%
Dry Weight Prepared:	27.683 grams	Extract Dilution:	1
Wet Weight Prepared:	30.610 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	ND	7.2	
91-57-6	2-Methylnapthalene	ND	7.2	
90-12-0	1-Methylnapthalene	ND	7.2	
208-96-8	Acenaphthylene	**8.4**	7.2	
83-32-9	Acenaphthene	ND	7.2	
86-73-7	Fluorene	ND	7.2	
85-01-8	Phenanthrene	**72**	7.2	
120-12-7	Anthracene	**16**	7.2	
206-44-0	Fluoranthene	**170**	7.2	
129-00-0	Pyrene	**130**	7.2	
56-55-3	Benzo(a)anthracene	**78**	7.2	
218-01-9	Chrysene	**84**	7.2	
205-99-2	Benzo(b)fluoranthene	**110**	7.2	
207-08-9	Benzo(k)fluoranthene	**81**	7.2	
50-32-8	Benzo(a)pyrene	**79**	7.2	
193-39-5	Indeno(1,2,3-cd)pyrene	**35**	7.2	
53-70-3	Dibenz(a,h)anthracene	ND	7.2	
191-24-2	Benzo(g,h,i)perylene	**39**	7.2	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	92	32 - 102
p-Terphenyl-d14 (SS2)	95	41 - 106

VT Urban Soils

PAHs in Soil - SIM

Client Sample ID:	DUP-1	Lab Sample ID:	AB58345
Date of Collection:	9/09/2015	Matrix:	Soil
Date of Preparation:	9/16/2015	Amount Prepared:	N/A
Date of Analysis:	9/16/2015	Percent Solids:	92%
Dry Weight Prepared:	28.037 grams	Extract Dilution:	1
Wet Weight Prepared:	30.563 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	ND	7.1	
91-57-6	2-Methylnapthalene	ND	7.1	
90-12-0	1-Methylnapthalene	ND	7.1	
208-96-8	Acenaphthylene	ND	7.1	
83-32-9	Acenaphthene	ND	7.1	
86-73-7	Fluorene	ND	7.1	
85-01-8	Phenanthrene	**33**	7.1	
120-12-7	Anthracene	**8.4**	7.1	
206-44-0	Fluoranthene	**87**	7.1	
129-00-0	Pyrene	**71**	7.1	
56-55-3	Benzo(a)anthracene	**42**	7.1	
218-01-9	Chrysene	**50**	7.1	
205-99-2	Benzo(b)fluoranthene	**64**	7.1	
207-08-9	Benzo(k)fluoranthene	**49**	7.1	
50-32-8	Benzo(a)pyrene	**47**	7.1	
193-39-5	Indeno(1,2,3-cd)pyrene	**25**	7.1	
53-70-3	Dibenz(a,h)anthracene	ND	7.1	
191-24-2	Benzo(g,h,i)perylene	**28**	7.1	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	82	32 - 102
p-Terphenyl-d14 (SS2)	90	41 - 106

VT Urban Soils

PAHs in Soil - SIM

Client Sample ID:	I-6	Lab Sample ID:	AB58346
Date of Collection:	9/09/2015	Matrix:	Soil
Date of Preparation:	9/16/2015	Amount Prepared:	N/A
Date of Analysis:	9/17/2015	Percent Solids:	90%
Dry Weight Prepared:	28.029 grams	Extract Dilution:	1
Wet Weight Prepared:	30.973 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	ND	7.1	
91-57-6	2-Methylnapthalene	ND	7.1	
90-12-0	1-Methylnapthalene	ND	7.1	
208-96-8	Acenaphthylene	ND	7.1	
83-32-9	Acenaphthene	ND	7.1	
86-73-7	Fluorene	ND	7.1	
85-01-8	Phenanthrene	**10**	7.1	
120-12-7	Anthracene	ND	7.1	
206-44-0	Fluoranthene	**15**	7.1	
129-00-0	Pyrene	**16**	7.1	
56-55-3	Benzo(a)anthracene	**9.4**	7.1	
218-01-9	Chrysene	**14**	7.1	
205-99-2	Benzo(b)fluoranthene	**15**	7.1	
207-08-9	Benzo(k)fluoranthene	**11**	7.1	
50-32-8	Benzo(a)pyrene	**11**	7.1	
193-39-5	Indeno(1,2,3-cd)pyrene	**7.5**	7.1	
53-70-3	Dibenz(a,h)anthracene	ND	7.1	
191-24-2	Benzo(g,h,i)perylene	**7.3**	7.1	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	98	32 - 102
p-Terphenyl-d14 (SS2)	92	41 - 106

VT Urban Soils

PAHs in Soil - SIM

Client Sample ID:	I-7	Lab Sample ID:	AB58347
Date of Collection:	9/09/2015	Matrix:	Soil
Date of Preparation:	9/16/2015	Amount Prepared:	N/A
Date of Analysis:	9/17/2015	Percent Solids:	97%
Dry Weight Prepared:	29.006 grams	Extract Dilution:	1
Wet Weight Prepared:	29.983 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	ND	6.9	
91-57-6	2-Methylnapthalene	ND	6.9	
90-12-0	1-Methylnapthalene	ND	6.9	
208-96-8	Acenaphthylene	**8.4**	6.9	
83-32-9	Acenaphthene	ND	6.9	
86-73-7	Fluorene	ND	6.9	
85-01-8	Phenanthrene	**32**	6.9	
120-12-7	Anthracene	ND	6.9	
206-44-0	Fluoranthene	**71**	6.9	
129-00-0	Pyrene	**60**	6.9	
56-55-3	Benzo(a)anthracene	**35**	6.9	
218-01-9	Chrysene	**50**	6.9	
205-99-2	Benzo(b)fluoranthene	**69**	6.9	
207-08-9	Benzo(k)fluoranthene	**46**	6.9	
50-32-8	Benzo(a)pyrene	**48**	6.9	
193-39-5	Indeno(1,2,3-cd)pyrene	**26**	6.9	
53-70-3	Dibenz(a,h)anthracene	ND	6.9	
191-24-2	Benzo(g,h,i)perylene	**26**	6.9	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	120	32 - 102
p-Terphenyl-d14 (SS2)	110	41 - 106

VT Urban Soils

MATRIX SPIKE (MS) RECOVERY

Sample ID: AB58342

PARAMETER	SPIKE ADDED ug/Kg	SAMPLE CONCENTRATION ug/Kg	MS CONCENTRATION ug/Kg	MS % REC	QC LIMITS (% REC)
1-Methylnapthalene	144	ND	111	77	49 - 99
2-Methylnapthalene	144	ND	131	91	43 - 101
Acenaphthene	144	ND	145	101	31 - 119
Acenaphthylene	144	46.0	184	96	32 - 116
Anthracene	144	27.0	181	107	17 - 151
Benzo(a)anthracene	144	170	362	133	18 - 136
Benzo(a)pyrene	144	210	379	117	26 - 115
Benzo(b)fluoranthene	144	260	495	163	13 - 144
Benzo(g,h,i)perylene	144	96.0	211	80	21 - 137
Benzo(k)fluoranthene	144	240	455	149	27 - 139
Chrysene	144	250	422	119	20 - 130
Dibenz(a,h)anthracene	144	ND	148	103	24 - 137
Fluoranthene	144	390	642	175	17 - 149
Fluorene	144	17.0	165	103	34 - 121
Indeno(1,2,3-cd)pyrene	144	87.0	210	85	18 - 148
Naphthalene	144	11.0	133	85	22 - 112
Phenanthrene	144	200	445	170	18 - 134
Pyrene	144	350	567	151	19 - 133

Target compounds present in the sample caused recoveries of the spike to be high.

VT Urban Soils

Laboratory Duplicate Results

Sample ID: AB58342

PARAMETER	SAMPLE RESULT ug/Kg	SAMPLE DUPLICATE RESULT ug/Kg	PRECISION RPD %	QC LIMITS
1-Methylnapthalene	ND	ND	NC	40
2-Methylnapthalene	ND	ND	NC	40
Acenaphthene	ND	ND	NC	40
Acenaphthylene	46.0	42.6	7.67	40
Anthracene	27.0	25.8	4.55	40
Benzo(a)anthracene	170	158	7.32	40
Benzo(a)pyrene	210	191	9.48	40
Benzo(b)fluoranthene	260	277	6.33	40
Benzo(g,h,i)perylene	96.0	92.4	3.82	40
Benzo(k)fluoranthene	240	200	18.2	40
Chrysene	250	222	11.9	40
Dibenz(a,h)anthracene	ND	ND	NC	40
Fluoranthene	390	359	8.28	40
Fluorene	17.0	16.2	4.82	40
Indeno(1,2,3-cd)pyrene	87.0	84.0	3.51	40
Naphthalene	11.0	9.46	15.1	40
Phenanthrene	200	186	7.25	40
Pyrene	350	324	7.72	40

VT Urban Soils

Laboratory Fortified Blank (LFB) Results

PARAMETER	LFB AMOUNT SPIKED ppb	LFB RESULT ppb	LFB RECOVERY %	QC LIMITS %
1-Methylnapthalene	132	108	82	41 - 117
2-Methylnapthalene	132	109	83	35 - 120
Acenaphthene	132	115	87	40 - 110
Acenaphthylene	132	112	85	41 - 108
Anthracene	132	124	94	46 - 122
Benzo(a)anthracene	132	136	103	49 - 120
Benzo(a)pyrene	132	133	101	44 - 124
Benzo(b)fluoranthene	132	164	124	45 - 123
Benzo(g,h,i)perylene	132	146	111	48 - 120
Benzo(k)fluoranthene	132	162	123	40 - 127
Chrysene	132	133	101	44 - 117
Dibenz(a,h)anthracene	132	148	112	49 - 124
Fluoranthene	132	130	99	47 - 124
Fluorene	132	120	91	42 - 112
Indeno(1,2,3-cd)pyrene	132	146	111	48 - 121
Naphthalene	132	107	81	38 - 104
Phenanthrene	132	127	96	41 - 116
Pyrene	132	125	95	43 - 117

Comments:

Samples in Batch: AB58341, AB58342, AB58343, AB58344, AB58345, AB58346, AB58347

15090018 $PAHS
15090018 $METMS_PE

ENVIRONMENTAL PROTECTION AGENCY

REGION 1

CHAIN OF CUSTODY RECORD

PROJ. NO.: 15090018

PROJECT NAME: Soil Background Study

SAMPLERS: (Signature) VT DEC

STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS	PAHs	ARSENIC	LEAD				REMARKS
	9/8/15	14:00	X		K-3	2	X	X	X				
	9/8/15	15:00	X		I-3	2	X	X	X				
	9/9	0930	X		L-4	2	X	X	X				
	9/9	11AM	X		A-6	2	X	X	X				
	9/9	[redacted]	X		[redacted] DUP-1	2	X	X	X				[redacted]
	9/11	0830	X		I-6	2	X	X	X				
	9/11	1030	X		I-7	2	X	X	X				

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
[signature]	9/14/15 15:00	FEDEX 774498793019			
Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature) [signature]	Date / Time 9/15/15 10:30	Remarks	

Distribution: Original Accompanies Shipment; Copy to Coordinator Field Files

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United States Environmental Protection Agency
Office of Environmental Measurement & Evaluation
11 Technology Drive
North Chelmsford, MA 01863-2431

Laboratory Report

October 19, 2015

Jim Byrne - Mail Code OSRR07-2
US EPA New England R1

Project Number: 15100005
Project: VT Urban Soils
Analysis: PAHs in Soil - SIM
EPA Chemist: Bhavita Patel

Date Samples Received by the Laboratory: 10/06/2015

Analytical Procedure:

All samples were received and logged in by the laboratory according to the USEPA New England Laboratory SOP for Sample Log-in.

Sample preparation and analysis was done following the EPA Region I SOP, EIASOP-PAHSOLL6.

Samples were analyzed by a quadrapole GC/MS operating in the Selective Ion Monitoring (SIM) mode.. The extraction and analysis SOPs are based on SW-846 methods 3545A, 3630C,8270C, and EIASOP-BNAGCMS9.

Data were reviewed in accordance with the internal verification procedures described in the EPA New England Quality Manual for NERL.

Results relate only to the items tested or to the samples as received by the Laboratory. This analytical report shall not be reproduced except in full, without written approval of the laboratory.

If you have any questions please call me at 617-918-8340 .

Sincerely,

Qualifiers:

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ND = Not Detected above Reporting limit
NA = Not Applicable due to high sample dilutions or sample interferences
NC = Not calculated since analyte concentration is ND.
J = Estimated value
J1 = Estimated value due to MS recovery outside accceptance criteria
J2 = Estimated value due to LFB result outside acceptance criteria
J3 = Estimated value due to RPD result outside acceptance criteria
J4 = Estimated value due to LCS result outside acceptance criteria
E = Estimated value exceeds the calibration range
L = Estimated value is below the calibration range
B = Analyte is associated with the lab blank or trip blank contamination. Values are qualified when the observed concentration of the contamination in the sample extract is less than 10 times the concentration in the blank.
R = No recovery was calculated since the analyte concentration is greater than four times the spike level.
P = The confirmation value exceeded 35% difference and is less than 100%. The lower value is reported.
C = The identification has been confirmed by GC/MS.
A = Suspected Aldol condensation product.
N = Tentatively identified compound.

VT Urban Soils

PAHs in Soil - SIM

Client Sample ID:	H4	Lab Sample ID:	AB58729
Date of Collection:	9/29/2015	Matrix:	Soil
Date of Preparation:	10/06/2015	Amount Prepared:	N/A
Date of Analysis:	10/07/2015	Percent Solids:	83%
Dry Weight Prepared:	25.307 grams	Extract Dilution:	1
Wet Weight Prepared:	30.331 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	**43**	2.0	
91-57-6	2-Methylnaphthalene	**15**	2.0	
90-12-0	1-Methylnaphthalene	**17**	2.0	
208-96-8	Acenaphthylene	**85**	2.0	
83-32-9	Acenaphthene	**21**	2.0	
86-73-7	Fluorene	**44**	2.0	
85-01-8	Phenanthrene	**1200**	10	
120-12-7	Anthracene	**120**	2.0	
206-44-0	Fluoranthene	**1500**	10	
129-00-0	Pyrene	**1200**	10	
56-55-3	Benzo(a)anthracene	**420**	2.0	
218-01-9	Chrysene	**560**	2.0	
205-99-2	Benzo(b)fluoranthene	**480**	2.0	
207-08-9	Benzo(k)fluoranthene	**340**	2.0	
50-32-8	Benzo(a)pyrene	**420**	2.0	
193-39-5	Indeno(1,2,3-cd)pyrene	**270**	2.0	
53-70-3	Dibenz(a,h)anthracene	**16**	2.0	
191-24-2	Benzo(g,h,i)perylene	**290**	2.0	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	75	32 - 102
p-Terphenyl-d14 (SS2)	80	41 - 106

Comments: Phenanthrene, fluoranthene, and pyrene are reported from a 5x dilution.

VT Urban Soils

PAHs in Soil - SIM

Client Sample ID:	J3	Lab Sample ID:	AB58730
Date of Collection:	9/29/2015	Matrix:	Soil
Date of Preparation:	10/06/2015	Amount Prepared:	N/A
Date of Analysis:	10/07/2015	Percent Solids:	81%
Dry Weight Prepared:	24.451 grams	Extract Dilution:	1
Wet Weight Prepared:	30.271 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	**11**	2.0	
91-57-6	2-Methylnaphthalene	**5.5**	2.0	
90-12-0	1-Methylnaphthalene	**6.8**	2.0	
208-96-8	Acenaphthylene	**68**	2.0	
83-32-9	Acenaphthene	**8.1**	2.0	
86-73-7	Fluorene	**23**	2.0	
85-01-8	Phenanthrene	**260**	2.0	
120-12-7	Anthracene	**59**	2.0	
206-44-0	Fluoranthene	**550**	2.0	
129-00-0	Pyrene	**430**	2.0	
56-55-3	Benzo(a)anthracene	**170**	2.0	
218-01-9	Chrysene	**250**	2.0	
205-99-2	Benzo(b)fluoranthene	**290**	2.0	
207-08-9	Benzo(k)fluoranthene	**190**	2.0	
50-32-8	Benzo(a)pyrene	**210**	2.0	
193-39-5	Indeno(1,2,3-cd)pyrene	**160**	2.0	
53-70-3	Dibenz(a,h)anthracene	**11**	2.0	
191-24-2	Benzo(g,h,i)perylene	**180**	2.0	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	75	32 - 102
p-Terphenyl-d14 (SS2)	80	41 - 106

VT Urban Soils

PAHs in Soil - SIM

Client Sample ID:	P2	Lab Sample ID:	AB58731
Date of Collection:	10/01/2015	Matrix:	Soil
Date of Preparation:	10/06/2015	Amount Prepared:	N/A
Date of Analysis:	10/07/2015	Percent Solids:	56%
Dry Weight Prepared:	16.955 grams	Extract Dilution:	1
Wet Weight Prepared:	30.378 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	ND	2.9	
91-57-6	2-Methylnaphthalene	ND	2.9	
90-12-0	1-Methylnaphthalene	ND	2.9	
208-96-8	Acenaphthylene	**8.2**	2.9	
83-32-9	Acenaphthene	ND	2.9	
86-73-7	Fluorene	**4.9**	2.9	
85-01-8	Phenanthrene	**7.0**	2.9	
120-12-7	Anthracene	**4.1**	2.9	
206-44-0	Fluoranthene	**12**	2.9	
129-00-0	Pyrene	**9.5**	2.9	
56-55-3	Benzo(a)anthracene	**3.8**	2.9	
218-01-9	Chrysene	**8.0**	2.9	
205-99-2	Benzo(b)fluoranthene	**7.0**	2.9	
207-08-9	Benzo(k)fluoranthene	**4.3**	2.9	
50-32-8	Benzo(a)pyrene	**4.8**	2.9	
193-39-5	Indeno(1,2,3-cd)pyrene	**5.8**	2.9	
53-70-3	Dibenz(a,h)anthracene	ND	2.9	
191-24-2	Benzo(g,h,i)perylene	**6.7**	2.9	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	65	32 - 102
p-Terphenyl-d14 (SS2)	78	41 - 106

VT Urban Soils

PAHs in Soil - SIM

Client Sample ID:	P1	Lab Sample ID:	AB58732
Date of Collection:	10/01/2015	Matrix:	Soil
Date of Preparation:	10/06/2015	Amount Prepared:	N/A
Date of Analysis:	10/07/2015	Percent Solids:	79%
Dry Weight Prepared:	24.134 grams	Extract Dilution:	1
Wet Weight Prepared:	30.432 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	**2.2**	2.1	
91-57-6	2-Methylnaphthalene	**2.2**	2.1	
90-12-0	1-Methylnaphthalene	**2.1**	2.1	
208-96-8	Acenaphthylene	**4.4**	2.1	
83-32-9	Acenaphthene	ND	2.1	
86-73-7	Fluorene	ND	2.1	
85-01-8	Phenanthrene	**13**	2.1	
120-12-7	Anthracene	**2.7**	2.1	
206-44-0	Fluoranthene	**39**	2.1	
129-00-0	Pyrene	**32**	2.1	
56-55-3	Benzo(a)anthracene	**18**	2.1	
218-01-9	Chrysene	**27**	2.1	
205-99-2	Benzo(b)fluoranthene	**33**	2.1	
207-08-9	Benzo(k)fluoranthene	**19**	2.1	
50-32-8	Benzo(a)pyrene	**21**	2.1	
193-39-5	Indeno(1,2,3-cd)pyrene	**18**	2.1	
53-70-3	Dibenz(a,h)anthracene	ND	2.1	
191-24-2	Benzo(g,h,i)perylene	**20**	2.1	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	78	32 - 102
p-Terphenyl-d14 (SS2)	82	41 - 106

VT Urban Soils

PAHs in Soil - SIM

Client Sample ID:	DUP 16	Lab Sample ID:	AB58733
Date of Collection:	10/01/2015	Matrix:	Soil
Date of Preparation:	10/06/2015	Amount Prepared:	N/A
Date of Analysis:	10/07/2015	Percent Solids:	80%
Dry Weight Prepared:	24.222 grams	Extract Dilution:	1
Wet Weight Prepared:	30.456 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	**2.9**	2.1	
91-57-6	2-Methylnaphthalene	**2.9**	2.1	
90-12-0	1-Methylnaphthalene	**2.7**	2.1	
208-96-8	Acenaphthylene	**4.1**	2.1	
83-32-9	Acenaphthene	ND	2.1	
86-73-7	Fluorene	**2.2**	2.1	
85-01-8	Phenanthrene	**17**	2.1	
120-12-7	Anthracene	**3.4**	2.1	
206-44-0	Fluoranthene	**41**	2.1	
129-00-0	Pyrene	**34**	2.1	
56-55-3	Benzo(a)anthracene	**18**	2.1	
218-01-9	Chrysene	**28**	2.1	
205-99-2	Benzo(b)fluoranthene	**35**	2.1	
207-08-9	Benzo(k)fluoranthene	**20**	2.1	
50-32-8	Benzo(a)pyrene	**21**	2.1	
193-39-5	Indeno(1,2,3-cd)pyrene	**19**	2.1	
53-70-3	Dibenz(a,h)anthracene	ND	2.1	
191-24-2	Benzo(g,h,i)perylene	**21**	2.1	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	75	32 - 102
p-Terphenyl-d14 (SS2)	80	41 - 106

VT Urban Soils

PAHs in Soil - SIM

Client Sample ID:	L2	Lab Sample ID:	AB58734
Date of Collection:	10/01/2015	Matrix:	Soil
Date of Preparation:	10/06/2015	Amount Prepared:	N/A
Date of Analysis:	10/07/2015	Percent Solids:	80%
Dry Weight Prepared:	24.563 grams	Extract Dilution:	1
Wet Weight Prepared:	30.602 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	ND	2.0	
91-57-6	2-Methylnaphthalene	ND	2.0	
90-12-0	1-Methylnaphthalene	ND	2.0	
208-96-8	Acenaphthylene	**3.1**	2.0	
83-32-9	Acenaphthene	ND	2.0	
86-73-7	Fluorene	ND	2.0	
85-01-8	Phenanthrene	**3.2**	2.0	
120-12-7	Anthracene	**2.3**	2.0	
206-44-0	Fluoranthene	**11**	2.0	
129-00-0	Pyrene	**12**	2.0	
56-55-3	Benzo(a)anthracene	**5.6**	2.0	
218-01-9	Chrysene	**8.7**	2.0	
205-99-2	Benzo(b)fluoranthene	**14**	2.0	
207-08-9	Benzo(k)fluoranthene	**8.0**	2.0	
50-32-8	Benzo(a)pyrene	**8.4**	2.0	
193-39-5	Indeno(1,2,3-cd)pyrene	**7.4**	2.0	
53-70-3	Dibenz(a,h)anthracene	ND	2.0	
191-24-2	Benzo(g,h,i)perylene	**8.2**	2.0	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	85	32 - 102
p-Terphenyl-d14 (SS2)	92	41 - 106

VT Urban Soils

PAHs in Soil - SIM

Client Sample ID:	D8	Lab Sample ID:	AB58735
Date of Collection:	10/01/2015	Matrix:	Soil
Date of Preparation:	10/06/2015	Amount Prepared:	N/A
Date of Analysis:	10/07/2015	Percent Solids:	75%
Dry Weight Prepared:	22.747 grams	Extract Dilution:	1
Wet Weight Prepared:	30.325 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	**4.6**	2.2	
91-57-6	2-Methylnaphthalene	**2.4**	2.2	
90-12-0	1-Methylnaphthalene	ND	2.2	
208-96-8	Acenaphthylene	**28**	2.2	
83-32-9	Acenaphthene	ND	2.2	
86-73-7	Fluorene	**5.2**	2.2	
85-01-8	Phenanthrene	**80**	2.2	
120-12-7	Anthracene	**15**	2.2	
206-44-0	Fluoranthene	**180**	2.2	
129-00-0	Pyrene	**150**	2.2	
56-55-3	Benzo(a)anthracene	**64**	2.2	
218-01-9	Chrysene	**98**	2.2	
205-99-2	Benzo(b)fluoranthene	**97**	2.2	
207-08-9	Benzo(k)fluoranthene	**62**	2.2	
50-32-8	Benzo(a)pyrene	**69**	2.2	
193-39-5	Indeno(1,2,3-cd)pyrene	**50**	2.2	
53-70-3	Dibenz(a,h)anthracene	**3.8**	2.2	
191-24-2	Benzo(g,h,i)perylene	**54**	2.2	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	80	32 - 102
p-Terphenyl-d14 (SS2)	82	41 - 106

VT Urban Soils

PAHs in Soil - SIM

Client Sample ID:	DUP-13	Lab Sample ID:	AB58736
Date of Collection:	10/01/2015	Matrix:	Soil
Date of Preparation:	10/06/2015	Amount Prepared:	N/A
Date of Analysis:	10/07/2015	Percent Solids:	83%
Dry Weight Prepared:	25.115 grams	Extract Dilution:	1
Wet Weight Prepared:	30.368 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	**24**	2.0	
91-57-6	2-Methylnaphthalene	**16**	2.0	
90-12-0	1-Methylnaphthalene	**21**	2.0	
208-96-8	Acenaphthylene	**100**	2.0	
83-32-9	Acenaphthene	**12**	2.0	
86-73-7	Fluorene	**31**	2.0	
85-01-8	Phenanthrene	**510**	2.0	
120-12-7	Anthracene	**82**	2.0	
206-44-0	Fluoranthene	**700**	10	
129-00-0	Pyrene	**780**	2.0	
56-55-3	Benzo(a)anthracene	**330**	2.0	
218-01-9	Chrysene	**430**	2.0	
205-99-2	Benzo(b)fluoranthene	**370**	2.0	
207-08-9	Benzo(k)fluoranthene	**300**	2.0	
50-32-8	Benzo(a)pyrene	**360**	2.0	
193-39-5	Indeno(1,2,3-cd)pyrene	**240**	2.0	
53-70-3	Dibenz(a,h)anthracene	**19**	2.0	
191-24-2	Benzo(g,h,i)perylene	**260**	2.0	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	78	32 - 102
p-Terphenyl-d14 (SS2)	82	41 - 106

Comments: Fluoranthene is reported from a 5x dilution.

VT Urban Soils

PAHs in Soil - SIM

Client Sample ID:	L5	Lab Sample ID:	AB58737
Date of Collection:	10/01/2015	Matrix:	Soil
Date of Preparation:	10/06/2015	Amount Prepared:	N/A
Date of Analysis:	10/07/2015	Percent Solids:	85%
Dry Weight Prepared:	25.830 grams	Extract Dilution:	1
Wet Weight Prepared:	30.321 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	**27**	1.9	
91-57-6	2-Methylnaphthalene	**10**	1.9	
90-12-0	1-Methylnaphthalene	**8.2**	1.9	
208-96-8	Acenaphthylene	**82**	1.9	
83-32-9	Acenaphthene	**11**	1.9	
86-73-7	Fluorene	**13**	1.9	
85-01-8	Phenanthrene	**280**	1.9	
120-12-7	Anthracene	**53**	1.9	
206-44-0	Fluoranthene	**640**	1.9	
129-00-0	Pyrene	**580**	1.9	
56-55-3	Benzo(a)anthracene	**270**	1.9	
218-01-9	Chrysene	**330**	1.9	
205-99-2	Benzo(b)fluoranthene	**290**	1.9	
207-08-9	Benzo(k)fluoranthene	**240**	1.9	
50-32-8	Benzo(a)pyrene	**330**	1.9	
193-39-5	Indeno(1,2,3-cd)pyrene	**230**	1.9	
53-70-3	Dibenz(a,h)anthracene	**14**	1.9	
191-24-2	Benzo(g,h,i)perylene	**260**	1.9	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	62	32 - 102
p-Terphenyl-d14 (SS2)	65	41 - 106

VT Urban Soils

Laboratory Blank (PAHs)

Client Sample ID:	N/A	Lab Sample ID:	N/A
Date of Collection:	N/A	Matrix:	Soil
Date of Preparation:	10/06/2015	Amount Prepared:	N/A
Date of Analysis:	10/07/2015	Percent Solids:	100%
Dry Weight Prepared:	30.165 grams	Extract Dilution:	1
Wet Weight Prepared:	30.232 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	ND	1.7	
91-57-6	2-Methylnapthalene	ND	1.7	
90-12-0	1-Methylnapthalene	ND	1.7	
208-96-8	Acenaphthylene	ND	1.7	
83-32-9	Acenaphthene	ND	1.7	
86-73-7	Fluorene	ND	1.7	
85-01-8	Phenanthrene	ND	1.7	
120-12-7	Anthracene	ND	1.7	
206-44-0	Fluoranthene	ND	1.7	
129-00-0	Pyrene	ND	1.7	
56-55-3	Benzo(a)anthracene	ND	1.7	
218-01-9	Chrysene	ND	1.7	
205-99-2	Benzo(b)fluoranthene	ND	1.7	
207-08-9	Benzo(k)fluoranthene	ND	1.7	
50-32-8	Benzo(a)pyrene	ND	1.7	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	1.7	
53-70-3	Dibenz(a,h)anthracene	ND	1.7	
191-24-2	Benzo(g,h,i)perylene	ND	1.7	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	87	32 - 102
p-Terphenyl-d14 (SS2)	85	41 - 106

VT Urban Soils

PAHs in Soil - SIM

Client Sample ID:	M5	Lab Sample ID:	AB58738
Date of Collection:	10/01/2015	Matrix:	Soil
Date of Preparation:	10/06/2015	Amount Prepared:	N/A
Date of Analysis:	10/07/2015	Percent Solids:	84%
Dry Weight Prepared:	25.711 grams	Extract Dilution:	1
Wet Weight Prepared:	30.651 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	**20**	1.9	
91-57-6	2-Methylnaphthalene	**18**	1.9	
90-12-0	1-Methylnaphthalene	**27**	1.9	
208-96-8	Acenaphthylene	**81**	1.9	
83-32-9	Acenaphthene	**16**	1.9	
86-73-7	Fluorene	**32**	1.9	
85-01-8	Phenanthrene	**400**	1.9	
120-12-7	Anthracene	**69**	1.9	
206-44-0	Fluoranthene	**650**	1.9	
129-00-0	Pyrene	**620**	1.9	
56-55-3	Benzo(a)anthracene	**270**	1.9	
218-01-9	Chrysene	**350**	1.9	
205-99-2	Benzo(b)fluoranthene	**300**	1.9	
207-08-9	Benzo(k)fluoranthene	**230**	1.9	
50-32-8	Benzo(a)pyrene	**280**	1.9	
193-39-5	Indeno(1,2,3-cd)pyrene	**180**	1.9	
53-70-3	Dibenz(a,h)anthracene	**15**	1.9	
191-24-2	Benzo(g,h,i)perylene	**200**	1.9	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	62	32 - 102
p-Terphenyl-d14 (SS2)	65	41 - 106

VT Urban Soils

PAHs in Soil - SIM

Client Sample ID:	K6	Lab Sample ID:	AB58739
Date of Collection:	10/01/2015	Matrix:	Soil
Date of Preparation:	10/06/2015	Amount Prepared:	N/A
Date of Analysis:	10/07/2015	Percent Solids:	76%
Dry Weight Prepared:	23.285 grams	Extract Dilution:	1
Wet Weight Prepared:	30.531 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	**10**	2.1	
91-57-6	2-Methylnaphthalene	**11**	2.1	
90-12-0	1-Methylnaphthalene	**12**	2.1	
208-96-8	Acenaphthylene	**19**	2.1	
83-32-9	Acenaphthene	**4.8**	2.1	
86-73-7	Fluorene	**5.8**	2.1	
85-01-8	Phenanthrene	**81**	2.1	
120-12-7	Anthracene	**22**	2.1	
206-44-0	Fluoranthene	**170**	2.1	
129-00-0	Pyrene	**140**	2.1	
56-55-3	Benzo(a)anthracene	**77**	2.1	
218-01-9	Chrysene	**94**	2.1	
205-99-2	Benzo(b)fluoranthene	**110**	2.1	
207-08-9	Benzo(k)fluoranthene	**70**	2.1	
50-32-8	Benzo(a)pyrene	**85**	2.1	
193-39-5	Indeno(1,2,3-cd)pyrene	**61**	2.1	
53-70-3	Dibenz(a,h)anthracene	**4.8**	2.1	
191-24-2	Benzo(g,h,i)perylene	**67**	2.1	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	72	32 - 102
p-Terphenyl-d14 (SS2)	75	41 - 106

VT Urban Soils

PAHs in Soil - SIM

Client Sample ID:	K6a	Lab Sample ID:	AB58740
Date of Collection:	10/01/2015	Matrix:	Soil
Date of Preparation:	10/06/2015	Amount Prepared:	N/A
Date of Analysis:	10/07/2015	Percent Solids:	81%
Dry Weight Prepared:	24.504 grams	Extract Dilution:	1
Wet Weight Prepared:	30.432 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	ND	2.0	
91-57-6	2-Methylnaphthalene	ND	2.0	
90-12-0	1-Methylnaphthalene	ND	2.0	
208-96-8	Acenaphthylene	**4.2**	2.0	
83-32-9	Acenaphthene	ND	2.0	
86-73-7	Fluorene	ND	2.0	
85-01-8	Phenanthrene	**6.4**	2.0	
120-12-7	Anthracene	ND	2.0	
206-44-0	Fluoranthene	**16**	2.0	
129-00-0	Pyrene	**14**	2.0	
56-55-3	Benzo(a)anthracene	**7.7**	2.0	
218-01-9	Chrysene	**9.5**	2.0	
205-99-2	Benzo(b)fluoranthene	**9.8**	2.0	
207-08-9	Benzo(k)fluoranthene	**7.2**	2.0	
50-32-8	Benzo(a)pyrene	**7.8**	2.0	
193-39-5	Indeno(1,2,3-cd)pyrene	**6.5**	2.0	
53-70-3	Dibenz(a,h)anthracene	ND	2.0	
191-24-2	Benzo(g,h,i)perylene	**7.1**	2.0	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	65	32 - 102
p-Terphenyl-d14 (SS2)	70	41 - 106

VT Urban Soils

PAHs in Soil - SIM

Client Sample ID:	K6b	Lab Sample ID:	AB58741
Date of Collection:	10/05/2015	Matrix:	Soil
Date of Preparation:	10/06/2015	Amount Prepared:	N/A
Date of Analysis:	10/07/2015	Percent Solids:	81%
Dry Weight Prepared:	24.679 grams	Extract Dilution:	1
Wet Weight Prepared:	30.563 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	ND	2.0	
91-57-6	2-Methylnaphthalene	ND	2.0	
90-12-0	1-Methylnaphthalene	ND	2.0	
208-96-8	Acenaphthylene	**2.3**	2.0	
83-32-9	Acenaphthene	ND	2.0	
86-73-7	Fluorene	ND	2.0	
85-01-8	Phenanthrene	**2.6**	2.0	
120-12-7	Anthracene	ND	2.0	
206-44-0	Fluoranthene	**5.8**	2.0	
129-00-0	Pyrene	**4.7**	2.0	
56-55-3	Benzo(a)anthracene	**2.6**	2.0	
218-01-9	Chrysene	**4.2**	2.0	
205-99-2	Benzo(b)fluoranthene	**5.3**	2.0	
207-08-9	Benzo(k)fluoranthene	**3.0**	2.0	
50-32-8	Benzo(a)pyrene	**2.5**	2.0	
193-39-5	Indeno(1,2,3-cd)pyrene	**2.7**	2.0	
53-70-3	Dibenz(a,h)anthracene	ND	2.0	
191-24-2	Benzo(g,h,i)perylene	**3.2**	2.0	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	70	32 - 102
p-Terphenyl-d14 (SS2)	78	41 - 106

VT Urban Soils

PAHs in Soil - SIM

Client Sample ID:	K6c	Lab Sample ID:	AB58742
Date of Collection:	10/01/2015	Matrix:	Soil
Date of Preparation:	10/06/2015	Amount Prepared:	N/A
Date of Analysis:	10/07/2015	Percent Solids:	78%
Dry Weight Prepared:	23.780 grams	Extract Dilution:	1
Wet Weight Prepared:	30.631 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	ND	2.1	
91-57-6	2-Methylnaphthalene	ND	2.1	
90-12-0	1-Methylnaphthalene	ND	2.1	
208-96-8	Acenaphthylene	**3.5**	2.1	
83-32-9	Acenaphthene	ND	2.1	
86-73-7	Fluorene	ND	2.1	
85-01-8	Phenanthrene	**6.3**	2.1	
120-12-7	Anthracene	ND	2.1	
206-44-0	Fluoranthene	**16**	2.1	
129-00-0	Pyrene	**14**	2.1	
56-55-3	Benzo(a)anthracene	**5.4**	2.1	
218-01-9	Chrysene	**9.6**	2.1	
205-99-2	Benzo(b)fluoranthene	**12**	2.1	
207-08-9	Benzo(k)fluoranthene	**7.4**	2.1	
50-32-8	Benzo(a)pyrene	**7.5**	2.1	
193-39-5	Indeno(1,2,3-cd)pyrene	**7.1**	2.1	
53-70-3	Dibenz(a,h)anthracene	ND	2.1	
191-24-2	Benzo(g,h,i)perylene	**7.9**	2.1	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	60	32 - 102
p-Terphenyl-d14 (SS2)	65	41 - 106

VT Urban Soils

PAHs in Soil - SIM

Client Sample ID:	K6d	Lab Sample ID:	AB58743
Date of Collection:	10/01/2015	Matrix:	Soil
Date of Preparation:	10/06/2015	Amount Prepared:	N/A
Date of Analysis:	10/07/2015	Percent Solids:	85%
Dry Weight Prepared:	25.965 grams	Extract Dilution:	1
Wet Weight Prepared:	30.651 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	ND	1.9	
91-57-6	2-Methylnaphthalene	ND	1.9	
90-12-0	1-Methylnaphthalene	ND	1.9	
208-96-8	Acenaphthylene	**3.5**	1.9	
83-32-9	Acenaphthene	ND	1.9	
86-73-7	Fluorene	ND	1.9	
85-01-8	Phenanthrene	**9.2**	1.9	
120-12-7	Anthracene	**2.6**	1.9	
206-44-0	Fluoranthene	**22**	1.9	
129-00-0	Pyrene	**20**	1.9	
56-55-3	Benzo(a)anthracene	**10**	1.9	
218-01-9	Chrysene	**13**	1.9	
205-99-2	Benzo(b)fluoranthene	**15**	1.9	
207-08-9	Benzo(k)fluoranthene	**9.8**	1.9	
50-32-8	Benzo(a)pyrene	**12**	1.9	
193-39-5	Indeno(1,2,3-cd)pyrene	**8.9**	1.9	
53-70-3	Dibenz(a,h)anthracene	ND	1.9	
191-24-2	Benzo(g,h,i)perylene	**10**	1.9	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	65	32 - 102
p-Terphenyl-d14 (SS2)	72	41 - 106

VT Urban Soils

MATRIX SPIKE (MS) RECOVERY

Sample ID: AB58737

PARAMETER	SPIKE ADDED ug/Kg	SAMPLE CONCENTRATION ug/Kg	MS CONCENTRATION ug/Kg	MS % REC	QC LIMITS (% REC)
1-Methylnaphthalene	153	8.2	106	64	49 - 99
2-Methylnaphthalene	153	10.0	109	64	43 - 101
Acenaphthene	153	11.0	112	66	31 - 119
Acenaphthylene	153	82.0	195	74	32 - 116
Anthracene	153	53.0	155	66	17 - 151
Benzo(a)anthracene	153	270	386	76	18 - 136
Benzo(a)pyrene	153	330	415	55	26 - 115
Benzo(b)fluoranthene	153	290	463	113	13 - 144
Benzo(g,h,i)perylene	153	260	358	64	21 - 137
Benzo(k)fluoranthene	153	240	356	76	27 - 139
Chrysene	153	330	444	74	20 - 130
Dibenz(a,h)anthracene	153	14.0	175	105	24 - 137
Fluoranthene	153	640	790	R	17 - 149
Fluorene	153	13.0	112	64	34 - 121
Indeno(1,2,3-cd)pyrene	153	230	332	66	18 - 148
Naphthalene	153	27.0	124	63	22 - 112
Phenanthrene	153	280	403	80	18 - 134
Pyrene	153	580	736	101	19 - 133

VT Urban Soils

Laboratory Duplicate Results

Sample ID: AB58737

PARAMETER	SAMPLE RESULT ug/Kg	SAMPLE DUPLICATE RESULT ug/Kg	PRECISION RPD %	QC LIMITS
1-Methylnaphthalene	8.2	8.70	5.92	40
2-Methylnaphthalene	10.0	11.5	14.0	40
Acenaphthene	11.0	11.4	3.57	40
Acenaphthylene	82.0	100	19.8	40
Anthracene	53.0	62.0	15.7	40
Benzo(a)anthracene	270	279	3.28	40
Benzo(a)pyrene	330	341	3.28	40
Benzo(b)fluoranthene	290	401	32.1	40
Benzo(g,h,i)perylene	260	278	6.69	40
Benzo(k)fluoranthene	240	257	6.84	40
Chrysene	330	367	10.6	40
Dibenz(a,h)anthracene	14.0	14.3	2.12	40
Fluoranthene	640	715	11.1	40
Fluorene	13.0	15.1	14.9	40
Indeno(1,2,3-cd)pyrene	230	248	7.53	40
Naphthalene	27.0	30.1	10.9	40
Phenanthrene	280	317	12.4	40
Pyrene	580	662	13.2	40

VT Urban Soils

Laboratory Fortified Blank (LFB) Results

PARAMETER	LFB AMOUNT SPIKED ppb	LFB RESULT ppb	LFB RECOVERY %	QC LIMITS %
1-Methylnaphthalene	132.6	90.9	69	41 - 117
2-Methylnaphthalene	132.6	91.2	69	35 - 120
Acenaphthene	132.6	89.8	68	40 - 110
Acenaphthylene	132.6	87.4	66	41 - 108
Anthracene	132.6	95.5	72	46 - 122
Benzo(a)anthracene	132.6	95.2	72	49 - 120
Benzo(a)pyrene	132.6	92.8	70	44 - 124
Benzo(b)fluoranthene	132.6	91.8	69	45 - 123
Benzo(g,h,i)perylene	132.6	98.2	74	48 - 120
Benzo(k)fluoranthene	132.6	88.3	67	40 - 127
Chrysene	132.6	94.7	71	44 - 117
Dibenz(a,h)anthracene	132.6	95.5	72	49 - 124
Fluoranthene	132.6	96.9	73	47 - 124
Fluorene	132.6	92.0	69	42 - 112
Indeno(1,2,3-cd)pyrene	132.6	96.5	73	48 - 121
Naphthalene	132.6	89.4	67	38 - 104
Phenanthrene	132.6	93.8	71	41 - 116
Pyrene	132.6	94.2	71	43 - 117

Comments:

Samples in Batch: AB58729, AB58730, AB58731, AB58732, AB58733, AB58734, AB58735, AB58736, AB58737, AB58738, AB58739, AB58740, AB58741, AB58742, AB58743

15100005 $PAHS
15100005 $METMS_PE

ENVIRONMENTAL PROTECTION AGENCY

REGION 1

CHAIN OF CUSTODY RECORD

PROJ. NO.: 15100005

PROJECT NAME: Soil Background Study

SAMPLERS: (Signature) VT DEC

STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS	PAHS	ARSENIC	LEAD				REMARKS
	9/29/15	0730	X		H4	2	X	X	X				
	9/29/15	0900	X		J3	2	X	X	X				
	10.1.15	1145	X		P2	2	X	X	X				
	10.1.15	1330	X		P1	2	X	X	X				
	10 1 15	[redacted]	X		DUP 16	2	X	X	X				
	10/1/15	1425	X		L2	2	X	X	X				
	10/2/15	1030	X		D8	2	X	X	X				
	10/1/15		X		DUP-13	2	X	X	X				
	10/1/15	130	X		L5	2	X	X	X				
	10/1/15	1230	X		M5	2	X	X	X				
	10/1/15	300	X		K6	2	X	X	X				
	10/1/15	200	X		K6a	2	X	X	X				
	10/1/15	245	X		K6b	2	X	X	X				
	10/1/15	230	X		K6c	2	X	X	X				
	10/1/15	315	X		K6d	2	X	X	X				

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
[signature]	10/5/15 1500	FEDEX# 7746 65001490			
Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature) [signature] ESMT	Date / Time 10/6/15 9:00	Remarks	

Distribution: Original Accompanies Shipment; Copy to Coordinator Field Files

1- 19381

United States Environmental Protection Agency
Office of Environmental Measurement & Evaluation
11 Technology Drive
North Chelmsford, MA 01863-2431

Laboratory Report

October 21, 2015

Jim Byrne - Mail Code OSRR07-2
US EPA New England R1

Project Number: 15100015
Project: VT Urban Soils
Analysis: PAHs in Soil - SIM
EPA Chemist: Inna Germansderfer

Date Samples Received by the Laboratory: 10/13/2015

Analytical Procedure:

All samples were received and logged in by the laboratory according to the USEPA New England Laboratory SOP for Sample Log-in.

Sample preparation and analysis was done following the EPA Region I SOP, EIASOP-PAHSOLL6.

Samples were analyzed by a quadrapole GC/MS operating in the Selective Ion Monitoring (SIM) mode.. The extraction and analysis SOPs are based on SW-846 methods 3545A, 3630C,8270C, and EIASOP-BNAGCMS9.

Data were reviewed in accordance with the internal verification procedures described in the EPA New England Quality Manual for NERL.

Results relate only to the items tested or to the samples as received by the Laboratory. This analytical report shall not be reproduced except in full, without written approval of the laboratory.

If you have any questions please call me at 617-918-8340 .

Sincerely,

Qualifiers:

RL = Reporting limit
ND = Not Detected above Reporting limit
NA = Not Applicable due to high sample dilutions or sample interferences
NC = Not calculated since analyte concentration is ND.
J = Estimated value
J1 = Estimated value due to MS recovery outside accceptance criteria
J2 = Estimated value due to LFB result outside acceptance criteria
J3 = Estimated value due to RPD result outside acceptance criteria
J4 = Estimated value due to LCS result outside acceptance criteria
E = Estimated value exceeds the calibration range
L = Estimated value is below the calibration range
B = Analyte is associated with the lab blank or trip blank contamination. Values are qualified when the observed concentration of the contamination in the sample extract is less than 10 times the concentration in the blank.
R = No recovery was calculated since the analyte concentration is greater than four times the spike level.
P = The confirmation value exceeded 35% difference and is less than 100%. The lower value is reported.
C = The identification has been confirmed by GC/MS.
A = Suspected Aldol condensation product.
N = Tentatively identified compound.

VT Urban Soils

PAHs in Soil - SIM

Client Sample ID:	E7	Lab Sample ID:	AB58847
Date of Collection:	10/06/2015	Matrix:	Soil
Date of Preparation:	10/13/2015	Amount Prepared:	N/A
Date of Analysis:	10/14/2015	Percent Solids:	80%
Dry Weight Prepared:	24.318 grams	Extract Dilution:	N/A
Wet Weight Prepared:	30.374 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	**5.0**	2.1	
91-57-6	2-Methylnaphthalene	**2.2**	2.1	
90-12-0	1-Methylnaphthalene	ND	2.1	
208-96-8	Acenaphthylene	**22**	2.1	
83-32-9	Acenaphthene	**3.1**	2.1	
86-73-7	Fluorene	**4.5**	2.1	
85-01-8	Phenanthrene	**65**	2.1	
120-12-7	Anthracene	**22**	2.1	
206-44-0	Fluoranthene	**210**	2.1	
129-00-0	Pyrene	**170**	2.1	
56-55-3	Benzo(a)anthracene	**100**	2.1	
218-01-9	Chrysene	**110**	2.1	
205-99-2	Benzo(b)fluoranthene	**110**	2.1	
207-08-9	Benzo(k)fluoranthene	**85**	2.1	
50-32-8	Benzo(a)pyrene	**110**	2.1	
193-39-5	Indeno(1,2,3-cd)pyrene	**74**	2.1	
53-70-3	Dibenz(a,h)anthracene	**25**	2.1	
191-24-2	Benzo(g,h,i)perylene	**84**	2.1	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	77	32 - 102
p-Terphenyl-d14 (SS2)	80	41 - 106

VT Urban Soils

PAHs in Soil - SIM

Client Sample ID:	F2	Lab Sample ID:	AB58848
Date of Collection:	10/09/2015	Matrix:	Soil
Date of Preparation:	10/13/2015	Amount Prepared:	N/A
Date of Analysis:	10/14/2015	Percent Solids:	80%
Dry Weight Prepared:	24.126 grams	Extract Dilution:	N/A
Wet Weight Prepared:	30.056 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	ND	2.1	
91-57-6	2-Methylnaphthalene	ND	2.1	
90-12-0	1-Methylnaphthalene	ND	2.1	
208-96-8	Acenaphthylene	**2.1**	2.1	
83-32-9	Acenaphthene	ND	2.1	
86-73-7	Fluorene	ND	2.1	
85-01-8	Phenanthrene	**9.4**	2.1	
120-12-7	Anthracene	ND	2.1	
206-44-0	Fluoranthene	**19**	2.1	
129-00-0	Pyrene	**14**	2.1	
56-55-3	Benzo(a)anthracene	**6.9**	2.1	
218-01-9	Chrysene	**10**	2.1	
205-99-2	Benzo(b)fluoranthene	**10**	2.1	
207-08-9	Benzo(k)fluoranthene	**8.4**	2.1	
50-32-8	Benzo(a)pyrene	**8.1**	2.1	
193-39-5	Indeno(1,2,3-cd)pyrene	**7.4**	2.1	
53-70-3	Dibenz(a,h)anthracene	**2.9**	2.1	
191-24-2	Benzo(g,h,i)perylene	**8.4**	2.1	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	62	32 - 102
p-Terphenyl-d14 (SS2)	63	41 - 106

VT Urban Soils

Laboratory Blank (PAHs)

Client Sample ID:	N/A	Lab Sample ID:	N/A
Date of Collection:	N/A	Matrix:	Soil
Date of Preparation:	10/13/2015	Amount Prepared:	N/A
Date of Analysis:	10/14/2015	Percent Solids:	100%
Dry Weight Prepared:	30.407 grams	Extract Dilution:	1
Wet Weight Prepared:	30.412 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	ND	1.7	
91-57-6	2-Methylnapthalene	ND	1.7	
90-12-0	1-Methylnapthalene	ND	1.7	
208-96-8	Acenaphthylene	ND	1.7	
83-32-9	Acenaphthene	ND	1.7	
86-73-7	Fluorene	ND	1.7	
85-01-8	Phenanthrene	ND	1.7	
120-12-7	Anthracene	ND	1.7	
206-44-0	Fluoranthene	ND	1.7	
129-00-0	Pyrene	ND	1.7	
56-55-3	Benzo(a)anthracene	ND	1.7	
218-01-9	Chrysene	ND	1.7	
205-99-2	Benzo(b)fluoranthene	ND	1.7	
207-08-9	Benzo(k)fluoranthene	ND	1.7	
50-32-8	Benzo(a)pyrene	ND	1.7	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	1.7	
53-70-3	Dibenz(a,h)anthracene	ND	1.7	
191-24-2	Benzo(g,h,i)perylene	ND	1.7	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	70	32 - 102
p-Terphenyl-d14 (SS2)	75	41 - 106

VT Urban Soils

PAHs in Soil - SIM

Client Sample ID:	E2	Lab Sample ID:	AB58849
Date of Collection:	10/09/2015	Matrix:	Soil
Date of Preparation:	10/13/2015	Amount Prepared:	N/A
Date of Analysis:	10/14/2015	Percent Solids:	84%
Dry Weight Prepared:	25.860 grams	Extract Dilution:	N/A
Wet Weight Prepared:	30.693 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	ND	1.9	
91-57-6	2-Methylnaphthalene	ND	1.9	
90-12-0	1-Methylnaphthalene	ND	1.9	
208-96-8	Acenaphthylene	**2.1**	1.9	
83-32-9	Acenaphthene	ND	1.9	
86-73-7	Fluorene	ND	1.9	
85-01-8	Phenanthrene	**7.9**	1.9	
120-12-7	Anthracene	**2.2**	1.9	
206-44-0	Fluoranthene	**20**	1.9	
129-00-0	Pyrene	**17**	1.9	
56-55-3	Benzo(a)anthracene	**10**	1.9	
218-01-9	Chrysene	**13**	1.9	
205-99-2	Benzo(b)fluoranthene	**12**	1.9	
207-08-9	Benzo(k)fluoranthene	**9.5**	1.9	
50-32-8	Benzo(a)pyrene	**11**	1.9	
193-39-5	Indeno(1,2,3-cd)pyrene	**8.6**	1.9	
53-70-3	Dibenz(a,h)anthracene	**3.7**	1.9	
191-24-2	Benzo(g,h,i)perylene	**9.4**	1.9	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	79	32 - 102
p-Terphenyl-d14 (SS2)	88	41 - 106

VT Urban Soils

MATRIX SPIKE (MS) RECOVERY

Sample ID: AB58848

PARAMETER	SPIKE ADDED ug/Kg	SAMPLE CONCENTRATION ug/Kg	MS CONCENTRATION ug/Kg	MS % REC	QC LIMITS (% REC)
1-Methylnaphthalene	165	ND	118	72	49 - 99
2-Methylnaphthalene	165	ND	118	72	43 - 101
Acenaphthene	165	ND	122	74	31 - 119
Acenaphthylene	165	2.1	126	75	32 - 116
Anthracene	165	ND	132	80	17 - 151
Benzo(a)anthracene	165	6.9	136	78	18 - 136
Benzo(a)pyrene	165	8.1	122	69	26 - 115
Benzo(b)fluoranthene	165	10.0	129	72	13 - 144
Benzo(g,h,i)perylene	165	8.4	130	74	21 - 137
Benzo(k)fluoranthene	165	8.4	118	66	27 - 139
Chrysene	165	10.0	130	73	20 - 130
Dibenz(a,h)anthracene	165	2.9	128	76	24 - 137
Fluoranthene	165	19.0	153	81	17 - 149
Fluorene	165	ND	122	74	34 - 121
Indeno(1,2,3-cd)pyrene	165	7.4	130	74	18 - 148
Naphthalene	165	ND	120	73	22 - 112
Phenanthrene	165	9.4	134	76	18 - 134
Pyrene	165	14.0	130	70	19 - 133

VT Urban Soils

Laboratory Duplicate Results

Sample ID: AB58848

PARAMETER	SAMPLE RESULT ug/Kg	SAMPLE DUPLICATE RESULT ug/Kg	PRECISION RPD %	QC LIMITS
1-Methylnaphthalene	ND	ND	NC	40
2-Methylnaphthalene	ND	ND	NC	40
Acenaphthene	ND	ND	NC	40
Acenaphthylene	2.1	1.79	15.9	40
Anthracene	ND	ND	NC	40
Benzo(a)anthracene	6.9	6.09	12.5	40
Benzo(a)pyrene	8.1	6.77	17.9	40
Benzo(b)fluoranthene	10.0	9.22	8.12	40
Benzo(g,h,i)perylene	8.4	6.91	19.5	40
Benzo(k)fluoranthene	8.4	7.14	16.2	40
Chrysene	10.0	8.85	12.2	40
Dibenz(a,h)anthracene	2.9	2.41	18.5	40
Fluoranthene	19.0	16.4	14.7	40
Fluorene	ND	ND	NC	40
Indeno(1,2,3-cd)pyrene	7.4	6.30	16.1	40
Naphthalene	ND	ND	NC	40
Phenanthrene	9.4	8.12	14.6	40
Pyrene	14.0	12.6	10.5	40

VT Urban Soils

Laboratory Fortified Blank (LFB) Results

PARAMETER	LFB AMOUNT SPIKED ppb	LFB RESULT ppb	LFB RECOVERY %	QC LIMITS %
1-Methylnaphthalene	131	90.3	69	41 - 117
2-Methylnaphthalene	131	90.6	69	35 - 120
Acenaphthene	131	92.2	70	40 - 110
Acenaphthylene	131	93.7	72	41 - 108
Anthracene	131	106	81	46 - 122
Benzo(a)anthracene	131	107	82	49 - 120
Benzo(a)pyrene	131	97.4	74	44 - 124
Benzo(b)fluoranthene	131	98.6	75	45 - 123
Benzo(g,h,i)perylene	131	104	79	48 - 120
Benzo(k)fluoranthene	131	90.7	69	40 - 127
Chrysene	131	99.2	76	44 - 117
Dibenz(a,h)anthracene	131	108	82	49 - 124
Fluoranthene	131	104	79	47 - 124
Fluorene	131	91.7	70	42 - 112
Indeno(1,2,3-cd)pyrene	131	105	80	48 - 121
Naphthalene	131	89.7	69	38 - 104
Phenanthrene	131	97.2	74	41 - 116
Pyrene	131	90.7	69	43 - 117

Comments:

Samples in Batch: AB58847, AB58848, AB58849

ENVIRONMENTAL PROTECTION AGENCY

REGION 1

CHAIN OF CUSTODY RECORD

PROJ. NO.: 15100015

PROJECT NAME: Soil Background Study

SAMPLERS: (Signature) VT DEC

STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS	PAHS	ARSENIC	LEAD				REMARKS
	10/6/15	1325	X		E7	2	X	X	X				
	10/9/15	1015	X		F2	2	X	X	X				
	10/9/15	1115	X		E2	2	X	X	X				

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
[signature]	10/12/15 1500	FEDEX # 7747 1478 4763			
Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature)	Date / Time	Remarks	
		[signature] ESAT	10/13/15 08:30		

Distribution: Original Accompanies Shipment; Copy to Coordinator Field Files

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15100017 $PAHS
15100015 $METMS_PE

1- 19381

United States Environmental Protection Agency
Office of Environmental Measurement & Evaluation
11 Technology Drive
North Chelmsford, MA 01863-2431

Laboratory Report

October 26, 2015

Jim Byrne - Mail Code OSRR07-2
US EPA New England R1

Project Number: 15100025
Project: VT Urban Soils
Analysis: PAHs in Soil - SIM
EPA Chemist: Inna Germansderfer

Date Samples Received by the Laboratory: 10/20/2015

Analytical Procedure:

All samples were received and logged in by the laboratory according to the USEPA New England Laboratory SOP for Sample Log-in.

Sample preparation and analysis was done following the EPA Region I SOP, EIASOP-PAHSOLL6.

Samples were analyzed by a quadrapole GC/MS operating in the Selective Ion Monitoring (SIM) mode.. The extraction and analysis SOPs are based on SW-846 methods 3545A, 3630C,8270C, and EIASOP-BNAGCMS9.

Data were reviewed in accordance with the internal verification procedures described in the EPA New England Quality Manual for NERL.

Results relate only to the items tested or to the samples as received by the Laboratory. This analytical report shall not be reproduced except in full, without written approval of the laboratory.

If you have any questions please call me at 617-918-8340 .

Sincerely,

Qualifiers:

RL = Reporting limit
ND = Not Detected above Reporting limit
NA = Not Applicable due to high sample dilutions or sample interferences
NC = Not calculated since analyte concentration is ND.
J = Estimated value
J1 = Estimated value due to MS recovery outside accceptance criteria
J2 = Estimated value due to LFB result outside acceptance criteria
J3 = Estimated value due to RPD result outside acceptance criteria
J4 = Estimated value due to LCS result outside acceptance criteria
E = Estimated value exceeds the calibration range
L = Estimated value is below the calibration range
B = Analyte is associated with the lab blank or trip blank contamination. Values are qualified when the observed concentration of the contamination in the sample extract is less than 10 times the concentration in the blank.
R = No recovery was calculated since the analyte concentration is greater than four times the spike level.
P = The confirmation value exceeded 35% difference and is less than 100%. The lower value is reported.
C = The identification has been confirmed by GC/MS.
A = Suspected Aldol condensation product.
N = Tentatively identified compound.

VT Urban Soils

PAHs in Soil - SIM

Client Sample ID:	A1	Lab Sample ID:	AB59043
Date of Collection:	10/13/2015	Matrix:	Soil
Date of Preparation:	10/20/2015	Amount Prepared:	N/A
Date of Analysis:	10/21/2015	Percent Solids:	92%
Dry Weight Prepared:	28.503 grams	Extract Dilution:	10
Wet Weight Prepared:	30.921 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	**29**	18	
91-57-6	2-Methylnaphthalene	**22**	18	
90-12-0	1-Methylnaphthalene	**18**	18	
208-96-8	Acenaphthylene	**220**	18	
83-32-9	Acenaphthene	**81**	18	
86-73-7	Fluorene	**84**	18	
85-01-8	Phenanthrene	**690**	18	
120-12-7	Anthracene	**240**	18	
206-44-0	Fluoranthene	**1400**	18	
129-00-0	Pyrene	**1200**	18	
56-55-3	Benzo(a)anthracene	**870**	18	
218-01-9	Chrysene	**850**	18	
205-99-2	Benzo(b)fluoranthene	**820**	18	
207-08-9	Benzo(k)fluoranthene	**710**	18	
50-32-8	Benzo(a)pyrene	**890**	18	
193-39-5	Indeno(1,2,3-cd)pyrene	**580**	18	
53-70-3	Dibenz(a,h)anthracene	**48**	18	
191-24-2	Benzo(g,h,i)perylene	**650**	18	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	38	32 - 102
p-Terphenyl-d14 (SS2)	45	41 - 106

Comments: Sample diluted 10x due to nature of extract

VT Urban Soils

PAHs in Soil - SIM

Client Sample ID:	A5	Lab Sample ID:	AB59044
Date of Collection:	10/13/2015	Matrix:	Soil
Date of Preparation:	10/20/2015	Amount Prepared:	N/A
Date of Analysis:	10/21/2015	Percent Solids:	79%
Dry Weight Prepared:	23.736 grams	Extract Dilution:	1
Wet Weight Prepared:	30.110 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	ND	2.1	
91-57-6	2-Methylnaphthalene	ND	2.1	
90-12-0	1-Methylnaphthalene	ND	2.1	
208-96-8	Acenaphthylene	ND	2.1	
83-32-9	Acenaphthene	ND	2.1	
86-73-7	Fluorene	**2.3**	2.1	
85-01-8	Phenanthrene	**22**	2.1	
120-12-7	Anthracene	ND	2.1	
206-44-0	Fluoranthene	**28**	2.1	
129-00-0	Pyrene	**20**	2.1	
56-55-3	Benzo(a)anthracene	**10**	2.1	
218-01-9	Chrysene	**15**	2.1	
205-99-2	Benzo(b)fluoranthene	**17**	2.1	
207-08-9	Benzo(k)fluoranthene	**13**	2.1	
50-32-8	Benzo(a)pyrene	**11**	2.1	
193-39-5	Indeno(1,2,3-cd)pyrene	**12**	2.1	
53-70-3	Dibenz(a,h)anthracene	**6.4**	2.1	
191-24-2	Benzo(g,h,i)perylene	**13**	2.1	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	78	32 - 102
p-Terphenyl-d14 (SS2)	91	41 - 106

VT Urban Soils

PAHs in Soil - SIM

Client Sample ID:	B2	Lab Sample ID:	AB59045
Date of Collection:	10/13/2015	Matrix:	Soil
Date of Preparation:	10/20/2015	Amount Prepared:	N/A
Date of Analysis:	10/21/2015	Percent Solids:	86%
Dry Weight Prepared:	25.872 grams	Extract Dilution:	10
Wet Weight Prepared:	30.063 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	**21**	19	
91-57-6	2-Methylnaphthalene	ND	19	
90-12-0	1-Methylnaphthalene	ND	19	
208-96-8	Acenaphthylene	**50**	19	
83-32-9	Acenaphthene	ND	19	
86-73-7	Fluorene	ND	19	
85-01-8	Phenanthrene	**280**	19	
120-12-7	Anthracene	**71**	19	
206-44-0	Fluoranthene	**760**	19	
129-00-0	Pyrene	**620**	19	
56-55-3	Benzo(a)anthracene	**410**	19	
218-01-9	Chrysene	**440**	19	
205-99-2	Benzo(b)fluoranthene	**410**	19	
207-08-9	Benzo(k)fluoranthene	**350**	19	
50-32-8	Benzo(a)pyrene	**410**	19	
193-39-5	Indeno(1,2,3-cd)pyrene	**270**	19	
53-70-3	Dibenz(a,h)anthracene	**22**	19	
191-24-2	Benzo(g,h,i)perylene	**300**	19	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	68	32 - 102
p-Terphenyl-d14 (SS2)	82	41 - 106

Comments: Sample diluted 10x due to nature of extract

VT Urban Soils

PAHs in Soil - SIM

Client Sample ID:	C3	Lab Sample ID:	AB59046
Date of Collection:	10/13/2015	Matrix:	Soil
Date of Preparation:	10/20/2015	Amount Prepared:	N/A
Date of Analysis:	10/21/2015	Percent Solids:	78%
Dry Weight Prepared:	23.641 grams	Extract Dilution:	1
Wet Weight Prepared:	30.136 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	ND	2.1	
91-57-6	2-Methylnaphthalene	ND	2.1	
90-12-0	1-Methylnaphthalene	ND	2.1	
208-96-8	Acenaphthylene	ND	2.1	
83-32-9	Acenaphthene	ND	2.1	
86-73-7	Fluorene	ND	2.1	
85-01-8	Phenanthrene	**19**	2.1	
120-12-7	Anthracene	ND	2.1	
206-44-0	Fluoranthene	**20**	2.1	
129-00-0	Pyrene	**16**	2.1	
56-55-3	Benzo(a)anthracene	**6.6**	2.1	
218-01-9	Chrysene	**11**	2.1	
205-99-2	Benzo(b)fluoranthene	**11**	2.1	
207-08-9	Benzo(k)fluoranthene	**8.0**	2.1	
50-32-8	Benzo(a)pyrene	**8.0**	2.1	
193-39-5	Indeno(1,2,3-cd)pyrene	**8.0**	2.1	
53-70-3	Dibenz(a,h)anthracene	**4.2**	2.1	
191-24-2	Benzo(g,h,i)perylene	**8.6**	2.1	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	51	32 - 102
p-Terphenyl-d14 (SS2)	66	41 - 106

VT Urban Soils

PAHs in Soil - SIM

Client Sample ID:	O2	Lab Sample ID:	AB59047
Date of Collection:	10/13/2015	Matrix:	Soil
Date of Preparation:	10/20/2015	Amount Prepared:	N/A
Date of Analysis:	10/21/2015	Percent Solids:	80%
Dry Weight Prepared:	24.298 grams	Extract Dilution:	1
Wet Weight Prepared:	30.228 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	ND	2.1	
91-57-6	2-Methylnaphthalene	ND	2.1	
90-12-0	1-Methylnaphthalene	ND	2.1	
208-96-8	Acenaphthylene	ND	2.1	
83-32-9	Acenaphthene	ND	2.1	
86-73-7	Fluorene	ND	2.1	
85-01-8	Phenanthrene	**5.8**	2.1	
120-12-7	Anthracene	ND	2.1	
206-44-0	Fluoranthene	**4.4**	2.1	
129-00-0	Pyrene	**2.8**	2.1	
56-55-3	Benzo(a)anthracene	ND	2.1	
218-01-9	Chrysene	**3.1**	2.1	
205-99-2	Benzo(b)fluoranthene	**4.2**	2.1	
207-08-9	Benzo(k)fluoranthene	**2.8**	2.1	
50-32-8	Benzo(a)pyrene	ND	2.1	
193-39-5	Indeno(1,2,3-cd)pyrene	**3.5**	2.1	
53-70-3	Dibenz(a,h)anthracene	**2.7**	2.1	
191-24-2	Benzo(g,h,i)perylene	**3.2**	2.1	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	68	32 - 102
p-Terphenyl-d14 (SS2)	85	41 - 106

VT Urban Soils

PAHs in Soil - SIM

Client Sample ID:	E4a	Lab Sample ID:	AB59048
Date of Collection:	10/15/2015	Matrix:	Soil
Date of Preparation:	10/20/2015	Amount Prepared:	N/A
Date of Analysis:	10/21/2015	Percent Solids:	79%
Dry Weight Prepared:	23.727 grams	Extract Dilution:	1
Wet Weight Prepared:	30.110 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	ND	2.1	
91-57-6	2-Methylnaphthalene	ND	2.1	
90-12-0	1-Methylnaphthalene	ND	2.1	
208-96-8	Acenaphthylene	ND	2.1	
83-32-9	Acenaphthene	ND	2.1	
86-73-7	Fluorene	**2.1**	2.1	
85-01-8	Phenanthrene	**14**	2.1	
120-12-7	Anthracene	ND	2.1	
206-44-0	Fluoranthene	**6.0**	2.1	
129-00-0	Pyrene	**2.8**	2.1	
56-55-3	Benzo(a)anthracene	ND	2.1	
218-01-9	Chrysene	ND	2.1	
205-99-2	Benzo(b)fluoranthene	**2.2**	2.1	
207-08-9	Benzo(k)fluoranthene	ND	2.1	
50-32-8	Benzo(a)pyrene	ND	2.1	
193-39-5	Indeno(1,2,3-cd)pyrene	**2.4**	2.1	
53-70-3	Dibenz(a,h)anthracene	ND	2.1	
191-24-2	Benzo(g,h,i)perylene	**2.3**	2.1	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	53	32 - 102
p-Terphenyl-d14 (SS2)	71	41 - 106

VT Urban Soils

Laboratory Blank (PAHs)

Client Sample ID:	N/A	Lab Sample ID:	N/A
Date of Collection:	N/A	Matrix:	Soil
Date of Preparation:	10/20/2015	Amount Prepared:	N/A
Date of Analysis:	10/21/2015	Percent Solids:	100%
Dry Weight Prepared:	30.862 grams	Extract Dilution:	1
Wet Weight Prepared:	30.867 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	ND	1.6	
91-57-6	2-Methylnapthalene	ND	1.6	
90-12-0	1-Methylnapthalene	ND	1.6	
208-96-8	Acenaphthylene	ND	1.6	
83-32-9	Acenaphthene	ND	1.6	
86-73-7	Fluorene	ND	1.6	
85-01-8	Phenanthrene	ND	1.6	
120-12-7	Anthracene	ND	1.6	
206-44-0	Fluoranthene	ND	1.6	
129-00-0	Pyrene	ND	1.6	
56-55-3	Benzo(a)anthracene	ND	1.6	
218-01-9	Chrysene	ND	1.6	
205-99-2	Benzo(b)fluoranthene	ND	1.6	
207-08-9	Benzo(k)fluoranthene	ND	1.6	
50-32-8	Benzo(a)pyrene	ND	1.6	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	1.6	
53-70-3	Dibenz(a,h)anthracene	ND	1.6	
191-24-2	Benzo(g,h,i)perylene	ND	1.6	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	70	32 - 102
p-Terphenyl-d14 (SS2)	90	41 - 106

VT Urban Soils

PAHs in Soil - SIM

Client Sample ID:	E4	Lab Sample ID:	AB59049
Date of Collection:	10/15/2015	Matrix:	Soil
Date of Preparation:	10/20/2015	Amount Prepared:	N/A
Date of Analysis:	10/21/2015	Percent Solids:	66%
Dry Weight Prepared:	20.093 grams	Extract Dilution:	1
Wet Weight Prepared:	30.228 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	ND	2.5	
91-57-6	2-Methylnaphthalene	ND	2.5	
90-12-0	1-Methylnaphthalene	ND	2.5	
208-96-8	Acenaphthylene	ND	2.5	
83-32-9	Acenaphthene	ND	2.5	
86-73-7	Fluorene	ND	2.5	
85-01-8	Phenanthrene	**20**	2.5	
120-12-7	Anthracene	ND	2.5	
206-44-0	Fluoranthene	**18**	2.5	
129-00-0	Pyrene	**12**	2.5	
56-55-3	Benzo(a)anthracene	**6.0**	2.5	
218-01-9	Chrysene	**9.3**	2.5	
205-99-2	Benzo(b)fluoranthene	**9.6**	2.5	
207-08-9	Benzo(k)fluoranthene	**7.5**	2.5	
50-32-8	Benzo(a)pyrene	**6.3**	2.5	
193-39-5	Indeno(1,2,3-cd)pyrene	**6.8**	2.5	
53-70-3	Dibenz(a,h)anthracene	**3.7**	2.5	
191-24-2	Benzo(g,h,i)perylene	**7.1**	2.5	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	50	32 - 102
p-Terphenyl-d14 (SS2)	67	41 - 106

VT Urban Soils

PAHs in Soil - SIM

Client Sample ID:	D5	Lab Sample ID:	AB59050
Date of Collection:	10/16/2015	Matrix:	Soil
Date of Preparation:	10/20/2015	Amount Prepared:	N/A
Date of Analysis:	10/21/2015	Percent Solids:	79%
Dry Weight Prepared:	23.949 grams	Extract Dilution:	1
Wet Weight Prepared:	30.176 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	ND	2.1	
91-57-6	2-Methylnaphthalene	ND	2.1	
90-12-0	1-Methylnaphthalene	ND	2.1	
208-96-8	Acenaphthylene	ND	2.1	
83-32-9	Acenaphthene	ND	2.1	
86-73-7	Fluorene	ND	2.1	
85-01-8	Phenanthrene	**9.7**	2.1	
120-12-7	Anthracene	ND	2.1	
206-44-0	Fluoranthene	**12**	2.1	
129-00-0	Pyrene	**10**	2.1	
56-55-3	Benzo(a)anthracene	**7.1**	2.1	
218-01-9	Chrysene	**10**	2.1	
205-99-2	Benzo(b)fluoranthene	**9.0**	2.1	
207-08-9	Benzo(k)fluoranthene	**7.0**	2.1	
50-32-8	Benzo(a)pyrene	**6.0**	2.1	
193-39-5	Indeno(1,2,3-cd)pyrene	**6.3**	2.1	
53-70-3	Dibenz(a,h)anthracene	**3.6**	2.1	
191-24-2	Benzo(g,h,i)perylene	**6.6**	2.1	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	67	32 - 102
p-Terphenyl-d14 (SS2)	84	41 - 106

VT Urban Soils

PAHs in Soil - SIM

Client Sample ID:	D4	Lab Sample ID:	AB59051
Date of Collection:	10/16/2015	Matrix:	Soil
Date of Preparation:	10/20/2015	Amount Prepared:	N/A
Date of Analysis:	10/21/2015	Percent Solids:	80%
Dry Weight Prepared:	24.419 grams	Extract Dilution:	1
Wet Weight Prepared:	30.699 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	ND	2.0	
91-57-6	2-Methylnaphthalene	ND	2.0	
90-12-0	1-Methylnaphthalene	ND	2.0	
208-96-8	Acenaphthylene	ND	2.0	
83-32-9	Acenaphthene	ND	2.0	
86-73-7	Fluorene	ND	2.0	
85-01-8	Phenanthrene	**19**	2.0	
120-12-7	Anthracene	ND	2.0	
206-44-0	Fluoranthene	**22**	2.0	
129-00-0	Pyrene	**16**	2.0	
56-55-3	Benzo(a)anthracene	**8.3**	2.0	
218-01-9	Chrysene	**12**	2.0	
205-99-2	Benzo(b)fluoranthene	**11**	2.0	
207-08-9	Benzo(k)fluoranthene	**8.5**	2.0	
50-32-8	Benzo(a)pyrene	**8.6**	2.0	
193-39-5	Indeno(1,2,3-cd)pyrene	**7.4**	2.0	
53-70-3	Dibenz(a,h)anthracene	**3.2**	2.0	
191-24-2	Benzo(g,h,i)perylene	**7.8**	2.0	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	37	32 - 102
p-Terphenyl-d14 (SS2)	52	41 - 106

VT Urban Soils

MATRIX SPIKE (MS) RECOVERY

Sample ID: AB59048

PARAMETER	SPIKE ADDED ug/Kg	SAMPLE CONCENTRATION ug/Kg	MS CONCENTRATION ug/Kg	MS % REC	QC LIMITS (% REC)
1-Methylnaphthalene	165	ND	117	71	49 - 99
2-Methylnaphthalene	165	ND	117	71	43 - 101
Acenaphthene	165	ND	125	76	31 - 119
Acenaphthylene	165	ND	128	78	32 - 116
Anthracene	165	ND	145	88	17 - 151
Benzo(a)anthracene	165	ND	155	94	18 - 136
Benzo(a)pyrene	165	ND	140	85	26 - 115
Benzo(b)fluoranthene	165	2.2	146	87	13 - 144
Benzo(g,h,i)perylene	165	2.3	151	90	21 - 137
Benzo(k)fluoranthene	165	ND	139	84	27 - 139
Chrysene	165	ND	146	89	20 - 130
Dibenz(a,h)anthracene	165	ND	155	94	24 - 137
Fluoranthene	165	6.0	154	90	17 - 149
Fluorene	165	2.1	129	77	34 - 121
Indeno(1,2,3-cd)pyrene	165	2.4	152	91	18 - 148
Naphthalene	165	ND	110	67	22 - 112
Phenanthrene	165	14.0	148	81	18 - 134
Pyrene	165	2.8	140	83	19 - 133

VT Urban Soils

Laboratory Duplicate Results

Sample ID: AB59048

PARAMETER	SAMPLE RESULT ug/Kg	SAMPLE DUPLICATE RESULT ug/Kg	PRECISION RPD %	QC LIMITS
1-Methylnaphthalene	ND	ND	NC	40
2-Methylnaphthalene	ND	ND	NC	40
Acenaphthene	ND	ND	NC	40
Acenaphthylene	ND	ND	NC	40
Anthracene	ND	ND	NC	40
Benzo(a)anthracene	ND	ND	NC	40
Benzo(a)pyrene	ND	ND	NC	40
Benzo(b)fluoranthene	2.2	ND	ND	40
Benzo(g,h,i)perylene	2.3	ND	ND	40
Benzo(k)fluoranthene	ND	ND	NC	40
Chrysene	ND	ND	NC	40
Dibenz(a,h)anthracene	ND	ND	NC	40
Fluoranthene	6.0	6.84	13.1	40
Fluorene	2.1	2.29	8.66	40
Indeno(1,2,3-cd)pyrene	2.4	ND	ND	40
Naphthalene	ND	ND	NC	40
Phenanthrene	14.0	16.2	14.6	40
Pyrene	2.8	2.99	6.56	40

VT Urban Soils

Laboratory Fortified Blank (LFB) Results

PARAMETER	LFB AMOUNT SPIKED ppb	LFB RESULT ppb	LFB RECOVERY %	QC LIMITS %
1-Methylnaphthalene	130	92.4	71	41 - 117
2-Methylnaphthalene	130	91.7	71	35 - 120
Acenaphthene	130	96.7	74	40 - 110
Acenaphthylene	130	95.8	74	41 - 108
Anthracene	130	110	85	46 - 122
Benzo(a)anthracene	130	112	86	49 - 120
Benzo(a)pyrene	130	110	85	44 - 124
Benzo(b)fluoranthene	130	125	96	45 - 123
Benzo(g,h,i)perylene	130	121	93	48 - 120
Benzo(k)fluoranthene	130	122	94	40 - 127
Chrysene	130	112	86	44 - 117
Dibenz(a,h)anthracene	130	124	95	49 - 124
Fluoranthene	130	108	83	47 - 124
Fluorene	130	97.9	75	42 - 112
Indeno(1,2,3-cd)pyrene	130	119	92	48 - 121
Naphthalene	130	91.3	70	38 - 104
Phenanthrene	130	107	82	41 - 116
Pyrene	130	110	85	43 - 117

Comments:

Samples in Batch: AB59043, AB59044, AB59045, AB59046, AB59047, AB59048, AB59049, AB59050, AB59051

15100025 $PAHS
15100025 $METMS_PE

ENVIRONMENTAL PROTECTION AGENCY
REGION 1

CHAIN OF CUSTODY RECORD

PROJ. NO.: 15100025
PROJECT NAME: Soil Background Study
SAMPLERS: (Signature) VT DEC

STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS	PAHs	ARSENIC	LEAD				REMARKS
	10.13.15	1035	X		A1	2	X	X	X				
	10.13.15	1215	X		A5	2	X	X	X				
	10.13.15	930	X		B2	2	X	X	X				
	10.13.15	1430	X		C3	2	X	X	X				
	10.13.15	1440	X		O2	2	X	X	X				
	10/15/15	0900	X		E4a	2	X	X	X				
	10/15/15	1000	X		E4	2	X	X	X				
	10/16/15	1115	X		D5	2	X	X	X				
	10/16/15	1300	X		D4	2	X	X	X				

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
[signature]	10/19/15 1500	FEDEX# 774770606218			
Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature) ESAT	Date / Time	Remarks	
		[signature]	10/20/15 08:30		

Distribution: Original Accompanies Shipment; Copy to Coordinator Field Files

1- 19381

United States Environmental Protection Agency
Office of Environmental Measurement & Evaluation
11 Technology Drive
North Chelmsford, MA 01863-2431

Laboratory Report

November 24, 2015

Jim Byrne - Mail Code OSRR07-2
US EPA New England R1

Project Number: 15100039
Project: VT Urban Soils
Analysis: PAHs in Soil - SIM
EPA Chemist: Inna Germansderfer

Date Samples Received by the Laboratory: 10/27/2015

Analytical Procedure:

All samples were received and logged in by the laboratory according to the USEPA New England Laboratory SOP for Sample Log-in.

Sample preparation and analysis was done following the EPA Region I SOP, EIASOP-PAHSOLL6.

Samples were analyzed by a quadrapole GC/MS operating in the Selective Ion Monitoring (SIM) mode.. The extraction and analysis SOPs are based on SW-846 methods 3545A, 3630C,8270C, and EIASOP-BNAGCMS9.

Data were reviewed in accordance with the internal verification procedures described in the EPA New England Quality Manual for NERL.

Results relate only to the items tested or to the samples as received by the Laboratory. This analytical report shall not be reproduced except in full, without written approval of the laboratory.

If you have any questions please call me at 617-918-8340 .

Sincerely,

Qualifiers:

RL = Reporting limit
ND = Not Detected above Reporting limit
NA = Not Applicable due to high sample dilutions or sample interferences
NC = Not calculated since analyte concentration is ND.
J = Estimated value
J1 = Estimated value due to MS recovery outside accceptance criteria
J2 = Estimated value due to LFB result outside acceptance criteria
J3 = Estimated value due to RPD result outside acceptance criteria
J4 = Estimated value due to LCS result outside acceptance criteria
E = Estimated value exceeds the calibration range
L = Estimated value is below the calibration range
B = Analyte is associated with the lab blank or trip blank contamination. Values are qualified when the observed concentration of the contamination in the sample extract is less than 10 times the concentration in the blank.
R = No recovery was calculated since the analyte concentration is greater than four times the spike level.
P = The confirmation value exceeded 35% difference and is less than 100%. The lower value is reported.
C = The identification has been confirmed by GC/MS.
A = Suspected Aldol condensation product.
N = Tentatively identified compound.

VT Urban Soils

PAHs in Soil - SIM

Client Sample ID:	E1	Lab Sample ID:	AB59206
Date of Collection:	10/19/2015	Matrix:	Soil
Date of Preparation:	10/29/2015	Amount Prepared:	N/A
Date of Analysis:	11/03/2015	Percent Solids:	84%
Dry Weight Prepared:	25.607 grams	Extract Dilution:	1
Wet Weight Prepared:	30.568 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	**7.4**	2.0	
91-57-6	2-Methylnaphthalene	**6.2**	2.0	
90-12-0	1-Methylnaphthalene	**4.6**	2.0	
208-96-8	Acenaphthylene	**18**	2.0	
83-32-9	Acenaphthene	ND	2.0	
86-73-7	Fluorene	ND	2.0	
85-01-8	Phenanthrene	**42**	2.0	
120-12-7	Anthracene	**11**	2.0	
206-44-0	Fluoranthene	**120**	2.0	
129-00-0	Pyrene	**99**	2.0	
56-55-3	Benzo(a)anthracene	**52**	2.0	
218-01-9	Chrysene	**76**	2.0	
205-99-2	Benzo(b)fluoranthene	**80**	2.0	
207-08-9	Benzo(k)fluoranthene	**56**	2.0	
50-32-8	Benzo(a)pyrene	**64**	2.0	
193-39-5	Indeno(1,2,3-cd)pyrene	**46**	2.0	
53-70-3	Dibenz(a,h)anthracene	**17**	2.0	
191-24-2	Benzo(g,h,i)perylene	**54**	2.0	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	64	32 - 102
p-Terphenyl-d14 (SS2)	69	41 - 106

VT Urban Soils

PAHs in Soil - SIM

Client Sample ID:	E1A	Lab Sample ID:	AB59207
Date of Collection:	10/19/2015	Matrix:	Soil
Date of Preparation:	10/29/2015	Amount Prepared:	N/A
Date of Analysis:	11/03/2015	Percent Solids:	80%
Dry Weight Prepared:	24.213 grams	Extract Dilution:	1
Wet Weight Prepared:	30.310 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	**4.2**	2.1	
91-57-6	2-Methylnaphthalene	**5.1**	2.1	
90-12-0	1-Methylnaphthalene	**5.1**	2.1	
208-96-8	Acenaphthylene	**5.0**	2.1	
83-32-9	Acenaphthene	ND	2.1	
86-73-7	Fluorene	ND	2.1	
85-01-8	Phenanthrene	**12**	2.1	
120-12-7	Anthracene	**2.9**	2.1	
206-44-0	Fluoranthene	**26**	2.1	
129-00-0	Pyrene	**21**	2.1	
56-55-3	Benzo(a)anthracene	**11**	2.1	
218-01-9	Chrysene	**21**	2.1	
205-99-2	Benzo(b)fluoranthene	**22**	2.1	
207-08-9	Benzo(k)fluoranthene	**15**	2.1	
50-32-8	Benzo(a)pyrene	**15**	2.1	
193-39-5	Indeno(1,2,3-cd)pyrene	**11**	2.1	
53-70-3	Dibenz(a,h)anthracene	**4.7**	2.1	
191-24-2	Benzo(g,h,i)perylene	**13**	2.1	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	60	32 - 102
p-Terphenyl-d14 (SS2)	66	41 - 106

VT Urban Soils

PAHs in Soil - SIM

Client Sample ID:	E1B	Lab Sample ID:	AB59208
Date of Collection:	10/19/2015	Matrix:	Soil
Date of Preparation:	10/29/2015	Amount Prepared:	N/A
Date of Analysis:	11/03/2015	Percent Solids:	87%
Dry Weight Prepared:	26.793 grams	Extract Dilution:	1
Wet Weight Prepared:	30.888 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	**11**	1.9	
91-57-6	2-Methylnaphthalene	**4.8**	1.9	
90-12-0	1-Methylnaphthalene	**3.4**	1.9	
208-96-8	Acenaphthylene	**43**	1.9	
83-32-9	Acenaphthene	**4.8**	1.9	
86-73-7	Fluorene	**4.7**	1.9	
85-01-8	Phenanthrene	**110**	1.9	
120-12-7	Anthracene	**27**	1.9	
206-44-0	Fluoranthene	**330**	1.9	
129-00-0	Pyrene	**260**	1.9	
56-55-3	Benzo(a)anthracene	**170**	1.9	
218-01-9	Chrysene	**200**	1.9	
205-99-2	Benzo(b)fluoranthene	**230**	1.9	
207-08-9	Benzo(k)fluoranthene	**180**	1.9	
50-32-8	Benzo(a)pyrene	**200**	1.9	
193-39-5	Indeno(1,2,3-cd)pyrene	**140**	1.9	
53-70-3	Dibenz(a,h)anthracene	**50**	1.9	
191-24-2	Benzo(g,h,i)perylene	**150**	1.9	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	64	32 - 102
p-Terphenyl-d14 (SS2)	71	41 - 106

VT Urban Soils

PAHs in Soil - SIM

Client Sample ID:	E1C	Lab Sample ID:	AB59209
Date of Collection:	10/19/2015	Matrix:	Soil
Date of Preparation:	10/29/2015	Amount Prepared:	N/A
Date of Analysis:	11/03/2015	Percent Solids:	86%
Dry Weight Prepared:	25.98 grams	Extract Dilution:	1
Wet Weight Prepared:	30.102 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	**14**	1.9	
91-57-6	2-Methylnaphthalene	**16**	1.9	
90-12-0	1-Methylnaphthalene	**13**	1.9	
208-96-8	Acenaphthylene	**16**	1.9	
83-32-9	Acenaphthene	ND	1.9	
86-73-7	Fluorene	**2.2**	1.9	
85-01-8	Phenanthrene	**32**	1.9	
120-12-7	Anthracene	**9.9**	1.9	
206-44-0	Fluoranthene	**80**	1.9	
129-00-0	Pyrene	**68**	1.9	
56-55-3	Benzo(a)anthracene	**45**	1.9	
218-01-9	Chrysene	**55**	1.9	
205-99-2	Benzo(b)fluoranthene	**62**	1.9	
207-08-9	Benzo(k)fluoranthene	**47**	1.9	
50-32-8	Benzo(a)pyrene	**54**	1.9	
193-39-5	Indeno(1,2,3-cd)pyrene	**39**	1.9	
53-70-3	Dibenz(a,h)anthracene	**17**	1.9	
191-24-2	Benzo(g,h,i)perylene	**47**	1.9	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	63	32 - 102
p-Terphenyl-d14 (SS2)	72	41 - 106

VT Urban Soils

PAHs in Soil - SIM

Client Sample ID:	E1D	Lab Sample ID:	AB59210
Date of Collection:	10/19/2015	Matrix:	Soil
Date of Preparation:	10/29/2015	Amount Prepared:	N/A
Date of Analysis:	11/03/2015	Percent Solids:	79%
Dry Weight Prepared:	23.715 grams	Extract Dilution:	1
Wet Weight Prepared:	30.187 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	**5.4**	2.1	
91-57-6	2-Methylnaphthalene	**2.5**	2.1	
90-12-0	1-Methylnaphthalene	**2.1**	2.1	
208-96-8	Acenaphthylene	**9.0**	2.1	
83-32-9	Acenaphthene	**8.0**	2.1	
86-73-7	Fluorene	**6.6**	2.1	
85-01-8	Phenanthrene	**110**	2.1	
120-12-7	Anthracene	**23**	2.1	
206-44-0	Fluoranthene	**260**	2.1	
129-00-0	Pyrene	**200**	2.1	
56-55-3	Benzo(a)anthracene	**120**	2.1	
218-01-9	Chrysene	**140**	2.1	
205-99-2	Benzo(b)fluoranthene	**130**	2.1	
207-08-9	Benzo(k)fluoranthene	**100**	2.1	
50-32-8	Benzo(a)pyrene	**120**	2.1	
193-39-5	Indeno(1,2,3-cd)pyrene	**75**	2.1	
53-70-3	Dibenz(a,h)anthracene	**6.5**	2.1	
191-24-2	Benzo(g,h,i)perylene	**84**	2.1	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	56	32 - 102
p-Terphenyl-d14 (SS2)	62	41 - 106

VT Urban Soils

PAHs in Soil - SIM

Client Sample ID:	E1E	Lab Sample ID:	AB59211
Date of Collection:	10/19/2015	Matrix:	Soil
Date of Preparation:	10/29/2015	Amount Prepared:	N/A
Date of Analysis:	11/03/2015	Percent Solids:	84%
Dry Weight Prepared:	25.446 grams	Extract Dilution:	1
Wet Weight Prepared:	30.299 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	**10**	2.0	
91-57-6	2-Methylnaphthalene	**5.8**	2.0	
90-12-0	1-Methylnaphthalene	**3.9**	2.0	
208-96-8	Acenaphthylene	**13**	2.0	
83-32-9	Acenaphthene	**2.7**	2.0	
86-73-7	Fluorene	**3.4**	2.0	
85-01-8	Phenanthrene	**61**	2.0	
120-12-7	Anthracene	**13**	2.0	
206-44-0	Fluoranthene	**140**	2.0	
129-00-0	Pyrene	**110**	2.0	
56-55-3	Benzo(a)anthracene	**66**	2.0	
218-01-9	Chrysene	**84**	2.0	
205-99-2	Benzo(b)fluoranthene	**88**	2.0	
207-08-9	Benzo(k)fluoranthene	**66**	2.0	
50-32-8	Benzo(a)pyrene	**74**	2.0	
193-39-5	Indeno(1,2,3-cd)pyrene	**51**	2.0	
53-70-3	Dibenz(a,h)anthracene	**3.6**	2.0	
191-24-2	Benzo(g,h,i)perylene	**58**	2.0	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	64	32 - 102
p-Terphenyl-d14 (SS2)	70	41 - 106

VT Urban Soils

PAHs in Soil - SIM

Client Sample ID:	E1F	Lab Sample ID:	AB59212
Date of Collection:	10/19/2015	Matrix:	Soil
Date of Preparation:	10/29/2015	Amount Prepared:	N/A
Date of Analysis:	11/03/2015	Percent Solids:	87%
Dry Weight Prepared:	25.528 grams	Extract Dilution:	1
Wet Weight Prepared:	29.344 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	**6.4**	2.0	
91-57-6	2-Methylnaphthalene	**3.3**	2.0	
90-12-0	1-Methylnaphthalene	**2.1**	2.0	
208-96-8	Acenaphthylene	**26**	2.0	
83-32-9	Acenaphthene	**2.9**	2.0	
86-73-7	Fluorene	**3.7**	2.0	
85-01-8	Phenanthrene	**66**	2.0	
120-12-7	Anthracene	**17**	2.0	
206-44-0	Fluoranthene	**170**	2.0	
129-00-0	Pyrene	**140**	2.0	
56-55-3	Benzo(a)anthracene	**75**	2.0	
218-01-9	Chrysene	**100**	2.0	
205-99-2	Benzo(b)fluoranthene	**110**	2.0	
207-08-9	Benzo(k)fluoranthene	**93**	2.0	
50-32-8	Benzo(a)pyrene	**93**	2.0	
193-39-5	Indeno(1,2,3-cd)pyrene	**69**	2.0	
53-70-3	Dibenz(a,h)anthracene	**5.4**	2.0	
191-24-2	Benzo(g,h,i)perylene	**77**	2.0	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	61	32 - 102
p-Terphenyl-d14 (SS2)	69	41 - 106

VT Urban Soils

Laboratory Blank (PAHs)

Client Sample ID:	N/A	Lab Sample ID:	N/A
Date of Collection:	N/A	Matrix:	Soil
Date of Preparation:	10/29/2015	Amount Prepared:	N/A
Date of Analysis:	11/03/2015	Percent Solids:	100%
Dry Weight Prepared:	30.382 grams	Extract Dilution:	1
Wet Weight Prepared:	30.393 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	ND	1.7	
91-57-6	2-Methylnapthalene	ND	1.7	
90-12-0	1-Methylnapthalene	ND	1.7	
208-96-8	Acenaphthylene	ND	1.7	
83-32-9	Acenaphthene	ND	1.7	
86-73-7	Fluorene	ND	1.7	
85-01-8	Phenanthrene	ND	1.7	
120-12-7	Anthracene	ND	1.7	
206-44-0	Fluoranthene	ND	1.7	
129-00-0	Pyrene	ND	1.7	
56-55-3	Benzo(a)anthracene	ND	1.7	
218-01-9	Chrysene	ND	1.7	
205-99-2	Benzo(b)fluoranthene	ND	1.7	
207-08-9	Benzo(k)fluoranthene	ND	1.7	
50-32-8	Benzo(a)pyrene	ND	1.7	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	1.7	
53-70-3	Dibenz(a,h)anthracene	ND	1.7	
191-24-2	Benzo(g,h,i)perylene	ND	1.7	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	65	32 - 102
p-Terphenyl-d14 (SS2)	87	41 - 106

VT Urban Soils

PAHs in Soil - SIM

Client Sample ID:	D7	Lab Sample ID:	AB59213
Date of Collection:	10/23/2015	Matrix:	Soil
Date of Preparation:	10/29/2015	Amount Prepared:	N/A
Date of Analysis:	11/03/2015	Percent Solids:	88%
Dry Weight Prepared:	26.204 grams	Extract Dilution:	1
Wet Weight Prepared:	29.833 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	ND	1.9	
91-57-6	2-Methylnaphthalene	ND	1.9	
90-12-0	1-Methylnaphthalene	ND	1.9	
208-96-8	Acenaphthylene	**2.0**	1.9	
83-32-9	Acenaphthene	ND	1.9	
86-73-7	Fluorene	ND	1.9	
85-01-8	Phenanthrene	ND	1.9	
120-12-7	Anthracene	ND	1.9	
206-44-0	Fluoranthene	ND	1.9	
129-00-0	Pyrene	ND	1.9	
56-55-3	Benzo(a)anthracene	ND	1.9	
218-01-9	Chrysene	ND	1.9	
205-99-2	Benzo(b)fluoranthene	ND	1.9	
207-08-9	Benzo(k)fluoranthene	ND	1.9	
50-32-8	Benzo(a)pyrene	ND	1.9	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	1.9	
53-70-3	Dibenz(a,h)anthracene	ND	1.9	
191-24-2	Benzo(g,h,i)perylene	ND	1.9	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	63	32 - 102
p-Terphenyl-d14 (SS2)	72	41 - 106

VT Urban Soils

PAHs in Soil - SIM

Client Sample ID:	E9	Lab Sample ID:	AB59214
Date of Collection:	10/23/2015	Matrix:	Soil
Date of Preparation:	10/29/2015	Amount Prepared:	N/A
Date of Analysis:	11/03/2015	Percent Solids:	69%
Dry Weight Prepared:	20.630 grams	Extract Dilution:	1
Wet Weight Prepared:	29.98 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	ND	2.4	
91-57-6	2-Methylnaphthalene	ND	2.4	
90-12-0	1-Methylnaphthalene	ND	2.4	
208-96-8	Acenaphthylene	ND	2.4	
83-32-9	Acenaphthene	ND	2.4	
86-73-7	Fluorene	ND	2.4	
85-01-8	Phenanthrene	**2.4**	2.4	
120-12-7	Anthracene	ND	2.4	
206-44-0	Fluoranthene	**3.2**	2.4	
129-00-0	Pyrene	ND	2.4	
56-55-3	Benzo(a)anthracene	ND	2.4	
218-01-9	Chrysene	**3.3**	2.4	
205-99-2	Benzo(b)fluoranthene	**4.8**	2.4	
207-08-9	Benzo(k)fluoranthene	ND	2.4	
50-32-8	Benzo(a)pyrene	ND	2.4	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	2.4	
53-70-3	Dibenz(a,h)anthracene	ND	2.4	
191-24-2	Benzo(g,h,i)perylene	ND	2.4	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	52	32 - 102
p-Terphenyl-d14 (SS2)	58	41 - 106

VT Urban Soils

PAHs in Soil - SIM

Client Sample ID:	DUP-4	Lab Sample ID:	AB59215
Date of Collection:	10/23/2015	Matrix:	Soil
Date of Preparation:	10/29/2015	Amount Prepared:	N/A
Date of Analysis:	11/03/2015	Percent Solids:	88%
Dry Weight Prepared:	26.306 grams	Extract Dilution:	1
Wet Weight Prepared:	30.026 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	ND	1.9	
91-57-6	2-Methylnaphthalene	ND	1.9	
90-12-0	1-Methylnaphthalene	ND	1.9	
208-96-8	Acenaphthylene	ND	1.9	
83-32-9	Acenaphthene	ND	1.9	
86-73-7	Fluorene	ND	1.9	
85-01-8	Phenanthrene	ND	1.9	
120-12-7	Anthracene	ND	1.9	
206-44-0	Fluoranthene	ND	1.9	
129-00-0	Pyrene	ND	1.9	
56-55-3	Benzo(a)anthracene	ND	1.9	
218-01-9	Chrysene	ND	1.9	
205-99-2	Benzo(b)fluoranthene	ND	1.9	
207-08-9	Benzo(k)fluoranthene	ND	1.9	
50-32-8	Benzo(a)pyrene	ND	1.9	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	1.9	
53-70-3	Dibenz(a,h)anthracene	ND	1.9	
191-24-2	Benzo(g,h,i)perylene	ND	1.9	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	52	32 - 102
p-Terphenyl-d14 (SS2)	58	41 - 106

VT Urban Soils

PAHs in Soil - SIM

Client Sample ID:	L-3	Lab Sample ID:	AB59216
Date of Collection:	10/23/2015	Matrix:	Soil
Date of Preparation:	10/29/2015	Amount Prepared:	N/A
Date of Analysis:	11/03/2015	Percent Solids:	67%
Dry Weight Prepared:	20.211 grams	Extract Dilution:	1
Wet Weight Prepared:	30.061 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	ND	2.5	
91-57-6	2-Methylnaphthalene	ND	2.5	
90-12-0	1-Methylnaphthalene	ND	2.5	
208-96-8	Acenaphthylene	ND	2.5	
83-32-9	Acenaphthene	ND	2.5	
86-73-7	Fluorene	ND	2.5	
85-01-8	Phenanthrene	**3.2**	2.5	
120-12-7	Anthracene	ND	2.5	
206-44-0	Fluoranthene	**6.9**	2.5	
129-00-0	Pyrene	**5.6**	2.5	
56-55-3	Benzo(a)anthracene	**3.9**	2.5	
218-01-9	Chrysene	**5.5**	2.5	
205-99-2	Benzo(b)fluoranthene	**5.7**	2.5	
207-08-9	Benzo(k)fluoranthene	**4.3**	2.5	
50-32-8	Benzo(a)pyrene	**4.0**	2.5	
193-39-5	Indeno(1,2,3-cd)pyrene	**3.3**	2.5	
53-70-3	Dibenz(a,h)anthracene	ND	2.5	
191-24-2	Benzo(g,h,i)perylene	**3.4**	2.5	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	50	32 - 102
p-Terphenyl-d14 (SS2)	48	41 - 106

VT Urban Soils

PAHs in Soil - SIM

Client Sample ID:	DUP-12	Lab Sample ID:	AB59217
Date of Collection:	10/23/2015	Matrix:	Soil
Date of Preparation:	10/29/2015	Amount Prepared:	N/A
Date of Analysis:	11/03/2015	Percent Solids:	67%
Dry Weight Prepared:	21.063 grams	Extract Dilution:	1
Wet Weight Prepared:	31.265 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	ND	2.4	
91-57-6	2-Methylnaphthalene	ND	2.4	
90-12-0	1-Methylnaphthalene	ND	2.4	
208-96-8	Acenaphthylene	ND	2.4	
83-32-9	Acenaphthene	ND	2.4	
86-73-7	Fluorene	ND	2.4	
85-01-8	Phenanthrene	**3.5**	2.4	
120-12-7	Anthracene	ND	2.4	
206-44-0	Fluoranthene	**6.1**	2.4	
129-00-0	Pyrene	**4.8**	2.4	
56-55-3	Benzo(a)anthracene	**2.5**	2.4	
218-01-9	Chrysene	**3.8**	2.4	
205-99-2	Benzo(b)fluoranthene	**4.0**	2.4	
207-08-9	Benzo(k)fluoranthene	**3.0**	2.4	
50-32-8	Benzo(a)pyrene	**2.8**	2.4	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	2.4	
53-70-3	Dibenz(a,h)anthracene	ND	2.4	
191-24-2	Benzo(g,h,i)perylene	ND	2.4	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	48	32 - 102
p-Terphenyl-d14 (SS2)	48	41 - 106

VT Urban Soils

PAHs in Soil - SIM

Client Sample ID:	M-3	Lab Sample ID:	AB59218
Date of Collection:	10/23/2015	Matrix:	Soil
Date of Preparation:	10/29/2015	Amount Prepared:	N/A
Date of Analysis:	11/03/2015	Percent Solids:	45%
Dry Weight Prepared:	14.248 grams	Extract Dilution:	1
Wet Weight Prepared:	31.743 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	ND	3.5	
91-57-6	2-Methylnaphthalene	ND	3.5	
90-12-0	1-Methylnaphthalene	ND	3.5	
208-96-8	Acenaphthylene	**3.6**	3.5	
83-32-9	Acenaphthene	ND	3.5	
86-73-7	Fluorene	**4.3**	3.5	
85-01-8	Phenanthrene	**21**	3.5	
120-12-7	Anthracene	**5.9**	3.5	
206-44-0	Fluoranthene	**28**	3.5	
129-00-0	Pyrene	**21**	3.5	
56-55-3	Benzo(a)anthracene	**11**	3.5	
218-01-9	Chrysene	**21**	3.5	
205-99-2	Benzo(b)fluoranthene	**23**	3.5	
207-08-9	Benzo(k)fluoranthene	**16**	3.5	
50-32-8	Benzo(a)pyrene	**11**	3.5	
193-39-5	Indeno(1,2,3-cd)pyrene	**12**	3.5	
53-70-3	Dibenz(a,h)anthracene	**6.7**	3.5	
191-24-2	Benzo(g,h,i)perylene	**12**	3.5	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	48	32 - 102
p-Terphenyl-d14 (SS2)	58	41 - 106

VT Urban Soils

PAHs in Soil - SIM

Client Sample ID:	N-3	Lab Sample ID:	AB59219
Date of Collection:	10/23/2015	Matrix:	Soil
Date of Preparation:	10/29/2015	Amount Prepared:	N/A
Date of Analysis:	11/03/2015	Percent Solids:	68%
Dry Weight Prepared:	20.917 grams	Extract Dilution:	1
Wet Weight Prepared:	30.917 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	ND	2.4	
91-57-6	2-Methylnaphthalene	ND	2.4	
90-12-0	1-Methylnaphthalene	ND	2.4	
208-96-8	Acenaphthylene	**4.4**	2.4	
83-32-9	Acenaphthene	ND	2.4	
86-73-7	Fluorene	ND	2.4	
85-01-8	Phenanthrene	**13**	2.4	
120-12-7	Anthracene	**3.2**	2.4	
206-44-0	Fluoranthene	**29**	2.4	
129-00-0	Pyrene	**24**	2.4	
56-55-3	Benzo(a)anthracene	**14**	2.4	
218-01-9	Chrysene	**18**	2.4	
205-99-2	Benzo(b)fluoranthene	**17**	2.4	
207-08-9	Benzo(k)fluoranthene	**13**	2.4	
50-32-8	Benzo(a)pyrene	**13**	2.4	
193-39-5	Indeno(1,2,3-cd)pyrene	**9.6**	2.4	
53-70-3	Dibenz(a,h)anthracene	ND	2.4	
191-24-2	Benzo(g,h,i)perylene	**11**	2.4	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	51	32 - 102
p-Terphenyl-d14 (SS2)	55	41 - 106

VT Urban Soils

PAHs in Soil - SIM

Client Sample ID:	N-4	Lab Sample ID:	AB59220
Date of Collection:	10/23/2015	Matrix:	Soil
Date of Preparation:	10/29/2015	Amount Prepared:	N/A
Date of Analysis:	11/03/2015	Percent Solids:	64%
Dry Weight Prepared:	19.732 grams	Extract Dilution:	1
Wet Weight Prepared:	30.638 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	ND	2.5	
91-57-6	2-Methylnaphthalene	ND	2.5	
90-12-0	1-Methylnaphthalene	ND	2.5	
208-96-8	Acenaphthylene	ND	2.5	
83-32-9	Acenaphthene	ND	2.5	
86-73-7	Fluorene	ND	2.5	
85-01-8	Phenanthrene	**2.6**	2.5	
120-12-7	Anthracene	ND	2.5	
206-44-0	Fluoranthene	**3.8**	2.5	
129-00-0	Pyrene	**2.8**	2.5	
56-55-3	Benzo(a)anthracene	ND	2.5	
218-01-9	Chrysene	**2.5**	2.5	
205-99-2	Benzo(b)fluoranthene	**2.8**	2.5	
207-08-9	Benzo(k)fluoranthene	ND	2.5	
50-32-8	Benzo(a)pyrene	ND	2.5	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	2.5	
53-70-3	Dibenz(a,h)anthracene	ND	2.5	
191-24-2	Benzo(g,h,i)perylene	ND	2.5	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	51	32 - 102
p-Terphenyl-d14 (SS2)	45	41 - 106

VT Urban Soils

PAHs in Soil - SIM

Client Sample ID:	M-4	Lab Sample ID:	AB59221
Date of Collection:	10/23/2015	Matrix:	Soil
Date of Preparation:	10/29/2015	Amount Prepared:	N/A
Date of Analysis:	11/03/2015	Percent Solids:	79%
Dry Weight Prepared:	24.595 grams	Extract Dilution:	1
Wet Weight Prepared:	31.143 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	ND	2.0	
91-57-6	2-Methylnaphthalene	ND	2.0	
90-12-0	1-Methylnaphthalene	ND	2.0	
208-96-8	Acenaphthylene	**4.6**	2.0	
83-32-9	Acenaphthene	ND	2.0	
86-73-7	Fluorene	ND	2.0	
85-01-8	Phenanthrene	**12**	2.0	
120-12-7	Anthracene	**3.0**	2.0	
206-44-0	Fluoranthene	**27**	2.0	
129-00-0	Pyrene	**20**	2.0	
56-55-3	Benzo(a)anthracene	**11**	2.0	
218-01-9	Chrysene	**13**	2.0	
205-99-2	Benzo(b)fluoranthene	**12**	2.0	
207-08-9	Benzo(k)fluoranthene	**10**	2.0	
50-32-8	Benzo(a)pyrene	**11**	2.0	
193-39-5	Indeno(1,2,3-cd)pyrene	**7.2**	2.0	
53-70-3	Dibenz(a,h)anthracene	ND	2.0	
191-24-2	Benzo(g,h,i)perylene	**7.9**	2.0	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	60	32 - 102
p-Terphenyl-d14 (SS2)	70	41 - 106

VT Urban Soils

MATRIX SPIKE (MS) RECOVERY

Sample ID: AB59212

PARAMETER	SPIKE ADDED ug/Kg	SAMPLE CONCENTRATION ug/Kg	MS CONCENTRATION ug/Kg	MS % REC	QC LIMITS (% REC)
1-Methylnaphthalene	156	2.1	105	66	49 - 99
2-Methylnaphthalene	156	3.3	110	68	43 - 101
Acenaphthene	156	2.9	116	72	31 - 119
Acenaphthylene	156	26.0	141	73	32 - 116
Anthracene	156	17.0	137	77	17 - 151
Benzo(a)anthracene	156	75.0	203	82	18 - 136
Benzo(a)pyrene	156	93.0	210	75	26 - 115
Benzo(b)fluoranthene	156	110	232	78	13 - 144
Benzo(g,h,i)perylene	156	77.0	192	73	21 - 137
Benzo(k)fluoranthene	156	93.0	212	76	27 - 139
Chrysene	156	100	224	79	20 - 130
Dibenz(a,h)anthracene	156	5.4	147	90	24 - 137
Fluoranthene	156	170	288	75	17 - 149
Fluorene	156	3.7	114	70	34 - 121
Indeno(1,2,3-cd)pyrene	156	69.0	184	73	18 - 148
Naphthalene	156	6.4	113	68	22 - 112
Phenanthrene	156	66.0	173	68	18 - 134
Pyrene	156	140	251	71	19 - 133

VT Urban Soils

Laboratory Duplicate Results

Sample ID: AB59212

PARAMETER	SAMPLE RESULT ug/Kg	SAMPLE DUPLICATE RESULT ug/Kg	PRECISION RPD %	QC LIMITS
1-Methylnaphthalene	2.1	ND	ND	40
2-Methylnaphthalene	3.3	2.73	18.9	40
Acenaphthene	2.9	2.21	27.0	40
Acenaphthylene	26.0	25.9	0.385	40
Anthracene	17.0	16.1	5.44	40
Benzo(a)anthracene	75.0	68.4	9.20	40
Benzo(a)pyrene	93.0	87.6	5.98	40
Benzo(b)fluoranthene	110	103	6.57	40
Benzo(g,h,i)perylene	77.0	75.6	1.83	40
Benzo(k)fluoranthene	93.0	91.6	1.52	40
Chrysene	100	96.1	3.98	40
Dibenz(a,h)anthracene	5.4	5.66	4.70	40
Fluoranthene	170	151	11.8	40
Fluorene	3.7	2.27	47.9	40
Indeno(1,2,3-cd)pyrene	69.0	65.9	4.60	40
Naphthalene	6.4	20.6	105	40
Phenanthrene	66.0	55.7	16.9	40
Pyrene	140	125	11.3	40

VT Urban Soils

Laboratory Fortified Blank (LFB) Results

PARAMETER	LFB AMOUNT SPIKED ppb	LFB RESULT ppb	LFB RECOVERY %	QC LIMITS %
1-Methylnaphthalene	131.7	92.9	71	41 - 117
2-Methylnaphthalene	131.7	94.4	72	35 - 120
Acenaphthene	131.7	98.8	75	40 - 110
Acenaphthylene	131.7	99.0	75	41 - 108
Anthracene	131.7	109	83	46 - 122
Benzo(a)anthracene	131.7	110	84	49 - 120
Benzo(a)pyrene	131.7	111	84	44 - 124
Benzo(b)fluoranthene	131.7	121	92	45 - 123
Benzo(g,h,i)perylene	131.7	104	79	48 - 120
Benzo(k)fluoranthene	131.7	110	84	40 - 127
Chrysene	131.7	110	84	44 - 117
Dibenz(a,h)anthracene	131.7	105	80	49 - 124
Fluoranthene	131.7	110	84	47 - 124
Fluorene	131.7	103	78	42 - 112
Indeno(1,2,3-cd)pyrene	131.7	104	79	48 - 121
Naphthalene	131.7	93.0	71	38 - 104
Phenanthrene	131.7	105	80	41 - 116
Pyrene	131.7	108	82	43 - 117

Comments:

Samples in Batch: AB59206, AB59207, AB59208, AB59209, AB59210, AB59211, AB59212, AB59213, AB59214, AB59215, AB59216, AB59217, AB59218, AB59219, AB59220, AB59221

ENVIRONMENTAL PROTECTION AGENCY

REGION 1

CHAIN OF CUSTODY RECORD

PROJ. NO.: 15100039

PROJECT NAME: Soil Background Study

SAMPLERS: (Signature) VT DEC

STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS	PAHs	ARSENIC	LEAD				REMARKS
													PG 1 of 2
	10/19	14:25	X		E1	2	X	X	X				
	10/19	12:15	X		E1 A	2	X	X	X				
	10/19	12:40	X		E1 B	2	X	X	X				
	10/19	10:50	X		E1 C	2	X	X	X				
	10/19	10:30	X		E1 D	2	X	X	X				
	10/19	15:00	X		E1 E	2	X	X	X				
	10/19	11:30	X		E1 F	2	X	X	X				
	10/23	1000	X		D7	2	X	X	X				
	10/23	1145	X		E9	2	X	X	X				
	10/23		X		DUP-4	2	X	X	X				
	10/23	9:50	X		L-3	2	X	X	X				
	10/23	[redacted]	X		Dup-12	2	X	X	X				
	10/23	11:00	X		M-3	2	X	X	X				
	10/23	11:40	X		N-3	2	X	X	X				
	10/23	12:30	X		N-4	2	X	X	X				

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
[signature]	10/26/15 1500	FEDEX 774820532254			

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)

Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature)	Date / Time	Remarks
		ESAT [signature]	10/27/15 09:00	

Distribution: Original Accompanies Shipment; Copy to Coordinator Field Files

1- 19381

ENVIRONMENTAL PROTECTION AGENCY

REGION 1

CHAIN OF CUSTODY RECORD

PROJ. NO.: 15100039

PROJECT NAME: Soil Background Study

SAMPLERS: (Signature) VT DEC

STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS	PAHs	ARSENIC	LEAD				REMARKS
	10/23/15	14:10	X		M-4	2							pg. 2 of 2

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
[signature]	10/26/15 1500	FEDEX 774820532254			
Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature) ESAT	Date / Time	Remarks	
		[signature]	10/27/15 09:00		

Distribution: Original Accompanies Shipment; Copy to Coordinator Field Files

1- 19381

United States Environmental Protection Agency
Office of Environmental Measurement & Evaluation
11 Technology Drive
North Chelmsford, MA 01863-2431

Laboratory Report

December 03, 2015

Jim Byrne - Mail Code OSRR07-2
US EPA New England R1

Project Number: 15110003
Project: VT Urban Soils
Analysis: PAHs in Soil - SIM
EPA Chemist: Dan Boudreau

Date Samples Received by the Laboratory: 11/03/2015

Analytical Procedure:

All samples were received and logged in by the laboratory according to the USEPA New England Laboratory SOP for Sample Log-in.

Sample preparation and analysis was done following the EPA Region I SOP, EIASOP-PAHSOLL6.

Samples were analyzed by a quadrapole GC/MS operating in the Selective Ion Monitoring (SIM) mode.. The extraction and analysis SOPs are based on SW-846 methods 3545A, 3630C,8270C, and EIASOP-BNAGCMS9.

Data were reviewed in accordance with the internal verification procedures described in the EPA New England Quality Manual for NERL.

Results relate only to the items tested or to the samples as received by the Laboratory. This analytical report shall not be reproduced except in full, without written approval of the laboratory.

If you have any questions please call me at 617-918-8340 .

Sincerely,

Qualifiers:

RL = Reporting limit
ND = Not Detected above Reporting limit
NA = Not Applicable due to high sample dilutions or sample interferences
NC = Not calculated since analyte concentration is ND.
J = Estimated value
J1 = Estimated value due to MS recovery outside accceptance criteria
J2 = Estimated value due to LFB result outside acceptance criteria
J3 = Estimated value due to RPD result outside acceptance criteria
J4 = Estimated value due to LCS result outside acceptance criteria
E = Estimated value exceeds the calibration range
L = Estimated value is below the calibration range
B = Analyte is associated with the lab blank or trip blank contamination. Values are qualified when the observed concentration of the contamination in the sample extract is less than 10 times the concentration in the blank.
R = No recovery was calculated since the analyte concentration is greater than four times the spike level.
P = The confirmation value exceeded 35% difference and is less than 100%. The lower value is reported.
C = The identification has been confirmed by GC/MS.
A = Suspected Aldol condensation product.
N = Tentatively identified compound.

VT Urban Soils

PAHs in Soil - SIM

Client Sample ID:	G-4	Lab Sample ID:	AB59331
Date of Collection:	10/26/2015	Matrix:	Soil
Date of Preparation:	11/03/2015	Amount Prepared:	N/A
Date of Analysis:	11/09/2015	Percent Solids:	55%
Dry Weight Prepared:	16.598 grams	Extract Dilution:	1
Wet Weight Prepared:	30.232 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	ND	3.0	
91-57-6	2-Methylnaphthalene	ND	3.0	
90-12-0	1-Methylnaphthalene	ND	3.0	
208-96-8	Acenaphthylene	ND	3.0	
83-32-9	Acenaphthene	ND	3.0	
86-73-7	Fluorene	ND	3.0	
85-01-8	Phenanthrene	**4.2**	3.0	
120-12-7	Anthracene	ND	3.0	
206-44-0	Fluoranthene	**6.7**	3.0	
129-00-0	Pyrene	**5.0**	3.0	
56-55-3	Benzo(a)anthracene	ND	3.0	
218-01-9	Chrysene	**5.0**	3.0	
205-99-2	Benzo(b)fluoranthene	**6.6**	3.0	
207-08-9	Benzo(k)fluoranthene	ND	3.0	
50-32-8	Benzo(a)pyrene	ND	3.0	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	3.0	
53-70-3	Dibenz(a,h)anthracene	ND	3.0	
191-24-2	Benzo(g,h,i)perylene	ND	3.0	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	55	32 - 102
p-Terphenyl-d14 (SS2)	58	41 - 106

VT Urban Soils

PAHs in Soil - SIM

Client Sample ID:	F-3	Lab Sample ID:	AB59332
Date of Collection:	10/26/2015	Matrix:	Soil
Date of Preparation:	11/03/2015	Amount Prepared:	N/A
Date of Analysis:	11/09/2015	Percent Solids:	79%
Dry Weight Prepared:	22.076 grams	Extract Dilution:	1
Wet Weight Prepared:	27.987 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	**4.5**	2.3	
91-57-6	2-Methylnaphthalene	**3.0**	2.3	
90-12-0	1-Methylnaphthalene	**2.8**	2.3	
208-96-8	Acenaphthylene	**10**	2.3	
83-32-9	Acenaphthene	ND	2.3	
86-73-7	Fluorene	ND	2.3	
85-01-8	Phenanthrene	**33**	2.3	
120-12-7	Anthracene	**7.0**	2.3	
206-44-0	Fluoranthene	**100**	2.3	
129-00-0	Pyrene	**86**	2.3	
56-55-3	Benzo(a)anthracene	**49**	2.3	
218-01-9	Chrysene	**66**	2.3	
205-99-2	Benzo(b)fluoranthene	**63**	2.3	
207-08-9	Benzo(k)fluoranthene	**57**	2.3	
50-32-8	Benzo(a)pyrene	**56**	2.3	
193-39-5	Indeno(1,2,3-cd)pyrene	**38**	2.3	
53-70-3	Dibenz(a,h)anthracene	**3.3**	2.3	
191-24-2	Benzo(g,h,i)perylene	**42**	2.3	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	56	32 - 102
p-Terphenyl-d14 (SS2)	62	41 - 106

VT Urban Soils

PAHs in Soil - SIM

Client Sample ID:	G-1	Lab Sample ID:	AB59333
Date of Collection:	10/27/2015	Matrix:	Soil
Date of Preparation:	11/03/2015	Amount Prepared:	N/A
Date of Analysis:	11/09/2015	Percent Solids:	88%
Dry Weight Prepared:	24.577 grams	Extract Dilution:	1
Wet Weight Prepared:	28.060 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	**12**	2.0	
91-57-6	2-Methylnaphthalene	**16**	2.0	
90-12-0	1-Methylnaphthalene	**11**	2.0	
208-96-8	Acenaphthylene	**11**	2.0	
83-32-9	Acenaphthene	ND	2.0	
86-73-7	Fluorene	ND	2.0	
85-01-8	Phenanthrene	**22**	2.0	
120-12-7	Anthracene	**6.9**	2.0	
206-44-0	Fluoranthene	**38**	2.0	
129-00-0	Pyrene	**36**	2.0	
56-55-3	Benzo(a)anthracene	**22**	2.0	
218-01-9	Chrysene	**33**	2.0	
205-99-2	Benzo(b)fluoranthene	**25**	2.0	
207-08-9	Benzo(k)fluoranthene	**23**	2.0	
50-32-8	Benzo(a)pyrene	**26**	2.0	
193-39-5	Indeno(1,2,3-cd)pyrene	**17**	2.0	
53-70-3	Dibenz(a,h)anthracene	ND	2.0	
191-24-2	Benzo(g,h,i)perylene	**23**	2.0	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	57	32 - 102
p-Terphenyl-d14 (SS2)	62	41 - 106

VT Urban Soils

Laboratory Blank (PAHs)

Client Sample ID:	N/A	Lab Sample ID:	N/A
Date of Collection:	N/A	Matrix:	Soil
Date of Preparation:	11/03/2015	Amount Prepared:	N/A
Date of Analysis:	11/09/2015	Percent Solids:	100%
Dry Weight Prepared:	29.021 grams	Extract Dilution:	1
Wet Weight Prepared:	29.043 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	ND	1.7	
91-57-6	2-Methylnapthalene	ND	1.7	
90-12-0	1-Methylnapthalene	ND	1.7	
208-96-8	Acenaphthylene	ND	1.7	
83-32-9	Acenaphthene	ND	1.7	
86-73-7	Fluorene	ND	1.7	
85-01-8	Phenanthrene	ND	1.7	
120-12-7	Anthracene	ND	1.7	
206-44-0	Fluoranthene	ND	1.7	
129-00-0	Pyrene	ND	1.7	
56-55-3	Benzo(a)anthracene	ND	1.7	
218-01-9	Chrysene	ND	1.7	
205-99-2	Benzo(b)fluoranthene	ND	1.7	
207-08-9	Benzo(k)fluoranthene	ND	1.7	
50-32-8	Benzo(a)pyrene	ND	1.7	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	1.7	
53-70-3	Dibenz(a,h)anthracene	ND	1.7	
191-24-2	Benzo(g,h,i)perylene	ND	1.7	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	54	32 - 102
p-Terphenyl-d14 (SS2)	65	41 - 106

VT Urban Soils

PAHs in Soil - SIM

Client Sample ID:	H-1	Lab Sample ID:	AB59334
Date of Collection:	10/27/2015	Matrix:	Soil
Date of Preparation:	11/03/2015	Amount Prepared:	N/A
Date of Analysis:	11/09/2015	Percent Solids:	72%
Dry Weight Prepared:	20.228 grams	Extract Dilution:	1
Wet Weight Prepared:	27.970 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	**3.4**	2.5	
91-57-6	2-Methylnaphthalene	ND	2.5	
90-12-0	1-Methylnaphthalene	ND	2.5	
208-96-8	Acenaphthylene	**10**	2.5	
83-32-9	Acenaphthene	ND	2.5	
86-73-7	Fluorene	ND	2.5	
85-01-8	Phenanthrene	**32**	2.5	
120-12-7	Anthracene	**7.3**	2.5	
206-44-0	Fluoranthene	**89**	2.5	
129-00-0	Pyrene	**71**	2.5	
56-55-3	Benzo(a)anthracene	**36**	2.5	
218-01-9	Chrysene	**52**	2.5	
205-99-2	Benzo(b)fluoranthene	**58**	2.5	
207-08-9	Benzo(k)fluoranthene	**38**	2.5	
50-32-8	Benzo(a)pyrene	**43**	2.5	
193-39-5	Indeno(1,2,3-cd)pyrene	**32**	2.5	
53-70-3	Dibenz(a,h)anthracene	ND	2.5	
191-24-2	Benzo(g,h,i)perylene	**36**	2.5	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	53	32 - 102
p-Terphenyl-d14 (SS2)	60	41 - 106

VT Urban Soils

PAHs in Soil - SIM

Client Sample ID:	DUP-8	Lab Sample ID:	AB59335
Date of Collection:	10/27/2015	Matrix:	Soil
Date of Preparation:	11/03/2015	Amount Prepared:	N/A
Date of Analysis:	11/09/2015	Percent Solids:	76%
Dry Weight Prepared:	21.318 grams	Extract Dilution:	1
Wet Weight Prepared:	28.208 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	**2.7**	2.3	
91-57-6	2-Methylnaphthalene	ND	2.3	
90-12-0	1-Methylnaphthalene	ND	2.3	
208-96-8	Acenaphthylene	**8.9**	2.3	
83-32-9	Acenaphthene	ND	2.3	
86-73-7	Fluorene	ND	2.3	
85-01-8	Phenanthrene	**30**	2.3	
120-12-7	Anthracene	**6.1**	2.3	
206-44-0	Fluoranthene	**77**	2.3	
129-00-0	Pyrene	**60**	2.3	
56-55-3	Benzo(a)anthracene	**31**	2.3	
218-01-9	Chrysene	**44**	2.3	
205-99-2	Benzo(b)fluoranthene	**43**	2.3	
207-08-9	Benzo(k)fluoranthene	**37**	2.3	
50-32-8	Benzo(a)pyrene	**37**	2.3	
193-39-5	Indeno(1,2,3-cd)pyrene	**27**	2.3	
53-70-3	Dibenz(a,h)anthracene	ND	2.3	
191-24-2	Benzo(g,h,i)perylene	**31**	2.3	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	51	32 - 102
p-Terphenyl-d14 (SS2)	56	41 - 106

VT Urban Soils

PAHs in Soil - SIM

Client Sample ID:	DUP-14	Lab Sample ID:	AB59336
Date of Collection:	10/27/2015	Matrix:	Soil
Date of Preparation:	11/03/2015	Amount Prepared:	N/A
Date of Analysis:	11/09/2015	Percent Solids:	76%
Dry Weight Prepared:	20.622 grams	Extract Dilution:	1
Wet Weight Prepared:	27.295 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	ND	2.4	
91-57-6	2-Methylnaphthalene	ND	2.4	
90-12-0	1-Methylnaphthalene	ND	2.4	
208-96-8	Acenaphthylene	**2.4**	2.4	
83-32-9	Acenaphthene	ND	2.4	
86-73-7	Fluorene	ND	2.4	
85-01-8	Phenanthrene	**6.2**	2.4	
120-12-7	Anthracene	ND	2.4	
206-44-0	Fluoranthene	**18**	2.4	
129-00-0	Pyrene	**15**	2.4	
56-55-3	Benzo(a)anthracene	**9.0**	2.4	
218-01-9	Chrysene	**10**	2.4	
205-99-2	Benzo(b)fluoranthene	**9.7**	2.4	
207-08-9	Benzo(k)fluoranthene	**8.8**	2.4	
50-32-8	Benzo(a)pyrene	**8.6**	2.4	
193-39-5	Indeno(1,2,3-cd)pyrene	**5.9**	2.4	
53-70-3	Dibenz(a,h)anthracene	**2.4**	2.4	
191-24-2	Benzo(g,h,i)perylene	**7.0**	2.4	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	61	32 - 102
p-Terphenyl-d14 (SS2)	68	41 - 106

VT Urban Soils

PAHs in Soil - SIM

Client Sample ID:	L1	Lab Sample ID:	AB59337
Date of Collection:	10/27/2015	Matrix:	Soil
Date of Preparation:	11/03/2015	Amount Prepared:	N/A
Date of Analysis:	11/09/2015	Percent Solids:	84%
Dry Weight Prepared:	23.592 grams	Extract Dilution:	1
Wet Weight Prepared:	28.216 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	ND	2.1	
91-57-6	2-Methylnaphthalene	ND	2.1	
90-12-0	1-Methylnaphthalene	ND	2.1	
208-96-8	Acenaphthylene	**2.7**	2.1	
83-32-9	Acenaphthene	ND	2.1	
86-73-7	Fluorene	ND	2.1	
85-01-8	Phenanthrene	**4.0**	2.1	
120-12-7	Anthracene	ND	2.1	
206-44-0	Fluoranthene	**16**	2.1	
129-00-0	Pyrene	**11**	2.1	
56-55-3	Benzo(a)anthracene	**8.8**	2.1	
218-01-9	Chrysene	**10**	2.1	
205-99-2	Benzo(b)fluoranthene	**13**	2.1	
207-08-9	Benzo(k)fluoranthene	**11**	2.1	
50-32-8	Benzo(a)pyrene	**9.2**	2.1	
193-39-5	Indeno(1,2,3-cd)pyrene	**7.1**	2.1	
53-70-3	Dibenz(a,h)anthracene	ND	2.1	
191-24-2	Benzo(g,h,i)perylene	**7.1**	2.1	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	56	32 - 102
p-Terphenyl-d14 (SS2)	59	41 - 106

VT Urban Soils

PAHs in Soil - SIM

Client Sample ID:	K1	Lab Sample ID:	AB59338
Date of Collection:	10/27/2015	Matrix:	Soil
Date of Preparation:	11/03/2015	Amount Prepared:	N/A
Date of Analysis:	11/09/2015	Percent Solids:	86%
Dry Weight Prepared:	24.635 grams	Extract Dilution:	1
Wet Weight Prepared:	28.770 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	**9.4**	2.0	
91-57-6	2-Methylnaphthalene	**3.8**	2.0	
90-12-0	1-Methylnaphthalene	**2.7**	2.0	
208-96-8	Acenaphthylene	**71**	2.0	
83-32-9	Acenaphthene	**7.8**	2.0	
86-73-7	Fluorene	**9.9**	2.0	
85-01-8	Phenanthrene	**240**	2.0	
120-12-7	Anthracene	**59**	2.0	
206-44-0	Fluoranthene	**830**	2.0	E
129-00-0	Pyrene	**620**	2.0	
56-55-3	Benzo(a)anthracene	**380**	2.0	
218-01-9	Chrysene	**480**	2.0	
205-99-2	Benzo(b)fluoranthene	**530**	2.0	
207-08-9	Benzo(k)fluoranthene	**410**	2.0	
50-32-8	Benzo(a)pyrene	**420**	2.0	
193-39-5	Indeno(1,2,3-cd)pyrene	**290**	2.0	
53-70-3	Dibenz(a,h)anthracene	**23**	2.0	
191-24-2	Benzo(g,h,i)perylene	**310**	2.0	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	60	32 - 102
p-Terphenyl-d14 (SS2)	68	41 - 106

VT Urban Soils

PAHs in Soil - SIM

Client Sample ID:	M1	Lab Sample ID:	AB59339
Date of Collection:	10/27/2015	Matrix:	Soil
Date of Preparation:	11/03/2015	Amount Prepared:	N/A
Date of Analysis:	11/09/2015	Percent Solids:	89%
Dry Weight Prepared:	26.6 grams	Extract Dilution:	1
Wet Weight Prepared:	29.728 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	**4.5**	1.9	
91-57-6	2-Methylnaphthalene	**2.8**	1.9	
90-12-0	1-Methylnaphthalene	ND	1.9	
208-96-8	Acenaphthylene	**12**	1.9	
83-32-9	Acenaphthene	ND	1.9	
86-73-7	Fluorene	ND	1.9	
85-01-8	Phenanthrene	**13**	1.9	
120-12-7	Anthracene	**9.1**	1.9	
206-44-0	Fluoranthene	**56**	1.9	
129-00-0	Pyrene	**48**	1.9	
56-55-3	Benzo(a)anthracene	**38**	1.9	
218-01-9	Chrysene	**43**	1.9	
205-99-2	Benzo(b)fluoranthene	**43**	1.9	
207-08-9	Benzo(k)fluoranthene	**40**	1.9	
50-32-8	Benzo(a)pyrene	**46**	1.9	
193-39-5	Indeno(1,2,3-cd)pyrene	**30**	1.9	
53-70-3	Dibenz(a,h)anthracene	**2.7**	1.9	
191-24-2	Benzo(g,h,i)perylene	**37**	1.9	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	61	32 - 102
p-Terphenyl-d14 (SS2)	72	41 - 106

VT Urban Soils

PAHs in Soil - SIM

Client Sample ID:	N2	Lab Sample ID:	AB59340
Date of Collection:	10/27/2015	Matrix:	Soil
Date of Preparation:	11/03/2015	Amount Prepared:	N/A
Date of Analysis:	11/09/2015	Percent Solids:	77%
Dry Weight Prepared:	21.508 grams	Extract Dilution:	1
Wet Weight Prepared:	27.869 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	ND	2.3	
91-57-6	2-Methylnaphthalene	ND	2.3	
90-12-0	1-Methylnaphthalene	ND	2.3	
208-96-8	Acenaphthylene	**3.5**	2.3	
83-32-9	Acenaphthene	ND	2.3	
86-73-7	Fluorene	ND	2.3	
85-01-8	Phenanthrene	**3.4**	2.3	
120-12-7	Anthracene	ND	2.3	
206-44-0	Fluoranthene	**11**	2.3	
129-00-0	Pyrene	**9.6**	2.3	
56-55-3	Benzo(a)anthracene	**5.8**	2.3	
218-01-9	Chrysene	**7.8**	2.3	
205-99-2	Benzo(b)fluoranthene	**8.1**	2.3	
207-08-9	Benzo(k)fluoranthene	**7.2**	2.3	
50-32-8	Benzo(a)pyrene	**6.9**	2.3	
193-39-5	Indeno(1,2,3-cd)pyrene	**5.3**	2.3	
53-70-3	Dibenz(a,h)anthracene	ND	2.3	
191-24-2	Benzo(g,h,i)perylene	**6.5**	2.3	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	58	32 - 102
p-Terphenyl-d14 (SS2)	64	41 - 106

VT Urban Soils

PAHs in Soil - SIM

Client Sample ID:	M2	Lab Sample ID:	AB59341
Date of Collection:	10/27/2015	Matrix:	Soil
Date of Preparation:	11/03/2015	Amount Prepared:	N/A
Date of Analysis:	11/09/2015	Percent Solids:	64%
Dry Weight Prepared:	17.996 grams	Extract Dilution:	1
Wet Weight Prepared:	28.13 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	**3.8**	2.8	
91-57-6	2-Methylnaphthalene	ND	2.8	
90-12-0	1-Methylnaphthalene	ND	2.8	
208-96-8	Acenaphthylene	**6.2**	2.8	
83-32-9	Acenaphthene	ND	2.8	
86-73-7	Fluorene	**3.7**	2.8	
85-01-8	Phenanthrene	**55**	2.8	
120-12-7	Anthracene	**11**	2.8	
206-44-0	Fluoranthene	**120**	2.8	
129-00-0	Pyrene	**95**	2.8	
56-55-3	Benzo(a)anthracene	**50**	2.8	
218-01-9	Chrysene	**54**	2.8	
205-99-2	Benzo(b)fluoranthene	**45**	2.8	
207-08-9	Benzo(k)fluoranthene	**42**	2.8	
50-32-8	Benzo(a)pyrene	**48**	2.8	
193-39-5	Indeno(1,2,3-cd)pyrene	**28**	2.8	
53-70-3	Dibenz(a,h)anthracene	ND	2.8	
191-24-2	Benzo(g,h,i)perylene	**31**	2.8	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	53	32 - 102
p-Terphenyl-d14 (SS2)	58	41 - 106

VT Urban Soils

PAHs in Soil - SIM

Client Sample ID:	N1	Lab Sample ID:	AB59342
Date of Collection:	10/27/2015	Matrix:	Soil
Date of Preparation:	11/03/2015	Amount Prepared:	N/A
Date of Analysis:	11/09/2015	Percent Solids:	79%
Dry Weight Prepared:	20.914 grams	Extract Dilution:	1
Wet Weight Prepared:	26.609 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	ND	2.4	
91-57-6	2-Methylnaphthalene	ND	2.4	
90-12-0	1-Methylnaphthalene	ND	2.4	
208-96-8	Acenaphthylene	ND	2.4	
83-32-9	Acenaphthene	ND	2.4	
86-73-7	Fluorene	ND	2.4	
85-01-8	Phenanthrene	ND	2.4	
120-12-7	Anthracene	ND	2.4	
206-44-0	Fluoranthene	ND	2.4	
129-00-0	Pyrene	ND	2.4	
56-55-3	Benzo(a)anthracene	ND	2.4	
218-01-9	Chrysene	ND	2.4	
205-99-2	Benzo(b)fluoranthene	**3.8**	2.4	
207-08-9	Benzo(k)fluoranthene	ND	2.4	
50-32-8	Benzo(a)pyrene	ND	2.4	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	2.4	
53-70-3	Dibenz(a,h)anthracene	ND	2.4	
191-24-2	Benzo(g,h,i)perylene	ND	2.4	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	53	32 - 102
p-Terphenyl-d14 (SS2)	60	41 - 106

VT Urban Soils

PAHs in Soil - SIM

Client Sample ID:	F7	Lab Sample ID:	AB59343
Date of Collection:	10/28/2015	Matrix:	Soil
Date of Preparation:	11/03/2015	Amount Prepared:	N/A
Date of Analysis:	11/09/2015	Percent Solids:	83%
Dry Weight Prepared:	23.703 grams	Extract Dilution:	1
Wet Weight Prepared:	28.494 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	ND	2.1	
91-57-6	2-Methylnaphthalene	ND	2.1	
90-12-0	1-Methylnaphthalene	ND	2.1	
208-96-8	Acenaphthylene	ND	2.1	
83-32-9	Acenaphthene	ND	2.1	
86-73-7	Fluorene	ND	2.1	
85-01-8	Phenanthrene	ND	2.1	
120-12-7	Anthracene	ND	2.1	
206-44-0	Fluoranthene	**3.3**	2.1	
129-00-0	Pyrene	**2.5**	2.1	
56-55-3	Benzo(a)anthracene	ND	2.1	
218-01-9	Chrysene	**2.6**	2.1	
205-99-2	Benzo(b)fluoranthene	**3.1**	2.1	
207-08-9	Benzo(k)fluoranthene	**2.5**	2.1	
50-32-8	Benzo(a)pyrene	ND	2.1	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	2.1	
53-70-3	Dibenz(a,h)anthracene	ND	2.1	
191-24-2	Benzo(g,h,i)perylene	ND	2.1	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	60	32 - 102
p-Terphenyl-d14 (SS2)	69	41 - 106

VT Urban Soils

PAHs in Soil - SIM

Client Sample ID:	I5	Lab Sample ID:	AB59344
Date of Collection:	10/29/2015	Matrix:	Soil
Date of Preparation:	11/03/2015	Amount Prepared:	N/A
Date of Analysis:	11/09/2015	Percent Solids:	82%
Dry Weight Prepared:	24.307 grams	Extract Dilution:	1
Wet Weight Prepared:	29.703 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	ND	2.1	
91-57-6	2-Methylnaphthalene	ND	2.1	
90-12-0	1-Methylnaphthalene	ND	2.1	
208-96-8	Acenaphthylene	ND	2.1	
83-32-9	Acenaphthene	ND	2.1	
86-73-7	Fluorene	ND	2.1	
85-01-8	Phenanthrene	ND	2.1	
120-12-7	Anthracene	ND	2.1	
206-44-0	Fluoranthene	**2.4**	2.1	
129-00-0	Pyrene	ND	2.1	
56-55-3	Benzo(a)anthracene	ND	2.1	
218-01-9	Chrysene	ND	2.1	
205-99-2	Benzo(b)fluoranthene	**2.5**	2.1	
207-08-9	Benzo(k)fluoranthene	ND	2.1	
50-32-8	Benzo(a)pyrene	ND	2.1	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	2.1	
53-70-3	Dibenz(a,h)anthracene	ND	2.1	
191-24-2	Benzo(g,h,i)perylene	ND	2.1	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	57	32 - 102
p-Terphenyl-d14 (SS2)	63	41 - 106

VT Urban Soils

PAHs in Soil - SIM

Client Sample ID:	J5	Lab Sample ID:	AB59345
Date of Collection:	10/29/2015	Matrix:	Soil
Date of Preparation:	11/03/2015	Amount Prepared:	N/A
Date of Analysis:	11/10/2015	Percent Solids:	82%
Dry Weight Prepared:	23.708 grams	Extract Dilution:	1
Wet Weight Prepared:	28.828 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	ND	2.1	
91-57-6	2-Methylnaphthalene	ND	2.1	
90-12-0	1-Methylnaphthalene	ND	2.1	
208-96-8	Acenaphthylene	ND	2.1	
83-32-9	Acenaphthene	ND	2.1	
86-73-7	Fluorene	ND	2.1	
85-01-8	Phenanthrene	ND	2.1	
120-12-7	Anthracene	ND	2.1	
206-44-0	Fluoranthene	ND	2.1	
129-00-0	Pyrene	ND	2.1	
56-55-3	Benzo(a)anthracene	ND	2.1	
218-01-9	Chrysene	ND	2.1	
205-99-2	Benzo(b)fluoranthene	ND	2.1	
207-08-9	Benzo(k)fluoranthene	ND	2.1	
50-32-8	Benzo(a)pyrene	ND	2.1	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	2.1	
53-70-3	Dibenz(a,h)anthracene	ND	2.1	
191-24-2	Benzo(g,h,i)perylene	ND	2.1	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	60	32 - 102
p-Terphenyl-d14 (SS2)	66	41 - 106

VT Urban Soils

MATRIX SPIKE (MS) RECOVERY

Sample ID: AB59333

PARAMETER	SPIKE ADDED ug/Kg	SAMPLE CONCENTRATION ug/Kg	MS CONCENTRATION ug/Kg	MS % REC	QC LIMITS (% REC)
1-Methylnaphthalene	163	11.0	101	55	49 - 99
2-Methylnaphthalene	163	16.0	117	62	43 - 101
Acenaphthene	163	ND	108	66	31 - 119
Acenaphthylene	163	11.0	120	67	32 - 116
Anthracene	163	6.9	119	68	17 - 151
Benzo(a)anthracene	163	22.0	144	75	18 - 136
Benzo(a)pyrene	163	26.0	134	66	26 - 115
Benzo(b)fluoranthene	163	25.0	144	73	13 - 144
Benzo(g,h,i)perylene	163	23.0	129	65	21 - 137
Benzo(k)fluoranthene	163	23.0	124	62	27 - 139
Chrysene	163	33.0	147	70	20 - 130
Dibenz(a,h)anthracene	163	ND	113	69	24 - 137
Fluoranthene	163	38.0	160	75	17 - 149
Fluorene	163	ND	106	65	34 - 121
Indeno(1,2,3-cd)pyrene	163	17.0	123	65	18 - 148
Naphthalene	163	12.0	115	63	22 - 112
Phenanthrene	163	22.0	132	67	18 - 134
Pyrene	163	36.0	146	67	19 - 133

VT Urban Soils

Laboratory Duplicate Results

Sample ID: AB59333

PARAMETER	SAMPLE RESULT ug/Kg	SAMPLE DUPLICATE RESULT ug/Kg	PRECISION RPD %	QC LIMITS
1-Methylnaphthalene	11.0	8.15	29.8	40
2-Methylnaphthalene	16.0	11.4	33.6	40
Acenaphthene	ND	ND	NC	40
Acenaphthylene	11.0	10.0	9.52	40
Anthracene	6.9	5.94	15.0	40
Benzo(a)anthracene	22.0	19.9	10.0	40
Benzo(a)pyrene	26.0	23.1	11.8	40
Benzo(b)fluoranthene	25.0	22.6	10.1	40
Benzo(g,h,i)perylene	23.0	19.8	15.0	40
Benzo(k)fluoranthene	23.0	21.1	8.62	40
Chrysene	33.0	27.9	16.7	40
Dibenz(a,h)anthracene	ND	ND	NC	40
Fluoranthene	38.0	32.3	16.2	40
Fluorene	ND	ND	NC	40
Indeno(1,2,3-cd)pyrene	17.0	14.9	13.2	40
Naphthalene	12.0	9.46	23.7	40
Phenanthrene	22.0	16.7	27.4	40
Pyrene	36.0	30.3	17.2	40

VT Urban Soils

Laboratory Fortified Blank (LFB) Results

PARAMETER	LFB AMOUNT SPIKED ppb	LFB RESULT ppb	LFB RECOVERY %	QC LIMITS %
1-Methylnaphthalene	148	93.7	63	41 - 117
2-Methylnaphthalene	148	104	70	35 - 120
Acenaphthene	148	110	74	40 - 110
Acenaphthylene	148	107	72	41 - 108
Anthracene	148	120	81	46 - 122
Benzo(a)anthracene	148	123	83	49 - 120
Benzo(a)pyrene	148	118	80	44 - 124
Benzo(b)fluoranthene	148	132	89	45 - 123
Benzo(g,h,i)perylene	148	116	78	48 - 120
Benzo(k)fluoranthene	148	115	78	40 - 127
Chrysene	148	120	81	44 - 117
Dibenz(a,h)anthracene	148	115	78	49 - 124
Fluoranthene	148	118	80	47 - 124
Fluorene	148	110	74	42 - 112
Indeno(1,2,3-cd)pyrene	148	114	77	48 - 121
Naphthalene	148	105	71	38 - 104
Phenanthrene	148	117	79	41 - 116
Pyrene	148	119	80	43 - 117

Comments:

Samples in Batch: AB59331, AB59332, AB59333, AB59334, AB59335, AB59336, AB59337, AB59338, AB59339, AB59340, AB59341, AB59342, AB59343, AB59344, AB59345

ENVIRONMENTAL PROTECTION AGENCY

REGION 1

CHAIN OF CUSTODY RECORD

PROJ. NO.: 15110003

PROJECT NAME: Soil Background Study

SAMPLERS: (Signature) VT DEC

STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS	PAHs	ARSENIC	LEAD				REMARKS
	10/26/15	1100	X		G-4	2	X	X	X				PG 1 of 2
	10/26/15	1300	X		F-3	2	X	X	X				
	10/27/15	1100	X		G-1	2	X	X	X				
	10/27/15	1230	X		H-1	2	X	X	X				
	10/27/15	[redacted]	X		DUP-8	2	X	X	X				
	10/27	[redacted]	X		DUP-14	2	X	X	X				
	10/27/15	1050	X		L1	2	X	X	X				
	10/27/15	1000	X		K1	2	X	X	X				
	10/27/15	1130	X		M1	2	X	X	X				
	10/27/15	1410	X		N2	2	X	X	X				
	10/27/15	1445	X		M2	2	X	X	X				
	10/27/15	1230	X		N1	2	X	X	X				
	10/28/15	1000	X		F7	2	X	X	X				
	10/29/15	0930	X		I5	2	X	X	X				
	10/29/15	1100	X		J5	2	X	X	X				

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
[signature]	11/2/15 1500	FEDEX 774875875310			
Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature) [signature] ESAT	Date / Time 11/3/15 09:30	Remarks	

Distribution: Original Accompanies Shipment; Copy to Coordinator Field Files

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15110003 $PAHS
15110003 $METMS_PE

1- 19381

United States Environmental Protection Agency
Office of Environmental Measurement & Evaluation
11 Technology Drive
North Chelmsford, MA 01863-2431

Laboratory Report

December 03, 2015

Jim Byrne - Mail Code OSRR07-2
US EPA New England R1

Project Number: 15110004
Project: VT Urban Soils
Analysis: PAHs in Soil - SIM
EPA Chemist: Dan Boudreau

Date Samples Received by the Laboratory: 11/03/2015

Analytical Procedure:

All samples were received and logged in by the laboratory according to the USEPA New England Laboratory SOP for Sample Log-in.

Sample preparation and analysis was done following the EPA Region I SOP, EIASOP-PAHSOLL6.

Samples were analyzed by a quadrapole GC/MS operating in the Selective Ion Monitoring (SIM) mode.. The extraction and analysis SOPs are based on SW-846 methods 3545A, 3630C,8270C, and EIASOP-BNAGCMS9.

Data were reviewed in accordance with the internal verification procedures described in the EPA New England Quality Manual for NERL.

Results relate only to the items tested or to the samples as received by the Laboratory. This analytical report shall not be reproduced except in full, without written approval of the laboratory.

If you have any questions please call me at 617-918-8340 .

Sincerely,

Qualifiers:

RL = Reporting limit
ND = Not Detected above Reporting limit
NA = Not Applicable due to high sample dilutions or sample interferences
NC = Not calculated since analyte concentration is ND.
J = Estimated value
J1 = Estimated value due to MS recovery outside accceptance criteria
J2 = Estimated value due to LFB result outside acceptance criteria
J3 = Estimated value due to RPD result outside acceptance criteria
J4 = Estimated value due to LCS result outside acceptance criteria
E = Estimated value exceeds the calibration range
L = Estimated value is below the calibration range
B = Analyte is associated with the lab blank or trip blank contamination. Values are qualified when the observed concentration of the contamination in the sample extract is less than 10 times the concentration in the blank.
R = No recovery was calculated since the analyte concentration is greater than four times the spike level.
P = The confirmation value exceeded 35% difference and is less than 100%. The lower value is reported.
C = The identification has been confirmed by GC/MS.
A = Suspected Aldol condensation product.
N = Tentatively identified compound.

VT Urban Soils

PAHs in Soil - SIM

Client Sample ID:	B6	Lab Sample ID:	AB59346
Date of Collection:	10/30/2015	Matrix:	Soil
Date of Preparation:	11/05/2015	Amount Prepared:	N/A
Date of Analysis:	11/10/2015	Percent Solids:	83%
Dry Weight Prepared:	24.872 grams	Extract Dilution:	1
Wet Weight Prepared:	29.901 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	**3.5**	2.0	
91-57-6	2-Methylnaphthalene	**2.1**	2.0	
90-12-0	1-Methylnaphthalene	ND	2.0	
208-96-8	Acenaphthylene	**5.3**	2.0	
83-32-9	Acenaphthene	ND	2.0	
86-73-7	Fluorene	ND	2.0	
85-01-8	Phenanthrene	**19**	2.0	
120-12-7	Anthracene	**3.0**	2.0	
206-44-0	Fluoranthene	**27**	2.0	
129-00-0	Pyrene	**34**	2.0	
56-55-3	Benzo(a)anthracene	**10**	2.0	
218-01-9	Chrysene	**20**	2.0	
205-99-2	Benzo(b)fluoranthene	**15**	2.0	
207-08-9	Benzo(k)fluoranthene	**10**	2.0	
50-32-8	Benzo(a)pyrene	**15**	2.0	
193-39-5	Indeno(1,2,3-cd)pyrene	**10**	2.0	
53-70-3	Dibenz(a,h)anthracene	**4.3**	2.0	
191-24-2	Benzo(g,h,i)perylene	**13**	2.0	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	50	32 - 102
p-Terphenyl-d14 (SS2)	58	41 - 106

VT Urban Soils

PAHs in Soil - SIM

Client Sample ID:	B4	Lab Sample ID:	AB59347
Date of Collection:	10/30/2015	Matrix:	Soil
Date of Preparation:	11/05/2015	Amount Prepared:	N/A
Date of Analysis:	11/10/2015	Percent Solids:	86%
Dry Weight Prepared:	26.333 grams	Extract Dilution:	1
Wet Weight Prepared:	30.448 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	ND	1.9	
91-57-6	2-Methylnaphthalene	ND	1.9	
90-12-0	1-Methylnaphthalene	ND	1.9	
208-96-8	Acenaphthylene	ND	1.9	
83-32-9	Acenaphthene	ND	1.9	
86-73-7	Fluorene	ND	1.9	
85-01-8	Phenanthrene	ND	1.9	
120-12-7	Anthracene	ND	1.9	
206-44-0	Fluoranthene	ND	1.9	
129-00-0	Pyrene	ND	1.9	
56-55-3	Benzo(a)anthracene	ND	1.9	
218-01-9	Chrysene	ND	1.9	
205-99-2	Benzo(b)fluoranthene	ND	1.9	
207-08-9	Benzo(k)fluoranthene	ND	1.9	
50-32-8	Benzo(a)pyrene	ND	1.9	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	1.9	
53-70-3	Dibenz(a,h)anthracene	ND	1.9	
191-24-2	Benzo(g,h,i)perylene	ND	1.9	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	52	32 - 102
p-Terphenyl-d14 (SS2)	62	41 - 106

VT Urban Soils

PAHs in Soil - SIM

Client Sample ID:	A3	Lab Sample ID:	AB59348
Date of Collection:	10/30/2015	Matrix:	Soil
Date of Preparation:	11/05/2015	Amount Prepared:	N/A
Date of Analysis:	11/10/2015	Percent Solids:	81%
Dry Weight Prepared:	23.4 grams	Extract Dilution:	1
Wet Weight Prepared:	28.93 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	ND	2.1	
91-57-6	2-Methylnaphthalene	ND	2.1	
90-12-0	1-Methylnaphthalene	ND	2.1	
208-96-8	Acenaphthylene	ND	2.1	
83-32-9	Acenaphthene	ND	2.1	
86-73-7	Fluorene	ND	2.1	
85-01-8	Phenanthrene	ND	2.1	
120-12-7	Anthracene	ND	2.1	
206-44-0	Fluoranthene	ND	2.1	
129-00-0	Pyrene	ND	2.1	
56-55-3	Benzo(a)anthracene	ND	2.1	
218-01-9	Chrysene	ND	2.1	
205-99-2	Benzo(b)fluoranthene	**2.8**	2.1	
207-08-9	Benzo(k)fluoranthene	ND	2.1	
50-32-8	Benzo(a)pyrene	ND	2.1	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	2.1	
53-70-3	Dibenz(a,h)anthracene	ND	2.1	
191-24-2	Benzo(g,h,i)perylene	ND	2.1	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	58	32 - 102
p-Terphenyl-d14 (SS2)	68	41 - 106

VT Urban Soils

Laboratory Blank (PAHs)

Client Sample ID:	N/A	Lab Sample ID:	N/A
Date of Collection:	N/A	Matrix:	Soil
Date of Preparation:	11/05/2015	Amount Prepared:	N/A
Date of Analysis:	11/10/2015	Percent Solids:	100%
Dry Weight Prepared:	30.021 grams	Extract Dilution:	1
Wet Weight Prepared:	30.044 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	ND	1.7	
91-57-6	2-Methylnapthalene	ND	1.7	
90-12-0	1-Methylnapthalene	ND	1.7	
208-96-8	Acenaphthylene	ND	1.7	
83-32-9	Acenaphthene	ND	1.7	
86-73-7	Fluorene	ND	1.7	
85-01-8	Phenanthrene	ND	1.7	
120-12-7	Anthracene	ND	1.7	
206-44-0	Fluoranthene	ND	1.7	
129-00-0	Pyrene	ND	1.7	
56-55-3	Benzo(a)anthracene	ND	1.7	
218-01-9	Chrysene	ND	1.7	
205-99-2	Benzo(b)fluoranthene	ND	1.7	
207-08-9	Benzo(k)fluoranthene	ND	1.7	
50-32-8	Benzo(a)pyrene	ND	1.7	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	1.7	
53-70-3	Dibenz(a,h)anthracene	ND	1.7	
191-24-2	Benzo(g,h,i)perylene	ND	1.7	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	47	32 - 102
p-Terphenyl-d14 (SS2)	60	41 - 106

VT Urban Soils

PAHs in Soil - SIM

Client Sample ID:	B5	Lab Sample ID:	AB59349
Date of Collection:	10/30/2015	Matrix:	Soil
Date of Preparation:	11/05/2015	Amount Prepared:	N/A
Date of Analysis:	11/10/2015	Percent Solids:	79%
Dry Weight Prepared:	23.953 grams	Extract Dilution:	1
Wet Weight Prepared:	30.333 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	ND	2.1	
91-57-6	2-Methylnaphthalene	ND	2.1	
90-12-0	1-Methylnaphthalene	ND	2.1	
208-96-8	Acenaphthylene	ND	2.1	
83-32-9	Acenaphthene	ND	2.1	
86-73-7	Fluorene	ND	2.1	
85-01-8	Phenanthrene	ND	2.1	
120-12-7	Anthracene	ND	2.1	
206-44-0	Fluoranthene	**2.7**	2.1	
129-00-0	Pyrene	**2.4**	2.1	
56-55-3	Benzo(a)anthracene	ND	2.1	
218-01-9	Chrysene	**2.8**	2.1	
205-99-2	Benzo(b)fluoranthene	**2.8**	2.1	
207-08-9	Benzo(k)fluoranthene	ND	2.1	
50-32-8	Benzo(a)pyrene	ND	2.1	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	2.1	
53-70-3	Dibenz(a,h)anthracene	ND	2.1	
191-24-2	Benzo(g,h,i)perylene	ND	2.1	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	52	32 - 102
p-Terphenyl-d14 (SS2)	62	41 - 106

VT Urban Soils

PAHs in Soil - SIM

Client Sample ID:	Q4	Lab Sample ID:	AB59350
Date of Collection:	10/30/2015	Matrix:	Soil
Date of Preparation:	11/05/2015	Amount Prepared:	N/A
Date of Analysis:	11/10/2015	Percent Solids:	80%
Dry Weight Prepared:	24.174 grams	Extract Dilution:	1
Wet Weight Prepared:	30.105 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	**6.1**	2.1	
91-57-6	2-Methylnaphthalene	**3.2**	2.1	
90-12-0	1-Methylnaphthalene	**2.7**	2.1	
208-96-8	Acenaphthylene	**24**	2.1	
83-32-9	Acenaphthene	**2.6**	2.1	
86-73-7	Fluorene	**3.4**	2.1	
85-01-8	Phenanthrene	**93**	2.1	
120-12-7	Anthracene	**16**	2.1	
206-44-0	Fluoranthene	**280**	2.1	
129-00-0	Pyrene	**210**	2.1	
56-55-3	Benzo(a)anthracene	**110**	2.1	
218-01-9	Chrysene	**160**	2.1	
205-99-2	Benzo(b)fluoranthene	**170**	2.1	
207-08-9	Benzo(k)fluoranthene	**130**	2.1	
50-32-8	Benzo(a)pyrene	**130**	2.1	
193-39-5	Indeno(1,2,3-cd)pyrene	**94**	2.1	
53-70-3	Dibenz(a,h)anthracene	**6.8**	2.1	
191-24-2	Benzo(g,h,i)perylene	**100**	2.1	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	55	32 - 102
p-Terphenyl-d14 (SS2)	60	41 - 106

VT Urban Soils

PAHs in Soil - SIM

Client Sample ID:	Q3	Lab Sample ID:	AB59351
Date of Collection:	10/30/2015	Matrix:	Soil
Date of Preparation:	11/05/2015	Amount Prepared:	N/A
Date of Analysis:	11/10/2015	Percent Solids:	65%
Dry Weight Prepared:	19.538 grams	Extract Dilution:	1
Wet Weight Prepared:	29.933 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	ND	2.6	
91-57-6	2-Methylnaphthalene	ND	2.6	
90-12-0	1-Methylnaphthalene	ND	2.6	
208-96-8	Acenaphthylene	ND	2.6	
83-32-9	Acenaphthene	ND	2.6	
86-73-7	Fluorene	ND	2.6	
85-01-8	Phenanthrene	ND	2.6	
120-12-7	Anthracene	ND	2.6	
206-44-0	Fluoranthene	ND	2.6	
129-00-0	Pyrene	ND	2.6	
56-55-3	Benzo(a)anthracene	ND	2.6	
218-01-9	Chrysene	ND	2.6	
205-99-2	Benzo(b)fluoranthene	ND	2.6	
207-08-9	Benzo(k)fluoranthene	ND	2.6	
50-32-8	Benzo(a)pyrene	ND	2.6	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	2.6	
53-70-3	Dibenz(a,h)anthracene	ND	2.6	
191-24-2	Benzo(g,h,i)perylene	ND	2.6	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	58	32 - 102
p-Terphenyl-d14 (SS2)	58	41 - 106

VT Urban Soils

PAHs in Soil - SIM

Client Sample ID:	DUP-17	Lab Sample ID:	AB59352
Date of Collection:	10/30/2015	Matrix:	Soil
Date of Preparation:	11/05/2015	Amount Prepared:	N/A
Date of Analysis:	11/10/2015	Percent Solids:	84%
Dry Weight Prepared:	23.889 grams	Extract Dilution:	1
Wet Weight Prepared:	28.497 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	**7.2**	2.1	
91-57-6	2-Methylnaphthalene	**3.6**	2.1	
90-12-0	1-Methylnaphthalene	**3.1**	2.1	
208-96-8	Acenaphthylene	**28**	2.1	
83-32-9	Acenaphthene	**3.5**	2.1	
86-73-7	Fluorene	**4.5**	2.1	
85-01-8	Phenanthrene	**110**	2.1	
120-12-7	Anthracene	**20**	2.1	
206-44-0	Fluoranthene	**310**	2.1	
129-00-0	Pyrene	**230**	2.1	
56-55-3	Benzo(a)anthracene	**120**	2.1	
218-01-9	Chrysene	**180**	2.1	
205-99-2	Benzo(b)fluoranthene	**180**	2.1	
207-08-9	Benzo(k)fluoranthene	**150**	2.1	
50-32-8	Benzo(a)pyrene	**150**	2.1	
193-39-5	Indeno(1,2,3-cd)pyrene	**100**	2.1	
53-70-3	Dibenz(a,h)anthracene	**7.9**	2.1	
191-24-2	Benzo(g,h,i)perylene	**110**	2.1	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	58	32 - 102
p-Terphenyl-d14 (SS2)	62	41 - 106

VT Urban Soils

PAHs in Soil - SIM

Client Sample ID:	O4	Lab Sample ID:	AB59353
Date of Collection:	10/30/2015	Matrix:	Soil
Date of Preparation:	11/05/2015	Amount Prepared:	N/A
Date of Analysis:	11/10/2015	Percent Solids:	77%
Dry Weight Prepared:	22.666 grams	Extract Dilution:	1
Wet Weight Prepared:	29.481 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	ND	2.2	
91-57-6	2-Methylnaphthalene	ND	2.2	
90-12-0	1-Methylnaphthalene	ND	2.2	
208-96-8	Acenaphthylene	ND	2.2	
83-32-9	Acenaphthene	ND	2.2	
86-73-7	Fluorene	ND	2.2	
85-01-8	Phenanthrene	ND	2.2	
120-12-7	Anthracene	ND	2.2	
206-44-0	Fluoranthene	**5.1**	2.2	
129-00-0	Pyrene	**4.2**	2.2	
56-55-3	Benzo(a)anthracene	**3.0**	2.2	
218-01-9	Chrysene	**3.8**	2.2	
205-99-2	Benzo(b)fluoranthene	**5.3**	2.2	
207-08-9	Benzo(k)fluoranthene	**3.6**	2.2	
50-32-8	Benzo(a)pyrene	**2.8**	2.2	
193-39-5	Indeno(1,2,3-cd)pyrene	**2.7**	2.2	
53-70-3	Dibenz(a,h)anthracene	ND	2.2	
191-24-2	Benzo(g,h,i)perylene	**2.9**	2.2	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	55	32 - 102
p-Terphenyl-d14 (SS2)	60	41 - 106

VT Urban Soils

PAHs in Soil - SIM

Client Sample ID:	P5	Lab Sample ID:	AB59354
Date of Collection:	10/30/2015	Matrix:	Soil
Date of Preparation:	11/05/2015	Amount Prepared:	N/A
Date of Analysis:	11/10/2015	Percent Solids:	82%
Dry Weight Prepared:	24.834 grams	Extract Dilution:	1
Wet Weight Prepared:	30.161 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	ND	2.0	
91-57-6	2-Methylnaphthalene	ND	2.0	
90-12-0	1-Methylnaphthalene	ND	2.0	
208-96-8	Acenaphthylene	ND	2.0	
83-32-9	Acenaphthene	ND	2.0	
86-73-7	Fluorene	ND	2.0	
85-01-8	Phenanthrene	**2.7**	2.0	
120-12-7	Anthracene	ND	2.0	
206-44-0	Fluoranthene	**4.0**	2.0	
129-00-0	Pyrene	**3.4**	2.0	
56-55-3	Benzo(a)anthracene	ND	2.0	
218-01-9	Chrysene	**2.6**	2.0	
205-99-2	Benzo(b)fluoranthene	**2.8**	2.0	
207-08-9	Benzo(k)fluoranthene	**2.0**	2.0	
50-32-8	Benzo(a)pyrene	ND	2.0	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	2.0	
53-70-3	Dibenz(a,h)anthracene	ND	2.0	
191-24-2	Benzo(g,h,i)perylene	ND	2.0	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	50	32 - 102
p-Terphenyl-d14 (SS2)	52	41 - 106

VT Urban Soils

PAHs in Soil - SIM

Client Sample ID:	O3	Lab Sample ID:	AB59355
Date of Collection:	10/30/2015	Matrix:	Soil
Date of Preparation:	11/05/2015	Amount Prepared:	N/A
Date of Analysis:	11/10/2015	Percent Solids:	84%
Dry Weight Prepared:	24.970 grams	Extract Dilution:	1
Wet Weight Prepared:	29.775 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	ND	2.0	
91-57-6	2-Methylnaphthalene	ND	2.0	
90-12-0	1-Methylnaphthalene	ND	2.0	
208-96-8	Acenaphthylene	ND	2.0	
83-32-9	Acenaphthene	ND	2.0	
86-73-7	Fluorene	ND	2.0	
85-01-8	Phenanthrene	ND	2.0	
120-12-7	Anthracene	ND	2.0	
206-44-0	Fluoranthene	ND	2.0	
129-00-0	Pyrene	ND	2.0	
56-55-3	Benzo(a)anthracene	ND	2.0	
218-01-9	Chrysene	ND	2.0	
205-99-2	Benzo(b)fluoranthene	ND	2.0	
207-08-9	Benzo(k)fluoranthene	ND	2.0	
50-32-8	Benzo(a)pyrene	ND	2.0	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	2.0	
53-70-3	Dibenz(a,h)anthracene	ND	2.0	
191-24-2	Benzo(g,h,i)perylene	ND	2.0	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	60	32 - 102
p-Terphenyl-d14 (SS2)	68	41 - 106

VT Urban Soils

PAHs in Soil - SIM

Client Sample ID:	P3	Lab Sample ID:	AB59356
Date of Collection:	10/30/2015	Matrix:	Soil
Date of Preparation:	11/10/2015	Amount Prepared:	N/A
Date of Analysis:	11/10/2015	Percent Solids:	84%
Dry Weight Prepared:	25.248 grams	Extract Dilution:	N/A
Wet Weight Prepared:	30.024 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	ND	2.0	
91-57-6	2-Methylnaphthalene	ND	2.0	
90-12-0	1-Methylnaphthalene	ND	2.0	
208-96-8	Acenaphthylene	**3.8**	2.0	
83-32-9	Acenaphthene	ND	2.0	
86-73-7	Fluorene	ND	2.0	
85-01-8	Phenanthrene	**3.3**	2.0	
120-12-7	Anthracene	**2.1**	2.0	
206-44-0	Fluoranthene	**11**	2.0	
129-00-0	Pyrene	**11**	2.0	
56-55-3	Benzo(a)anthracene	**7.0**	2.0	
218-01-9	Chrysene	**9.5**	2.0	
205-99-2	Benzo(b)fluoranthene	**12**	2.0	
207-08-9	Benzo(k)fluoranthene	**9.0**	2.0	
50-32-8	Benzo(a)pyrene	**11**	2.0	
193-39-5	Indeno(1,2,3-cd)pyrene	**9.2**	2.0	
53-70-3	Dibenz(a,h)anthracene	**3.4**	2.0	
191-24-2	Benzo(g,h,i)perylene	**12**	2.0	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	60	32 - 102
p-Terphenyl-d14 (SS2)	65	41 - 106

VT Urban Soils

PAHs in Soil - SIM

Client Sample ID:	P4	Lab Sample ID:	AB59357
Date of Collection:	10/30/2015	Matrix:	Soil
Date of Preparation:	11/10/2015	Amount Prepared:	N/A
Date of Analysis:	11/10/2015	Percent Solids:	88%
Dry Weight Prepared:	24.554 grams	Extract Dilution:	N/A
Wet Weight Prepared:	27.784 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	ND	2.0	
91-57-6	2-Methylnaphthalene	ND	2.0	
90-12-0	1-Methylnaphthalene	ND	2.0	
208-96-8	Acenaphthylene	ND	2.0	
83-32-9	Acenaphthene	ND	2.0	
86-73-7	Fluorene	ND	2.0	
85-01-8	Phenanthrene	**2.8**	2.0	
120-12-7	Anthracene	ND	2.0	
206-44-0	Fluoranthene	**4.6**	2.0	
129-00-0	Pyrene	**3.5**	2.0	
56-55-3	Benzo(a)anthracene	ND	2.0	
218-01-9	Chrysene	**3.1**	2.0	
205-99-2	Benzo(b)fluoranthene	**3.4**	2.0	
207-08-9	Benzo(k)fluoranthene	**2.4**	2.0	
50-32-8	Benzo(a)pyrene	ND	2.0	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	2.0	
53-70-3	Dibenz(a,h)anthracene	ND	2.0	
191-24-2	Benzo(g,h,i)perylene	ND	2.0	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	55	32 - 102
p-Terphenyl-d14 (SS2)	60	41 - 106

VT Urban Soils

MATRIX SPIKE (MS) RECOVERY

Sample ID: AB59348

PARAMETER	SPIKE ADDED ug/Kg	SAMPLE CONCENTRATION ug/Kg	MS CONCENTRATION ug/Kg	MS % REC	QC LIMITS (% REC)
1-Methylnaphthalene	172	ND	98.8	57	49 - 99
2-Methylnaphthalene	172	ND	101	59	43 - 101
Acenaphthene	172	ND	110	64	31 - 119
Acenaphthylene	172	ND	107	62	32 - 116
Anthracene	172	ND	114	66	17 - 151
Benzo(a)anthracene	172	ND	121	70	18 - 136
Benzo(a)pyrene	172	ND	111	65	26 - 115
Benzo(b)fluoranthene	172	2.8	121	69	13 - 144
Benzo(g,h,i)perylene	172	ND	113	66	21 - 137
Benzo(k)fluoranthene	172	ND	111	65	27 - 139
Chrysene	172	ND	117	68	20 - 130
Dibenz(a,h)anthracene	172	ND	115	67	24 - 137
Fluoranthene	172	ND	115	67	17 - 149
Fluorene	172	ND	108	63	34 - 121
Indeno(1,2,3-cd)pyrene	172	ND	113	66	18 - 148
Naphthalene	172	ND	104	61	22 - 112
Phenanthrene	172	ND	113	66	18 - 134
Pyrene	172	ND	110	64	19 - 133

VT Urban Soils

Laboratory Duplicate Results

Sample ID: AB59348

PARAMETER	SAMPLE RESULT ug/Kg	SAMPLE DUPLICATE RESULT ug/Kg	PRECISION RPD %	QC LIMITS
1-Methylnaphthalene	ND	ND	NC	40
2-Methylnaphthalene	ND	ND	NC	40
Acenaphthene	ND	ND	NC	40
Acenaphthylene	ND	ND	NC	40
Anthracene	ND	ND	NC	40
Benzo(a)anthracene	ND	ND	NC	40
Benzo(a)pyrene	ND	ND	NC	40
Benzo(b)fluoranthene	2.8	2.94	4.88	40
Benzo(g,h,i)perylene	ND	ND	NC	40
Benzo(k)fluoranthene	ND	ND	NC	40
Chrysene	ND	ND	NC	40
Dibenz(a,h)anthracene	ND	ND	NC	40
Fluoranthene	ND	2.17	NC	40
Fluorene	ND	ND	NC	40
Indeno(1,2,3-cd)pyrene	ND	ND	NC	40
Naphthalene	ND	ND	NC	40
Phenanthrene	ND	ND	NC	40
Pyrene	ND	ND	NC	40

VT Urban Soils

Laboratory Fortified Blank (LFB) Results

PARAMETER	LFB AMOUNT SPIKED ppb	LFB RESULT ppb	LFB RECOVERY %	QC LIMITS %
1-Methylnaphthalene	133	82.0	62	41 - 117
2-Methylnaphthalene	133	84.7	64	35 - 120
Acenaphthene	133	90.6	68	40 - 110
Acenaphthylene	133	89.1	67	41 - 108
Anthracene	133	93.9	71	46 - 122
Benzo(a)anthracene	133	94.9	71	49 - 120
Benzo(a)pyrene	133	92.2	69	44 - 124
Benzo(b)fluoranthene	133	108	81	45 - 123
Benzo(g,h,i)perylene	133	95.7	72	48 - 120
Benzo(k)fluoranthene	133	97.4	73	40 - 127
Chrysene	133	91.8	69	44 - 117
Dibenz(a,h)anthracene	133	95.1	72	49 - 124
Fluoranthene	133	92.2	69	47 - 124
Fluorene	133	87.9	66	42 - 112
Indeno(1,2,3-cd)pyrene	133	91.0	68	48 - 121
Naphthalene	133	87.2	66	38 - 104
Phenanthrene	133	91.4	69	41 - 116
Pyrene	133	86.1	65	43 - 117

Comments:

Samples in Batch: AB59346, AB59347, AB59348, AB59349, AB59350, AB59351, AB59352, AB59353, AB59354, AB59355, AB59356, AB59357

ENVIRONMENTAL PROTECTION AGENCY

REGION 1

CHAIN OF CUSTODY RECORD

PROJ. NO.: 15110004

PROJECT NAME: Soil Background Study

SAMPLERS: (Signature) VT DEC

STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS	PAHS	ARSENIC	LEAD				REMARKS
	10/30/15	1302	X		B6	2	X	X	X				pg 2 of 2
		1040	X		B4	2	X	X	X				
		0952	X		A3	2	X	X	X				
		1130	X		B5	2	X	X	X				
		1500	X		Q4	2	X	X	X				
		1400	X		Q3	2	X	X	X				
			X		DUP-17	2	X	X	X				
		1100	X		O4	2	X	X	X				
		0915	X		P5	2	X	X	X				
		1215	X		O3	2	X	X	X				
		1330	X		P3	2	X	X	X				
		1000	X		P4	2	X	X	X				

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
[signature]	11/2/15 1500	Fedex 774875875310			
Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature) ESAT	Date / Time	Remarks	
		[signature]	11/3/15 09:30		

Distribution: Original Accompanies Shipment; Copy to Coordinator Field Files

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15110004 $METMS_PE

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United States Environmental Protection Agency
Office of Environmental Measurement & Evaluation
11 Technology Drive
North Chelmsford, MA 01863-2431

Laboratory Report

December 08, 2015

Jim Byrne - Mail Code OSRR07-2
US EPA New England R1

Project Number: 15110018
Project: VT Urban Soils
Analysis: PAHs in Soil - SIM
EPA Chemist: Dan Boudreau

Date Samples Received by the Laboratory: 11/10/2015

Analytical Procedure:

All samples were received and logged in by the laboratory according to the USEPA New England Laboratory SOP for Sample Log-in.

Sample preparation and analysis was done following the EPA Region I SOP, EIASOP-PAHSOLL6.

Samples were analyzed by a quadrapole GC/MS operating in the Selective Ion Monitoring (SIM) mode.. The extraction and analysis SOPs are based on SW-846 methods 3545A, 3630C,8270C, and EIASOP-BNAGCMS9.

Data were reviewed in accordance with the internal verification procedures described in the EPA New England Quality Manual for NERL.

Results relate only to the items tested or to the samples as received by the Laboratory. This analytical report shall not be reproduced except in full, without written approval of the laboratory.

If you have any questions please call me at 617-918-8340 .

Sincerely,

Qualifiers:

RL = Reporting limit
ND = Not Detected above Reporting limit
NA = Not Applicable due to high sample dilutions or sample interferences
NC = Not calculated since analyte concentration is ND.
J = Estimated value
J1 = Estimated value due to MS recovery outside accceptance criteria
J2 = Estimated value due to LFB result outside acceptance criteria
J3 = Estimated value due to RPD result outside acceptance criteria
J4 = Estimated value due to LCS result outside acceptance criteria
E = Estimated value exceeds the calibration range
L = Estimated value is below the calibration range
B = Analyte is associated with the lab blank or trip blank contamination. Values are qualified when the observed concentration of the contamination in the sample extract is less than 10 times the concentration in the blank.
R = No recovery was calculated since the analyte concentration is greater than four times the spike level.
P = The confirmation value exceeded 35% difference and is less than 100%. The lower value is reported.
C = The identification has been confirmed by GC/MS.
A = Suspected Aldol condensation product.
N = Tentatively identified compound.

VT Urban Soils

PAHs in Soil - SIM

Client Sample ID:	H3	Lab Sample ID:	AB59708
Date of Collection:	11/04/2015	Matrix:	Soil
Date of Preparation:	11/16/2015	Amount Prepared:	N/A
Date of Analysis:	11/24/2015	Percent Solids:	93%
Dry Weight Prepared:	28.450 grams	Extract Dilution:	1
Wet Weight Prepared:	30.608 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	**19**	1.8	
91-57-6	2-Methylnaphthalene	**7.8**	1.8	
90-12-0	1-Methylnaphthalene	**4.2**	1.8	
208-96-8	Acenaphthylene	**98**	1.8	
83-32-9	Acenaphthene	**4.9**	1.8	
86-73-7	Fluorene	**3.9**	1.8	
85-01-8	Phenanthrene	**60**	1.8	
120-12-7	Anthracene	**35**	1.8	
206-44-0	Fluoranthene	**220**	1.8	
129-00-0	Pyrene	**220**	1.8	
56-55-3	Benzo(a)anthracene	**180**	1.8	
218-01-9	Chrysene	**210**	1.8	
205-99-2	Benzo(b)fluoranthene	**210**	1.8	
207-08-9	Benzo(k)fluoranthene	**180**	1.8	
50-32-8	Benzo(a)pyrene	**240**	1.8	
193-39-5	Indeno(1,2,3-cd)pyrene	**140**	1.8	
53-70-3	Dibenz(a,h)anthracene	**14**	1.8	
191-24-2	Benzo(g,h,i)perylene	**170**	1.8	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	72	32 - 102
p-Terphenyl-d14 (SS2)	65	41 - 106

VT Urban Soils

PAHs in Soil - SIM

Client Sample ID:	O1	Lab Sample ID:	AB59709
Date of Collection:	11/04/2015	Matrix:	Soil
Date of Preparation:	11/16/2015	Amount Prepared:	N/A
Date of Analysis:	11/24/2015	Percent Solids:	91%
Dry Weight Prepared:	27.993 grams	Extract Dilution:	1
Wet Weight Prepared:	30.754 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	ND	1.8	
91-57-6	2-Methylnaphthalene	ND	1.8	
90-12-0	1-Methylnaphthalene	ND	1.8	
208-96-8	Acenaphthylene	ND	1.8	
83-32-9	Acenaphthene	ND	1.8	
86-73-7	Fluorene	ND	1.8	
85-01-8	Phenanthrene	**3.1**	1.8	B
120-12-7	Anthracene	ND	1.8	
206-44-0	Fluoranthene	**4.0**	1.8	
129-00-0	Pyrene	**3.3**	1.8	
56-55-3	Benzo(a)anthracene	ND	1.8	
218-01-9	Chrysene	**2.7**	1.8	
205-99-2	Benzo(b)fluoranthene	**3.7**	1.8	
207-08-9	Benzo(k)fluoranthene	**2.2**	1.8	
50-32-8	Benzo(a)pyrene	**2.0**	1.8	
193-39-5	Indeno(1,2,3-cd)pyrene	**2.3**	1.8	
53-70-3	Dibenz(a,h)anthracene	ND	1.8	
191-24-2	Benzo(g,h,i)perylene	**2.8**	1.8	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	60	32 - 102
p-Terphenyl-d14 (SS2)	65	41 - 106

VT Urban Soils

PAHs in Soil - SIM

Client Sample ID:	Q1	Lab Sample ID:	AB59710
Date of Collection:	11/04/2015	Matrix:	Soil
Date of Preparation:	11/16/2015	Amount Prepared:	N/A
Date of Analysis:	11/24/2015	Percent Solids:	73%
Dry Weight Prepared:	22.475 grams	Extract Dilution:	1
Wet Weight Prepared:	30.650 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	ND	2.2	
91-57-6	2-Methylnaphthalene	ND	2.2	
90-12-0	1-Methylnaphthalene	ND	2.2	
208-96-8	Acenaphthylene	ND	2.2	
83-32-9	Acenaphthene	ND	2.2	
86-73-7	Fluorene	ND	2.2	
85-01-8	Phenanthrene	**4.4**	2.2	B
120-12-7	Anthracene	ND	2.2	
206-44-0	Fluoranthene	**6.1**	2.2	
129-00-0	Pyrene	**4.4**	2.2	
56-55-3	Benzo(a)anthracene	ND	2.2	
218-01-9	Chrysene	**3.5**	2.2	
205-99-2	Benzo(b)fluoranthene	**4.3**	2.2	
207-08-9	Benzo(k)fluoranthene	**2.3**	2.2	
50-32-8	Benzo(a)pyrene	ND	2.2	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	2.2	
53-70-3	Dibenz(a,h)anthracene	ND	2.2	
191-24-2	Benzo(g,h,i)perylene	**2.4**	2.2	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	55	32 - 102
p-Terphenyl-d14 (SS2)	55	41 - 106

VT Urban Soils

PAHs in Soil - SIM

Client Sample ID:	Q2	Lab Sample ID:	AB59711
Date of Collection:	11/04/2015	Matrix:	Soil
Date of Preparation:	11/16/2015	Amount Prepared:	N/A
Date of Analysis:	11/24/2015	Percent Solids:	52%
Dry Weight Prepared:	16.039 grams	Extract Dilution:	1
Wet Weight Prepared:	30.605 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	ND	3.1	
91-57-6	2-Methylnaphthalene	ND	3.1	
90-12-0	1-Methylnaphthalene	ND	3.1	
208-96-8	Acenaphthylene	ND	3.1	
83-32-9	Acenaphthene	ND	3.1	
86-73-7	Fluorene	ND	3.1	
85-01-8	Phenanthrene	**8.6**	3.1	B
120-12-7	Anthracene	ND	3.1	
206-44-0	Fluoranthene	**9.8**	3.1	
129-00-0	Pyrene	**7.7**	3.1	
56-55-3	Benzo(a)anthracene	**3.5**	3.1	
218-01-9	Chrysene	**7.0**	3.1	
205-99-2	Benzo(b)fluoranthene	**10**	3.1	
207-08-9	Benzo(k)fluoranthene	**5.5**	3.1	
50-32-8	Benzo(a)pyrene	**4.2**	3.1	
193-39-5	Indeno(1,2,3-cd)pyrene	**5.3**	3.1	
53-70-3	Dibenz(a,h)anthracene	ND	3.1	
191-24-2	Benzo(g,h,i)perylene	**5.5**	3.1	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	68	32 - 102
p-Terphenyl-d14 (SS2)	72	41 - 106

VT Urban Soils

PAHs in Soil - SIM

Client Sample ID:	Q5	Lab Sample ID:	AB59712
Date of Collection:	11/04/2015	Matrix:	Soil
Date of Preparation:	11/16/2015	Amount Prepared:	N/A
Date of Analysis:	11/24/2015	Percent Solids:	91%
Dry Weight Prepared:	27.886 grams	Extract Dilution:	1
Wet Weight Prepared:	30.600 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	**1.9**	1.8	
91-57-6	2-Methylnaphthalene	ND	1.8	
90-12-0	1-Methylnaphthalene	ND	1.8	
208-96-8	Acenaphthylene	**2.0**	1.8	
83-32-9	Acenaphthene	ND	1.8	
86-73-7	Fluorene	ND	1.8	
85-01-8	Phenanthrene	**10**	1.8	B
120-12-7	Anthracene	ND	1.8	
206-44-0	Fluoranthene	**17**	1.8	
129-00-0	Pyrene	**14**	1.8	
56-55-3	Benzo(a)anthracene	**5.3**	1.8	
218-01-9	Chrysene	**10**	1.8	
205-99-2	Benzo(b)fluoranthene	**11**	1.8	
207-08-9	Benzo(k)fluoranthene	**7.7**	1.8	
50-32-8	Benzo(a)pyrene	**7.4**	1.8	
193-39-5	Indeno(1,2,3-cd)pyrene	**6.5**	1.8	
53-70-3	Dibenz(a,h)anthracene	ND	1.8	
191-24-2	Benzo(g,h,i)perylene	**7.7**	1.8	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	75	32 - 102
p-Terphenyl-d14 (SS2)	80	41 - 106

VT Urban Soils

PAHs in Soil - SIM

Client Sample ID:	DUP 15	Lab Sample ID:	AB59713
Date of Collection:	11/04/2015	Matrix:	Soil
Date of Preparation:	11/16/2015	Amount Prepared:	N/A
Date of Analysis:	11/24/2015	Percent Solids:	82%
Dry Weight Prepared:	25.113 grams	Extract Dilution:	1
Wet Weight Prepared:	30.800 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	ND	2.0	
91-57-6	2-Methylnaphthalene	ND	2.0	
90-12-0	1-Methylnaphthalene	ND	2.0	
208-96-8	Acenaphthylene	**3.3**	2.0	
83-32-9	Acenaphthene	ND	2.0	
86-73-7	Fluorene	ND	2.0	
85-01-8	Phenanthrene	**2.5**	2.0	B
120-12-7	Anthracene	ND	2.0	
206-44-0	Fluoranthene	**3.5**	2.0	
129-00-0	Pyrene	**3.0**	2.0	
56-55-3	Benzo(a)anthracene	ND	2.0	
218-01-9	Chrysene	**2.1**	2.0	
205-99-2	Benzo(b)fluoranthene	**2.5**	2.0	
207-08-9	Benzo(k)fluoranthene	ND	2.0	
50-32-8	Benzo(a)pyrene	ND	2.0	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	2.0	
53-70-3	Dibenz(a,h)anthracene	ND	2.0	
191-24-2	Benzo(g,h,i)perylene	ND	2.0	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	50	32 - 102
p-Terphenyl-d14 (SS2)	52	41 - 106

VT Urban Soils

PAHs in Soil - SIM

Client Sample ID:	K5	Lab Sample ID:	AB59714
Date of Collection:	11/05/2015	Matrix:	Soil
Date of Preparation:	11/16/2015	Amount Prepared:	N/A
Date of Analysis:	11/24/2015	Percent Solids:	89%
Dry Weight Prepared:	27.448 grams	Extract Dilution:	1
Wet Weight Prepared:	30.687 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	ND	1.8	
91-57-6	2-Methylnaphthalene	ND	1.8	
90-12-0	1-Methylnaphthalene	ND	1.8	
208-96-8	Acenaphthylene	**2.7**	1.8	
83-32-9	Acenaphthene	ND	1.8	
86-73-7	Fluorene	ND	1.8	
85-01-8	Phenanthrene	**5.1**	1.8	B
120-12-7	Anthracene	ND	1.8	
206-44-0	Fluoranthene	**11**	1.8	
129-00-0	Pyrene	**8.8**	1.8	
56-55-3	Benzo(a)anthracene	**5.0**	1.8	
218-01-9	Chrysene	**8.1**	1.8	
205-99-2	Benzo(b)fluoranthene	**9.4**	1.8	
207-08-9	Benzo(k)fluoranthene	**7.5**	1.8	
50-32-8	Benzo(a)pyrene	**6.0**	1.8	
193-39-5	Indeno(1,2,3-cd)pyrene	**4.2**	1.8	
53-70-3	Dibenz(a,h)anthracene	ND	1.8	
191-24-2	Benzo(g,h,i)perylene	**4.8**	1.8	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	58	32 - 102
p-Terphenyl-d14 (SS2)	60	41 - 106

VT Urban Soils

PAHs in Soil - SIM

Client Sample ID:	K4	Lab Sample ID:	AB59715
Date of Collection:	11/05/2015	Matrix:	Soil
Date of Preparation:	11/16/2015	Amount Prepared:	N/A
Date of Analysis:	11/24/2015	Percent Solids:	86%
Dry Weight Prepared:	26.691 grams	Extract Dilution:	1
Wet Weight Prepared:	30.920 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	ND	1.9	
91-57-6	2-Methylnaphthalene	ND	1.9	
90-12-0	1-Methylnaphthalene	ND	1.9	
208-96-8	Acenaphthylene	ND	1.9	
83-32-9	Acenaphthene	ND	1.9	
86-73-7	Fluorene	ND	1.9	
85-01-8	Phenanthrene	**3.4**	1.9	B
120-12-7	Anthracene	ND	1.9	
206-44-0	Fluoranthene	**4.1**	1.9	
129-00-0	Pyrene	**3.1**	1.9	
56-55-3	Benzo(a)anthracene	ND	1.9	
218-01-9	Chrysene	**2.6**	1.9	
205-99-2	Benzo(b)fluoranthene	**3.5**	1.9	
207-08-9	Benzo(k)fluoranthene	**2.5**	1.9	
50-32-8	Benzo(a)pyrene	ND	1.9	
193-39-5	Indeno(1,2,3-cd)pyrene	**1.9**	1.9	
53-70-3	Dibenz(a,h)anthracene	ND	1.9	
191-24-2	Benzo(g,h,i)perylene	**2.0**	1.9	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	72	32 - 102
p-Terphenyl-d14 (SS2)	80	41 - 106

VT Urban Soils

PAHs in Soil - SIM

Client Sample ID:	I2	Lab Sample ID:	AB59716
Date of Collection:	11/06/2015	Matrix:	Soil
Date of Preparation:	11/16/2015	Amount Prepared:	N/A
Date of Analysis:	11/24/2015	Percent Solids:	92%
Dry Weight Prepared:	28.358 grams	Extract Dilution:	1
Wet Weight Prepared:	30.687 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	ND	1.8	
91-57-6	2-Methylnaphthalene	ND	1.8	
90-12-0	1-Methylnaphthalene	ND	1.8	
208-96-8	Acenaphthylene	**1.8**	1.8	
83-32-9	Acenaphthene	ND	1.8	
86-73-7	Fluorene	ND	1.8	
85-01-8	Phenanthrene	**5.1**	1.8	B
120-12-7	Anthracene	ND	1.8	
206-44-0	Fluoranthene	**7.0**	1.8	
129-00-0	Pyrene	**6.3**	1.8	
56-55-3	Benzo(a)anthracene	**2.3**	1.8	
218-01-9	Chrysene	**5.6**	1.8	
205-99-2	Benzo(b)fluoranthene	**5.2**	1.8	
207-08-9	Benzo(k)fluoranthene	**3.5**	1.8	
50-32-8	Benzo(a)pyrene	**2.9**	1.8	
193-39-5	Indeno(1,2,3-cd)pyrene	**2.4**	1.8	
53-70-3	Dibenz(a,h)anthracene	ND	1.8	
191-24-2	Benzo(g,h,i)perylene	**2.8**	1.8	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	70	32 - 102
p-Terphenyl-d14 (SS2)	75	41 - 106

VT Urban Soils

Laboratory Blank (PAHs)

Client Sample ID:	N/A	Lab Sample ID:	N/A
Date of Collection:	N/A	Matrix:	Soil
Date of Preparation:	11/16/2015	Amount Prepared:	N/A
Date of Analysis:	11/24/2015	Percent Solids:	97%
Dry Weight Prepared:	29.584 grams	Extract Dilution:	1
Wet Weight Prepared:	30.402 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	ND	1.7	
91-57-6	2-Methylnapthalene	ND	1.7	
90-12-0	1-Methylnapthalene	ND	1.7	
208-96-8	Acenaphthylene	ND	1.7	
83-32-9	Acenaphthene	ND	1.7	
86-73-7	Fluorene	ND	1.7	
85-01-8	Phenanthrene	**1.93**	1.7	
120-12-7	Anthracene	ND	1.7	
206-44-0	Fluoranthene	ND	1.7	
129-00-0	Pyrene	ND	1.7	
56-55-3	Benzo(a)anthracene	ND	1.7	
218-01-9	Chrysene	ND	1.7	
205-99-2	Benzo(b)fluoranthene	ND	1.7	
207-08-9	Benzo(k)fluoranthene	ND	1.7	
50-32-8	Benzo(a)pyrene	ND	1.7	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	1.7	
53-70-3	Dibenz(a,h)anthracene	ND	1.7	
191-24-2	Benzo(g,h,i)perylene	ND	1.7	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	79	32 - 102
p-Terphenyl-d14 (SS2)	95	41 - 106

VT Urban Soils

PAHs in Soil - SIM

Client Sample ID:	K2	Lab Sample ID:	AB59717
Date of Collection:	11/06/2015	Matrix:	Soil
Date of Preparation:	11/16/2015	Amount Prepared:	N/A
Date of Analysis:	11/24/2015	Percent Solids:	86%
Dry Weight Prepared:	26.245 grams	Extract Dilution:	10
Wet Weight Prepared:	30.65 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	**79**	19	
91-57-6	2-Methylnaphthalene	**27**	19	
90-12-0	1-Methylnaphthalene	ND	19	
208-96-8	Acenaphthylene	**760**	19	
83-32-9	Acenaphthene	**83**	19	
86-73-7	Fluorene	**140**	19	
85-01-8	Phenanthrene	**2900**	19	
120-12-7	Anthracene	**980**	19	
206-44-0	Fluoranthene	**11000**	19	E
129-00-0	Pyrene	**9200**	19	E
56-55-3	Benzo(a)anthracene	**5100**	19	
218-01-9	Chrysene	**4800**	19	
205-99-2	Benzo(b)fluoranthene	**4000**	19	
207-08-9	Benzo(k)fluoranthene	**3700**	19	
50-32-8	Benzo(a)pyrene	**4400**	19	
193-39-5	Indeno(1,2,3-cd)pyrene	**2500**	19	
53-70-3	Dibenz(a,h)anthracene	**230**	19	
191-24-2	Benzo(g,h,i)perylene	**2900**	19	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	95	32 - 102
p-Terphenyl-d14 (SS2)	100	41 - 106

Comments: The reported concentrations of fluorantene and pyrene exceeded the calibration range.

VT Urban Soils

PAHs in Soil - SIM

Client Sample ID:	K2a	Lab Sample ID:	AB59718
Date of Collection:	11/06/2015	Matrix:	Soil
Date of Preparation:	11/16/2015	Amount Prepared:	N/A
Date of Analysis:	11/24/2015	Percent Solids:	88%
Dry Weight Prepared:	26.997 grams	Extract Dilution:	1
Wet Weight Prepared:	30.650 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	**14**	1.9	
91-57-6	2-Methylnaphthalene	**3.5**	1.9	
90-12-0	1-Methylnaphthalene	**2.1**	1.9	
208-96-8	Acenaphthylene	**22**	1.9	
83-32-9	Acenaphthene	**4.8**	1.9	
86-73-7	Fluorene	**4.8**	1.9	
85-01-8	Phenanthrene	**54**	1.9	
120-12-7	Anthracene	**19**	1.9	
206-44-0	Fluoranthene	**130**	1.9	
129-00-0	Pyrene	**110**	1.9	
56-55-3	Benzo(a)anthracene	**70**	1.9	
218-01-9	Chrysene	**72**	1.9	
205-99-2	Benzo(b)fluoranthene	**78**	1.9	
207-08-9	Benzo(k)fluoranthene	**69**	1.9	
50-32-8	Benzo(a)pyrene	**85**	1.9	
193-39-5	Indeno(1,2,3-cd)pyrene	**58**	1.9	
53-70-3	Dibenz(a,h)anthracene	**5.6**	1.9	
191-24-2	Benzo(g,h,i)perylene	**69**	1.9	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	75	32 - 102
p-Terphenyl-d14 (SS2)	78	41 - 106

VT Urban Soils

PAHs in Soil - SIM

Client Sample ID:	K2b	Lab Sample ID:	AB59719
Date of Collection:	11/06/2015	Matrix:	Soil
Date of Preparation:	11/16/2015	Amount Prepared:	N/A
Date of Analysis:	11/24/2015	Percent Solids:	96%
Dry Weight Prepared:	29.279 grams	Extract Dilution:	10
Wet Weight Prepared:	30.583 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	**78**	17	
91-57-6	2-Methylnaphthalene	**26**	17	
90-12-0	1-Methylnaphthalene	ND	17	
208-96-8	Acenaphthylene	**380**	17	
83-32-9	Acenaphthene	**35**	17	
86-73-7	Fluorene	**40**	17	
85-01-8	Phenanthrene	**710**	17	
120-12-7	Anthracene	**600**	17	
206-44-0	Fluoranthene	**4300**	17	
129-00-0	Pyrene	**4600**	17	
56-55-3	Benzo(a)anthracene	**2800**	17	
218-01-9	Chrysene	**2600**	17	
205-99-2	Benzo(b)fluoranthene	**2300**	17	
207-08-9	Benzo(k)fluoranthene	**2400**	17	
50-32-8	Benzo(a)pyrene	**3000**	17	
193-39-5	Indeno(1,2,3-cd)pyrene	**1700**	17	
53-70-3	Dibenz(a,h)anthracene	**140**	17	
191-24-2	Benzo(g,h,i)perylene	**1900**	17	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	95	32 - 102
p-Terphenyl-d14 (SS2)	10	41 - 106

VT Urban Soils

PAHs in Soil - SIM

Client Sample ID:	K2c	Lab Sample ID:	AB59720
Date of Collection:	11/06/2015	Matrix:	Soil
Date of Preparation:	11/16/2015	Amount Prepared:	N/A
Date of Analysis:	11/24/2015	Percent Solids:	91%
Dry Weight Prepared:	28.137 grams	Extract Dilution:	1
Wet Weight Prepared:	30.862 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	ND	1.8	
91-57-6	2-Methylnaphthalene	ND	1.8	
90-12-0	1-Methylnaphthalene	ND	1.8	
208-96-8	Acenaphthylene	**3.3**	1.8	
83-32-9	Acenaphthene	ND	1.8	
86-73-7	Fluorene	ND	1.8	
85-01-8	Phenanthrene	**7.1**	1.8	B
120-12-7	Anthracene	ND	1.8	
206-44-0	Fluoranthene	**18**	1.8	
129-00-0	Pyrene	**14**	1.8	
56-55-3	Benzo(a)anthracene	**6.9**	1.8	
218-01-9	Chrysene	**9.8**	1.8	
205-99-2	Benzo(b)fluoranthene	**10**	1.8	
207-08-9	Benzo(k)fluoranthene	**8.9**	1.8	
50-32-8	Benzo(a)pyrene	**8.8**	1.8	
193-39-5	Indeno(1,2,3-cd)pyrene	**6.2**	1.8	
53-70-3	Dibenz(a,h)anthracene	ND	1.8	
191-24-2	Benzo(g,h,i)perylene	**7.4**	1.8	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	70	32 - 102
p-Terphenyl-d14 (SS2)	75	41 - 106

VT Urban Soils

PAHs in Soil - SIM

Client Sample ID:	K2d	Lab Sample ID:	AB59721
Date of Collection:	11/06/2015	Matrix:	Soil
Date of Preparation:	11/16/2015	Amount Prepared:	N/A
Date of Analysis:	11/24/2015	Percent Solids:	87%
Dry Weight Prepared:	26.785 grams	Extract Dilution:	1
Wet Weight Prepared:	30.875 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	**4.8**	1.9	
91-57-6	2-Methylnaphthalene	**2.6**	1.9	
90-12-0	1-Methylnaphthalene	**2.2**	1.9	
208-96-8	Acenaphthylene	**36**	1.9	
83-32-9	Acenaphthene	**3.5**	1.9	
86-73-7	Fluorene	**4.9**	1.9	
85-01-8	Phenanthrene	**61**	1.9	
120-12-7	Anthracene	**19**	1.9	
206-44-0	Fluoranthene	**170**	1.9	
129-00-0	Pyrene	**160**	1.9	
56-55-3	Benzo(a)anthracene	**92**	1.9	
218-01-9	Chrysene	**110**	1.9	
205-99-2	Benzo(b)fluoranthene	**100**	1.9	
207-08-9	Benzo(k)fluoranthene	**98**	1.9	
50-32-8	Benzo(a)pyrene	**110**	1.9	
193-39-5	Indeno(1,2,3-cd)pyrene	**74**	1.9	
53-70-3	Dibenz(a,h)anthracene	**6.1**	1.9	
191-24-2	Benzo(g,h,i)perylene	**89**	1.9	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	75	32 - 102
p-Terphenyl-d14 (SS2)	82	41 - 106

VT Urban Soils

PAHs in Soil - SIM

Client Sample ID:	DUP 11	Lab Sample ID:	AB59722
Date of Collection:	11/06/2015	Matrix:	Soil
Date of Preparation:	11/16/2015	Amount Prepared:	N/A
Date of Analysis:	11/24/2015	Percent Solids:	86%
Dry Weight Prepared:	26.217 grams	Extract Dilution:	10
Wet Weight Prepared:	30.459 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	**47**	19	
91-57-6	2-Methylnaphthalene	**20**	19	
90-12-0	1-Methylnaphthalene	ND	19	
208-96-8	Acenaphthylene	**490**	19	
83-32-9	Acenaphthene	**58**	19	
86-73-7	Fluorene	**77**	19	
85-01-8	Phenanthrene	**1300**	19	
120-12-7	Anthracene	**530**	19	
206-44-0	Fluoranthene	**6600**	19	
129-00-0	Pyrene	**5400**	19	
56-55-3	Benzo(a)anthracene	**3100**	19	
218-01-9	Chrysene	**2900**	19	
205-99-2	Benzo(b)fluoranthene	**2500**	19	
207-08-9	Benzo(k)fluoranthene	**2400**	19	
50-32-8	Benzo(a)pyrene	**2800**	19	
193-39-5	Indeno(1,2,3-cd)pyrene	**1600**	19	
53-70-3	Dibenz(a,h)anthracene	**140**	19	
191-24-2	Benzo(g,h,i)perylene	**1900**	19	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	9	32 - 102
p-Terphenyl-d14 (SS2)	10	41 - 106

VT Urban Soils

MATRIX SPIKE (MS) RECOVERY

Sample ID: AB59716

PARAMETER	SPIKE ADDED ug/Kg	SAMPLE CONCENTRATION ug/Kg	MS CONCENTRATION ug/Kg	MS % REC	QC LIMITS (% REC)
1-Methylnaphthalene	140	ND	96.5	69	49 - 99
2-Methylnaphthalene	140	ND	99.2	71	43 - 101
Acenaphthene	140	ND	106	76	31 - 119
Acenaphthylene	140	1.8	102	72	32 - 116
Anthracene	140	ND	109	78	17 - 151
Benzo(a)anthracene	140	2.3	119	83	18 - 136
Benzo(a)pyrene	140	2.9	107	74	26 - 115
Benzo(b)fluoranthene	140	5.2	125	86	13 - 144
Benzo(g,h,i)perylene	140	2.8	107	74	21 - 137
Benzo(k)fluoranthene	140	3.5	107	74	27 - 139
Chrysene	140	5.6	117	80	20 - 130
Dibenz(a,h)anthracene	140	ND	111	79	24 - 137
Fluoranthene	140	7.0	120	81	17 - 149
Fluorene	140	ND	106	76	34 - 121
Indeno(1,2,3-cd)pyrene	140	2.4	108	75	18 - 148
Naphthalene	140	ND	102	73	22 - 112
Phenanthrene	140	5.1	113	77	18 - 134
Pyrene	140	6.3	110	74	19 - 133

VT Urban Soils

Laboratory Duplicate Results

Sample ID: AB59716

PARAMETER	SAMPLE RESULT ug/Kg	SAMPLE DUPLICATE RESULT ug/Kg	PRECISION RPD %	QC LIMITS
1-Methylnaphthalene	ND	ND	NC	40
2-Methylnaphthalene	ND	ND	NC	40
Acenaphthene	ND	ND	NC	40
Acenaphthylene	1.8	ND	ND	40
Anthracene	ND	ND	NC	40
Benzo(a)anthracene	2.3	2.95	24.8	40
Benzo(a)pyrene	2.9	3.80	26.9	40
Benzo(b)fluoranthene	5.2	6.41	20.8	40
Benzo(g,h,i)perylene	2.8	3.47	21.4	40
Benzo(k)fluoranthene	3.5	3.51	0.285	40
Chrysene	5.6	6.36	12.7	40
Dibenz(a,h)anthracene	ND	ND	NC	40
Fluoranthene	7.0	8.05	14.0	40
Fluorene	ND	ND	NC	40
Indeno(1,2,3-cd)pyrene	2.4	2.91	19.2	40
Naphthalene	ND	ND	NC	40
Phenanthrene	5.1	5.87	14.0	40
Pyrene	6.3	7.38	15.8	40

VT Urban Soils

Laboratory Fortified Blank (LFB) Results

PARAMETER	LFB AMOUNT SPIKED ppb	LFB RESULT ppb	LFB RECOVERY %	QC LIMITS %
1-Methylnaphthalene	135	108	80	41 - 117
2-Methylnaphthalene	135	111	82	35 - 120
Acenaphthene	135	120	89	40 - 110
Acenaphthylene	135	116	86	41 - 108
Anthracene	135	129	96	46 - 122
Benzo(a)anthracene	135	139	103	49 - 120
Benzo(a)pyrene	135	132	98	44 - 124
Benzo(b)fluoranthene	135	150	111	45 - 123
Benzo(g,h,i)perylene	135	136	101	48 - 120
Benzo(k)fluoranthene	135	133	99	40 - 127
Chrysene	135	134	99	44 - 117
Dibenz(a,h)anthracene	135	136	101	49 - 124
Fluoranthene	135	133	99	47 - 124
Fluorene	135	123	91	42 - 112
Indeno(1,2,3-cd)pyrene	135	134	99	48 - 121
Naphthalene	135	112	83	38 - 104
Phenanthrene	135	128	95	41 - 116
Pyrene	135	129	96	43 - 117

Comments:

Samples in Batch: AB59708, AB59709, AB59710, AB59711, AB59712, AB59713, AB59714, AB59715, AB59716, AB59717, AB59718, AB59719, AB59720, AB59721, AB59722, AB60351

15110018 $PAHS
15110018 $METMS_PE

ENVIRONMENTAL PROTECTION AGENCY

REGION 1

CHAIN OF CUSTODY RECORD

PROJ. NO.: 15110018

PROJECT NAME: Soil Background Study

SAMPLERS: (Signature) VT DEC

STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS	PAHS	ARSENIC	LEAD				REMARKS
	11/4/15	0:00	X		H3	2	X	X	X				
	11/4/15	1530	X		Q1	2	X	X	X				
	11/4/15	1400	X		Q1	2	X	X	X				
	11/4/15	1130	X		Q7	2	X	X	X				
	11/4	1000	X		Q5	2	X	X	X				
	11/4	[redacted]	X		DUP 15	2	X	X	X				
	11/5/15	0830	X		K5	2	X	X	X				
	11/5/15	1000	X		K4	2	X	X	X				
	11/6/15	0900	X		I2	2	X	X	X				
	11/6/15	1000	X		K2	2	X	X	X				
	11/6/15	1045	X		K2a	2	X	X	X				
	11/6/15	1200	X		K2b	2	X	X	X				
	11/6/15	1300	X		K2c	2	X	X	X				
	11/6/15	1345	X		K2d	2	X	X	X				
	11/6/15		X		DUP 11	2	X	X	X				

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
[signature]	11/9/15 1500	FEDEX #774931442789			
Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature) ESAT	Date / Time	Remarks	
		[signature]	11/10/15 08.48		

Distribution: Original Accompanies Shipment; Copy to Coordinator Field Files

2°C

1- 19191

United States Environmental Protection Agency
Office of Environmental Measurement & Evaluation
11 Technology Drive
North Chelmsford, MA 01863-2431

Laboratory Report

December 08, 2015

Jim Byrne - Mail Code OSRR07-2
US EPA New England R1

Project Number: 15110027
Project: VT Urban Soils
Analysis: PAHs in Soil - SIM
EPA Chemist: Dan Boudreau

Date Samples Received by the Laboratory: 11/17/2015

Analytical Procedure:

All samples were received and logged in by the laboratory according to the USEPA New England Laboratory SOP for Sample Log-in.

Sample preparation and analysis was done following the EPA Region I SOP, EIASOP-PAHSOLL6.

Samples were analyzed by a quadrapole GC/MS operating in the Selective Ion Monitoring (SIM) mode.. The extraction and analysis SOPs are based on SW-846 methods 3545A, 3630C,8270C, and EIASOP-BNAGCMS9.

Data were reviewed in accordance with the internal verification procedures described in the EPA New England Quality Manual for NERL.

Results relate only to the items tested or to the samples as received by the Laboratory. This analytical report shall not be reproduced except in full, without written approval of the laboratory.

If you have any questions please call me at 617-918-8340 .

Sincerely,

Qualifiers:

RL = Reporting limit
ND = Not Detected above Reporting limit
NA = Not Applicable due to high sample dilutions or sample interferences
NC = Not calculated since analyte concentration is ND.
J = Estimated value
J1 = Estimated value due to MS recovery outside accceptance criteria
J2 = Estimated value due to LFB result outside acceptance criteria
J3 = Estimated value due to RPD result outside acceptance criteria
J4 = Estimated value due to LCS result outside acceptance criteria
E = Estimated value exceeds the calibration range
L = Estimated value is below the calibration range
B = Analyte is associated with the lab blank or trip blank contamination. Values are qualified when the observed concentration of the contamination in the sample extract is less than 10 times the concentration in the blank.
R = No recovery was calculated since the analyte concentration is greater than four times the spike level.
P = The confirmation value exceeded 35% difference and is less than 100%. The lower value is reported.
C = The identification has been confirmed by GC/MS.
A = Suspected Aldol condensation product.
N = Tentatively identified compound.

VT Urban Soils

PAHs in Soil - SIM

Client Sample ID:	H7	Lab Sample ID:	AB59990
Date of Collection:	11/13/2015	Matrix:	Soil
Date of Preparation:	11/16/2015	Amount Prepared:	N/A
Date of Analysis:	11/24/2015	Percent Solids:	91%
Dry Weight Prepared:	27.807 grams	Extract Dilution:	1
Wet Weight Prepared:	30.603 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	**2.5**	1.8	
91-57-6	2-Methylnaphthalene	ND	1.8	
90-12-0	1-Methylnaphthalene	ND	1.8	
208-96-8	Acenaphthylene	**13**	1.8	
83-32-9	Acenaphthene	**2.0**	1.8	
86-73-7	Fluorene	**2.8**	1.8	
85-01-8	Phenanthrene	**38**	1.8	
120-12-7	Anthracene	**15**	1.8	
206-44-0	Fluoranthene	**91**	1.8	
129-00-0	Pyrene	**77**	1.8	
56-55-3	Benzo(a)anthracene	**42**	1.8	
218-01-9	Chrysene	**49**	1.8	
205-99-2	Benzo(b)fluoranthene	**44**	1.8	
207-08-9	Benzo(k)fluoranthene	**38**	1.8	
50-32-8	Benzo(a)pyrene	**41**	1.8	
193-39-5	Indeno(1,2,3-cd)pyrene	**25**	1.8	
53-70-3	Dibenz(a,h)anthracene	**2.4**	1.8	
191-24-2	Benzo(g,h,i)perylene	**27**	1.8	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	62	32 - 102
p-Terphenyl-d14 (SS2)	65	41 - 106

Comments: The project was extracted and analyzed with project 15110018; the sample duplicate and matrix spike are with 15110018.

VT Urban Soils

Laboratory Blank (PAHs)

Client Sample ID:	N/A	Lab Sample ID:	N/A
Date of Collection:	N/A	Matrix:	Soil
Date of Preparation:	11/16/2015	Amount Prepared:	N/A
Date of Analysis:	11/24/2015	Percent Solids:	97%
Dry Weight Prepared:	29.584 grams	Extract Dilution:	1
Wet Weight Prepared:	30.402 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	ND	1.7	
91-57-6	2-Methylnapthalene	ND	1.7	
90-12-0	1-Methylnapthalene	ND	1.7	
208-96-8	Acenaphthylene	ND	1.7	
83-32-9	Acenaphthene	ND	1.7	
86-73-7	Fluorene	ND	1.7	
85-01-8	Phenanthrene	**1.93**	1.7	
120-12-7	Anthracene	ND	1.7	
206-44-0	Fluoranthene	ND	1.7	
129-00-0	Pyrene	ND	1.7	
56-55-3	Benzo(a)anthracene	ND	1.7	
218-01-9	Chrysene	ND	1.7	
205-99-2	Benzo(b)fluoranthene	ND	1.7	
207-08-9	Benzo(k)fluoranthene	ND	1.7	
50-32-8	Benzo(a)pyrene	ND	1.7	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	1.7	
53-70-3	Dibenz(a,h)anthracene	ND	1.7	
191-24-2	Benzo(g,h,i)perylene	ND	1.7	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	79	32 - 102
p-Terphenyl-d14 (SS2)	95	41 - 106

VT Urban Soils

Laboratory Fortified Blank (LFB) Results

PARAMETER	LFB AMOUNT SPIKED ppb	LFB RESULT ppb	LFB RECOVERY %	QC LIMITS %
1-Methylnaphthalene	135	109	81	41 - 117
2-Methylnaphthalene	135	111	82	35 - 120
Acenaphthene	135	120	89	40 - 110
Acenaphthylene	135	115	85	41 - 108
Anthracene	135	129	96	46 - 122
Benzo(a)anthracene	135	139	103	49 - 120
Benzo(a)pyrene	135	132	98	44 - 124
Benzo(b)fluoranthene	135	150	111	45 - 123
Benzo(g,h,i)perylene	135	136	101	48 - 120
Benzo(k)fluoranthene	135	133	99	40 - 127
Chrysene	135	134	99	44 - 117
Dibenz(a,h)anthracene	135	136	101	49 - 124
Fluoranthene	135	133	99	47 - 124
Fluorene	135	123	91	42 - 112
Indeno(1,2,3-cd)pyrene	135	134	99	48 - 121
Naphthalene	135	112	83	38 - 104
Phenanthrene	135	128	95	41 - 116
Pyrene	135	129	96	43 - 117

Comments:

Samples in Batch: AB59990

ENVIRONMENTAL PROTECTION AGENCY

REGION 1

CHAIN OF CUSTODY RECORD

PROJ. NO.: 15110027

PROJECT NAME: Soil Background Study

SAMPLERS: (Signature) VT DEC

STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS	PAHs	ARSENIC	LEAD				REMARKS
	11/13/15	1015	X		H7	2	X	X	X				

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
[signature]	11/16/15 1500	FEDEX 774985430969			
Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature) [signature] ESAT	Date / Time 11-17-15 08:00	Remarks	

Distribution: Original Accompanies Shipment; Copy to Coordinator Field Files

3-C

15110027 $PAHS
15110027 $METMS_PE

1- 19381

United States Environmental Protection Agency
Office of Environmental Measurement & Evaluation
11 Technology Drive
North Chelmsford, MA 01863-2431

Laboratory Report

December 09, 2015

Jim Byrne - Mail Code OSRR07-2
US EPA New England R1

Project Number: 15110039
Project: VT Urban Soils
Analysis: PAHs in Soil - SIM
EPA Chemist: Dan Boudreau

Date Samples Received by the Laboratory: 11/24/2015

Analytical Procedure:

All samples were received and logged in by the laboratory according to the USEPA New England Laboratory SOP for Sample Log-in.

Sample preparation and analysis was done following the EPA Region I SOP, EIASOP-PAHSOLL6.

Samples were analyzed by a quadrapole GC/MS operating in the Selective Ion Monitoring (SIM) mode.. The extraction and analysis SOPs are based on SW-846 methods 3545A, 3630C,8270C, and EIASOP-BNAGCMS9.

Data were reviewed in accordance with the internal verification procedures described in the EPA New England Quality Manual for NERL.

Results relate only to the items tested or to the samples as received by the Laboratory. This analytical report shall not be reproduced except in full, without written approval of the laboratory.

If you have any questions please call me at 617-918-8340 .

Sincerely,

Qualifiers:

RL = Reporting limit
ND = Not Detected above Reporting limit
NA = Not Applicable due to high sample dilutions or sample interferences
NC = Not calculated since analyte concentration is ND.
J = Estimated value
J1 = Estimated value due to MS recovery outside accceptance criteria
J2 = Estimated value due to LFB result outside acceptance criteria
J3 = Estimated value due to RPD result outside acceptance criteria
J4 = Estimated value due to LCS result outside acceptance criteria
E = Estimated value exceeds the calibration range
L = Estimated value is below the calibration range
B = Analyte is associated with the lab blank or trip blank contamination. Values are qualified when the observed concentration of the contamination in the sample extract is less than 10 times the concentration in the blank.
R = No recovery was calculated since the analyte concentration is greater than four times the spike level.
P = The confirmation value exceeded 35% difference and is less than 100%. The lower value is reported.
C = The identification has been confirmed by GC/MS.
A = Suspected Aldol condensation product.
N = Tentatively identified compound.

VT Urban Soils

PAHs in Soil - SIM

Client Sample ID:	O5	Lab Sample ID:	AB60351
Date of Collection:	11/17/2015	Matrix:	Soil
Date of Preparation:	12/01/2015	Amount Prepared:	N/A
Date of Analysis:	12/02/2015	Percent Solids:	84%
Dry Weight Prepared:	24.834 grams	Extract Dilution:	1
Wet Weight Prepared:	29.543 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	ND	2.0	
91-57-6	2-Methylnaphthalene	ND	2.0	
90-12-0	1-Methylnaphthalene	ND	2.0	
208-96-8	Acenaphthylene	**3.7**	2.0	
83-32-9	Acenaphthene	ND	2.0	
86-73-7	Fluorene	ND	2.0	
85-01-8	Phenanthrene	**12**	2.0	
120-12-7	Anthracene	**2.8**	2.0	
206-44-0	Fluoranthene	**32**	2.0	
129-00-0	Pyrene	**27**	2.0	
56-55-3	Benzo(a)anthracene	**15**	2.0	
218-01-9	Chrysene	**20**	2.0	
205-99-2	Benzo(b)fluoranthene	**21**	2.0	
207-08-9	Benzo(k)fluoranthene	**17**	2.0	
50-32-8	Benzo(a)pyrene	**17**	2.0	
193-39-5	Indeno(1,2,3-cd)pyrene	**12**	2.0	
53-70-3	Dibenz(a,h)anthracene	ND	2.0	
191-24-2	Benzo(g,h,i)perylene	**14**	2.0	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	70	32 - 102
p-Terphenyl-d14 (SS2)	80	41 - 106

VT Urban Soils

Laboratory Blank (PAHs)

Client Sample ID:	N/A	Lab Sample ID:	N/A
Date of Collection:	N/A	Matrix:	Soil
Date of Preparation:	12/01/2015	Amount Prepared:	N/A
Date of Analysis:	12/02/2015	Percent Solids:	100%
Dry Weight Prepared:	30.131 grams	Extract Dilution:	1
Wet Weight Prepared:	30.134 grams	pH:	N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
91-20-3	Naphthalene	ND	1.7	
91-57-6	2-Methylnapthalene	ND	1.7	
90-12-0	1-Methylnapthalene	ND	1.7	
208-96-8	Acenaphthylene	ND	1.7	
83-32-9	Acenaphthene	ND	1.7	
86-73-7	Fluorene	ND	1.7	
85-01-8	Phenanthrene	ND	1.7	
120-12-7	Anthracene	ND	1.7	
206-44-0	Fluoranthene	ND	1.7	
129-00-0	Pyrene	ND	1.7	
56-55-3	Benzo(a)anthracene	ND	1.7	
218-01-9	Chrysene	ND	1.7	
205-99-2	Benzo(b)fluoranthene	ND	1.7	
207-08-9	Benzo(k)fluoranthene	ND	1.7	
50-32-8	Benzo(a)pyrene	ND	1.7	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	1.7	
53-70-3	Dibenz(a,h)anthracene	ND	1.7	
191-24-2	Benzo(g,h,i)perylene	ND	1.7	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorobiphenyl (SS1)	60	32 - 102
p-Terphenyl-d14 (SS2)	70	41 - 106

VT Urban Soils

Laboratory Duplicate Results

Sample ID: AB60351

PARAMETER	SAMPLE RESULT ug/Kg	SAMPLE DUPLICATE RESULT ug/Kg	PRECISION RPD %	QC LIMITS
1-Methylnaphthalene	ND	ND	NC	40
2-Methylnaphthalene	ND	ND	NC	40
Acenaphthene	ND	ND	NC	40
Acenaphthylene	3.7	4.04	8.79	40
Anthracene	2.8	2.78	0.717	40
Benzo(a)anthracene	15.0	15.4	2.63	40
Benzo(a)pyrene	17.0	17.9	5.16	40
Benzo(b)fluoranthene	21.0	21.5	2.35	40
Benzo(g,h,i)perylene	14.0	14.5	3.51	40
Benzo(k)fluoranthene	17.0	17.6	3.47	40
Chrysene	20.0	21.5	7.23	40
Dibenz(a,h)anthracene	ND	ND	NC	40
Fluoranthene	32.0	32.1	0.312	40
Fluorene	ND	ND	NC	40
Indeno(1,2,3-cd)pyrene	12.0	12.9	7.23	40
Naphthalene	ND	2.15	200	40
Phenanthrene	12.0	13.6	12.5	40
Pyrene	27.0	27.9	3.28	40

VT Urban Soils

Laboratory Fortified Blank (LFB) Results

PARAMETER	LFB AMOUNT SPIKED ppb	LFB RESULT ppb	LFB RECOVERY %	QC LIMITS %
1-Methylnaphthalene	146	88.8	61	41 - 117
2-Methylnaphthalene	146	91.0	62	35 - 120
Acenaphthene	146	92.4	63	40 - 110
Acenaphthylene	146	89.2	61	41 - 108
Anthracene	146	99.7	68	46 - 122
Benzo(a)anthracene	146	103	71	49 - 120
Benzo(a)pyrene	146	99.3	68	44 - 124
Benzo(b)fluoranthene	146	105	72	45 - 123
Benzo(g,h,i)perylene	146	101	69	48 - 120
Benzo(k)fluoranthene	146	104	71	40 - 127
Chrysene	146	101	69	44 - 117
Dibenz(a,h)anthracene	146	101	69	49 - 124
Fluoranthene	146	98.5	68	47 - 124
Fluorene	146	93.5	64	42 - 112
Indeno(1,2,3-cd)pyrene	146	99.3	68	48 - 121
Naphthalene	146	93.2	64	38 - 104
Phenanthrene	146	100	69	41 - 116
Pyrene	146	99.3	68	43 - 117

Comments:

VT Urban Soils

LABORATORY FORTIFIED DUPLICATE (LFB Dup) RECOVERY

COMPOUND	LFB Dup CONCENTRATION ppb	LFB Dup RECOVERY %	RPD %	QC LIMITS RPD
1-Methylnapthalene	103	71	15	30
2-Methylnapthalene	105	72	14	30
Acenaphthene	109	75	17	30
Acenaphthylene	106	73	17	30
Anthracene	117	80	16	30
Benzo(a)anthracene	122	84	17	30
Benzo(a)pyrene	118	81	17	30
Benzo(b)fluoranthene	128	88	20	30
Benzo(g,h,i)perylene	119	82	16	30
Benzo(k)fluoranthene	122	84	16	30
Chrysene	119	82	16	30
Dibenz(a,h)anthracene	119	82	16	30
Fluoranthene	116	80	16	30
Fluorene	109	75	15	30
Indeno(1,2,3-cd)pyrene	117	80	16	30
Naphthalene	109	75	16	30
Phenanthrene	117	80	16	30
Pyrene	118	81	17	30

Samples in Batch: AB60351

ENVIRONMENTAL PROTECTION AGENCY

REGION 1

CHAIN OF CUSTODY RECORD

15110039 $PAHS
15110039 $METMS_PE

PROJ. NO.: 15110039

PROJECT NAME: Soil Background Study

SAMPLERS: (Signature) VT DEC

STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS	PAHS	ARSENIC	LEAD				REMARKS
	11/17/15	0900	X		05	2	X	X	X				

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
[signature]	11/23/15 1500	FEDEX 775036941698			
Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature)	Date / Time	Remarks	
		[signature] ESAT	11/24/15 09:00		

Distribution: Original Accompanies Shipment; Copy to Coordinator Field Files

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