Indoor Air Sampling Summary Report
August – October 2006

Keith Middle School
225 Hathaway Boulevard
New Bedford, MA 02740

November 14, 2006

Prepared for:

Mr. Scott Alfonse, Director
Office of Environmental Stewardship
City of New Bedford
133 William Street, Room 311
New Bedford, MA 02740

Prepared by:

BETA Group, Inc.
Engineers • Scientists • Planners
315 Norwood Park South, Norwood, MA 02062 781.255.1982 fax: 781.255.1974
6 Blackstone Valley Place, Lincoln, RI 02865 401.333.2382 fax: 401.333.9225
email: BETA@BETA-Inc.com

Indoor Air Sampling Summary Report
August – October 2006

Site: Keith Middle School
225 Hathaway Boulevard
New Bedford, MA 02740

Prepared for: Mr. Scott Alfonse, Director
Department of Environmental Stewardship
City of New Bedford
133 William Street, Room 311
New Bedford, MA 02740

Prepared by: BETA Group, Inc.
315 Norwood Park South
Norwood, MA 02062

Associate: Alan D. Hanscom, P.E., LSP
Licensed Site Professional No. 2152

Senior Project Manager: Elizabeth R. Connell for DGB
David Billo, LSP

November 14, 2006

Table of Contents

1.0 Introduction **1**

2.0 Indoor Air Sampling **1**

2.1 Sample Collection 1

2.2 Analysis 2

2.3 Results 2

3.0 Foundation Vent Stack Sampling **3**

3.1 Sample Collection 3

3.2 Analysis 3

3.3 Results 4

4.0 Quality Assurance/ Quality Control **4**

Figures

Figure No.	Title
1	Indoor Air Sample Locations
2	Foundation Vent Stack Locations

Tables

Table No.	Title
1	Sampling Events Summary
2	Indoor Air Sampling PCB Results
3	Indoor Air Sampling VOC Results
4	Foundation Vent Sampling PCB and VOC Results

Appendices

Appendix	Description
A	Air Sampling Protocols
B	NWS Weather Data
C	Field Notes
D	Hi Volume Air Calculation Summary Sheets
E	Graph – PCBs in Indoor Air
F	Graph – VOCs in Indoor Air
G	Graph – VOCs in Foundation Vent Stacks
H	Laboratory Data Sheets August 4-5, 2006
I	Laboratory Data Sheets August 18-19, 2006
J	Laboratory Data Sheets September 14-15, 2006
K	Laboratory Data Sheets October 24-25, 2006
L	Data Validation

1.0 Introduction

BETA Group, Inc. (BETA) has completed four sampling events of foundation vent stacks and indoor air at the Keith Middle School in New Bedford, Massachusetts. BETA collected 24-hour composite indoor air samples on August 4-5, August 18-19, September 14-15, and October 24-25, 2006 and four-hour foundation vent stack samples on August 4, August 14, September 18, and October 24-25, 2006. At each event, samples were analyzed for polychlorinated biphenyls (PCBs) and volatile organic compounds (VOCs). The sample collection and the subsequent laboratory analyses were performed in accordance with U.S. Environmental Protection Agency (EPA) methods as described in the EPA's "Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air." PCBs were collected and analyzed by EPA Method TO-4A (for indoor air samples) and EPA Method TO-10A (for vent stack samples). VOCs were collected and analyzed by EPA Method TO-15.

BETA also collected the air samples in accordance with the draft Long-Term Monitoring and Maintenance Implementation Plan previously submitted to the City and EPA. A summary of BETA's sampling protocols is included in Appendix A. For the August 18, September 14, and October 24, 2006 sampling, BETA collected duplicate samples at all sample locations to ensure completeness of sample collection. All of the resulting sample pairs were submitted to the analytical laboratory for analysis of one of the duplicates, with the other backup samples held until all analyses were successfully completed.

In addition to the Site temperature and barometric pressure readings measured by BETA at the start and finish of each air sample, BETA has included in Appendix B hourly weather conditions, including barometric pressure, temperature, and wind speed and direction, recorded by the National Weather Service at the New Bedford Airport. The New Bedford Airport is located approximately two miles north northwest of the Site.

2.0 Indoor Air Sampling

2.1 Sample Collection

During each sampling event, the indoor air samples were collected from the ground floor of each of the three school building sections (Sections A, B and C). Refer to the attached sampling location plan. Each location was selected to be representative of portions of the school building normally occupied by students and teachers. The sample in Building Section A was collected in the main hallway; the sample in Building Section B was collected in the auditorium; and the sample in Building Section C was collected in the Faculty Dining Room. Additionally, BETA collected two outdoor samples from the vicinity of the flagpole, immediately to the south of the building, using the same methods to provide comparative background results. Copies of field notes recorded by BETA's sample collection personnel are included in Appendix C.

Standard 6.0-liter laboratory pre-cleaned and evacuated passivated stainless steel SUMMA canisters were used to collect the 24-hour composite VOC samples. High volume air sampling pumps (Tisch-1000) were used to draw air through quartz pre-filters and polyurethane foam (PUF) cartridges to collect the 24-hour composite PCB samples. Refer to Appendix A for a summary of BETA's sampling protocols.

2.2 Analysis

BETA submitted the samples to Alpha Woods Hole Laboratories (Alpha) of Westborough, Massachusetts for analysis of VOCs and PCBs. Alpha analyzed for VOCs using EPA Method TO-15. Alpha analyzed for PCBs using EPA Method TO-4A. Alpha analyzed each PCB sample for all 209 PCB congeners. BETA submitted the high volume PUF cartridges and the quartz prefilters as separate samples in order to differentiate between airborne particulate contamination captured on the prefilter and vapor phase contamination absorbed by the PUF.

Alpha's data sheets for the VOC analyses provide concentrations of VOCs in air in both parts per billion by volume (ppbV) and micrograms per cubic meter (ug/M3). Alpha's data sheets for PCB detections provide a mass for each of the PCB congeners detected on the PUF cartridges and filters in nanograms (ng). In order to calculate the concentration of airborne PCBs, BETA used the laboratory detected mass of total PCB divided by the volume of air sampled by the high volume sampler. BETA calculated the total volume of air sampled based on a sampler specific calculation using a flow rate measured through a factory-calibrated orifice plate (calibrated within one year of use) and sample specific ambient temperature and barometric pressure measurements. Refer to Appendix D for a summary of BETA's air sample volume calculations.

2.3 Results

Alpha's analysis detected VOCs associated with standard construction materials in all samples. The concentrations declined between each sampling event. BETA anticipates that the concentrations of these compounds will continue to diminish over time as construction at the Site is completed.

Alpha's analysis also detected traces of airborne PCBs (measured in nanograms) as summarized below:

Indoor Air PCB Detections (ng)

Date	Building A Hallway		Building B Auditorium		Building C Faculty Dining		Background	
	PUF	Filter	PUF	Filter	PUF	Filter	PUF	Filter
Aug. 4-5, 2006	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	210
Aug. 18-19, 2006	< 0.5	< 0.5	83	< 0.5	< 0.5	< 0.5	112.3	< 0.5
Sept. 14-15, 2006	840	12	410	1.4	< 0.5	180	3,600	< 0.5
Oct. 24-25, 2006	260	1.2	91	< 0.5	25	1.3	26	11

The resulting concentrations (after conversion to units of $\mu g/M^3$, see Table 2) were well below EPA's Action Level. While Alpha detected various individual PCB congeners, no Arochlors were identified. Note that the highest concentrations were detected in the background outdoor air samples collected on September 14-15, 2006. The remediation of wetland sediment

occurring during the collection of these samples may have caused this elevated result.

A summary table of the detected VOC and PCB concentrations is attached. Graphs of the detected compounds are provided in Appendix E (PCBs) and Appendix F (VOCs). The complete laboratory data sheets are included in Appendices H-K.

3.0 Foundation Vent Stack Sampling

3.1 Sample Collection

The foundation venting system was designed and installed to provide a preferential pathway for any potential contaminants located beneath the foundation to vent directly to the atmosphere through the roof of the school, minimizing the possibility of migration of vapors into the occupied interior of the school building. The venting system consists of Geovent™ high permeability gas collection piping installed beneath the building's foundation slab. Vent stacks connected to the Geovent™ piping run up through the building and the roof to direct any such vapors to the atmosphere. Twenty four hours prior to the vent stack sampling, BETA placed temporary caps on each of the stacks to increase the likelihood of detecting any volatile contaminants that may be present in the system.

The samples for PCBs were collected on polyurethane foam (PUF) cartridges using battery-powered low-flow personal air sampling pumps operating at approximately 4.5 liters per minute. BETA calculated the volume of air contained within each individual vent stack and Geovent™ circuit and collected a sample of approximately 80% of that volume through each PUF cartridge.

BETA collected the VOC samples using 2.75-liter laboratory pre-cleaned and evacuated passivated stainless steel SUMMA canisters. Prior to sampling, the canisters were evacuated in the laboratory to a vacuum of approximately 0.05 millimeters of mercury (equivalent to approximately -35 pound per square inch). For sample collection, a valve connected to a calibrated flow controller is opened and the SUMMAs are allowed to fill with vent stack air over a four hour period through Teflon tubing attached to the top of the temporary vent stack cap.

BETA collected a total of five vent stack samples during each event. The samples consisted of three samples and a duplicate, and one background sample collected outside the school building in the vicinity of the flagpole immediately south of the building. Refer to Appendix A for a description of the sampling protocols.

3.2 Analysis

BETA submitted the samples to Alpha for analysis of VOCs and PCBs. Alpha analyzed for VOCs using EPA Method TO-15. Alpha analyzed for PCBs using EPA's low-volume analytical method TO-10A. Alpha analyzed each PCB sample for all 209 PCB congeners. EPA's low volume method TO-10A does not include the use of a prefilter.

Alpha's data sheets for the VOC analyses provide concentrations of VOCs in air in both ppbV and $\mu g/M^3$. Alpha's data sheets for PCB detections provide a mass for each of the PCB congeners detected on the PUF cartridges in nanograms. In order to calculate the single concentration of airborne PCB detected during these three sampling events (in vent stack VS-11 on September 14), BETA used the laboratory detected mass of total PCB divided by the volume of air sampled by the low volume sampler.

3.3 Results

Alpha detected standard construction-related VOCs as summarized in the attached table and as graphically shown in Appendix G. Due to the construction of the vent stacks using PVC pipe glue and because the Site is still an active construction site, the VOC analysis detected the constituents of PVC cements and cleaners and gasoline vapors. BETA anticipates that these compounds will diminish over time as the off-gassing from the glue decreases and construction at the Site is completed. The complete laboratory data sheets are included as Appendices H-K.

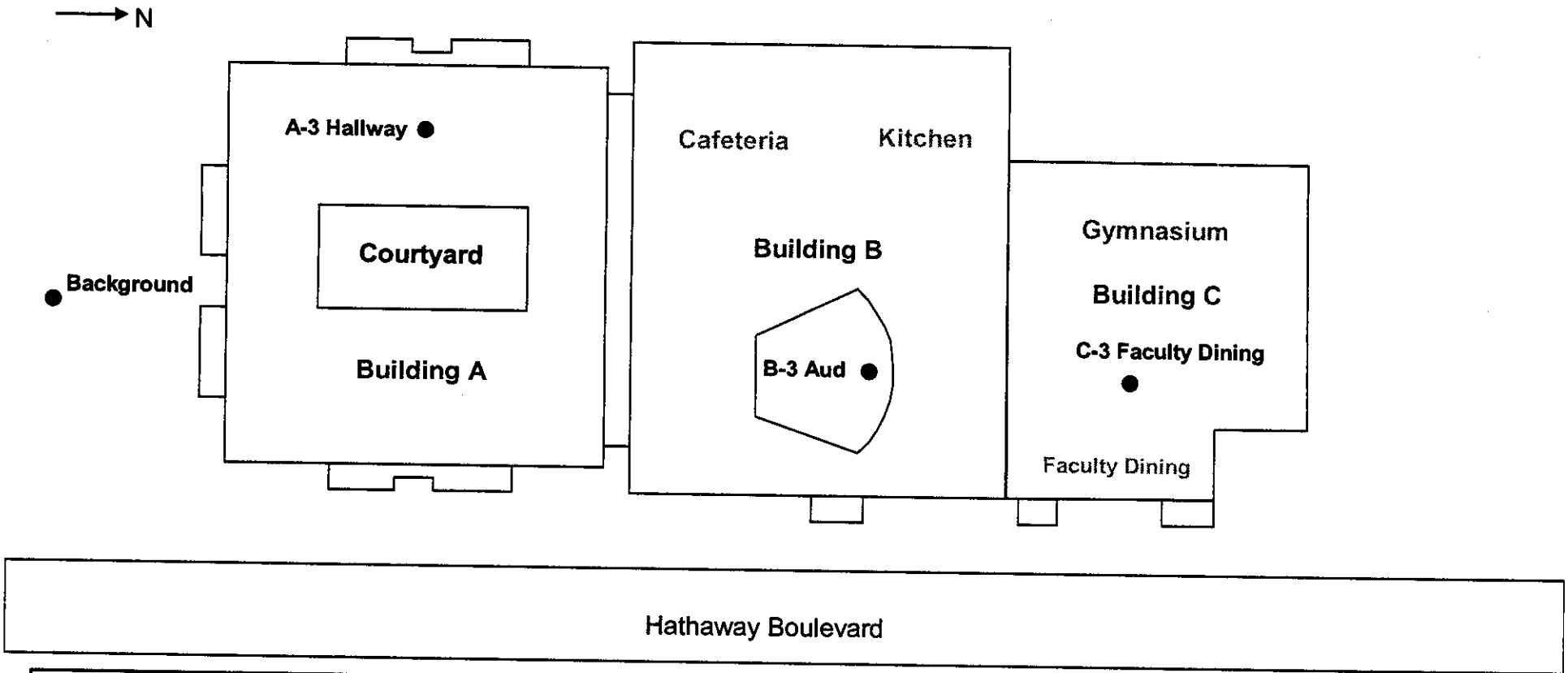
Alpha only detected trace PCBs in one foundation vent stack sample during one event. The detected concentration was well below the EPA Action Level.

4.0 Quality Assurance/ Quality Control

For each sampling event, BETA submitted at least one duplicate sample and one trip blank for the 6.0-liter SUMMAs, the 2.75-liter SUMMAs, the high-volume PUF cartridges, and the low-volume PUF cartridges. BETA submitted the PCB laboratory analytical data from each of the indoor sampling events to Ms. Cynthia Fuller of Wilcox & Barton, Inc. for a Level II data validation. Ms. Fuller has completed a review of the August 4-5, August 18-19, and September 14-15, 2006 PCB results (Refer to Appendix L). The balance of Ms. Fuller's evaluation will be forwarded under separate cover.

Figures

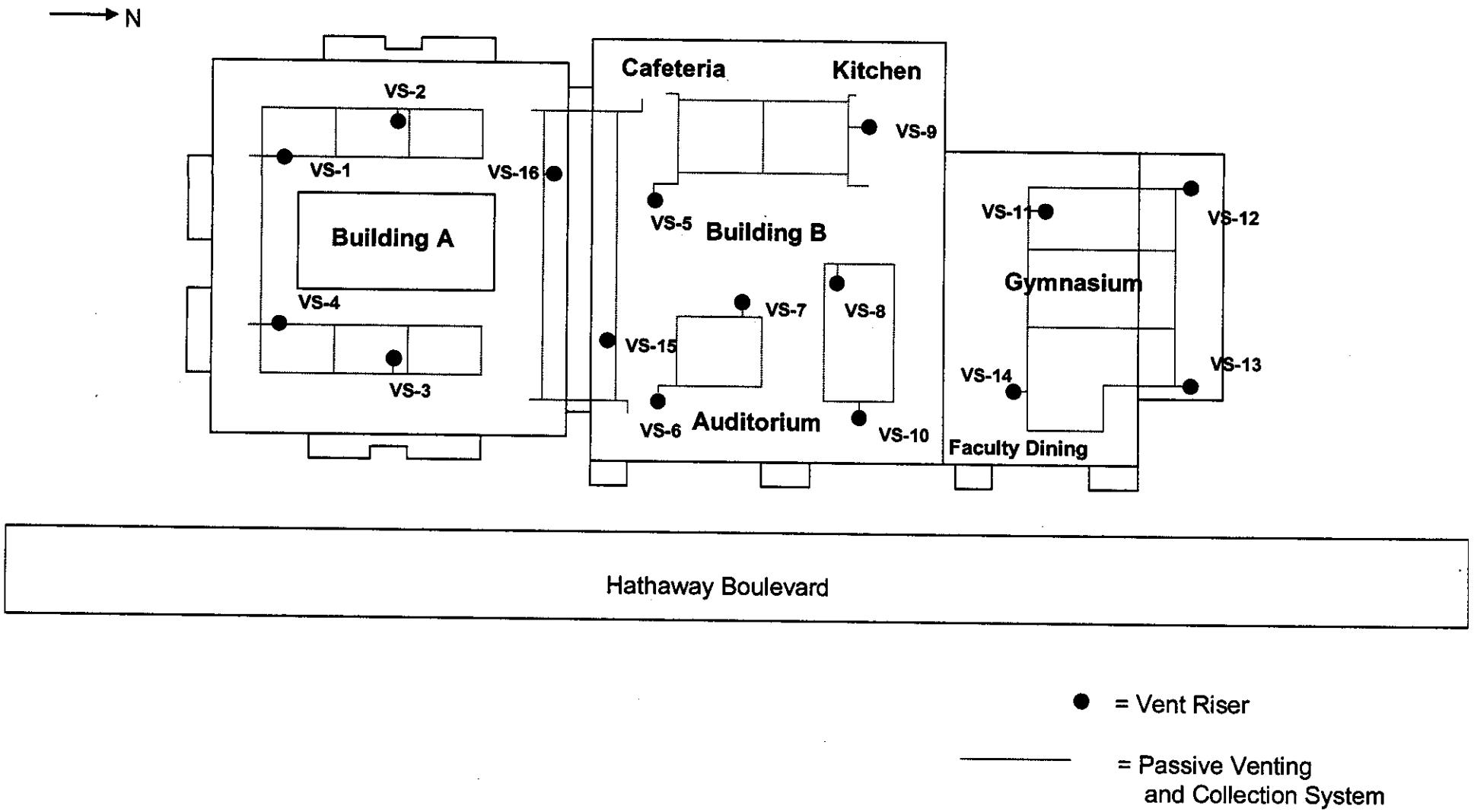
Figure 1
New Keith Middle School
Indoor Air Sampling Locations
August 2006



BETA Group, Inc.
Engineers • Scientists • Planners
315 Norwood Park South, Norwood, MA 02062 781.255.1982
email: beta@beta-inc.com

● = Indoor Air Sampling Point

Figure 2
New Keith Middle School
Foundation Venting System



Tables

Table 1
Keith Middle School
2006 Air Sampling Summary

Sample Date	Event Number	Location	Parameters	Findings	Comments
March 30-31, 2006	--	Rooftop Vent Stacks	PCB, PAHs, VOCs	• No PCBs or PAHs detected • Construction-related VOCs detected	Modification to collection protocols recommended
April 27, 2006	--	Rooftop Vent Stacks	3 Background Samples for VOCs 1 Vent Stack Air VOCs	Both background samples and vent stack sample contained reduced concentrations of construction-related VOCs	
July 21-22, 2006	1	Indoor Air	PCBs & VOCs	Construction-related VOCs detected.	PCBs not analyzed (orifice calibration out of date)
August 4-5, 2006	2	Rooftop Vent Stacks	PCBs and VOCs	• Construction-related VOCs detected. • No PCBs detected	Partial vent air analyses
		Indoor Air		• Construction-related VOCs detected • No indoor PCBs detected • Trace PCBs in background air	One invalid indoor VOC sample
August 18-19, 2006	3	Rooftop Vent Stacks	PCBs and VOCs	• Construction-related VOCs detected. • No PCBs detected	All samples completed
		Indoor Air		• Construction-related VOCs detected • Backgound level PCB concentrations detected in Auditorium	
September 14-15, 2006	4	Rooftop Vent Stacks	PCBs and VOCs	• Construction-related VOCs detected. • Trace PCBs in 1 sample	All samples completed
		Indoor Air		• Construction-related VOCs detected • Higher backgound level PCB concentrations	
October 24-25, 2006	5	Rooftop Vent Stacks	PCBs and VOCs	• Construction-related VOCs detected. • No PCBs detected	All samples completed
		Indoor Air		Results pending	

Table 2A
Keith Middle School
Indoor Air Sampling

August 4-5, 2006

	A-2 Hallway		B-2 Auditorium		C-2 Faculty Dining		Background-2		Background-2Dup		Trip Blank		Laboratory Blank	
Congener Groups (ng)	**PUF**	**Filter**	**PUF**	**Filter**	**PUF**	**Filter**	**PUF**	**Filter**	**PUF**	**Filter**	**PUF**	**Filter**	**PUF**	**Filter**
Dichlorobiphenyls	ND	ND	ND	ND	ND	ND	16	ND	8.5	ND	1.1	ND	ND	ND
Trichlorobiphenyls	ND	ND	ND	ND	ND	ND	75	ND	60	ND	ND	ND	0.52	ND
Tetrachlorobiphenyls	ND	ND	ND	ND	ND	ND	65	1.1	49	ND	ND	2.7	0.55	ND
Pentachlorobiphenyls	ND	ND	ND	ND	ND	ND	32	ND	25	ND	ND	ND	ND	ND
Hexachlorobiphenyls	ND	ND	ND	ND	ND	ND	16	ND	14	ND	ND	ND	ND	ND
Heptachlorobiphenyls	ND	ND	ND	ND	ND	ND	2.4	ND	2.6	ND	ND	ND	ND	ND
Total PCBs	ND	ND	ND	ND	ND	ND	210	ND	150.6	ND	1.1	2.7	1.1	ND
Sample Volume (M^3 of Air)	363		366		346		350		366		0		0	
Total PCB (ug/M^3)	ND		ND		ND		0.00060		0.00041		NA	NA	NA	NA
EPA Action Level (ug/M^3)	0.05		0.05		0.05		0.05		0.05					

ND = Not Detected
NA = Not Applicable
ng = nanograms

Table 2B
Keith Middle School
Indoor Air Sampling

August 18-19, 2006

	A-3 Hallway		B-3 Auditorium		C-3 Faculty Dining		Background		Background Dup		Trip Blank		Laboratory Blank	
Congener Groups (ng)	**PUF**	**Filter**	**PUF**	**Filter**	**PUF**	**Filter**	**PUF**	**Filter**	**PUF**	**Filter**	**PUF**	**Filter**	**PUF**	**Filter**
Trichlorobiphenyls	ND	ND	33	ND	ND	ND	27	ND	19	ND	ND	ND	ND	ND
Tetrachlorobiphenyls	ND	ND	50	ND	ND	ND	34	1.1	24	ND	0.59	ND	0.7	ND
Pentachlorobiphenyls	ND	ND	ND	ND	ND	ND	39	ND	29	ND	ND	0.56	ND	0.61
Hexachlorobiphenyls	ND	ND	ND	ND	ND	ND	11	ND	9.5	ND	ND	ND	ND	1.2
Heptachlorobiphenyls	ND	ND	ND	ND	ND	ND	1.3	ND	1.3	ND	ND	ND	ND	ND
Total PCBs	ND	ND	83	ND	ND	ND	112.3	ND	82.8	ND	0.59	0.56	0.7	1.81
Sample Volume (M^3 of Air)	377		366		353		364		365		0		0	
Total PCB (ug/M^3)	ND		0.00023		ND		0.00031		0.00023		NA		NA	
EPA Action Level (ug/M^3)	0.05		0.05		0.05		0.05		0.05					

ND = Not Detected
NA = Not Applicable
ng = nanograms

Table 2C
Keith Middle School
Indoor Air Sampling
September 14-15, 2006

	A-4 Hallway		B-4 Auditorium		C-4 Faculty Dining		Background-4		Background Dup-4		Trip Blank		Laboratory Blank	
Congener Groups (ng)	**PUF**	**Filter**	**PUF**	**Filter**	**PUF**	**Filter**	**PUF**	**Filter**	**PUF**	**Filter**	**PUF**	**Filter**	**PUF**	**Filter**
Monochlorobiphenyls	ND	ND	ND	ND	ND	ND	9.2	ND	8.4	ND	ND	ND	ND	ND
Dichlorobiphenyls	130	ND	ND	ND	ND	2.9	630	ND	610	ND	ND	14	ND	ND
Trichlorobiphenyls	500	ND	45	0.78	ND	50	1900	ND	1900	ND	ND	ND	ND	ND
Tetrachlorobiphenyls	160	ND	370	0.63	ND	6.5	820	ND	850	ND	0.53	0.53	0.7	0.64
Pentachlorobiphenyls	38	1.4	ND	ND	ND	110	270	ND	280	ND	ND	0.82	ND	0.61
Hexachlorobiphenyls	7.6	7.4	ND	ND	ND	7.9	42	ND	43	ND	ND	ND	ND	1.2
Heptachlorobiphenyls	0.61	3.5	ND	ND	ND	2.4	2.8	ND	3.5	ND	ND	ND	ND	ND
Total PCBs	840	12	410	1.4	ND	180	3,600	ND	3,700	ND	0.53	16	0.7	0.64
Sample Volume (M^3 of Air)	312		374		343		364		372		0		0	
Total PCB (ug/M^3)	0.00273		0.00110		0.00052		0.00989		0.00995		NA	NA	NA	NA
EPA Action Level (ug/M^3)	0.05		0.05		0.05		0.05		0.05					

ND = Not Detected
NA = Not Applicable
ng = nanograms

Table 2D
Keith Middle School
Indoor Air Sampling
October 24-25, 2006

	A-5 Hallway		B-5 Auditorium		C-5 Faculty Dining		Background-5		Background Dup-5		Trip Blank		Laboratory Blank	
Congener Groups (ng)	**PUF**	**Filter**	**PUF**	**Filter**	**PUF**	**Filter**	**PUF**	**Filter**	**PUF**	**Filter**	**PUF**	**Filter**	**PUF**	**Filter**
Monochlorobiphenyls	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dichlorobiphenyls	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichlorobiphenyls	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Tetrachlorobiphenyls	73	0.56	ND	ND	ND	0.56	9.6	ND	7.8	1.4	ND	4.9	ND	21
Pentachlorobiphenyls	140	ND	47	ND	ND	ND	15	ND	15	6.3	ND	1.65	ND	3.8
Hexachlorobiphenyls	41	0.63	19	ND	25	0.76	1.3	ND	1.2	2.9	ND	ND	ND	0.51
Heptachlorobiphenyls	4.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total PCBs	260	1.2	91	ND	25	1.3	26	ND	24	11	ND	5.5	ND	26
Sample Volume (M^3 of Air)	299		342		348		360		373		0		0	
Total PCB (ug/M^3)	0.00087		0.00027		0.00008		0.00007		0.00009					
EPA Action Level (ug/M^3)	0.05		0.05		0.05		0.05		0.05					

ND = Not Detected
NA = Not Applicable
ng = nanograms

Table 3A
Keith Middle School
Indoor Air Quality
Volatile Organic Compounds (VOCs)
August 4-5, 2006

Sample Identification	Date Sampled	Date Analyzed	1,2,4-Trimethylbenzene	1,3,5-Trimethylbenzene	2-Butanone	Acetone	Benzene	Carbon disulfide	Chloromethane	Cyclohexane	Ethyl Alcohol	Ethylbenzene	Methylene chloride	4-Methyl-2-pentanone	p/m-Xylene	o-Xylene	Heptane	n-Hexane	Styrene	Toluene	Total VOCs
			(ug/m³)	(ug/m³)	(ug/m³)	(ug/m³)	(ug/m³)	(ug/m³)	(ug/m³)	(ug/m³)	(ug/m³)	(ug/m³)	(ug/m³)	(ug/m³)	(ug/m³)	(ug/m³)	(ug/m³)	(ug/m³)	(ug/m³)	(ug/m³)	(ug/m³)
		TEL	-	-	-	160.54	1.74	0.10	-	280.82	-	300.00	-	-	11.80	11.80	-	-	200.00	80.00	-
		AAL	-	-	-	160.54	0.12	0.10	-	280.82	-	300.00	-	-	11.80	11.80	-	-	2.00	20.00	-
A-2 Hallway A *	8/4-5/2006	8/11/2006	ND	ND	8.30	53.80	ND	ND	ND	ND	13.70	11.20	59.20	2.69	240.60	112.60	ND	5.92	ND	17.70	226
B-2 Auditorium A	8/4-5/2006	8/11/2006	169.00	73.50	82.50	76.20	ND	ND	ND	4.40	94.40	78.30	12.70	76.40	178	70.50	3.83	31.70	ND	92.00	1052
C-2 Fac. Dining	8/4-5/2006	8/17/2006	160.00	59.00	98.20	151	3.65	247	ND	112	152	74.60	16.9	58.90	33	15.60	9.30	78.50	10.70	271.34	1262
C-2 Fac. Dining DUP	8/4-5/2006	8/17/2006	37.20	ND	28.50	98	ND	ND	ND	40.30	87.1	ND	34.7	ND	ND	ND	ND	59.40	ND	24.25	1300
Bkgnd-2A	8/4-5/2006	8/17/2006	ND	ND	3.33	110	ND	ND	2.47	ND	13.6	ND	17.3	ND	6.80	2.40	ND	ND	ND	2.40	158
Trip Blank	8/4-5/2006	8/11/2006	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0
Detected VOCs also found in these materials:			2,5,6,7		1	1,9	10	13		16	12	10	17	18	2,3,5,6 10	2,3,5,6 10	22	19	14	5,9	

NOTES:

* Vacuum gauge on SUMMA canister for A-2 Hallway sample indicated 0 psi after 24 hours. Sample therefore considered not valid.

TEL = Threshold Effects Exposure Limit for Ambient Air (24-hour average)

AAL = Allowable Ambient Limit for Ambient Air (annual average)

(ug/m³) = micrograms per cubic meters

ND = not detected above method detection limit

- = No standard available

value Bold font indicates concentration exceeding TEL

Gray shading indicates concentration exceeding AAL

Construction Materials

1. PVC cements, cleaners, primers (from Site MSDS)
2. Corothane: Zince Promer Moisture Cure (from Site MSDS)
3. Macropoxy 646: Fast Cure Epoxy Coating (from Site MSDS)
4. Industrial Enamel HS (from Site MSDS)
5. Kem Kromik: Universal Metal Primer (VOC Comp.) (from Site MSDS)
6. Wood Clasics: Interior Wood Oil Stain (golden oak) (from Site MSDS)
7. UltraCrete: Solvent Borne Texture Coating (from Site MSDS)
8. Promar 400: Interior Alkyd Semi-Gloss Enamel (from Site MSDS)
9. CCW-702, CCW-715: Quick Dry Primer (from Site MSDS)
10. Gasoline
11. Adhesive cleanup (from Site MSDS)
12. Waterborne Acrylic Dry Fall (Sherwin Williams) (from Site MSDS)
13. Used in the manufacture of paints, enamels, paint removers, varnishes, varnish removers, putty, and rubber cement (OSHA).
14. CCW-704 Mastic (Carlisle Coatings)(from Site MSDS)
15. Solvent and chemical intermediate. Solvent (as isomeric mixture) for perfumes, dyes, and lacquers.(Spectrum Laboratories Fact Sheet)
16. Use as a solvent to dissolve cellulose ethers, lacquers; used as an ingredient of surface coatings;Use as a paint and varnish remover (OSHA)□
17. Paint and Varnish remover (CA Office of Environmental Health Hazard Assessment Fact Sheet)□
18. Denaturant for rubbing alcohol; solvent for paints and varnishes.(Spectrum Laboratories Fact Sheet)
19. Certain kinds of special glues used in the roofing and shoe and leather industries contain n-hexane. Several consumer products contain n-hexane, such as gasoline, quick-drying glues used in various hobbies, and rubber cement.(ATSDR Fact Sheet)
20. Found in consumer products, including some paint and spot removers, water repellents, brake and wood cleaners, glues (NY State DOH Fact Sheet)
21. Has been used as a paint stripper, adhesive solvent, as an ingredient in paints and varnishes (NY State DOH Fact Sheet)
22. Use as a carrier and penetrant solvent for adhesives (OSHA)

Table 3B
Keith Middle School
Indoor Air Quality
Volatile Organic Compounds (VOCs)
August 18-19, 2006

Sample Identification	Date Sampled	Date Analyzed	1,2,4-Trimethylbenzene	2-Butanone	4-Ethyltoluene	Acetone	Carbon disulfide	cis-1,2-Dichloroethene	Cyclohexane	Ethyl Alcohol	Iso-Propyl Alcohol	Methylene chloride	Methyl tert butyl ether	p/m-Xylene	Toluene	Trichloroethene	Total VOCs
			(ug/m³)	(ug/m³)	(ug/m³)	(ug/m³)	(ug/m³)	(ug/m³)	(ug/m³)	(ug/m³)	(ug/m³)	(ug/m³)	(ug/m³)	(ug/m³)	(ug/m³)	(ug/m³)	(ug/m³)
		TEL	~	~	~	160.54	0.10	~	280.82	~	~	~	~	11.80	80.00	~	~
		AAL	~	~	~	160.54	0.10	~	280.82	~	~	~	~	11.80	20.00	~	~
A-3 Hallway A	8/18-19/2006	8/24/2006	ND	9.43	ND	60.30	ND	9.18	ND	ND	ND	ND	ND	5.63	5.22	57.30	147
B-3 Auditorium A	8/18-19/2006	8/24/2006	51.90	56.40	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	108
C-3 Fac. Dining	8/18-19/2006	8/25/2006	18.90	16.60	10.80	87.9	[redacted]	ND	7.14	20.9	120	27.7	ND	[redacted]	[redacted]	ND	401
C-3 Fac. Dining DUP	8/18-19/2006	8/25/2006	17.40	22.50	ND	13	[redacted]	ND	ND	26.8	82.8	36.2	15.6	[redacted]	[redacted]	ND	331
Bkgnd-3A	8/18-19/2006	8/24/2006	ND	ND	ND	15.6	ND	ND	ND	4.27	ND	9.25	ND	ND	ND	ND	29
Trip Blank	8/18-19/2006	8/24/2006	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0
Detected VOCs also found In these materials:			2,5,6,7	1		1,9	13	15	16	12	11	17	10	2,3,5,6	5,9	21	

NOTES:

TEL = Threshold Effects Exposure Limit for Ambient Air (24-hour average)
AAL = Allowable Ambient Limit for Ambient Air (annual average)
(ug/m³) = micrograms per cubic meters
ND = not detected above method detection limit
~ = No standard available
value Bold font indicates concentration exceeding TEL
[redacted] Gray shading indicates concentration exceeding AAL

Construction Materials

1. PVC cements, cleaners, primers (from Site MSDS)
2. Corothane: Zince Promer Moisture Cure (from Site MSDS)
3. Macropoxy 646: Fast Cure Epoxy Coating (from Site MSDS)
4. Industrial Enamel HS (from Site MSDS)
5. Kem Kromik: Universal Metal Primer (VOC Comp.) (from Site MSDS)
6. Wood Clasics: Interior Wood Oil Stain (golden oak) (from Site MSDS)
7. UltraCrete: Solvent Borne Texture Coating (from Site MSDS)
8. Promar 400: Interior Alkyd Semi-Gloss Enamel (from Site MSDS)
9. CCW-702, CCW-715: Quick Dry Primer (from Site MSDS)
10. Gasoline
11. Adhesive cleanup (from Site MSDS)
12. Waterborne Acrylic Dry Fall (Sherwin Williams) (from Site MSDS)
13. Used in the manufacture of paints, enamels, paint removers, varnishes, varnish removers, putty, an
14. CCW-704 Mastic (Carlisle Coatings)(from Site MSDS)
15. Solvent and chemical intermediate. Solvent (as isomeric mixture) for perfumes, dyes, and lacquers.(Spectrum Labc
16. Use as a solvent to dissolve cellulose ethers, lacquers; used as an ingredient of surface coatings;Use as a paint an
17. Paint and Varnish remover (CA Office of Environmental Health Hazard Assessment Fact Sheet)□
18. Denaturant for rubbing alcohol; solvent for paints and varnishes.(Spectrum Laboratories Fact Sheet)
19. Certain kinds of special glues used in the roofing and shoe and leather industries contain n-hexane. Several consumer products contain n-hexane, such as gasoline, quick-drying glues used in various hobb
20. Found in consumer products, including some paint and spot removers, water repellents, brake and wood cleaners,
21. Has been used as a paint stripper, adhesive solvent, as an ingredient in paints and varnishes (NY State DOH Fact
22. Use as a carrier and penetrant solvent for adhesives (OSHA)

Table 3C
Keith Middle School
Indoor Air Quality
Volatile Organic Compounds (VOCs)
September 14, 2006

Sample Identification	Date Sampled	Date Analyzed	1,2,4-Trimethylbenzene	1,3,5-Trimethylbenzene	2-Butanone	4-Ethyltoluene	4-Methyl-2-pentanone	Acetone	Carbon disulfide	Cyclohexane	Ethyl Alcohol	Ethylbenzene	Methylene chloride	p/m-Xylene	o-Xylene	n-Hexane	Toluene	Total VOCs
			(ug/m³)	(ug/m³)	(ug/m³)	(ug/m³)	(ug/m³)	(ug/m³)	(ug/m³)	(ug/m³)	(ug/m³)	(ug/m³)	(ug/m³)	(ug/m³)	(ug/m³)	(ug/m³)	(ug/m³)	(ug/m³)
		TEL	-	-	-	-	-	160.54	0.10	280.82	-	300.00	-	11.80	11.80	-	80.00	-
		AAL	-	-	-	-	-	160.54	0.10	280.82	-	300.00	-	11.80	11.80	-	20.00	-
A-4 Hallway A	9/14-15/2006	9/21/2006	ND	ND	4.38	ND	ND	167.00	2.78	ND	15.50	10.90	7.72	51.90	2.69	ND	6.26	269
A-4 Hallway B	9/14-15/2006	9/22/2006	ND	ND	2.64	ND	ND	265.00	ND	ND	17.80	16.00	21.40	73.50	3.48	ND	2.92	403
B-4 Auditorium A	9/14-15/2006	9/21/2006	ND	ND	108	ND	40.60	27.90	ND	ND	40.50	6.43	14.20	29.70	8.84	ND	40.30	316
B-4 Auditorium B	9/14-15/2006	9/21/2006	3.05	ND	114	ND	46.60	29.10	ND	ND	34.80	8.49	15.00	35.80	11.10	4.89	45.80	349
C-4 Fac. Dining A	9/14-15/2006	9/22/2006	6.98	2.66	120	2.76	24.80	31.7	ND	4.01	14.7	4.49	6.18	19.4	5.19	40.10	47.7	331
C-4 Fac. Dining B	9/14-15/2006	9/21/2006	4.84	ND	92.40	ND	13.30	33.2	ND	3.04	17	3.80	17.7	19.4	4.58	7.76	**35.4**	252
Bkgnd-4A	9/14-15/2006	9/21/2006	ND	ND	4.79	ND	ND	75	ND	ND	21.8	ND	3.5	1.07	ND	ND	ND	106
Bkgnd-4B	9/14-15/2006	9/21/2006	ND	ND	ND	ND	ND	13.7	ND	ND	13	ND	4.95	ND	ND	ND	1.99	34
Trip Blank	9/14-15/2006	9/21/2006	ND	ND	ND	ND	ND	5.36	ND	ND	ND	ND	4.68	6.85	ND	ND	ND	17
Detected VOCs also found in these materials:			2,5,6,7		1		18.00	1,9	13	16	12	10	17	2,3,5,6 10	2,3,5,6 10	19	5,9	

NOTES:

TEL = Threshold Effects Exposure Limit for Ambient Air (24-hour average)
AAL = Allowable Ambient Limit for Ambient Air (annual average)
(ug/m³) = micrograms per cubic meters
ND = not detected above method detection limit
- = No standard available
value Bold font indicates concentration exceeding TEL
value Gray shading indicates concentration exceeding AAL

Construction Materials

1. PVC cements, cleaners, primers (from Site MSDS)
2. Corothane: Zince Promer Moisture Cure (from Site MSDS)
3. Macropoxy 646: Fast Cure Epoxy Coating (from Site MSDS)
4. Industrial Enamel HS (from Site MSDS)
5. Kem Kromik: Universal Metal Primer (VOC Comp.) (from Site MSDS)
6. Wood Clasics: Interior Wood Oil Stain (golden oak) (from Site MSDS)
7. UltraCrete: Solvent Borne Texture Coating (from Site MSDS)
8. Promar 400: Interior Alkyd Semi-Gloss Enamel (from Site MSDS)
9. CCW-702, CCW-715: Quick Dry Primer (from Site MSDS)
10. Gasoline
11. Adhesive cleanup (from Site MSDS)
12. Waterborne Acrylic Dry Fall (Sherwin Williams) (from Site MSDS)
13. Used in the manufacture of paints, enamels, paint removers, varnishes, varnish removers, putty, and rubber cement (OSH/
14. CCW-704 Mastic (Carlisle Coatings)(from Site MSDS)
15. Solvent and chemical intermediate. Solvent (as isomeric mixture) for perfumes, dyes, and lacquers.(Spectrum Laboratories
16. Use as a solvent to dissolve cellulose ethers, lacquers; used as an ingredient of surface coatings;Use as a paint and varnis
17. Paint and Varnish remover (CA Office of Environmental Health Hazard Assessment Fact Sheet)L
18. Denaturant for rubbing alcohol; solvent for paints and varnishes.(Spectrum Laboratories Fact Sheet)
19. Certain kinds of special glues used in the roofing and shoe and leather industries contain n-hexane. Several consumer products contain n-hexane, such as gasoline, quick-drying glues used in various hobbies, and
20. Found in consumer products, including some paint and spot removers, water repellents, brake and wood cleaners, glues (N
21. Has been used as a paint stripper, adhesive solvent, as an ingredient in paints and varnishes (NY State DOH Fact Sheet)
22. Use as a carrier and penetrant solvent for adhesives (OSHA)

Table 4A
New Keith Middle School
Foundation Vent Stack Sampling
August 4, 2006

	A2 VS-1 (1)	A-2 VS-4	B-2 VS-9	C-2 VS-11	Background-2	Background-2 Dup	TEL (24-hr avg)	AAL (Annual Avg)	High Conc. Dec. 2001 Soil Gas
Date Sampled:	8/4/06	8/4/06	8/4/06	8/4/06	8/4/06	8/4/06			
2-Butanone (Methyl Ethyl Ketone)*	**332**	**169**			7.56	3.48	200	10	259.5
Tetrahydrofuran*		73.8			**3.57**	ND	160.35	80.18	ND
Acetone*	187				26.7	25.8	160.54	160.54	95
1,1,2-Trichloro-1,2,2-trifluoroethane	ND	5.44	ND	ND	ND	4.42	NS	NS	NT
1,2,4-Trimethylbenzene	ND	ND	3.52	**4.43**	ND	ND	NS	NS	5.9
2,2,4-Trimethylpentane	ND	ND	16.3	**11.4**	ND	ND	NS	NS	NT
2-Hexanone	ND		ND	ND	ND	ND	10.88	10.88	ND
4-Methyl-2-pentanone	2.92	26.7	ND	ND	ND	ND	NS	NS	49.2
Benzene	ND				ND	ND	1.74	0.12	27.1
Chloroform	ND	ND	**3.76**	**3.04**	ND	ND	132.76	0.04	ND
Cyclohexane	ND	ND	22	30.2	ND	ND	280.82	280.82	106.7
Ethyl Alcohol	12.6	139	ND	ND	4.88	4.89	51.24	51.24	1,158.80
Ethylbenzene	24.7	95.2	5.26	7.15	10.4	8.91	300	300	13.9
Heptane	ND	5.25	6.42	**5.82**	ND	ND	NS	NS	1,122.90
Methylene Chloride	5.94	24.7	ND	ND	6.04	9.71	NS	NS	ND
Methyl-t-butyl ether	ND	ND	233	370	ND	ND	NS	NS	10.5
n-Hexane	ND	11.3	35.1	28.1	ND	ND	NS	NS	222
Styrene	ND	**2.56**	**6.27**	**7.42**	ND	ND	200	2	ND
Tetrachloroethene	ND	ND	ND	ND	ND	ND	922.18	0.02	65.8
Toluene	6.18	**34.5**	**25.7**	**38**	3.04	2.73	80	20	462.8
Xylenes					**43.9**	38.87	11.8	11.8	84.7
Total VOCs:	849	4,752	5,153	11,066	106	99	NS	NS	
PCBs	NDCN (2)	NDCN	NDCN (2)	NDCN	NDCN	NDCN	0.3 (3)	0.05 (4)	NT

Bold typeface = Concentrations exceeding AAL; Yellow shading = Concentrations exceeding TEL
Results reported in ug/M^3
* Common constituents of PVC pipe cements and cleaners
1. Vacuum gauge on SUMMA canister for A2 VS-1 sample incicated 0 psi after 4 hours. Sample therefore not considered valid.
2. A sampling pump malfunction resulted insufficient sample volume; therefore the PCB sample is not considered valid.
3. Risk-based maximum accptable level
4. EPA action level at which additional assessment is required
TEL - Threshold Effects Exposure Limit, 24-hour average exposure
AAL - Allowable Ambient Limit, annual average exposure
NDCN = None detected on cartridge at detection limit of 2-5 nanograms
NS = No AAL or TEL
NT = Not Tested
Trip Blank all BRL

Table 4B
New Keith Middle School
Foundation Vent Stack Sampling
August 18, 2006

	A-3A VS-1	A-3A VS-4	B-3A VS-9	C-3A VS-11	C-3B VS-11	Background-3	TEL	AAL	High Conc. Dec. 2001
Date Sampled:	8/18/06	8/18/06	8/18/06	8/18/06	8/18/06	8/18/06	(24-hr avg)	(Annual Avg)	Soil Gas
2-Butanone (Methyl Ethyl Ketone)*	ND	**47**	[illegible]	[illegible]	[illegible]	ND	200	10	259.5
Tetrahydrofuran*	ND	64	[illegible]	[illegible]	[illegible]	ND	160.35	80.18	ND
Acetone*	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	10.6	160.54	160.54	95
1,2,4-Trimethylbenzene	ND	43.4	ND	5.74	5.53	ND	NS	NS	5.9
1,2,5-Trimethylbenzene	ND	17.7	ND	ND	ND	ND	NS	NS	NT
2,2,4-Trimethylpentane	ND	36.5	ND	75.8	68.4	ND	NS	NS	NT
2-Hexanone	ND	[illegible]	ND	ND	ND	ND	10.88	10.88	ND
4-Ethyltoluene	ND	6.86	ND	3.22	3.03	ND	NS	NS	NT
4-Methyl-2-pentanone	ND	17.8	ND	ND	ND	ND	NS	NS	49.2
Benzene	ND	ND	ND	[illegible]	[illegible]	ND	1.74	0.12	27.1
Chloroform	ND	ND	ND	**6.34**	**7.2**	ND	132.76	0.04	ND
Cyclohexane	ND	ND	ND	97.2	105	ND	280.82	280.82	106.7
Ethylbenzene	ND	18.2	ND	5.92	6.11	ND	300	300	13.9
Heptane	ND	ND	ND	4.53	5.57	ND	NS	NS	1,122.90
Iso-propyl Alcohol	ND	29.3	ND	ND	ND	ND	NS	NS	ND
Methylene Chloride	ND	ND	ND	ND	ND	ND	NS	NS	ND
Methyl-t-butyl ether	ND	ND	ND	723	775	ND	NS	NS	10.5
n-Hexane	ND	ND	ND	167	146	ND	NS	NS	222
Propylene	ND	9.77	ND	ND	ND	ND	NS	NS	1,774.40
Styrene	ND	**2.46**	ND	**4.25**	**3.98**	ND	200	2	ND
Trichloroethene	ND	ND	ND	**3.72**	**4.42**	ND	36.52	0.61	41.4
Xylenes	ND	[illegible]	[illegible]	[illegible]	[illegible]	ND	11.8	11.8	84.7
PCBs	NDCN	NDCN	NDCN	NDCN	NDCN	NDCN	0.3(1)	0.05(2)	NT

Bold typeface = Concentrations exceeding AAL; Yellow shading = Concentrations exceeding TEL
Results reported in ug/M^3
* Common constituents of PVC pipe cements and cleaners
1. Risk-based maximum acceptable level
2. EPA action level at which additional assessment is required
TEL - Threshold Effects Exposure Limit, 24-hour average exposure
AAL - Allowable Ambient Limit, annual average exposure
NDCM = None detected on cartridge at detection limit of 0.5 micrograms
NDCN = None detected on cartridge at detection limit of 0.5-1.0 nanograms
NS = No AAL or TEL
NT = Not Tested

Table 4C
New Keith Middle School
Foundation Vent Stack Sampling
September 14, 2006

	A4A VS-1	A-4A VS-4	B-4A VS-9	C-4B VS-11	C-4B VS-11	Background-4A	TEL (24-hr avg)	AAL (Annual Avg)	High Conc. Dec. 2001 Soil Gas
Date Sampled:	9/14/06	9/14/06	9/14/06	9/14/06	9/14/06	9/14/06			
2-Butanone (Methyl Ethyl Ketone)*	BRL	**43.7**	**80**	[illegible]	**156**	BRL	200	10	259.5
Tetrahydrofuran*	BRL	**91**	31	**121**	BRL	BRL	160.35	80.18	ND
Acetone*	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	53	160.54	160.54	95
1,2,4-Trimethylbenzene	BRL	2.91	3.22	BRL	BRL	BRL	NS	NS	5.9
4-Methyl-2-pentanone	BRL	BRL	BRL	28.40	BRL	BRL	NS	NS	49.2
Ethyl Acetate	BRL	BRL	2.32	BRL	BRL	BRL	391.84	391.84	14.8
Ethyl Alcohol	BRL	7.01	40.00	10.60	[illegible]	BRL	51.24	51.24	1,158.80
Ethylbenzene	BRL	2.68	BRL	8.44	BRL	BRL	300	300	13.9
Heptane	BRL	BRL	2.07	BRL	BRL	BRL	NS	NS	1,122.90
Iso-propyl Alcohol	BRL	BRL	13.40	BRL	BRL	20.90	NS	NS	ND
Methylene Chloride	BRL	BRL	157.00	BRL	BRL	BRL	NS	NS	ND
n-Hexane	BRL	6.26	45.80	BRL	BRL	BRL	NS	NS	222
Styrene	BRL	**2.15**	BRL	BRL	BRL	BRL	200	2	ND
Toluene	BRL	6.68	**21.20**	**57.50**	BRL	BRL	80	20	ND
Xylenes	BRL	8.52	7.04	[illegible]	BRL	BRL	11.8	11.8	84.7
PCBs	NDCN	NDCN	NDCN	14 ng / 0.02 ug/M^3(3)	NT	NDCN	0.3(1)	0.05(2)	NT

Bold typeface = Concentrations exceeding AAL; Yellow shading = Concentrations exceeding TEL
Results reported in ug/M^3
* Common constituents of PVC pipe cements and cleaners
1. Risk-based maximum accptable level
2. EPA action level at which additional assessment is required
3. 14 ng collected during sampling of 690 liters of air = 0.02 ug/M^3
TEL - Threshold Effects Exposure Limit, 24-hour average exposure
AAL - Allowable Ambient Limit, annual average exposure
BRL = Below laboratory Reporting Limit
NDCN = None detected on cartridge at detection limit of 0.5-1.0 nanograms per conegner
NS = No AAL or TEL
NT = Not Tested

Table 4D
New Keith Middle School
Foundation Vent Stack Sampling
October 24-25, 2006

	A5A VS-1	A-5A VS-4	A-5B VS-4	B-5A VS-16	C-5A VS-11	Background-5	Bkgrnd-5 Dup	TEL (24-hr avg)	AAL (Annual Avg)	High Conc. Dec. 2001 Soil Gas
Date Sampled:	10/24/06	10/25/06	10/24/06	10/24/06	10/24/06	10/24/06	10/24/06			
2-Butanone (Methyl Ethyl Ketone)*	BRL	BRL	5.96	11	78	BRL	BRL	200	10	259.5
Tetrahydrofuran*	19	94.2	71.4	18	63	BRL	BRL	160.35	80.18	ND
Acetone*	**11,300**	**678**	**552**	**1,010**	**>4,040**	BRL	BRL	160.54	160.54	95
Carbon Disulfide	BRL	BRL	BRL	BRL	154	BRL	BRL	NS	NS	18.1
Ethyl Alcohol	BRL	22.20	24.50	17.80	**245.00**	30.40	15.10	51.24	51.24	1,158.80
Iso-propyl Alcohol	9.38	6.28	4.85	3.13	675.00	BRL	BRL	NS	NS	ND
Methylene Chloride	BRL	11.10	12.60	12.30	125.00	BRL	BRL	NS	NS	ND
Methyl tert butyl ether	BRL	BRL	BRL	BRL	212.0	BRL	BRL	NS	NS	10.5
Toluene	BRL	BRL	BRL	BRL	**83.60**	BRL	BRL	80	20	ND
PCBs	BRL	BRL	BRL	BRL	BRL	BRL	BRL	0.3(1)	0.05(2)	NT

Bold typeface = Concentrations exceeding AAL; Yellow shading = Concentrations exceeding TEL
Results reported in ug/M^3
* Common constituents of PVC pipe cements and cleaners
1. Risk-based maximum accptable level
2. EPA action level at which additional assessment is required
TEL - Threshold Effects Exposure Limit, 24-hour average exposure
AAL - Allowable Ambient Limit, annual average exposure
BRL = Below laboratory Reporting Limit
NDCN = None detected on cartridge at detection limit of 0.5-1.0 nanograms per congener
NS = No AAL or TEL
NT = Not Tested

Appendix A
Air Sampling Protocols

Collection of Polychlorinated Biphenyl (PCB) Samples by EPA Method TO-10A

Refer to the EPA Method Description for TO-10A

Equipment & Materials (for each foundation vent stack sample)

1. MSA Escort Elf® Pump
2. MSA DigiCal Primary Calibrator
3. Teflon® tubing – 3/16-inch I.D.
4. Sample Cartridges (Supplied by Laboratory)
5. Barometer
6. Thermometer

Sample Collection Method

1. Place temporary air-tight cover on all vent stacks 24-hours before start of sampling.
2. Fully charge all sampling pumps.
3. Calibrate MSA Escort Elf® Pump using MSA DigiCal Primary Calibrator per manufacturer's instructions (Attached).
4. Attach sample pump intake to sample port on temporary vent stack cap with Teflon tubing.
5. Remove temporary vent stack cap and attach polyurethane foam (PUF) sampling cartridge to sampling port on underside of cap. Replace cap on vent stack.
6. Measure and record ambient barometric pressure, ambient temperature, wind conditions.
7. Start sampling pump. Record sampling start time and sampling pump air flow rate.
8. Shield sampling pump from weather as necessary.
9. After appropriate elapsed time, shut off sampling pump, remove sampling cartridges from vent stack, and wrap cartridges in hexane rinsed aluminum foil.
10. Label each cartridge with sample location, sampling start date and time, sampling end date and time, and total volume of air drawn through cartridge.
11. Record barometric pressure, ambient temperature and wind conditions.
12. Remove temporary vent stack caps.
13. Transport cartridges to laboratory under chain of custody at < 4°C. Include one trip blank (one unused sample cartridge) with each shipment of samples.

Collection of Volatile Organic Compound (VOC) Samples by EPA Method TO-15

Equipment & Materials (for each foundation vent stack sample)

1. SUMMA canister (3-6 liter)
2. Teflon® tubing – 3/16-inch I.D.
3. Barometer
4. Thermometer

Sample Collection Method

1. Place temporary air-tight cover on all vent stacks 24-hours before start of sampling.
2. Obtain a 2-75-liter evacuated, precleaned passivated stainless steel SUMMA® canister. Canister shall be fitted with flow-restrictive inlet valve designed to collect a sample over a 4-hour period.
3. Attach Teflon® sampling tube to inlet fitting of SUMMA® canister. Attach other end of tubing to sample port on temporary vent stack cap.
4. Open SUMMA® canister inlet valve. Record SUMMA® canister vacuum gauge reading.
5. Measure and record ambient barometric pressure, ambient temperature, and sampling start time.
6. After four hours close SUMMA® canister inlet valve.
7. Record time of closing of inlet valve, SUMMA® canister vacuum gauge reading, location of sample, barometric pressure, and ambient temperature.
8. Label SUMMA® canister with sample location, sampling start date and time, and sampling end date and time.
9. Transport canister to laboratory under chain of custody.
10. Remove temporary vent stack caps.

Collection of Polychlorinated Biphenyl (PCB) Samples by EPA Method TO-4A

Refer to EPA method description for TO-4A

Equipment & Materials (for each indoor air sample location)

1. Tisch Environmental, Inc. TE-1000 PUF High Volume Air Sampler
2. Tisch Environmental, Inc. TE-5040A Calibrator
3. Sample Cartridge (Supplied by Laboratory)
4. Teflon O-ring (Hexane rinsed)
5. Barometer
6. Thermometer

Sample Collection Method

1. Set up sampler in desired location. Sampler should be placed at least 2 meters from any obstacle to air flow. Exhaust hose should be directed away from sampler.
2. Turn on sampler and allow to warm up for approximately 10 minutes. Calibrate sampler using TE-5040 orifice per manufacturer's instructions. Turn off sampler.
3. Install Teflon O-ring (hexane rinsed), sampling cartridge, and pre-filter in sampler per manufacturer's instructions.
4. Start high volume sampler. Record sampling start time and Magnehelic gauge reading.
5. Record sampler Magnehelic gauge reading after 12 hours of operation.
6. After approximately 24 hours, record Magnehelic gauge reading and shut off high volume sampler.
7. Remove pre-filter and sampling cartridge and package separately for separate analyses and for transport to laboratory.
8. Label each cartridge and prefilter with sample location, sampling start date and time, and sampling end date and time.
9. Perform final calculated sampler flow check using the calibration orifice. If calibration deviates by more than 10% from initial reading, mark flow data as suspect and inspect and/or remove sampler from service.
10. Transport cartridges and filters to laboratory under chain of custody at < 4°C. Include one trip blank (one unused sample cartridge and one unused filter) with each shipment of samples.

Appendix B
NWS Weather Data

AWS ID	WBAN ID	Name	Country	State	Latitude	Longitude	Elevation
725065	99999	NEW BEDFORD RGNL	UNITED STATES	MASSACHUSETTS	41.667	-70.95	25 (meters)

USAF	WBAN	YR--MODAHRMN	DIR	SPD	GUS	CLG	SKC	L	M	H	VSB	WW	WW	WW	W	TEMP	DEWP	SLP	ALT	STP	MAX	MIN	PCP01	P
		GMT		MPH	MPH						Miles					F	F	Mb	inches	Mb	F	F	inches	i
725065	99999	200608040853	***	0	***	722	CLR	*	*	*	8.0	**	**	**	*	66	64	1008.2	29.78	******	***	***	*****	*
725065	99999	200608040953	040	3	***	6	OVC	*	*	*	6.0	**	**	**	*	66	64	1008.0	29.77	******	***	***	*****	*
725065	99999	200608041053	060	3	***	4	OVC	*	*	*	8.0	**	**	**	*	68	66	1008.1	29.77	******	***	***	*****	*
725065	99999	200608041153	310	3	***	4	OVC	*	*	*	7.0	**	**	**	*	70	66	1008.6	29.79	******	***	66	*****	*
725065	99999	200608041253	150	3	***	4	OVC	*	*	*	6.0	10	**	**	*	70	66	1008.3	29.78	******	***	***	*****	*
725065	99999	200608041353	***	0	***	5	OVC	*	*	*	7.0	**	**	**	*	72	68	1008.3	29.78	******	***	***	*****	*
725065	99999	200608041453	***	0	***	6	OVC	*	*	*	7.0	**	**	**	*	73	70	1008.5	29.78	******	***	***	*****	*
725065	99999	200608041553	990	7	***	6	OVC	*	*	*	8.0	**	**	**	*	73	70	1009.0	29.80	******	***	***	*****	*
725065	99999	200608041653	990	6	***	7	OVC	*	*	*	5.0	05	**	**	*	73	68	1008.9	29.79	******	***	***	*****	*
725065	99999	200608041753	360	7	***	19	BKN	*	*	*	10.0	**	**	**	*	75	66	1009.0	29.80	******	76	69	*****	*
725065	99999	200608041853	990	3	***	722	SCT	*	*	*	10.0	**	**	**	*	72	70	1009.3	29.81	******	***	***	0.05	*
725065	99999	200608041953	990	6	***	20	BKN	*	*	*	10.0	**	**	**	*	73	66	1009.5	29.81	******	***	***	*****	*
725065	99999	200608042053	020	6	***	25	BKN	*	*	*	10.0	**	**	**	*	75	66	1009.6	29.82	******	***	***	*****	*
725065	99999	200608042153	040	6	***	722	SCT	*	*	*	10.0	**	**	**	*	75	66	1009.7	29.82	******	***	***	*****	*
725065	99999	200608042253	***	0	***	722	CLR	*	*	*	10.0	**	**	**	*	75	64	1010.0	29.83	******	***	***	*****	*
725065	99999	200608042353	***	0	***	722	SCT	*	*	*	10.0	**	**	**	*	72	66	1010.8	29.85	******	76	71	*****	(
725065	99999	200608050053	***	0	***	722	CLR	*	*	*	10.0	**	**	**	*	66	64	1011.6	29.87	******	***	***	*****	*
725065	99999	200608050153	***	0	***	722	CLR	*	*	*	6.0	10	**	**	*	66	64	1012.0	29.89	******	***	***	*****	*
725065	99999	200608050253	***	0	***	722	CLR	*	*	*	10.0	**	**	**	*	66	64	1012.2	29.89	******	***	***	*****	*
725065	99999	200608050353	210	3	***	722	CLR	*	*	*	9.1	**	**	**	*	64	63	1012.3	29.89	******	***	***	*****	*
725065	99999	200608050453	210	3	***	722	CLR	*	*	*	6.0	**	**	**	*	64	64	1012.2	29.89	******	***	***	*****	*
725065	99999	200608050553	***	0	***	722	CLR	*	*	*	8.0	**	**	**	*	64	63	1012.2	29.89	******	71	64	*****	*
725065	99999	200608050653	***	0	***	722	CLR	*	*	*	7.0	**	**	**	*	66	64	1012.4	29.90	******	***	***	0.01	*
725065	99999	200608050753	***	0	***	722	CLR	*	*	*	0.8	**	**	**	*	64	63	1012.7	29.91	******	***	***	*****	*
725065	99999	200608050800	***	0	***	722	CLR	*	*	*	2.0	10	**	**	*	64	63	******	29.91	******	***	***	*****	*

725065	99999	200608050853	330	3	***	722	CLR	*	*	*	10.0	**	**	**	*	64	64	1013.4	29.93	******	***	***	*****	*
725065	99999	200608050953	***	0	***	722	CLR	*	*	*	10.0	**	**	**	*	64	63	1014.0	29.94	******	***	***	*****	*
725065	99999	200608051053	***	0	***	722	CLR	*	*	*	10.0	**	**	**	*	70	64	1014.4	29.96	******	***	***	*****	*
725065	99999	200608051153	990	5	***	722	CLR	*	*	*	10.0	**	**	**	*	73	66	1015.0	29.98	******	73	63	*****	(
725065	99999	200608051253	990	6	***	722	CLR	*	*	*	10.0	**	**	**	*	77	66	1015.4	29.99	******	***	***	*****	*
725065	99999	200608051353	020	8	***	722	CLR	*	*	*	10.0	**	**	**	*	81	64	1015.8	30.00	******	***	***	*****	*
725065	99999	200608051453	010	8	***	722	SCT	*	*	*	10.0	**	**	**	*	82	64	1016.4	30.02	******	***	***	*****	*
725065	99999	200608051553	990	5	***	49	BKN	*	*	*	10.0	**	**	**	*	82	64	1016.0	30.01	******	***	***	*****	*
725065	99999	200608051653	040	9	***	49	BKN	*	*	*	10.0	**	**	**	*	84	61	1016.0	30.01	******	***	***	*****	*
725065	99999	200608051753	070	9	***	59	BKN	*	*	*	10.0	**	**	**	*	84	63	1016.0	30.01	******	86	73	*****	*
725065	99999	200608051853	100	8	***	79	BKN	*	*	*	10.0	**	**	**	*	82	61	1016.2	30.01	******	***	***	*****	*
725065	99999	200608051953	100	9	***	89	OVC	*	*	*	10.0	**	**	**	*	81	61	1016.4	30.02	******	***	***	*****	*

AWS ID	WBAN ID	Name	Country	State	Latitude	Longitude	Elevation
725065	99999	NEW BEDFORD RGNL	UNITED STATES	MASSACHUSETTS	41.667	-70.95	25 (meters)

USAF	WBAN	YR--MODAHRMN	DIR	SPD	GUS	CLG	SKC	L	M	H	VSB	WW	WW	WW	W	TEMP	DEWP	SLP	ALT	STP	MAX	MIN	PCP01
		GMT		MPH	MPH						Miles					F	F	Mb	inches	Mb	F	F	inche
725065	99999	200608180846	***	0	***	722	SCT	*	*	*	1.8	10	**	**	*	57	55	******	30.22	******	***	***	****
725065	99999	200608180853	***	0	***	722	SCT	*	*	*	2.0	**	**	**	*	57	55	1023.2	30.22	******	***	***	****
725065	99999	200608180901	***	0	***	722	SCT	*	*	*	1.3	10	**	**	*	57	55	******	30.22	******	***	***	****
725065	99999	200608180910	***	0	***	722	SCT	*	*	*	0.5	44	**	**	*	57	55	******	30.22	******	***	***	****
725065	99999	200608180940	***	0	***	722	SCT	*	*	*	2.5	10	**	**	*	57	55	******	30.22	******	***	***	****
725065	99999	200608180953	***	0	***	722	SCT	*	*	*	4.0	**	**	**	*	57	57	1023.2	30.22	******	***	***	****
725065	99999	200608181000	***	0	***	722	SCT	*	*	*	2.0	10	**	**	*	57	57	******	30.22	******	***	***	****
725065	99999	200608181009	***	0	***	722	SCT	*	*	*	6.0	10	**	**	*	57	55	******	30.22	******	***	***	****
725065	99999	200608181053	***	0	***	59	BKN	*	*	*	9.1	**	**	**	*	57	57	1023.6	30.23	******	***	***	****
725065	99999	200608181120	***	0	***	59	BKN	*	*	*	9.1	**	**	**	*	61	59	******	30.23	******	***	***	****
725065	99999	200608181128	***	0	***	1	BKN	*	*	*	7.0	**	**	**	*	61	59	******	30.23	******	***	***	****
725065	99999	200608181141	***	0	***	1	OVC	*	*	*	1.5	10	**	**	*	64	63	******	30.23	******	***	***	****
725065	99999	200608181153	***	0	***	1	OVC	*	*	*	2.5	10	**	**	*	66	64	1023.8	30.23	******	66	57	****
725065	99999	200608181201	210	5	***	1	BKN	*	*	*	6.0	10	**	**	*	66	64	******	30.23	******	***	***	****
725065	99999	200608181207	210	3	***	10	BKN	*	*	*	7.0	**	**	**	*	66	64	******	30.23	******	***	***	****
725065	99999	200608181253	***	0	***	59	OVC	*	*	*	10.0	**	**	**	*	70	64	1023.8	30.23	******	***	***	****
725065	99999	200608181353	220	5	***	722	SCT	*	*	*	10.0	**	**	**	*	73	63	1023.6	30.23	******	***	***	****
725065	99999	200608181453	190	7	***	722	CLR	*	*	*	10.0	**	**	**	*	73	61	1023.1	30.21	******	***	***	****
725065	99999	200608181553	220	6	***	722	CLR	*	*	*	10.0	**	**	**	*	75	61	1022.9	30.21	******	***	***	****
725065	99999	200608181653	250	7	***	722	CLR	*	*	*	10.0	**	**	**	*	75	61	1022.6	30.20	******	***	***	****
725065	99999	200608181753	220	6	***	722	SCT	*	*	*	10.0	**	**	**	*	79	61	1022.1	30.19	******	***	66	****
725065	99999	200608181853	200	8	***	722	CLR	*	*	*	10.0	**	**	**	*	79	59	1021.5	30.17	******	***	***	****
725065	99999	200608181953	190	9	***	722	SCT	*	*	*	10.0	**	**	**	*	79	57	1021.2	30.16	******	***	***	****
725065	99999	200608182053	230	10	***	722	SCT	*	*	*	10.0	**	**	**	*	77	57	1021.1	30.15	******	***	***	****
725065	99999	200608182153	200	11	***	722	SCT	*	*	*	10.0	**	**	**	*	73	61	1020.9	30.15	******	***	***	****

725065	99999	200608182253	210	8	***	722	CLR	*	*	*	10.0	**	**	**	*	72	61	1020.6	30.14	******	***	***	****
725065	99999	200608182353	190	5	***	722	CLR	*	*	*	10.0	**	**	**	*	66	61	1020.9	30.15	******	80	***	****
725065	99999	200608190053	220	3	***	722	CLR	*	*	*	10.0	**	**	**	*	64	63	1020.8	30.15	******	***	***	****
725065	99999	200608190153	210	3	***	722	SCT	*	*	*	10.0	**	**	**	*	64	63	1020.6	30.14	******	***	***	****
725065	99999	200608190253	230	3	***	722	CLR	*	*	*	7.0	**	**	**	*	63	63	1020.3	30.13	******	***	***	****
725065	99999	200608190353	230	3	***	722	CLR	*	*	*	7.0	**	**	**	*	63	61	1020.0	30.12	******	***	***	****
725065	99999	200608190436	***	0	***	722	CLR	*	*	*	1.5	10	**	**	*	61	59	******	30.12	******	***	***	0.01
725065	99999	200608190445	***	0	***	722	CLR	*	*	*	0.8	10	**	**	*	61	59	******	30.12	******	***	***	0.01
725065	99999	200608190453	***	0	***	722	SCT	*	*	*	0.3	**	**	**	*	59	57	1020.1	30.12	******	***	***	0.01
725065	99999	200608190510	***	0	***	722	SCT	*	*	*	0.5	44	**	**	*	59	57	******	30.12	******	***	***	****
725065	99999	200608190518	***	0	***	722	SCT	*	*	*	1.5	10	**	**	*	61	59	******	30.12	******	***	***	****
725065	99999	200608190523	***	0	***	1	OBS	*	*	*	0.8	10	**	**	*	61	57	******	30.12	******	***	***	****
725065	99999	200608190526	***	0	***	722	SCT	*	*	*	0.3	44	**	**	*	59	57	******	30.12	******	***	***	****
725065	99999	200608190538	***	0	***	14	OBS	*	*	*	0.5	45	**	**	*	59	57	******	30.11	******	***	***	****
725065	99999	200608190542	***	0	***	19	OBS	*	*	*	1.0	10	**	**	*	57	55	******	30.11	******	***	***	****
725065	99999	200608190545	***	0	***	722	SCT	*	*	*	2.0	10	**	**	*	55	55	******	30.11	******	***	***	****
725065	99999	200608190553	200	5	***	722	SCT	*	*	*	2.5	**	**	**	*	57	55	1019.4	30.11	******	67	56	****
725065	99999	200608190600	210	3	***	722	SCT	*	*	*	0.8	10	**	**	*	57	55	******	30.11	******	***	***	****
725065	99999	200608190607	***	0	***	8	OBS	*	*	*	0.5	45	**	**	*	57	57	******	30.10	******	***	***	****
725065	99999	200608190611	***	0	***	7	OBS	*	*	*	0.3	45	**	**	*	57	55	******	30.10	******	***	***	****
725065	99999	200608190618	***	0	***	7	OBS	*	*	*	1.0	10	**	**	*	57	55	******	30.10	******	***	***	****
725065	99999	200608190620	***	0	***	722	SCT	*	*	*	2.5	10	**	**	*	57	55	******	30.10	******	***	***	****
725065	99999	200608190627	***	0	***	722	SCT	*	*	*	4.0	10	**	**	*	57	55	******	30.10	******	***	***	****
725065	99999	200608190653	***	0	***	722	SCT	*	*	*	0.3	**	**	**	*	57	55	1018.9	30.09	******	***	***	****
725065	99999	200608190721	***	0	***	722	SCT	*	*	*	1.0	10	**	**	*	57	57	******	30.08	******	***	***	****
725065	99999	200608190727	***	0	***	6	OBS	*	*	*	0.5	45	**	**	*	57	57	******	30.09	******	***	***	****
725065	99999	200608190731	***	0	***	722	SCT	*	*	*	0.3	44	**	**	*	57	57	******	30.09	******	***	***	****
725065	99999	200608190738	***	0	***	7	BKN	*	*	*	0.3	44	**	**	*	57	55	******	30.08	******	***	***	****
725065	99999	200608190753	***	0	***	7	OVC	*	*	*	0.3	**	**	**	*	57	57	1018.5	30.08	******	***	***	****

725065	99999	200608190828	***	0	***	7	OVC	*	*	*	0.5	44	**	**	*	57	55	******	30.07	******	***	***	****
725065	99999	200608190837	***	0	***	31	BKN	*	*	*	0.5	44	**	**	*	57	55	******	30.07	******	***	***	****
725065	99999	200608190853	***	0	***	722	SCT	*	*	*	1.0	**	**	**	*	57	55	1018.2	30.07	******	***	***	****
725065	99999	200608190900	***	0	***	722	SCT	*	*	*	4.0	10	**	**	*	57	55	******	30.07	******	***	***	****
725065	99999	200608190903	***	0	***	722	CLR	*	*	*	1.3	10	**	**	*	57	55	******	30.07	******	***	***	****
725065	99999	200608190906	***	0	***	722	SCT	*	*	*	0.5	44	**	**	*	57	55	******	30.07	******	***	***	****
725065	99999	200608190914	***	0	***	7	OBS	*	*	*	0.3	45	**	**	*	55	55	******	30.07	******	***	***	****
725065	99999	200608190953	***	0	***	7	OVC	*	*	*	0.3	**	**	**	*	55	54	1018.4	30.07	******	***	***	****
725065	99999	200608191014	***	0	***	1	OVC	*	*	*	0.3	44	**	**	*	55	54	******	30.08	******	***	***	****
725065	99999	200608191053	***	0	***	1	OVC	*	*	*	1.8	10	**	**	*	55	54	1018.5	30.08	******	***	***	****
725065	99999	200608191100	***	0	***	1	OVC	*	*	*	0.3	44	**	**	*	55	55	******	30.08	******	***	***	****
725065	99999	200608191110	***	0	***	1	OVC	*	*	*	1.0	10	**	**	*	57	57	******	30.08	******	***	***	****
725065	99999	200608191113	***	0	***	1	BKN	*	*	*	4.0	10	**	**	*	57	57	******	30.08	******	***	***	****
725065	99999	200608191124	***	0	***	722	SCT	*	*	*	10.0	**	**	**	*	61	59	******	30.08	******	***	***	****
725065	99999	200608191153	210	5	***	722	CLR	*	*	*	9.1	**	**	**	*	63	63	1018.4	30.08	******	63	54	****
725065	99999	200608191253	220	8	***	722	SCT	*	*	*	10.0	**	**	**	*	72	63	1018.3	30.07	******	***	***	****
725065	99999	200608191353	250	9	***	722	CLR	*	*	*	10.0	**	**	**	*	73	63	1018.3	30.07	******	***	***	****
725065	99999	200608191453	250	7	***	722	SCT	*	*	*	10.0	**	**	**	*	75	61	1017.9	30.06	******	***	***	0.01
725065	99999	200608191553	230	13	***	722	SCT	*	*	*	10.0	**	**	**	*	77	57	1017.3	30.04	******	***	***	****
725065	99999	200608191653	220	13	***	722	SCT	*	*	*	10.0	**	**	**	*	77	63	1016.9	30.03	******	***	***	****
725065	99999	200608191753	190	15	***	722	CLR	*	*	*	10.0	**	**	**	*	79	61	1016.6	30.02	******	79	64	****
725065	99999	200608191853	220	13	***	722	SCT	*	*	*	10.0	**	**	**	*	77	63	1015.9	30.00	******	***	***	****
725065	99999	200608191953	200	13	***	722	SCT	*	*	*	10.0	**	**	**	*	75	64	1015.2	29.98	******	***	***	****
725065	99999	200608192053	190	10	***	722	CLR	*	*	*	10.0	**	**	**	*	75	64	1014.7	29.97	******	***	***	****

AWS ID	WBAN ID	Name	Country	State	Latitude	Longitude	Elevation
725065	99999	NEW BEDFORD RGNL	UNITED STATES	MASSACHUSETTS	41.667	-70.95	25 (meters)

USAF	WBAN	YR--MODAHRMN	DIR	SPD	GUS	CLG	SKC	L	M	H	VSB	WW	WW	WW	W	TEMP	DEWP	SLP	ALT	STP	MAX	MIN	PCP01
		GMT		MPH	MPH						Miles					F	F	Mb	inches	Mb	F	F	inche
725065	99999	200609140753	***	0	***	118	BKN	*	*	*	10.0	**	**	**	*	59	55	1017.5	30.05	******	***	***	****
725065	99999	200609140853	160	6	***	108	OVC	*	*	*	10.0	**	**	**	*	63	55	1017.4	30.05	******	***	***	****
725065	99999	200609140953	150	6	***	108	BKN	*	*	*	10.0	**	**	**	*	63	55	1017.4	30.05	******	***	***	****
725065	99999	200609141053	170	5	***	108	OVC	*	*	*	10.0	**	**	**	*	63	55	1017.7	30.06	******	***	***	****
725065	99999	200609141153	130	5	***	108	BKN	*	*	*	10.0	**	**	**	*	64	57	1017.7	30.06	******	64	58	****
725065	99999	200609141253	150	8	***	722	CLR	*	*	*	10.0	**	**	**	*	66	57	1017.8	30.06	******	***	***	****
725065	99999	200609141353	160	9	***	89	BKN	*	*	*	10.0	**	**	**	*	66	57	1018.2	30.07	******	***	***	****
725065	99999	200609141427	170	9	***	29	BKN	*	*	*	10.0	**	**	**	*	70	59	******	30.08	******	***	***	****
725065	99999	200609141436	150	13	***	31	BKN	*	*	*	10.0	**	**	**	*	68	59	******	30.08	******	***	***	****
725065	99999	200609141453	160	10	***	89	BKN	*	*	*	10.0	**	**	**	*	68	59	1018.5	30.08	******	***	***	****
725065	99999	200609141553	170	8	***	79	BKN	*	*	*	10.0	**	**	**	*	70	61	1018.3	30.07	******	***	***	****
725065	99999	200609141653	160	11	***	79	BKN	*	*	*	10.0	**	**	**	*	70	61	1018.0	30.07	******	***	***	****
725065	99999	200609141753	220	6	***	37	OVC	*	*	*	10.0	**	**	**	*	66	63	1018.0	30.06	******	70	64	0.02
725065	99999	200609141853	220	10	***	49	OVC	*	*	*	10.0	61	**	**	*	64	61	1018.0	30.06	******	***	***	0.02
725065	99999	200609141942	240	5	***	18	OVC	*	*	*	8.0	61	**	**	*	64	63	******	30.06	******	***	***	0.04
725065	99999	200609141953	240	5	***	18	BKN	*	*	*	10.0	61	**	**	*	64	61	1018.0	30.06	******	***	***	0.04
725065	99999	200609142053	280	3	***	28	OVC	*	*	*	10.0	61	**	**	*	64	61	1018.1	30.07	******	***	***	0.04
725065	99999	200609142118	***	0	***	69	OVC	*	*	*	7.0	61	**	**	*	63	61	******	30.07	******	***	***	0.02
725065	99999	200609142153	***	0	***	69	OVC	*	*	*	8.0	61	**	**	*	63	61	1018.3	30.07	******	***	***	0.05
725065	99999	200609142253	***	0	***	79	BKN	*	*	*	10.0	61	**	**	*	63	61	1018.2	30.07	******	***	***	0.02
725065	99999	200609142353	050	3	***	722	SCT	*	*	*	10.0	**	**	**	*	63	61	1018.2	30.07	******	66	62	0.01
725065	99999	200609150053	***	0	***	20	BKN	*	*	*	10.0	**	**	**	*	63	61	1018.5	30.08	******	***	***	0.00
725065	99999	200609150153	070	5	***	16	BKN	*	*	*	10.0	**	**	**	*	63	61	1018.2	30.07	******	***	***	0.00
725065	99999	200609150200	060	5	***	79	BKN	*	*	*	10.0	**	**	**	*	63	61	******	30.07	******	***	***	0.00
725065	99999	200609150253	070	3	***	722	SCT	*	*	*	10.0	**	**	**	*	61	59	1018.1	30.07	******	***	***	0.00

725065	99999	200609150339	090	6	***	3	OVC	*	*	*	10.0	**	**	**	*	63	61	******	30.07	******	***	***	****
725065	99999	200609150353	070	6	***	3	OVC	*	*	*	9.1	**	**	**	*	63	61	1018.1	30.07	******	***	***	****
725065	99999	200609150445	040	6	***	1	OVC	*	*	*	4.0	10	**	**	*	61	61	******	30.07	******	***	***	****
725065	99999	200609150453	050	6	***	1	OVC	*	*	*	3.0	**	**	**	*	61	61	1018.0	30.06	******	***	***	****
725065	99999	200609150517	040	3	***	108	BKN	*	*	*	5.0	10	**	**	*	61	59	******	30.06	******	***	***	****
725065	99999	200609150531	040	5	***	39	BKN	*	*	*	1.8	10	**	**	*	61	59	******	30.05	******	***	***	****
725065	99999	200609150535	040	5	***	1	OVC	*	*	*	2.0	10	**	**	*	61	59	******	30.05	******	***	***	****
725065	99999	200609150553	990	3	***	1	OVC	*	*	*	2.5	**	**	**	*	61	59	1017.4	30.05	******	62	60	****
725065	99999	200609150600	***	0	***	1	OVC	*	*	*	4.0	10	**	**	*	61	59	******	30.05	******	***	***	****
725065	99999	200609150620	***	0	***	1	OVC	*	*	*	1.8	10	**	**	*	61	57	******	30.05	******	***	***	****
725065	99999	200609150635	***	0	***	1	OVC	*	*	*	0.5	44	**	**	*	59	57	******	30.05	******	***	***	****
725065	99999	200609150653	***	0	***	1	OVC	*	*	*	0.5	**	**	**	*	59	57	1017.4	30.05	******	***	***	****
725065	99999	200609150720	030	3	***	1	OVC	*	*	*	1.0	10	**	**	*	59	57	******	30.04	******	***	***	****
725065	99999	200609150744	990	3	***	1	OVC	*	*	*	2.5	10	**	**	*	59	57	******	30.04	******	***	***	****
725065	99999	200609150753	***	0	***	1	OVC	*	*	*	1.8	**	**	**	*	59	57	1017.2	30.04	******	***	***	****
725065	99999	200609150804	***	0	***	1	OVC	*	*	*	2.5	10	**	**	*	59	57	******	30.04	******	***	***	****
725065	99999	200609150812	***	0	***	1	OVC	*	*	*	4.0	10	**	**	*	59	57	******	30.04	******	***	***	****
725065	99999	200609150853	050	5	***	36	OVC	*	*	*	10.0	**	**	**	*	59	57	1016.9	30.03	******	***	***	****
725065	99999	200609150919	050	5	***	18	OVC	*	*	*	10.0	**	**	**	*	61	59	******	30.04	******	***	***	****
725065	99999	200609150926	040	5	***	18	OVC	*	*	*	10.0	**	**	**	*	61	59	******	30.04	******	***	***	****
725065	99999	200609150944	050	6	***	49	BKN	*	*	*	10.0	**	**	**	*	61	59	******	30.03	******	***	***	****
725065	99999	200609150953	060	7	***	722	SCT	*	*	*	10.0	**	**	**	*	61	57	1016.8	30.03	******	***	***	****
725065	99999	200609151028	050	7	***	722	SCT	*	*	*	10.0	**	**	**	*	61	59	******	30.04	******	***	***	****
725065	99999	200609151038	050	8	***	4	BKN	*	*	*	10.0	**	**	**	*	61	59	******	30.04	******	***	***	****
725065	99999	200609151053	040	7	***	4	OVC	*	*	*	6.0	**	**	**	*	61	59	1017.4	30.05	******	***	***	****
725065	99999	200609151153	060	7	***	4	BKN	*	*	*	6.0	10	**	**	*	63	61	1017.6	30.05	******	63	59	0.01
725065	99999	200609151253	060	10	***	5	OVC	*	*	*	6.0	10	**	**	*	66	63	1018.0	30.06	******	***	***	****
725065	99999	200609151332	060	9	***	11	OVC	*	*	*	6.0	10	**	**	*	66	63	******	30.06	******	***	***	****
725065	99999	200609151340	070	9	***	8	OVC	*	*	*	6.0	10	**	**	*	66	63	******	30.06	******	***	***	****

725065	99999	200609151353	060	9	***	10	OVC	*	*	*	10.0	**	**	**	*	64	61	1018.0	30.06	******	***	***	****
725065	99999	200609151453	060	11	***	28	OVC	*	*	*	5.0	63	10	**	*	64	63	1017.8	30.06	******	***	***	0.03
725065	99999	200609151517	040	7	***	17	OVC	*	*	*	5.0	63	10	**	*	64	63	******	30.07	******	***	***	0.05
725065	99999	200609151529	040	6	***	31	OVC	*	*	*	4.0	63	10	**	*	64	63	******	30.06	******	***	***	0.08
725065	99999	200609151553	040	8	***	14	OVC	*	*	*	6.0	61	10	**	*	64	63	1017.7	30.06	******	***	***	0.13

AWS ID	WBAN ID	Name	Country	State	Latitude	Longitude	Elevation
725065	99999	NEW BEDFORD RGNL	UNITED STATES	MASSACHUSETTS	41.667	-70.95	25 (meters)

USAF	WBAN	YR--MODAHRMN	DIR	SPD	GUS	CLG	SKC	L	M	H	VSB	WW	WW	WW	W	TEMP	DEWP	SLP	ALT	STP	MAX	MIN	PCP01	PCP0
		GMT		MPH	MPH						Miles					F	F	Mb	inches	Mb	F	F	inches	inch
725065	99999	200610240653	310	9	***	59	OVC	*	*	*	10.0	**	**	**	*	43	32	1001.9	29.59	******	***	***	*****	***
725065	99999	200610240753	320	6	***	79	OVC	*	*	*	10.0	**	**	**	*	43	32	1001.6	29.58	******	***	***	*****	***
725065	99999	200610240853	290	10	***	79	OVC	*	*	*	10.0	**	**	**	*	43	32	1001.5	29.58	******	***	***	*****	***
725065	99999	200610240953	280	7	***	59	OVC	*	*	*	10.0	**	**	**	*	43	34	1001.5	29.58	******	***	***	*****	***
725065	99999	200610241053	310	7	***	49	OVC	*	*	*	10.0	**	**	**	*	43	32	1001.4	29.57	******	***	***	*****	***
725065	99999	200610241153	310	8	***	79	OVC	*	*	*	10.0	**	**	**	*	43	32	1001.3	29.57	******	44	41	*****	***
725065	99999	200610241253	310	6	***	47	OVC	*	*	*	10.0	**	**	**	*	45	34	1001.7	29.58	******	***	***	*****	***
725065	99999	200610241353	300	10	***	89	OVC	*	*	*	10.0	**	**	**	*	45	34	1001.8	29.59	******	***	***	*****	***
725065	99999	200610241453	320	8	***	89	OVC	*	*	*	10.0	**	**	**	*	48	34	1001.6	29.58	******	***	***	*****	***
725065	99999	200610241553	300	11	17	89	OVC	*	*	*	10.0	**	**	**	*	50	34	1001.4	29.57	******	***	***	*****	***
725065	99999	200610241653	310	10	***	89	OVC	*	*	*	10.0	**	**	**	*	50	32	1000.9	29.56	******	***	***	*****	***
725065	99999	200610241753	310	10	17	89	OVC	*	*	*	10.0	**	**	**	*	50	34	1000.6	29.55	******	51	43	*****	***
725065	99999	200610241853	310	9	***	722	CLR	*	*	*	10.0	**	**	**	*	52	34	1000.6	29.55	******	***	***	*****	***
725065	99999	200610241953	300	11	18	89	BKN	*	*	*	10.0	**	**	**	*	48	30	1001.0	29.56	******	***	***	*****	***
725065	99999	200610242053	300	8	***	49	BKN	*	*	*	10.0	**	**	**	*	48	30	1001.4	29.57	******	***	***	*****	***
725065	99999	200610242153	300	11	18	49	BKN	*	*	*	10.0	**	**	**	*	48	28	1002.3	29.60	******	***	***	*****	***
725065	99999	200610242253	290	7	***	722	CLR	*	*	*	10.0	**	**	**	*	43	30	1002.9	29.61	******	***	***	*****	***
725065	99999	200610250053	290	10	***	59	OVC	*	*	*	10.0	**	**	**	*	46	32	1003.6	29.64	******	***	***	*****	***
725065	99999	200610250153	290	13	***	59	OVC	*	*	*	10.0	**	**	**	*	46	32	1003.8	29.64	******	***	***	*****	***
725065	99999	200610250253	290	9	***	59	OVC	*	*	*	10.0	**	**	**	*	45	34	1004.0	29.65	******	***	***	*****	***
725065	99999	200610250353	300	10	***	59	OVC	*	*	*	10.0	**	**	**	*	45	34	1003.9	29.65	******	***	***	*****	***
725065	99999	200610250453	280	11	***	722	CLR	*	*	*	10.0	**	**	**	*	43	34	1004.1	29.65	******	***	***	*****	***
725065	99999	200610250553	290	15	***	722	CLR	*	*	*	10.0	**	**	**	*	43	34	1004.3	29.66	******	46	42	*****	***
725065	99999	200610250653	280	14	***	722	CLR	*	*	*	10.0	**	**	**	*	43	34	1004.5	29.67	******	***	***	*****	***
725065	99999	200610250753	280	11	***	722	CLR	*	*	*	10.0	**	**	**	*	43	34	1004.5	29.66	******	***	***	*****	***

725065	99999	200610250853	280	9	***	722	CLR	*	*	*	10.0	**	**	**	*	41	34	1004.7	29.67	******	***	***	*****	***
725065	99999	200610250953	280	9	***	79	BKN	*	*	*	10.0	**	**	**	*	41	34	1005.1	29.68	******	***	***	*****	***
725065	99999	200610251053	280	11	***	722	SCT	*	*	*	10.0	**	**	**	*	41	34	1005.5	29.69	******	***	***	*****	***
725065	99999	200610251153	290	10	***	89	BKN	*	*	*	10.0	**	**	**	*	43	34	1006.0	29.71	******	***	40	*****	***
725065	99999	200610251253	290	13	18	89	OVC	*	*	*	10.0	**	**	**	*	45	34	1006.6	29.73	******	***	***	*****	***
725065	99999	200610251353	310	8	17	79	BKN	*	*	*	10.0	**	**	**	*	45	34	1006.7	29.73	******	***	***	*****	***
725065	99999	200610251453	290	17	26	722	SCT	*	*	*	10.0	**	**	**	*	50	34	1006.3	29.72	******	***	***	*****	***
725065	99999	200610251553	310	15	24	722	SCT	*	*	*	10.0	**	**	**	*	52	34	1006.2	29.72	******	***	***	*****	***
725065	99999	200610251653	280	16	23	722	SCT	*	*	*	10.0	**	**	**	*	52	32	1006.0	29.71	******	***	***	*****	***
725065	99999	200610251753	310	13	19	722	SCT	*	*	*	10.0	**	**	**	*	54	32	1005.7	29.70	******	54	42	*****	***
725065	99999	200610251853	300	16	23	722	SCT	*	*	*	10.0	**	**	**	*	54	30	1006.0	29.71	******	***	***	*****	***

04/11/2005

SURFACE HOURLY ABBREVIATED FORMAT

ONE HEADER RECORD FOLLOWED BY DATA RECORDS:

COLUMN	DATA DESCRIPTION
01-06	USAF = AIR FORCE CATALOG STATION NUMBER
08-12	WBAN = NCDC WBAN NUMBER
14-25	YR--MODAHRMN = YEAR-MONTH-DAY-HOUR-MINUTE IN GREENWICH MEAN TIME (GMT)
27-29	DIR = WIND DIRECTION IN COMPASS DEGREES, 990 = VARIABLE, REPORTED AS '***' WHEN AIR IS CALM (SPD WILL THEN BE 000)
31-37	SPD & GUS = WIND SPEED & GUST IN MILES PER HOUR
39-41	CLG = CLOUD CEILING--LOWEST OPAQUE LAYER WITH 5/8 OR GREATER COVERAGE, IN HUNDREDS OF FEET, 722 = UNLIMITED
43-45	SKC = SKY COVER -- CLR-CLEAR, SCT-SCATTERED-1/8 TO 4/8, BKN-BROKEN-5/8 TO 7/8, OVC-OVERCAST, OBS-OBSCURED, POB-PARTIAL OBSCURATION
47-47	L = LOW CLOUD TYPE, SEE BELOW
49-49	M = MIDDLE CLOUD TYPE, SEE BELOW
51-51	H = HIGH CLOUD TYPE, SEE BELOW
53-56	VSB = VISIBILITY IN STATUTE MILES TO NEAREST TENTH NOTE: FOR SOME STATIONS, VISIBILITY IS REPORTED ONLY UP TO A MAXIMUM OF 7 OR 10 MILES IN METAR OBSERVATIONS, BUT TO HIGHER VALUES IN SYNOPTIC OBSERVATIONS, WHICH CAUSES THE VALUES TO FLUCTUATE FROM ONE DATA RECORD TO THE NEXT. ALSO, VALUES ORIGINALLY REPORTED AS '10' MAY APPEAR AS '10.1' DUE TO DATA BEING ARCHIVED IN METRIC UNITS AND CONVERTED BACK TO ENGLISH.
58-65	WW WW WW = PRESENT WEATHER--LISTED BELOW
67-67	W = PAST WEATHER INDICATOR, SEE BELOW
69-77	TEMP & DEWP = TEMPERATURE & DEW POINT IN FAHRENHEIT
79-84	SLP = SEA LEVEL PRESSURE IN MILLIBARS TO NEAREST TENTH
86-90	ALT = ALTIMETER SETTING IN INCHES TO NEAREST HUNDREDTH
92-97	STP = STATION PRESSURE IN MILLIBARS TO NEAREST TENTH
99-101	MAX = MAXIMUM TEMPERATURE IN FAHRENHEIT (TIME PERIOD VARIES)
103-105	MIN = MINIMUM TEMPERATURE IN FAHRENHEIT (TIME PERIOD VARIES)
107-111	PCP01 = 1-HOUR LIQUID PRECIP REPORT IN INCHES AND HUNDREDTHS -- THAT IS, THE PRECIP FOR THE PRECEDING 1 HOUR PERIOD
113-117	PCP06 = 6-HOUR LIQUID PRECIP REPORT IN INCHES AND HUNDREDTHS -- THAT IS, THE PRECIP FOR THE PRECEDING 6 HOUR PERIOD
119-123	PCP24 = 24-HOUR LIQUID PRECIP REPORT IN INCHES AND HUNDREDTHS THAT IS, THE PRECIP FOR THE PRECEDING 24 HOUR PERIOD
125-129	PCPXX = LIQUID PRECIP REPORT IN INCHES AND HUNDREDTHS, FOR A PERIOD OTHER THAN 1, 6, OR 24 HOURS (USUALLY FOR 12 HOUR PERIOD FOR STATIONS OUTSIDE THE U.S., AND FOR 3 HOUR PERIOD FOR THE U.S.) T = TRACE FOR ANY PRECIP FIELD
131-132	SD = SNOW DEPTH IN INCHES

NOTES:

- *'s IN FIELD INDICATES ELEMENT NOT REPORTED.

- SOME VALUES WERE CONVERTED FROM METRIC TO ENGLISH UNITS. THIS WILL OCCASIONALLY RESULT IN MINOR DIFFERENCES VS ORIGINAL DATA DUE TO ROUNDING.

- COLUMN POSITION REFERS TO ASCII TEXT DATA.

- THIS FORMAT CAN BE EASILY IMPORTED INTO A SPREADSHEET OR A DATABASE MANAGEMENT SYSTEM SINCE FIELDS ARE SPACE-DELIMITED.

- THIS FORMAT DOES NOT INCLUDE QUALITY CONTROL FLAGS, WHICH ARE AVAILABLE IN THE ADVANCED FORMAT THROUGH THE CLIMATE DATA ONLINE SYSTEM.

PRESENT WEATHER CODE TABLE

The code that denotes a specific type of weather observed.

00-49 No precipitation at the station at the time of observation

---

00-19 No precipitation, fog, ice fog (except for 11 and 12), duststorm, sandstorm, drifting or blowing snow at the station at the time of observation or, except for 09 and 17, during the preceding hour

---

00: Cloud development not observed or not observable
01: Clouds generally dissolving or becoming less developed
02: State of sky on the whole unchanged
03: Clouds generally forming or developing
04: Visibility reduced by smoke, e.g. veldt or forest fires, industrial smoke or volcanic ashes
05: Haze
06: Widespread dust in suspension in the air, not raised by wind at or near the station at the time of observation
07: Dust or sand raised by wind at or near the station at the time of observation, but no well-developed dust whirl(s) or sand whirl(s), and no duststorm or sandstorm seen or, in the case of ships, blowing spray at the station
08: Well developed dust whirl(s) or sand whirl(s) seen at or near the station during the preceding hour or at the time of observation, but no duststorm or sandstorm
09: Duststorm or sandstorm within sight at the time of observation, or at the station during the preceding hour
10: Mist
11: Patches of shallow fog or ice fog at the station, whether on land or sea, not deeper than about 2 meters on land or 10 meters at sea
12: More or less continuous shallow fog or ice fog at the station, whether on land or sea, not deeper than about 2 meters on land or 10 meters at sea
13: Lightning visible, no thunder heard
14: Precipitation within sight, not reaching the ground or the surface of the sea
15: Precipitation within sight, reaching the ground or the surface of the sea, but distant, i.e., estimated to be more than 5 km from the station
16: Precipitation within sight, reaching the ground or the surface of the sea, near to, but not at the station
17: Thunderstorm, but no precipitation at the time of observation
18: Squalls at or within sight of the station during the preceding hour or at the time of observation
19: Funnel cloud(s) (Tornado cloud or waterspout) at or within sight of the station during the preceding hour or at the time of observation

---

20-29 Precipitation, fog, ice fog or thunderstorm at the station during the preceding hour, but not at the time of observation

---

20: Drizzle (not freezing) or snow grains not falling as shower(s)
21: Rain (not freezing) not falling as shower(s)
22: Snow not falling as shower(s)
23: Rain and snow or ice pellets not falling as shower(s)
24: Freezing drizzle or freezing rain not falling as shower(s)
25: Shower(s) of rain

26: Shower(s) of snow or of rain and snow
27: Shower(s) of hail (Hail, small hail, snow pellets), or rain and hail
28: Fog or ice fog
29: Thunderstorm (with or without precipitation)

30-39 Duststorm, sandstorm, or blowing snow

30: Slight or moderate duststorm or sandstorm has decreased during the preceding hour
31: Slight or moderate duststorm or sandstorm no appreciable change during the preceding hour
32: Slight or moderate duststorm or sandstorm has begun or has increased during the preceding hour
33: Severe duststorm or sandstorm has decreased during the preceding hour
34: Severe duststorm or sandstorm no appreciable change during the preceding hour
35: Severe duststorm or sandstorm has begun or has increased during the preceding hour
36: Slight or moderate drifting snow generally low (below eye level)
37: Heavy drifting snow generally low (below eye level)
38: Slight or moderate blowing snow generally high (above eye level)
39: Heavy blowing snow generally high (above eye level)

40-49 Fog or ice fog at the time of observation

40: Fog or ice fog at a distance at the time of observation, but not at the station during the preceding hour, the fog or ice fog extending to a level above that of the observer
41: Fog or ice fog in patches
42: Fog or ice fog, sky visible, has become thinner during the preceding hour
43: Fog or ice fog, sky invisible, has become thinner during the preceding hour
44: Fog or ice fog, sky visible, no appreciable change during the preceding hour
45: Fog or ice fog, sky invisible, no appreciable change during the preceding hour
46: Fog or ice fog, sky invisible, has begun or has become thicker during the preceding hour
47: Fog or ice fog, sky invisible, has begun or has become thicker during the preceding hour
48: Fog, depositing rime, sky visible
49: Fog, depositing rime, sky invisible

50-99 Precipitation at the station at the time of observation

---

50-59 Drizzle

50: Drizzle, not freezing, intermittent, slight at time of observation
51: Drizzle, not freezing, continuous, slight at time of observation
52: Drizzle, not freezing, intermittent, moderate at time of observation
53: Drizzle, not freezing, continuous, moderate at time of observation
54: Drizzle, not freezing, intermittent, heavy (dense) at time of observation
55: Drizzle, not freezing, continuous, heavy (dense) at time of observation
56: Drizzle, freezing, slight
57: Drizzle, freezing, moderate or heavy (dense)

58: Drizzle and rain, slight
59: Drizzle and rain, moderate or heavy

60-69 Rain

60: Rain, not freezing, intermittent, slight at time of observation
61: Rain, not freezing, continuous, slight at time of observation
62: Rain, not freezing, intermittent, moderate at time of observation
63: Rain, not freezing, continuous, moderate at time of observation
64: Rain, not freezing, intermittent, heavy at time of observation
65: Rain, not freezing, continuous, heavy at time of observation
66: Rain, freezing, slight
67: Rain, freezing, moderate or heavy
68: Rain or drizzle and snow, slight
69: Rain or drizzle and snow, moderate or heavy

70-79 Solid precipitation not in showers

70: Intermittent fall of snowflakes, slight at time of observation
71: Continuous fall of snowflakes, slight at time of observation
72: Intermittent fall of snowflakes, moderate at time of observation
73: Continuous fall of snowflakes, moderate at time of observation
74: Intermittent fall of snowflakes, heavy at time of observation
75: Continuous fall of snowflakes, heavy at time of observation
76: Diamond dust (with or without fog)
77: Snow grains (with or without fog)
78: Isolated star-like snow crystals (with or without fog)
79: Ice pellets

80-99 Showery precipitation, or precipitation with current or recent thunderstorm

---

80: Rain shower(s), slight
81: Rain shower(s), moderate or heavy
82: Rain shower(s), violent
83: Shower(s) of rain and snow mixed, slight
84: Shower(s) of rain and snow mixed, moderate or heavy
85: Show shower(s), slight
86: Snow shower(s), moderate or heavy
87: Shower(s) of snow pellets or small hail, with or without rain or rain and snow mixed, slight
88: Shower(s) of snow pellets or small hail, with or without rain or rain and snow mixed, moderate or heavy
89: Shower(s) of hail (hail, small hail, snow pellets) , with or without rain or rain and snow mixed, not associated with thunder, slight
90: Shower(s) of hail (hail, small hail, snow pellets), with or without rain or rain and snow mixed, not associated with thunder, moderate or heavy
91: Slight rain at time of observation, thunderstorm during the preceding hour but not at time of observation
92: Moderate or heavy rain at time of observation, thunderstorm during the preceding hour but not at time of observation
93: Slight snow, or rain and snow mixed or hail (Hail, small hail, snow pellets), at time of observation, thunderstorm during the preceding hour but not at time of observation
94: Moderate or heavy snow, or rain and snow mixed or hail(Hail, small hail, snow pellets) at time of observation, thunderstorm during the preceding hour but not at time of observation
95: Thunderstorm, slight or moderate, without hail (Hail, small hail, snow pellets), but with rain and/or snow at time of observation, thunderstorm at time of observation
96: Thunderstorm, slight or moderate, with hail (hail, small hail,

snow pellets) at time of observation, thunderstorm at time of observation
97: Thunderstorm, heavy, without hail (Hail, small hail, snow pellets), but with rain and/or snow at time of observation, thunderstorm at time of observation
98: Thunderstorm combined with duststorm or sandstorm at time of observation, thunderstorm at time of observation
99: Thunderstorm, heavy, with hail (Hail, small hail, snow pellets) at time of observation, thunderstorm at time of observation

PAST WEATHER CODE TABLE

The code that denotes a specific type of past weather observed.
0: Cloud covering 1/2 or less of the sky throughout the appropriate period
1: Cloud covering more than 1/2 of the sky during part of the appropriate period and covering 1/2 or less during part of the period
2: Cloud covering more than 1/2 of the sky throughout the appropriate period
3: Sandstorm, duststorm or blowing snow
4: Fog or ice fog or thick haze
5: Drizzle
6: Rain
7: Snow, or rain and snow mixed
8: Shower(s)
9: Thunderstorm(s) with or without precipitation

LOW CLOUD TYPE

0: No low clouds
1: Cumulus humulis or Cumulus fractus other than of bad weather or both
2: Cumulus mediocris or congestus, with or without Cumulus of species fractus or humulis or Stratocumulus all having bases at the same level
3: Cumulonimbus calvus, with or without Cumulus, Stratocumulus or Stratus
4: Stratocumulus cumulogenitus
5: Stratocumulus other than Stratocumulus cumulogenitus
6: Stratus nebulosus or Stratus fractus other than of bad weather, or both
7: Stratus fractus or Cumulus fractus of bad weather, or both (pannus) usually below Altostratus or Nimbostratus
8: Cumulus and Stratocumulus other than Stratocumulus cumulogenitus, with bases at different levels
9: Cumulonimbus capillatus (often with an anvil), with or without Cumulonimbus calvus, Cumulus, Stratocumulus, Stratus or pannus

MIDDLE CLOUD TYPE

0: No middle clouds
1: Altostratus translucidus
2: Altostratus opacus or Nimbostratus
3: Altocumulus translucidus at a single level
4: Patches (often lenticular) of Altocumulus translucidus, continually changing and occurring at one or more levels
5: Altocumulus translucidus in bands, or one or more layers of Altocumulus translucidus or opacus, progressively invading the sky; these Altocumulus clouds generally thicken as a whole
6: Altocumulus cumulogentis (or cumulonimbogentus)

7: Altocumulus translucidus or opacus in two or more layers, or Altocumulus opacus in a single layer, not progressively invading the sky, or Altocumulus with Altostratus or Nimbostratus
8: Altocumulus castellanus or floccus
9: Altocumulus of a chaotic sky; generally at several levels

HIGH CLOUD TYPE

0: No High Clouds
1: Cirrus fibratus, sometimes uncinus, not progressively invading the sky
2: Cirrus spissatus, in patches or entangled sheaves, which usually do not increase and sometimes seem to be the remains of the upper part of a Cumulonimbus; or Cirrus castellanus or floccus
3: Cirrus spissatus cumulonimbogenitus
4: Cirrus unicinus or fibratus, or both, progressively invading the sky; they generally thicken as a whole
5: Cirrus (often in bands) and Cirrostratus, or Cirrostratus alone, progressively invading the sky; they generally thicken as a whole, but the continuous veil does not reach 45 degrees above the horizon
6: Cirrus (often in bands) and Cirrostratus, or Cirrostratus alone, progressively invading the sky; they generally thicken as a whole; the continuous veil extends more than 45 degrees above the horizon, without the sky being totally covered
7: Cirrostratus covering the whole sky
8: Cirrostratus not progressively invading the sky and not entirely covering it
9: Cirrocumulus alone, or Cirrocumulus predominant among the High clouds

Appendix C
Field Notes

BETA Group, Inc.
Engineers • Scientists • Planners

JOB McCoy / KMS No. 03261
CALCULATED BY TMQ DATE 8/4/06
CHECKED BY _____ DATE _____
DESCRIPTION Hi Vol Sampling SHEET NO. 1 of 2

Hi Vol.

A-2 Hall by Rooms #169 & #171 Summa: ON - -30 Hg
OFF

	ON
70	5.8
60	5.0
50	4.1
40	3.5
30	2.1

ON: 1621
@ 60 Hg

Mag. 1x Calibration = 4.5 @ 60 Hg

Temp: ON - 28.7°C
Pressure: ON - 29.80
Set Magnehelic @ 60 Hg

B-2 - Aud by Stage Summa - ON: - 29 Hg
OFF:

	ON
70	5.9
60	5.2
50	4.5
40	3.6
30	2.5

ON: 1654

@ 60 Hg

Mag. 1x Calib. = 4.7 @ 60 Hg.
Temp: ON - 31.3°C
Press: ON - 29.80

C-2 - Faculty Dining Summa - ON: -29 Hg OFF:
Duplicate - ON: >30 Hg OFF

	ON
70	5.1
60	4.7
50	3.8
40	3.2
30	2.0

ON: 1729

Mag. 1x Calibration - 4.4
Temp: ON: 30.0°C OFF:
Pressure: ON: 29.80 OFF:

BETA Group, Inc.
Engineers • Scientists • Planners

JOB McCoy / KMS No. 03261
CALCULATED BY TMD DATE 8/4/06
CHECKED BY _____ DATE _____
DESCRIPTION Hi Vol Sampling SHEET NO. _____

Hi Vols

Background - By Flag Pole

	ON
70	5.4
60	4.8
50	4.1
40	3.3
30	2.4

ON: 1836

Summa: ON: 1756 / 29.80 / 28.6°C
ON - -30 Hg
OFF -
OFF -

Mag. 1x Calib. 4.3 @ 60 Hg
Temp: ON - 29.4°C OFF -
Pressure ON - 29.80 OFF -

Background - Duplicate

	ON
70	6.4
60	5.2
50	4.6
40	3.9
30	2.7

ON: 1857

~~Summa - ON~~
~~OFF -~~

Mag. 1x Calib. - 4.89 @ 60 Hg.
Temp: ON: 26.2°C OFF -
Pressure: ON: 29.80 OFF -

BETA Group, Inc.
Engineers • Scientists • Planners

JOB McCoy/KMS No. 03261
CALCULATED BY TMD DATE 8/4/06
CHECKED BY _____ DATE _____
DESCRIPTION VS/TAQ SHEET NO. _____

Low Flow

B-2 VS-9
Summa # 0390 ON: -29 Hg OFF:
Regulator # 7304106
Low Flow 3.3 lpm ON: 1217 OFF:
Temp: 29.2°C /
Press: 29.77 /

A-2, VS-1
Summa # 0393 ON: -28.5 Hg OFF: —
Regulator # 7262304
Low Flow - 4.4 lpm ON: 1300 OFF: —
Temp. 27.5°C / 28.3°C
Pressure 29.71 / 29.80

C-2, VS-11
Summa # 0385 ON: -30 Hg OFF:
Regulator: 7276953
Low Flow: 5.0 lpm ON: 1213 OFF:
Temp: 29.2°C /
Press: 29.77 /

Back-2
Summa # 0381 ON: -30 Hg.
Regulator: 7248258
Low flow: 3 lpm ON: 1330
Temp: 28.0°C /
Pressure: 29.77 /

Back-2 (Duplicate)
Summa # 0383 ON: -28 Hg OFF:
Regulator: 7309558
Low flow: 3 lpm ON: 1340 OFF:
Temp: 28.8°C /
Pressure: 29.77 /

BETA Group, Inc.
Engineers • Scientists • Planners

JOB McCoy / KMS No. 03261
CALCULATED BY TMQ DATE 8/4/06
CHECKED BY _____ DATE _____
DESCRIPTION Hi Vol Sampling SHEET NO. 1 of 2

Hi Vol.

A-2 Hall by Rooms #169 & #171 Summa: ON - -30 Hg
OFF

	ON
70	5.8
60	5.0
50	4.1
40	3.5
30	2.1

ON: 1621
@ 60 Hg

Mag. 1x Calibration = 4.5 @ 60 Hg

Temp: ON - 28.7°C
Pressure: ON - 29.80
Set Magnehelic @ 60 Hg

B-2 - Aud by Stage Summa - ON: -29 Hg
OFF:

	ON
70	5.9
60	5.2
50	4.5
40	3.6
30	2.5

ON: 1654

@ 60 Hg

Mag. 1x Calib. = 4.7 @ 60 Hg
Temp: ON - 31.3°C
Press: ON - 29.80

C-2 - Faculty Dining Summa - ON: -29 Hg OFF:
Duplicate - ON: >30 Hg OFF

	ON
70	5.1
60	4.7
50	3.8
40	3.2
30	2.0

ON: 1729

Mag. 1x Calibration - 4.4
Temp: ON: 30.0°C OFF:
Pressure: ON: 29.80 OFF:

BETA Group, Inc.
Engineers • Scientists • Planners

JOB McCoy / KMS No. 03261
CALCULATED BY TMD DATE 8/4/06
CHECKED BY _____ DATE _____
DESCRIPTION Hi Vol Sampling SHEET NO. _____

Hi Vols

Background - By Flag Pole

	ON
70	5.4
60	4.8
50	4.1
40	3.3
30	2.4

ON: 1836

Summa: ON: 1756 / 29.80 / 28.6°C
ON - -30 Hg
OFF -
OFF -

Mag. 1x Calib. 4.3 @ 60 Hg
Temp: ON - 29.4°C OFF -
Pressure ON - 29.80 OFF -

Background - Duplicate

	ON
70	6.4
60	5.2
50	4.6
40	3.9
30	2.7

ON: 1857

~~Summa - ON~~
~~OFF -~~

Mag. 1x Calib. - 4.39 @ 60 Hg.
Temp: ON: 26.2°C OFF -
Pressure: ON: 29.80 OFF -

Aug 4, 2006 (Fri.)

New Keith Middle School

Ar. C 740

Overcast 70's

Cline dozer operator
working on slope of
wetland by south parking
lot - E Wagner told him to stop

Reviewed situation w/
- E Van Lessner
- Joe Costa
- Al Amaral
- Jim Smith
- George Gibson w/ Cline
  - "Danny" was E/O
    when we arrived today

1000 — will check fence posts at S end of parking lot to see if there is any perforation of geotextile

- Maybe call Lenore Lehite to come out? (Fran)
- May be soil and/or fabric

looked at first 9 fence posts in holes starting @ SE corner of site - all perforated warning barrier by 6" - 12"
saw geotextile (unperforated) at bottom of 9th one in no where else.
Checked 2nd 18 posts - no fabric seen
CA heading N from SW corner, 14 along S side from SW corner

1000 - 1015 - Jim talking to Al
- Al suggests no samples - plan for 3' of new cap
- Don't need to notify EPA

1053 - To help JIM

@ VS-11 LP-0016 lost down hole
Jim Smith to get Teflon Tape
SUMMA SN0385 Lowflow pump 707491

VS-9 (@ Kitchen)
Lowflow pump 665207
SUMMA 0390

VS-

1150 - Talked to Howard Schiff regarding calculation of volume of foundation vent circuits.

VS-11 & VS-9 displays not working

100 @ VS-1
SUMMA 0393
Lo-Flow 584594
4.4 LPM
SUMMA -28.5 to start 01

102 Start for Both

150 - All background samplers running

Time to lunch

205 - Heavy rain
220 - Mod rain

Building A-1	2094 L total x0.8 = 966 L
A-2	Same
Building ~~A~~ B	778 L total x0.8 = 622 L
Building C	*1628 L total x0.8 = 1302 L

	ON	Needed	off
A-1	1300		
B	1217		
C	1213		
Back	1340		
	1330		

300 ~ at VS-1
Shutoff Summa 0393
it is at 0 ?
Low-vol pump not running
Indicates BATT Flow fault
SN 581594

306-
Building C
Pump
Hi Vol @

VS-4 1613 on
SUMMA & LoVol
0384 707523
-30psi

Pump @ 4.6 L 1.8 483 45
276
207
60
46
360
276
276.0

276 | 483
276
2070

4.6 | 207
184
230

VS-11 Turning Off
Lovol pump not running
1621 SUMMA Valve
Closed w -4 psi

VS-9
1623 SUMMA Valve
Off w/ 2.5 psi
Sample pump running OK
Background-2 Summa
SN 0381 1743
-6 psi offset 1743

Background-2 Dup offset
-9.5 psi 1744
SN 0383

Background -2 Pump Lowflow
off @ 1745
SN 665284

Background -2 lowflow
dead battery
SN 671921

VS-4 -off @ 1758
SUMMA @ 19 psi
lowflow SN 707523

Left @ 740

Aug 5, 2006 (Sat)
Keith Middle School
Arrived @ 320 pm
PHy Cloudy ~80's, H. breeze
from South
~~High~~

Kim Tisa, Mark Tisa, Mayor Lang, Scott Alfonse
on-site

Background area

1) Background sampler top
flipped up
@ 56" H_2O

2) Background dup @ 57"
SUMMA Can @ -12 psi

Building A Sampler @ 60" H_2O

Auditorium 58" H_2O, -11 psi

Faculty Dining (e 335)
60" H_2O

C-2 -11 psi
C-2 Dup -15 psi

338- Closed A-2 Somma
SN 107
regulator 7305 946
& packed it up-

Density vent & pressure

1	✓	9	✓	
2	✓	10	✓	
3	✓	11	✓	
4	✓	12	✓	
5	✓ 408 today	13	✓	
6	✓ 408 today	14	✓	
7	✓ 410 today	15	✓	@ 407 today
8	✓	16	✓	@ 407 today

Shut Downs

Location: A-2
Time: 1621
SUMMA PSI: 0
Hi Vol "H_2O: 60

Temp: 30.6 °C
Press: 29.97 "Hg
Filter color: Medium gray

Location: B-2
Time: 1654
SUMMA PSI: -10
Hi Vol "H_2O: 58

Temp: ~~28.3°C~~ 30.3
Press: 30.00
Filter color: Medium gray

Adjacent stage floor was coated w/ clear finish @ ~3:00 yesterday dry, but still odor today.

Location: C-2
Time: 1729
SUMMA ~~"Hg~~ PSI: -10 Reg 7204633 Unit A100
HiVol "~~Hg~~ H_2O: 60

Temp: 30.2
Press: 30.00
HiVol Filter Color: Med/dk gray

Location: C-2 dup
Time: 1729
SUMMA PSI: -14 SN 4451 Reg# 7204 795
HiVolume "H_2O: N/A

Temp: 30.2
Press: 30.00
Filter Color: N/A

Background-2
Time: 1836
SUMMA PSI: -9.5
HiVol "H_2O: 57

Temp: 27.8° C
Press: 30.03 "Hg
HiVol filter Color: Light gray

Background-2 DUP
Time: 1857
HiVol "H_2O: 65

Temp: ~~1857~~ 26.0
Press: 30.03
HiVol Filter Color:
3 pin pricks through Quartz filter
No visible particulates on PUF
[Filter support mesh was frayed]

others left @ ~~600~~ 700

Worked on COCs, packing
left @ 800

12-hour Hi-Vol pump readings
made by Al Amaral
at ~6:00 am on Aug 5

	# of H_2O
Building A - Hallway	60"
Building B - Aud	59
Building C - Fac. Dining	59
Background Flagpole	59
Background Dup	59

BETA Group, Inc.
Engineers • Scientists • Planners

JOB KMS No. 03261
CALCULATED BY TMD/Bill DATE 8/15/06
CHECKED BY _____ DATE _____
DESCRIPTION VS Sampling SHEET NO. 1 of

A3-A, VS-1
Summa - Mag On: -31 "Hg OFF: Cartridge LP-0015
Low Flow S/N 707509
Low Flow Time On: 1020 OFF: 1116 P/T: _____
Flow Rate On: 4.9 lpm OFF: lpm at _____
Barometer On: 30.21 OFF: @ 30.15 1125AM
Temp. On: 28.7°C/ OFF @ 28.5

2721 off -55 min

A3-B, VS-1
Summa - Mag. On: -31 "Hg OFF: ~~"Hg~~
Low Flow Time On: 1020 OFF: 1116 Cartridge LP-0011
Flow Rate On: 4.9 lpm OFF: Lowflow S/N 634106
Barometer On: 30.21 OFF: 30.15 1125 AM
Temp. On: 28.7 OFF: 28.5 1125 AM

B3-A, VS-9
Summa - Mag. On: -31 OFF: (SUMMA) 3:00 -4.0 "Hg
#0248
Low Flow Time On: 1100 OFF: 1109 Lowflow S/N 585533
Flow Rate On: 4.7 lpm OFF: 4.7 lpm Cartridge #LP-0020
Barometer On: 30.18 OFF:
Temp. On: 27.5 OFF:

B3-B, VS-9
Summa - Mag. On: -31 OFF: (SUMMA) 3:00 -4.5 "Hg
#~~0019~~ 0199 ↗ 4 grid recorded
Low Flow Time On: 1100 OFF: 1109 Lowflow S/N 707532
Flow Rate On: OFF: Cartridge #LP-0013
Barometer @ 1100 30.18
Temp 27.5

4.7 LPM

DUPO @ 1101 30.18
TEMP 27.1

BETA Group, Inc.
Engineers • Scientists • Planners

JOB Keith Middle School No. 3261
CALCULATED BY Billo/Howard DATE 8/8/06
CHECKED BY _____ DATE _____
DESCRIPTION _____ SHEET NO. _____

C3A VS-11

SuMMa - 0110 Sn# 665284 ~~4.8~~ 4.6 L/M
Cartridge - LP-0019

Temp - 28.3
Barometer - 30.15
Time on - 1135
Pressure - -31

SUMMA off @ 335
-7.0" Hg

2hrs
18 min
→ 145

C3B VS-11
SUMMa - 0238 Sn# 671921
Cartridge - LP-0014

Temp - 28.3
Barometer - ~~28.3~~ 30.15
Time on - 1135
pressure - -31

Lo Vol
Time off 2:15 160 min on pumps
30.09 in Hg
30.04°C
SUMMA off @ 335 : -2.5" Hg

Background

448
Shut down
SUMMA @ -3" Hg

Back-3
SUMMA # ~~0182~~ 0230
SUMMA in Hg = 29.5

Low flow S/N 58454 4.1 L/min Total of 150 min indicate
Cartridge # LP-0002

on - Barometer 30.18 All on @ 1148
Temp 30.3

BETA Group, Inc.
Engineers • Scientists • Planners

JOB Keith Middle School No. 3261
CALCULATED BY D. Dillo DATE 8/18/06
CHECKED BY _____ DATE _____
DESCRIPTION _____ SHEET NO. _____

A3-VS4A

SuMa #0111 SN# 707491
Cartridge - LP-0001

SUMMA & Loflow on @ 245
SUMMA "Hg: -30
Temp 30.8
Baro: 30.09

Low Flo off off 56 Min (301)
SUMMA off @ 645
-2 "Hg

A3-VS4B

SuMa #0232 SN# 707523
Cartridge - LP-0020 - (LP-0007 crossed out on tag)

SUMMA & Loflow on @: 245
SUMMA IN Hg :-29

Loflow off @ 341 (56 Min)
SUMMA off @ 645
-3 "Hg

A3B VS-1 SUMMA off @ 220
30.12 "Hg
31.0°
-3 "Hg

A3A VS-1 SUMMA off @ 220
-4.5 "Hg

BETA Group, Inc.
Engineers • Scientists • Planners

JOB Keith Middle School No. 326
CALCULATED BY Billo DATE 8/18/06
CHECKED BY _____ DATE _____
DESCRIPTION _____ SHEET NO. _____

300 - Bldg B SUMMAS off

535 Bldg C SUMMAS off
545 - Shut of Bld A Lo flow
448 - Background off
645 - Bldg A SUMMAS off

Ending Cal.	LPM	Station		LPM	Sta
707523	4.8	A3B US-4	707532	4.6	B3B US-9
671921	4.5	C3B US-11			D3A US-9
707491	4.8	A3A US-4	585533	4.8	585633
665284	4.6	C3A US-11			
707504	4.9	A3A US-1			
634106	4.9	A3B US-1			
584579	4.1	Back-3			
584607	4.5				

ppb RAE - 615 - 622

A Hallway 0-4 ppb
D Aud 10-4 ppm [Hall outside - 48 ppm]
C Fac Dir 1620-1660 ppb
Bkgd outside 0 ppb

BETA Group, Inc.
Engineers • Scientists • Planners

JOB Keith Middle No. 03261
CALCULATED BY TMD/Billo DATE 8/18/04
CHECKED BY _____ DATE _____
DESCRIPTION Hi Vol - IAQ SHEET NO. 1 of 2

Backup Summa

Hi Vol Sampling

A3 - Hallway

Summa - ON: -30 Hg →
OFF: ~~1526~~ -10" Hg → ~~1526~~

70	6.3
60	5.7
50	4.8
40	3.9
30	2.8

Baro: On 30.12 OFF: 29.97
Temp: On 28.4 OFF: 28.6
Time: On 1526 OFF: 1526
1 x Cal. @ 60 - 5.4
Filter is gray & dusty
Magnehelic off: 55" H_2O

B-3 - Aud

Summa - On: -27" Hg →
OFF: -10" Hg →

70	6.2
60	5.4
50	4.8
40	3.4
30	2.7

Baro: On: 30.15 OFF: 29.97
Temp: On: 28.0°C OFF: 27.9
Time: On: 1539 OFF: 1539
1 x Cal. @ 60 Hg = 5.2
Magnehelic off: 52" H_2O
Dusty - Lt gray filter

C3 - Faculty Dining

Summa Dup. On: -30 Hg/-11 → — —
Summa - On: 30 Hg/-11 → — —
OFF: 1555

70	5.9
60	5.1
50	4.5
40	3.4
30	2.5

1 x Calib. @ 60 Hg = 5.0 Hg
Baro: On: 30.12 OFF: 29.97
Temp: On: 27.6 OFF: 27.8°
Time: On: 1555 OFF: 1555
Magnehelic off: 50
Filter gray & dusty

Floor leaking just comfortable shutdown

Back-3 - Flagpole

Summa - On: 1640 -30 Hg →
OFF: 1640 -9 →

70	6.3
60	5.2
50	4.7
40	3.6
30	2.8

Baro: On: 30.12 OFF: 29.97
Temp: On: 31.2°C OFF: 28.3
Time: On: 1640 OFF: 1640
1 x Calib: 5.0 @ 60 Hg
Magnehelic off: ~~1555~~ 50" H_2O

BETA Group, Inc.
Engineers • Scientists • Planners

JOB KMS No. 03261
CALCULATED BY TMD / Bill DATE
CHECKED BY DATE 8/18/06
DESCRIPTION Hi Vol SHEET NO. 28 2

Background 3 - Duplicate

70	5.6
60	5.1
50	4.5
40	3.7
30	2.5

8/18
Time - On: 1658 OFF: 1658
Temp On: 31.6°C OFF: 28.4
Baro On: 30.12 OFF: 29.97
1x Calib: 4.6 @ 60 Hg
Magnehelic @ ~~off~~ 1640: 59" H_2O
at 1641 went up to 67 to end of run at 1658
Magnehelic at off: 67

Backup SUMMA Cans

Location	8/18/06 Start Time	Start Press	8/19/06 End Time	End Press
A-3 Hall	608pm	-33	608	-13
B-3 Aud	610pm	-33	610	-11
Background	606pm	-35	606pm	-11

BETA Group, Inc.
Engineers • Scientists • Planners

JOB Keith Middle School No. 3761
CALCULATED BY Billo DATE 8/18-19/06
CHECKED BY _____ DATE _____
DESCRIPTION _____ SHEET NO. _____

Background-3 Dup
SUMMA # ~~0230~~ 0182
ON: SUMMA in Hg -28.5

Shutdown @ 448
-1.5" Hg

8/19/06

620: Background 3 54" H_2O
Background 3 Dup 63" H_2O

622 A-3 58" H_2O

624 B-3 57" H_2O

626 C-3 57" H_2O

B3D - VS-9 - Found SUMMA Valve open.

Keith Middle School						
Hi Volume IAQ						
Date:	9/14-15/06					
Sampler:	TMD					
Sample Location		A-4A - Hall				
~~SUMMA ID~~:				~~Flow Controller ID:~~		
On Date & Time:		9/14	1:43	Off Date & Time:	9/15	1:43
Gauge Reading:		-30	"Hg	Gauge Reading:	-25	"Hg
Barometer:		30.06	"H2O	Barometer:		"H2O
Temp:		22	C	Temp:		C
SUMMA ID: A473				~~Flow Controller ID:~~		
On Date & Time:		9/14	1:43	Off Date & Time:	9/15	1:43
Gauge Reading:		>-30	"Hg	Gauge Reading:	-26	"Hg
Barometer:		30.06	"H2O	Barometer:		"H2O
Temp:		22	C	Temp:		C
Hi Volume Sampler						
S/N:	A-4			~~Cartridge ID:~~		
Calibration						
Gauge Reading		Manometer				
70	" Hg	5.1				
60	" Hg	4.4		4 hrs.	51	
50	" Hg	3.8				
40	" Hg	3.0		18 hrs.	50	
30	" Hg	2.2				
One Time Cal @ ~~50~~ 50:		4.1		Gauge at Shut Down:	50	
On Date & Time:		9/14	1:42	Off Date & Time:	9/15	1:42
Barometer:		30.06		Barometer:	30.06	
Temp:		22	°C	Temp:	21.4	
				Filter and PUF Observations:		

Charcoal/light gray

Keith Middle School					
Hi Volume IAQ					
Date: 9/14-15/06					
Sampler: TMD					
Sample Location	B-4A, And.				
~~SUMMA ID:~~			~~Flow Controller ID:~~		
On Date & Time:	9/14	2:03	Off Date & Time:	9/15	
Gauge Reading:	-30	"Hg	Gauge Reading:	-21	"Hg
Barometer:	30.06	"H2O	Barometer:	30.06	"H2O
Temp:	26.1	C	Temp:	24.2	C
SUMMA ID:	B-4B, And.		Flow Controller ID:		
On Date & Time:	9/14		Off Date & Time:	9/15	
Gauge Reading:	-30	"Hg	Gauge Reading:	-24	"Hg
~~Barometer:~~		~~"H2O~~	~~Barometer:~~		~~"H2O~~
~~Temp:~~		~~C~~	~~Temp:~~		~~C~~
Hi Volume Sampler					
S/N:	B-4, And.		~~Cartridge ID:~~		
Calibration					
Gauge Reading	Manometer				
70 " Hg	6.2				
60 " Hg	5.5		4 hrs.	59	
50 " Hg	4.9				
40 " Hg	3.7		18 hrs	59	
30 " Hg	2.9				
One Time Cal @ 60:	4.7		Gauge at Shut Down:	58	
On Date & Time:	9/14	2:03	Off Date & Time:	9/15	
Barometer:	30.06		Barometer:	30.06	
Temp:	26.1		Temp:	24.2	
			Filter and PUF Observations:		

Keith Middle School					
Hi Volume IAQ					
~~Date:~~	9/14-15				
Sampler:	C-4, Faculty Dining				
Sample Location					
~~SUMMA ID~~:			~~Flow Controller ID:~~		
On Date & Time:	9/14	2:23	Off Date & Time:	9/15	2:16
Gauge Reading:	-30	"Hg	Gauge Reading:	-2	"Hg
Barometer:	30.06	"H2O	Barometer:	30.06	"H2O
Temp:	24.2	C	Temp:	22.2	C
~~SUMMA ID:~~			~~Flow Controller ID:~~		
On Date & Time:	9/14	2:23	Off Date & Time:	9/15	2:32
Gauge Reading:	-30	"Hg	Gauge Reading:	-24	"Hg
Barometer:	30.06	"H2O	Barometer:	30.06	"H2O
Temp:	24.2	C	Temp:	22.3	C
Hi Volume Sampler					
S/N:	C-4, Faculty Dining		~~Cartridge ID:~~		
Calibration					
Gauge Reading	Manometer				
70 " Hg	5.1				
60 " Hg	4.8		4hrs.	59	
50 " Hg	3.8				
40 " Hg	3.0		18hrs.	59	
30 " Hg	2.3				
One Time Cal @ 60:			Gauge at Shut Down:		
On Date & Time:	9/14	2:22	Off Date & Time:	9/15	2:32
Barometer:	30.06		Barometer:	30.06	
Temp:	24.2		Temp:	22.3	
			Filter and PUF Observations:		Black

Keith Middle School					
Hi Volume IAQ					
Date: Background - 4					
Sampler: TMD					
Sample Location					
~~SUMMA ID:~~ Background - 4			~~Flow Controller ID:~~		
On Date & Time:	9/14		Off Date & Time:	9/15	2:43
Gauge Reading:	-30	"Hg	Gauge Reading:	-30	"Hg
Barometer:	30.06	"H2O	Barometer:	30.06	"H2O
Temp:	22.2	C	Temp:	22.3	C
~~SUMMA ID:~~			~~Flow Controller ID:~~		
On Date & Time:	9/14		Off Date & Time:	9/15	
Gauge Reading:	-30	"Hg	Gauge Reading:		"Hg
Barometer:	30.06	"H2O	Barometer:		"H2O
Temp:	22.2	C	Temp:		C
Hi Volume Sampler					
S/N: Back. 4			~~Cartridge ID:~~		
Calibration					
Gauge Reading	Manometer				
70 " Hg	5.8				
60 " Hg	5.2				
50 " Hg	4.5		4 hrs	60	
40 " Hg	3.4				
30 " Hg	2.6		18 hrs.	58	
One Time Cal @ 60:	5.4		Gauge at Shut Down:	60	
On Date & Time:	9/14		Off Date & Time:	9/15	
Barometer:	30.06		Barometer:		
Temp:	22.2		Temp:		
			Filter and PUF Observations:		Gray

Keith Middle School					
Hi Volume IAQ					
Date: Background - 4 Duplicate					
Sampler: TMD					
Sample Location					
~~SUMMA ID:~~		2:45	~~Flow Controller ID:~~		2:45
On Date & Time:	9/14	~~2:59~~	Off Date & Time:	9/15	~~2:59~~
Gauge Reading:	-30	"Hg	Gauge Reading:	-30	"Hg
Barometer:	30.06	"H2O	Barometer:		"H2O
Temp:	22.2	C	Temp:		C
~~SUMMA ID:~~			~~Flow Controller ID:~~		
On Date & Time:	9/14	2:59	Off Date & Time:	9/15	2:59
Gauge Reading:	-30	"Hg	Gauge Reading:	-5	"Hg
Barometer:	30.06	"H2O	Barometer:		"H2O
Temp:	22.2	C	Temp:		C
Hi Volume Sampler					
S/N:			~~Cartridge ID:~~		
Calibration					
Gauge Reading	Manometer				
70 " Hg	6.0				
60 " Hg	5.2		4 hrs.	61	
50 " Hg	4.5				
40 " Hg	3.8		18 hrs.	59	
30 " Hg	2.8				
One Time Cal @ 60:	5.1		Gauge at Shut Down:	71	
On Date & Time:	9/14	2:58	Off Date & Time:	9/15	
Barometer:	30.06		Barometer:	30.06	
Temp:	22.2		Temp:	20.9	
			Filter and PUF Observations:	Gray	

BETA Group, Inc.
Engineers • Scientists • Planners

JOB KMS No. 03261
CALCULATED BY TMD DATE 9/14/06
CHECKED BY _____ DATE _____
DESCRIPTION Hi Vol SHEET NO. _____

A-4

Barometer: 30.06 Thermometer 22.0
Summa A: ON 1:43 OFF Mag: ON 1:42 OFF
" B: ON 1:43 OFF ON OFF

70 - 5.1
60 - 4.4
50 - 3.8
40 - 3.0
30 - 2.2

1x Cal: 4.1 @ 50

Running @ 50" H_2O. Time on: 1:42 OFF:
Barometric (P): 30.06 " Hg
Temp: 22.0

~~Both~~ Summa CANS on @ 1:43
on off
A-4A : -30 " Hg
A-4B : > -30 " Hg

BETA Group, Inc.
Engineers • Scientists • Planners

JOB KMS No. 03261
CALCULATED BY TMD DATE 9/14/06
CHECKED BY _____ DATE _____
DESCRIPTION Hi Vol SHEET NO. _____

B-2

Barometer: 30.06 Thermometer: ~~23.4~~ 26.1

P	V
70	6.2
60	5.5
50	4.9
40	3.7
30	2.9

1 x CAL: 4.7 @ 60

Running At 60" H_2O . 4.7" (VAC)
Time On: 2:03
OFF:

SUMMA CANS on @ 2:04

	Pressure				Time	Pressure
B4-A:	-30 Hg	On	2:04	OFF		
B4-D	-30 Hg	On	2:04	OFF		

BETA Group, Inc.
Engineers • Scientists • Planners

JOB KMS No. 03201
CALCULATED BY TMD DATE 9/14/06
CHECKED BY DATE
DESCRIPTION Hi Vol SHEET NO.

C-4 Faculty Dining

Barometer: 30.06 Thermometer 24.2

P	V
70	5.1
60	4.8
50	3.8
40	3.0
30	2.3

1x CAL: 5.1" @ 60" on at: 2:22
OFF at:

Running At 5.1" @ 60"

Summary:
on < C-4A: Pressure -30" Hg on 2:23
C-4B: Pressure -30" Hg on 2:23

OFF < C-4A: Pressure OFF
C-4B: Pressure OFF

BETA Group, Inc.
Engineers • Scientists • Planners

JOB _____ No. _____
CALCULATED BY _____ DATE _____
CHECKED BY _____ DATE _____
DESCRIPTION _____ SHEET NO. _____

Background 4
~~Background~~ 4 Duplicate
Barometer 30.06 Temp 22.2

P	V
70	5.8
60	5.2
50	4.5
40	3.4
30	2.6

1 x Cal 5.4" @ 60"

Running @ 5.4 @ 59"

Time on 2:43
Time off

Background 4 Duplicate
Barometer 30.06 Temp 22.2

P	V
70	6.0
60	5.2
50	4.5
40	3.8
30	2.9

1 x Cal 5.1 @ 60"
Time on 2:58
Time off

Summary

4A : Time on 2:59 Pressure -30 off Pressure

4B Time on 2:59 Pressure -30 off Pressure

BETA Group, Inc.
Engineers • Scientists • Planners

JOB KMS + AQ No.
CALCULATED BY D. Dillo DATE 9/14/06
CHECKED BY DATE
DESCRIPTION SHEET NO.

Tisch-1000

Magnehelic Gauge Readings

	9/14 4 Hour	9/15 18 Hour	9/14 4 Hour Time	9/15 18 Hour
A-4	51 "H_2O	50	1710	9:18
B-4	59	59	1712	9:20
C-4	59	59	1715	9:22
Background-4	60	58	1718	9:16
Background-4 Dup	61	59	1718	9:16

Keith Middle School							
Vent Stack Sampling							
Date:	9/14/06						
Sampler:	D. Bilo / P. Smith						
Sample Location	A4-A, VS-1						
SUMMA ID:	~~A4A~~ 0185			Flow Controller ID;		7313532	
On Time:	9:00AM			Off Time;	~~10:20~~	100p	
Gauge Reading:	-28	"Hg		Gauge Reading:	-4.5		"Hg
Barometer:	30.06 Hg	~~"H2O~~ Hg		Barometer:	30.06		~~"H2O~~ Hg
Temp:	22.2	C		Temp:	23.5		C
Low Flow:		Pump ID:	584607	Cartridge ID:		001S	
On Time:	900			Off Time:	1020		
Flow Rate:	4.6 L/m			Flow Rate (at Calib.):		~~4.6~~ 4.7	L/m
Estimated Sample Time:							
Barometer:		30.06 Hg		Barometer:	30.06		
Temp:		22.2		Temp:	~~23.5~~		
Sample Location	A4-B VS-1						
SUMMA ID:	0482			Flow Controller ID;		7305292	
On Time:	9:00am			Off Time;	~~10:20~~ 100 pm		
Gauge Reading:	-29	"Hg		Gauge Reading:	-2.0		"Hg
Barometer:	30.06	"H2O		Barometer:	30.06 ~~30.06~~		"H2O
Temp:	22.2	C		Temp:	23.5	22.2	C
Low Flow:		Pump ID:	707523	Cartridge ID:		0019	
On Time:	900			Off Time:	1020		
Flow Rate:	4.6 L/m			Flow Rate (at Calib.):		4.8	L/m
Estimated Sample Time:	9:00Am						
Barometer:		30.06		Barometer:	30.06		
Temp:		22.2		Temp:	~~23.5~~		

Keith Middle School
Vent Stack Sampling

Date: 9/19/06
Sampler: D.B.W.

Sample Location A4-A VS-4

SUMMA ID:	0484		Flow Controller ID;	7305912	
On Time:	100		Off Time;	500	
Gauge Reading:	-32	"Hg	Gauge Reading:	-8.5	"Hg
Barometer:	30.06	"H2O	Barometer:	30.09	"H2O
Temp:	23.5	C	Temp:	22.0	C
Low Flow:		Pump ID: 584594	Cartridge ID:	0021	
On Time:	100 P		Off Time:	Stopped at 43 minutes - Restarted for add'l 18 min to 215	
Flow Rate:	4.6 L/min		Flow Rate (at Calib.):	4.6 L/min	
Estimated Sample Time:	1hr 200			2.7	
Barometer:	30.06		Barometer:	30.06	
Temp:	23.5		Temp:	25.7	

Sample Location A4-B, VS-4

SUMMA ID:	0478		Flow Controller ID;	7304100	
On Time:	100P		Off Time;	~~200~~ 500	
Gauge Reading:	-31	"Hg	Gauge Reading:	-7.5	"Hg
Barometer:	30.06	"H2O	Barometer:	30.09	"H2O
Temp:	23.5	C	Temp:	22.0	C
Low Flow:		Pump ID: 707491	Cartridge ID:	0020	
On Time:	100		Off Time:	200 end	
Flow Rate:	4.6 L/min		Flow Rate (at Calib.):	4.7 L/m	
Estimated Sample Time:	60 min				
Barometer:	30.06		Barometer:	30.06	
Temp:	23.5		Temp:	25.7	

Keith Middle School
Vent Stack Sampling
Date: 9/19/06
Sampler: D.Bilo / P. Smith

Sample Location B4-A, VS-9

SUMMA ID:	0119		Flow Controller ID;	7286458	
On Time:	9:36		Off Time;	~~1044~~ 136	
Gauge Reading:	-13	"Hg	Gauge Reading:	-1.5	"Hg
Barometer:	30.06	~~"H2O~~ Hg	Barometer:	30.06 3	"H2O
Temp:	22.2	C	Temp:	~~22.9~~	C
Low Flow:	Pump ID:	584128	Cartridge ID:	0018	
On Time:	9:36		Off Time:	10:44	4.6
Flow Rate:	4.6 L/m		Flow Rate (at end Calib.):	4.6	L/m
Estimated Sample Time:	70 min		10:46 (off)		
Barometer:	30.06 Hg		Barometer:	30.06	
Temp:	22.2 °C		Temp:	22.9	

Sample Location B4-~~A~~B VS-9

SUMMA ID:	0107		Flow Controller ID;	7305943	
On Time:	9:36		Off Time;	~~1044~~ 136	
Gauge Reading:	-29.5	"Hg	Gauge Reading:	-5.0	"Hg
Barometer:	30.06	~~"H2O~~ Hg	Barometer:	30.06 3	"H2O
Temp:	24.6	C	Temp:	~~22.9~~	C
Low Flow:	Pump ID:	707504	Cartridge ID:	0001 Batch 091106	
On Time:	9:36		Off Time:	1044	4.6
Flow Rate:	4.6 L/m		Flow Rate (at end Calib.):	4.6	L/m
Estimated Sample Time:					
Barometer:	30.06 Hg		Barometer:	30.06 ~~30.06~~	
Temp:	24.6		Temp:	22.9 ~~24.6~~	

Keith Middle School
Vent Stack Sampling

Date:	9/19/06				
Sampler:	D.B./P. Smith				
Sample Location	C4-A, VS-11				
SUMMA ID:	0169		Flow Controller ID;	7304096	
On Time:	10:10		Off Time;	210	
Gauge Reading:	28.5	"Hg	Gauge Reading:	-1.0	"Hg
Barometer:	30.06	~~"H2O~~ Hg	Barometer:	30.06	"H2O
Temp:	23.4	C	Temp:	25.3	C
Low Flow:		Pump ID: 584122	Cartridge ID:	0001	Batch ID 091106
On Time:	1010		Off Time:	1240	
Flow Rate:	4.6 L/m		Flow Rate (at Calib.):	~~4.6~~ 4.7 L/m	
Estimated Sample Time:	~~300~~ 150 min of 2.5 hrs			12:40 (off)	
Barometer:	30.06 Hg		Barometer:	30.06	
Temp:	23.4 °C		Temp:	21.6	
Sample Location	C4-~~A~~B, VS-11				
SUMMA ID:	0143		Flow Controller ID;	7308407	
On Time:	1010		Off Time;	210	
Gauge Reading:	27.5	"Hg	Gauge Reading:	-1.0	"Hg
Barometer:	30.06	~~"H2O~~ Hg	Barometer:	~~30.06~~ 30.06	"H2O
Temp:	23.4	C	Temp:	25.3	C
Low Flow:		Pump ID: 665284	Cartridge ID:	0012	
On Time:	1010		Off Time:	1240	
Flow Rate:	4.6 L/m		Flow Rate (at Calib.):	~~4.6~~ 4.8 L/m	
Estimated Sample Time:					
Barometer:	30.06	Hg	Barometer:	30.06	
Temp:	23.4	°C	Temp:	21.6	

Keith Middle School						
Vent Stack Sampling						
Date: 9/14/06						
Sampler: Billo/D. Smith						
Sample Location	Background 4					
SUMMA ID:	0465		Flow Controller ID;	7249416		
On Time:	1050		Off Time;	250		
Gauge Reading:	-29	"Hg	Gauge Reading:	-7.0		"Hg
Barometer:	30.06	"H2O	Barometer:	30.06		"H2O
Temp:	23.1	C	Temp:	21.7		C
Low Flow:		Pump ID: 584118	Cartridge ID:	0014		
On Time:	1050		Off Time:	250		
Flow Rate:	4.6 L/m		Flow Rate (at Calib.):	~~4.6~~ 4.6 L/min		
Estimated Sample Time:	4hr (250)					
Barometer:	~~30.2~~ 30.06		Barometer:	30.06		
Temp:	23.1		Temp:	21.7		
Sample Location						
SUMMA ID:	0414		Flow Controller ID;	7249383		
On Time:	1050		Off Time;	250		
Gauge Reading:	-30	"Hg	Gauge Reading:	-4.5		"Hg
Barometer:	30.06	"H2O	Barometer:	30.06		"H2O
Temp:	23.1	C	Temp:	21.7		C
Low Flow:	None	Pump ID: —		Cartridge ID: —		
On Time:	—		Off Time:	—		
Flow Rate:	—		Flow Rate (at Calib.):	—		
Estimated Sample Time:	—					
Barometer:	—		Barometer:	—		
Temp:	—		Temp:	—		

• 1240 Shut off Low Flow @ C

~~100~~ - Shut off A Summa

• ~~120~~ - Shut off Summas @ 2

• 210 - Shut off Summa @ C

~~250~~ Shut off all Background

~~100~~ Turn on A VS-4

~~200~~ - Turn off A VS-4 low flow

• ~~5~~00 - Turn off Summa PA

Keith Middle School — Vent Stack Sampling

Date: 10/24/06 — Sampler: Dave Billo, Paul Smith, Tim Downey

Sample Location VS-1

A-5

	ON			OFF	
A	SUMMA ID:	0383		Flow Controller ID:	7308373
	Gauge Reading:	-27.5	"Hg	Gauge Reading:	-4.0 "Hg
B	SUMMA ID:	0369		Flow Controller ID:	7313531
	Gauge Reading:	-28	"Hg	Gauge Reading:	-3.0 "Hg
	Time:	11:15		Time:	~~1214~~ 1515
	Barometer:	29.32	"Hg	Barometer:	29.35 ~~29.29~~ "Hg
	Temp:	63	°C	Temp:	~~62~~ 64.9 °C
	ppbRAE:	10	ppb	ppbRAE:	— ppb
A	Low Flow Pump ID:	799046		Cartridge ID:	52
	Flow Rate (Start):	4.6	LPM	Flow Rate (End Calib.):	4.5 LPM
B	Low Flow Pump ID:	799145		Cartridge ID:	47
	Flow Rate (Start):	4.6	LPM	Flow Rate (End Calib.):	4.6 LPM
	On Time:	11:15		Off Time:	1214
				Barometer:	29.29 "Hg
Vent Uncapped	X			Temp:	59° °C

Sample Location VS-16

B-5

	ON			OFF	
A	SUMMA ID:	0118		Flow Controller ID:	7273191
	Gauge Reading:	-27.5	"Hg	Gauge Reading:	-4.0 "Hg
B	SUMMA ID:	0380		Flow Controller ID:	7276953
	Gauge Reading:	-30	"Hg	Gauge Reading:	-2.0 "Hg
	Time:	11:40		Time:	1540
	Barometer:	29.38	"Hg	Barometer:	29.29 "Hg
	Temp:	66	°C	Temp:	62.1 °C
	ppbRAE:	1	ppb	ppbRAE:	— ppb
A	Low Flow Pump ID:	761804		Cartridge ID:	50
	Flow Rate (Start):	4.6	LPM	Flow Rate (End Calib.):	4.5
B	Low Flow Pump ID:	799069		Cartridge ID:	48
	Flow Rate (Start):	4.6	LPM	Flow Rate (End Calib.):	4.6
	On Time:	11:40		Off Time:	1246
				Barometer:	29.32 "Hg
Vent Uncapped	X			Temp:	62°F °C

Keith Middle School

Date: 10/24/06

Vent Stack Sampling

Sampler: Dave Billo, Paul Smith, Tim Downey

Sample Location VS-11

C-5

	ON		OFF	
A	SUMMA ID:	0322	Flow Controller ID:	7308375
	Gauge Reading:	-27.5 "Hg	Gauge Reading:	-3.5 "Hg
B	SUMMA ID:	0239	Flow Controller ID:	7305949
	Gauge Reading:	-28 "Hg	Gauge Reading:	-02.0 "Hg
	Time:	12:05	Time:	1605
	Barometer:	29.32 "Hg	Barometer:	29.32 "Hg
	Temp:	60 °C	Temp:	64.2 °C
	ppbRAE:	755 ppb	ppbRAE:	X ppb
A	Low Flow Pump ID:	644953	Cartridge ID:	53
	Flow Rate (Start):	4.6 LPM	Flow Rate (End Calib.):	4.4 LPM
B	Low Flow Pump ID:	761806	Cartridge ID:	54
	Flow Rate (Start):	4.6 LPM	Flow Rate (End Calib.):	4.7 LPM
	On Time:	1205	Off Time: (@ 100 min)	B 151
			Barometer:	B 29.32 "Hg
			Temp:	B 61.9 °C

100-50

Range 106 ~~114~~ min flashlapped

See notes on Reverse

A:335

A:29.2

A:61.9

Vent Uncapped [X]

Sample Location Background-5

	ON		OFF	
A	SUMMA ID:	0223	Flow Controller ID:	7249750
	Gauge Reading:	-2.32 "Hg	Gauge Reading:	-5.0 "Hg
Dup-B	SUMMA ID:	0379	Flow Controller ID:	7308371
	Gauge Reading:	-28.5 "Hg	Gauge Reading:	-2.5 "Hg
	Time:	1305	Time:	1705
	Barometer:	29.32 "Hg	Barometer:	29.38 "Hg
	Temp:	65 °C	Temp:	66.6 °C
	ppbRAE:	0 ppb	ppbRAE:	— ppb
A	Low Flow Pump ID:	644895	Cartridge ID:	55
	Flow Rate (Start):	4.6 LPM	Flow Rate (End Calib.):	5.0
B	Low Flow Pump ID:	644899	Cartridge ID:	46
	Flow Rate (Start):	4.6 LPM	Flow Rate (End Calib.):	4.8
	On Time:	1305	Off Time:	1705
			Barometer:	29.38 "Hg
			Temp:	65.1 °C

Vent Uncapped [X N/A]

E5A VS-1/

~~2220~~

220 - put lowflow pump on
for add'l ~~50~~ 75 minutes (~310)

@220 { Temp 61.2
Press 29.32

↳ off @ 335

Total of
175 min

New pump ID = 799150
ending Gal
= 5.2 LPM

Keith Middle School — Vent Stack Sampling

Date: 10/25/06 — Sampler:

Sample Location: A5 ~~B~~ VS-4

	ON		OFF	
A	SUMMA ID:	0483	Flow Controller ID:	7288353
	Gauge Reading:	-26 "Hg	Gauge Reading:	-6.5 "Hg
B	SUMMA ID:	0213	Flow Controller ID:	~~0~~ 7248245
	Gauge Reading:	-32 "Hg	Gauge Reading:	~~-26~~ 7.5 "Hg
	Time:	750	Time:	1140
	Barometer:	29.47 "Hg	Barometer:	29.47 "Hg
	Temp:	49.1 °C	Temp:	59 °C
	ppbRAE:	— ppb	ppbRAE:	— ppb
A	Low Flow Pump ID:	799145	Cartridge ID:	45
	Flow Rate (Start):	4.6 LPM	Flow Rate (End Calib.):	4.7 LPM
B	Low Flow Pump ID:	799046	Cartridge ID:	51
	Flow Rate (Start):	4.6 LPM	Flow Rate (End Calib.):	4.1 LPM
	On Time:	750	Off Time:	849
			Barometer:	29.50 "Hg
Vent Uncapped	✓		Temp:	62.1 °C

Sample Location

	ON		OFF	
A	SUMMA ID:		Flow Controller ID:	
	Gauge Reading:	"Hg	Gauge Reading:	"Hg
B	SUMMA ID:		Flow Controller ID:	
	Gauge Reading:	"Hg	Gauge Reading:	"Hg
	Time:		Time:	
	Barometer:	"Hg	Barometer:	"Hg
	Temp:	°C	Temp:	°C
	ppbRAE:	ppb	ppbRAE:	ppb
A	Low Flow Pump ID:		Cartridge ID:	
	Flow Rate (Start):	LPM	Flow Rate (End Calib.):	
B	Low Flow Pump ID:		Cartridge ID:	
	Flow Rate (Start):	LPM	Flow Rate (End Calib.):	
	On Time:		Off Time:	
			Barometer:	"Hg
Vent Uncapped			Temp:	°C

Keith Middle School								
Hi Volume IAQ								
Sampler:	MP							
Sample Location								
A5	ON	10/24/06	0830		OFF	10/25/06		0830
A	SUMMA S/N:		~~7111~~	7137	Flow Controller ID:		-7,	
	Gauge Reading:		>-30	"Hg	Gauge Reading:		~~29.59~~	"Hg
B	SUMMA S/N:		~~7138~~	7165	Flow Controller ID:			
	Gauge Reading:		>-30	"Hg	Gauge Reading:		-7.5	"Hg
	Date & Time:		10/24	0830	Date & Time:		10/25/06	0830
	Barometer:		29.35	"Hg	Barometer:		29.59	"Hg
	Temp:		63	°~~C~~F	Temp:		66	°~~C~~F
	ppbRAE :			ppb	ppbRAE:			ppb
	Hi Volume Sampler							
	S/N:	3894			Cartridge ID:		0011	
	Calibration							
	Magnehelic		Manometer					
	70	"H_2O	5.2					
	60	"H_2O	4.6					
	50	"H_2O	4.1					
	40	"H_2O	3.5					
	30	"H_2O	2.9					
	One Time Cal @ 60 "H_2O:			6.4	Magnehelic at Shut Down:			60 "H_2O
	On Date & Time:		1024	0830	Off Date & Time:		10/25/06	
	Magnehelic at Start:		60 "H_2O		Barometer: 29.59		"Hg	
	Barometer: 29.59		"Hg		Temp:	66	°~~C~~F	
	Temp:	66	°~~C~~F		Filter and PUF Observations:			Gray

Keith Middle School								
Hi Volume IAQ								
Sampler:	JMD							
Sample Location								
B5	ON		1017		OFF	10/25/06	1017	
A	SUMMA S/N:		7118		Flow Controller ID:		-6	
	Gauge Reading:		-28	"Hg	Gauge Reading:			"Hg
B	SUMMA S/N:		7111		Flow Controller ID:		-5	
	Gauge Reading:		-29	"Hg	Gauge Reading:			"Hg
	Date & Time:		10/24/06	1017	Date & Time:		10/25/06	1017
	Barometer:		29.38	"Hg	Barometer:		29.62	"Hg
	Temp:		66	°~~C~~F	Temp:		72	°~~C~~F
	ppbRAE :			ppb	ppbRAE:			ppb
	Hi Volume Sampler							
	S/N:				Cartridge ID:		0015	
	Calibration							
	Magnehelic		Manometer					
	70	"H_2O	317.1					
	60	"H_2O	6.1					
	50	"H_2O	5.3					
	40	"H_2O	4.8					
	30	"H_2O	2.4					
	One Time Cal @ 60		"H_2O:	6.9	Magnehelic at Shut Down:			56 "H_2O
	On Date & Time:		10/24/06	1017	Off Date & Time:		10/25/06	1017
	Magnehelic at Start:		60 "H_2O		Barometer: 29.62		"Hg	
	Barometer: 29.38		"Hg		Temp:	72	°~~C~~F	
	Temp:	66	°~~C~~F		Filter and PUF Observations:			Gray

Keith Middle School								
Hi Volume IAQ								
Sampler:	TWD							
Sample Location								
C5	ON	10/24/06	0957		OFF	0957	10/25/06	
A	SUMMA S/N:		7135		Flow Controller ID:			
	Gauge Reading:		-30	"Hg	Gauge Reading:		-5	"Hg
B	SUMMA S/N:		7136		Flow Controller ID:			
	Gauge Reading:		-30	"Hg	Gauge Reading:		-9	"Hg
	Date & Time:		10/24/06	0957	Date & Time:		10/25/06	0957
	Barometer:		29.41	"Hg	Barometer:		29.62	"Hg
	Temp:		68.4	°F	Temp:		71	°F
	ppbRAE :			ppb	ppbRAE:			ppb
	Hi Volume Sampler							
	S/N:	9387			Cartridge ID:		0021	
	Calibration							
	Magnehelic		Manometer					
	70	"H_2O	7.1					
	60	"H_2O	6.7					
	50	"H_2O	5.7					
	40	"H_2O	5.0					
	30	"H_2O	3.4					
	One Time Cal @ 60 "H_2O:			6.5	Magnehelic at Shut Down:			55 "H_2O
	On Date & Time:		10/24/06	0957	Off Date & Time:		10/25/06	
	Magnehelic at Start:		60 "H_2O		Barometer: 29.62 "Hg			
	Barometer: 29.41		"Hg		Temp:	71	°C	
	Temp:	68	°F		Filter and PUF Observations:			Cloudy

Keith Middle School								
Hi Volume IAQ								
Sampler:	TMD							
Sample Location								
Back	ON	10/24/06	1129		OFF	10/25/06	1129	
A	SUMMA S/N:		7116		Flow Controller ID:			
	Gauge Reading:		>30	"Hg	Gauge Reading:		-7	"Hg
~~B~~	~~SUMMA S/N~~:				Flow Controller ID:			
	Gauge Reading:			"Hg	Gauge Reading:			"Hg
	Date & Time:		10/24/06		Date & Time:		10/25/06	1129
	Barometer:		29.44	"Hg	Barometer:		29.53	"Hg
	Temp:		59	°~~C~~F	Temp:		60	°~~C~~
	ppbRAE :			ppb	ppbRAE:			ppb
	Hi Volume Sampler							
	S/N:				Cartridge ID:		0001	
	Calibration							
	Magnehelic		Manometer					
	70	"H_2O	8.1					
	60	"H_2O	7.2					
	50	"H_2O	5.9					
	40	"H_2O	4.8					
	30	"H_2O	3.7					
	One Time Cal @ 60 "H_2O:			7.4	Magnehelic at Shut Down:			5.4 "H_2O
	On Date & Time:		10/24/06	1129	Off Date & Time:		10/25/06	1129
	Magnehelic at Start:		60 "H_2O		Barometer: 29.53		"Hg	
	Barometer: 29.44		"Hg		Temp:	60	°~~C~~F	
	Temp:	59	°~~C~~F		Filter and PUF Observations:			white

Keith Middle School							
Hi Volume IAQ							
Sampler:	JMJ						
Sample Location							
Back/Rear	ON	10/24/06	1144		OFF	10/25/06	
A	SUMMA S/N:		7138		Flow Controller ID:		
	Gauge Reading:		-28	"Hg	Gauge Reading:	-3	"Hg
~~B~~	~~SUMMA S/N:~~				Flow Controller ID:		
	Gauge Reading:			"Hg	Gauge Reading:		"Hg
	Date & Time:		10/24/06		Date & Time:		
	Barometer:		29.44	"Hg	Barometer:	29.50	"Hg
	Temp:		68	°F	Temp:	57	°F
	ppbRAE :			ppb	ppbRAE:		ppb
	Hi Volume Sampler						
	S/N:				Cartridge ID:	0002	
	Calibration						
	Magnehelic		Manometer				
	70	"H_2O	8.1				
	60	"H_2O	7.2				
	50	"H_2O	6.4				
	40	"H_2O	5.3				
	30	"H_2O	4.4				
	One Time Cal @ 60 "H_2O:				Magnehelic at Shut Down:		60 "H_2O
	On Date & Time:		10/24/06	1144	Off Date & Time:	10/25/06	
	Magnehelic at Start:		60 "H_2O	7.4	Barometer: 29.50	"Hg	
	Barometer: 29.44		"Hg		Temp: 57	°F	
	Temp:	68	°C		Filter and PUF Observations:		white

Appendix D
High Volume Air Calculation Summaries

Keith Middle School
Indoor Air Sampling PCBs
High Volume Sampling

	Start 8/4/2006	Stop 8/5/2006	Running Time (Min.)	Flow Rate (M^3/Min.)	Total Air Volume (M^3)	Avg. Temp (°K)	Avg. Press. (mm Hg)	Avg. Magnehelic (In.)	Calibration Slope	Calibration Intercept
A-2	1621	1621	1,440	0.2520	363	302.7	759.079	60.0	27.0842	0.8558
B-2	1654	1654	1,440	0.2539	366	303.8	759.46	59.0	30.1323	-0.0448
C-2	1729	1729	1,440	0.2403	346	303.1	759.46	60.0	29.6847	0.5435
Background-2	1836	1836	1,440	0.2429	350	301.6	759.841	58.5	32.7988	-0.3658
Background-2Dup.	1,857	1,857	1,440	0.2540	366	300.9	759.841	62.5	30.1126	0.2182

	Start T	Stop T	AVG T
A-2	28.7	30.6	29.7
B-2	31.3	30.3	30.8
C-2	30.0	30.2	30.1
Background-2	29.4	27.8	28.6
Background-2Dup.	29.8	26.0	27.9

	Start P	Stop P	AVG P
A-2	29.8	30.0	29.9
B-2	29.8	30.0	29.9
C-2	29.8	30.0	29.9
Backgrou	29.8	30.0	29.9
Backgrou	29.8	30.0	29.9

	Start Magn	Stop Magn	AVG Magn
A-2	60.0	60.0	60.0
B-2	60.0	58.0	59.0
C-2	60.0	60.0	60.0
Background-2	60.0	57.0	58.5
Background-2Dup.	60.0	65.0	62.5

Tisch Environmental Inc.
PUF Sampler Calibration

SITE

Location:	KMS A-2	Date:	4-Aug-06
Sampler:	TE-1000	Tech:	T Downey

CONDITIONS

Sampler Elevation (feet):	0		
Measured Pressure (in Hg):	29.80	Corrected Pressure (mm Hg):	757
Temperature (deg F):	84	Temperature (deg K):	302
Average Press. (in Hg):	29.90	Corrected Seasonal (mm Hg):	759
Average Temp. (deg F):	86	Seasonal Temp. (deg K):	303

CALIBRATION ORIFICE

Make:	Tisch	Qstd Slope:	8.85214
Model:	TE-5040A	Qstd Intercept:	-0.00699
Serial#:	434	Date Certified:	5/30/2006

CALIBRATION

Plate or Test #	H2O (in)	Qstd (m3/min)	FLOW (magn)	FLOW (corrected)	LINEAR REGRESSION	
1	5.80	0.271	70.0	8.30	Slope =	27.0842
2	5.00	0.251	60.0	7.68	Intercept =	0.8558
3	4.10	0.228	50.0	7.01	Corr. coeff.=	0.9885
4	3.50	0.210	40.0	6.27		
5	2.10	0.163	30.0	5.43	# of Observations	5

Calculations

Qstd = 1/m[Sqrt(H2O(Pa/Pstd)(Tstd/Ta))-b]
Flow (corrected)=Sqrt((magn)(Pa/Pstd)(Tstd/Ta))

Qstd = standard flow rate
Flow (magn)= reading off of magnehelic gauge
Flow (corrected)= corrected flow rate
m = calibrator Qstd slope
b = calibrator Qstd intercept
Ta = actual temperature during calibration (deg K)
Pa = actual pressure during calibration (mm Hg)
Tstd = 298 deg K
Pstd = 760 mm Hg
For subsequent calculation of sampler flow:
1/m([Sqrt(magn)(Pav/760)(298/Tav)]-b)

m = sampler slope
b = sampler intercept
(magn)= magnehelic reading
Tav = daily average temperature
Pav = daily average pressure

Tisch Environmental Inc.
PUF Sampler Calibration

SITE

Location:	KMS B-2	Date:	4-Aug-06
Sampler:	TE-1000	Tech:	T Downey

CONDITIONS

Sampler Elevation (feet):	0		
Measured Pressure (in Hg):	29.80	Corrected Pressure (mm Hg):	757
Temperature (deg F):	88	Temperature (deg K):	304
Average Press. (in Hg):	29.90	Corrected Seasonal (mm Hg):	759
Average Temp. (deg F):	87	Seasonal Temp. (deg K):	304

CALIBRATION ORIFICE

Make:	Tisch	Qstd Slope:	8.85214
Model:	TE-5040A	Qstd Intercept:	-0.00699
Serial#:	434	Date Certified:	5/30/2006

CALIBRATION

Plate or Test #	H2O (in)	Qstd (m3/min)	FLOW (magn)	FLOW (corrected)	LINEAR REGRESSION	
1	5.90	0.272	70.0	8.26	Slope =	30.1323
2	5.20	0.255	60.0	7.65	Intercept =	-0.0448
3	4.50	0.237	50.0	6.98	Corr. coeff.=	0.9945
4	3.60	0.212	40.0	6.25		
5	2.50	0.177	30.0	5.41	# of Observations	5

Calculations

Qstd = 1/m[Sqrt(H2O(Pa/Pstd)(Tstd/Ta))-b]
Flow (corrected)=Sqrt((magn)(Pa/Pstd)(Tstd/Ta))

Qstd = standard flow rate
Flow (magn)= reading off of magnehelic gauge
Flow (corrected)= corrected flow rate
m = calibrator Qstd slope
b = calibrator Qstd intercept
Ta = actual temperature during calibration (deg K)
Pa = actual pressure during calibration (mm Hg)
Tstd = 298 deg K
Pstd = 760 mm Hg
For subsequent calculation of sampler flow:
1/m([Sqrt(magn)(Pav/760)(298/Tav)]-b)

m = sampler slope
b = sampler intercept
(magn)= magnehelic reading
Tav = daily average temperature
Pav = daily average pressure

Tisch Environmental Inc.
PUF Sampler Calibration

SITE

Location:	KMS C-2	Date:	4-Aug-06
Sampler:	TE-1000	Tech:	T Downey

CONDITIONS

Sampler Elevation (feet):	0		
Measured Pressure (in Hg):	29.80	Corrected Pressure (mm Hg):	757
Temperature (deg F):	86	Temperature (deg K):	303
Average Press. (in Hg):	29.90	Corrected Seasonal (mm Hg):	759
Average Temp. (deg F):	86	Seasonal Temp. (deg K):	303

CALIBRATION ORIFICE

Make:	Tisch	Qstd Slope:	8.85214
Model:	TE-5040A	Qstd Intercept:	-0.00699
Serial#:	434	Date Certified:	5/30/2006

CALIBRATION

Plate or Test #	H2O (in)	Qstd (m3/min)	FLOW (magn)	FLOW (corrected)	LINEAR REGRESSION	
1	5.10	0.253	70.0	8.28	Slope =	29.6847
2	4.70	0.243	60.0	7.67	Intercept =	0.5435
3	3.80	0.219	50.0	7.00	Corr. coeff.=	0.9858
4	3.20	0.201	40.0	6.26		
5	2.00	0.159	30.0	5.42	# of Observations	5

Calculations

Qstd = 1/m[Sqrt(H2O(Pa/Pstd)(Tstd/Ta))-b]
Flow (corrected)=Sqrt((magn)(Pa/Pstd)(Tstd/Ta))

Qstd = standard flow rate
Flow (magn)= reading off of magnehelic gauge
Flow (corrected)= corrected flow rate
m = calibrator Qstd slope
b = calibrator Qstd intercept
Ta = actual temperature during calibration (deg K)
Pa = actual pressure during calibration (mm Hg)
Tstd = 298 deg K
Pstd = 760 mm Hg
For subsequent calculation of sampler flow:
1/m([Sqrt(magn)(Pav/760)(298/Tav)]-b)

m = sampler slope
b = sampler intercept
(magn)= magnehelic reading
Tav = daily average temperature
Pav = daily average pressure

Tisch Environmental Inc.
PUF Sampler Calibration

SITE

Location:	KMS Background-2	Date:	4-Aug-06
Sampler:	TE-1000	Tech:	T Downey

CONDITIONS

Sampler Elevation (feet):	0		
Measured Pressure (in Hg):	29.80	Corrected Pressure (mm Hg):	757
Temperature (deg F):	85	Temperature (deg K):	302
Average Press. (in Hg):	29.90	Corrected Seasonal (mm Hg):	759
Average Temp. (deg F):	83	Seasonal Temp. (deg K):	302

CALIBRATION ORIFICE

Make:	Tisch	Qstd Slope:	8.85214
Model:	TE-5040A	Qstd Intercept:	-0.00699
Serial#:	434	Date Certified:	5/30/2006

CALIBRATION

Plate or Test #	H2O (in)	Qstd (m3/min)	FLOW (magn)	FLOW (corrected)	LINEAR REGRESSION	
1	5.40	0.261	70.0	8.29	Slope =	32.7988
2	4.80	0.246	60.0	7.67	Intercept =	-0.3658
3	4.10	0.227	50.0	7.01	Corr. coeff.=	0.9972
4	3.30	0.204	40.0	6.27		
5	2.40	0.174	30.0	5.43	# of Observations	5

Calculations

Qstd = 1/m[Sqrt(H2O(Pa/Pstd)(Tstd/Ta))-b]
Flow (corrected)=Sqrt((magn)(Pa/Pstd)(Tstd/Ta))

Qstd = standard flow rate
Flow (magn)= reading off of magnehelic gauge
Flow (corrected)= corrected flow rate
m = calibrator Qstd slope
b = calibrator Qstd intercept
Ta = actual temperature during calibration (deg K)
Pa = actual pressure during calibration (mm Hg)
Tstd = 298 deg K
Pstd = 760 mm Hg
For subsequent calculation of sampler flow:
1/m([Sqrt(magn)(Pav/760)(298/Tav)]-b)

m = sampler slope
b = sampler intercept
(magn)= magnehelic reading
Tav = daily average temperature
Pav = daily average pressure

Tisch Environmental Inc.
PUF Sampler Calibration

SITE

Location:	KMS Background-2Dup	Date:	4-Aug-06
Sampler:	TE-1000	Tech:	T Downey

CONDITIONS

Sampler Elevation (feet):	0		
Measured Pressure (in Hg):	29.80	Corrected Pressure (mm Hg):	757
Temperature (deg F):	85	Temperature (deg K):	302
Average Press. (in Hg):	29.90	Corrected Seasonal (mm Hg):	759
Average Temp. (deg F):	82	Seasonal Temp. (deg K):	301

CALIBRATION ORIFICE

Make:	Tisch	Qstd Slope:	8.85214
Model:	TE-5040A	Qstd Intercept:	-0.00699
Serial#:	434	Date Certified:	5/30/2006

CALIBRATION

Plate or Test #	H2O (in)	Qstd (m3/min)	FLOW (magn)	FLOW (corrected)	LINEAR REGRESSION	
1	6.40	0.284	70.0	8.29	Slope =	30.1126
2	5.20	0.256	60.0	7.68	Intercept =	-0.2182
3	4.60	0.241	50.0	7.01	Corr. coeff.=	0.9920
4	3.90	0.222	40.0	6.27		
5	2.70	0.185	30.0	5.43	# of Observations	5

Calculations

Qstd = 1/m[Sqrt(H2O(Pa/Pstd)(Tstd/Ta))-b]
Flow (corrected)=Sqrt((magn)(Pa/Pstd)(Tstd/Ta))

Qstd = standard flow rate
Flow (magn)= reading off of magnehelic gauge
Flow (corrected)= corrected flow rate
m = calibrator Qstd slope
b = calibrator Qstd intercept
Ta = actual temperature during calibration (deg K)
Pa = actual pressure during calibration (mm Hg)
Tstd = 298 deg K
Pstd = 760 mm Hg
For subsequent calculation of sampler flow:
1/m([Sqrt(magn)(Pav/760)(298/Tav)]-b)

m = sampler slope
b = sampler intercept
(magn)= magnehelic reading
Tav = daily average temperature
Pav = daily average pressure

Keith Middle School
Indoor Air Sampling PCBs
High Volume Sampling

	Start 8/18/2006	Stop 8/19/2006	Running Time (Min.)	Flow Rate (M^3/Min.)	Total Air Volume (M^3)	Avg. Temp (°K)	Avg. Press. (mm Hg)	Avg. Magnehelic (In.)	Calibration Slope	Calibration Intercept
A-3	1526	1526	1,440	0.2618	377	301.5	763.143	57.5	30.1249	-0.3335
B-3	1539	1539	1,440	0.2541	366	301.0	763.524	56.0	28.764	0.1558
C-3	1555	1555	1,440	0.2454	353	300.7	763.143	55.0	29.8376	0.0746
Background-3	1640	1640	1,440	0.2530	364	302.8	763.143	56.0	30.7286	-0.3356
Background-3Dup.	1,658	1,658	1,440	0.2531	365	303.0	763.143	59.5	32.0594	-0.4499

	Start T	Stop T	AVG T
A-3	28.4	28.6	28.5
B-3	28.0	27.9	28.0
C-3	27.6	27.8	27.7
Background-3	31.2	28.3	29.8
Background-3Dup.	31.6	28.4	30.0

	Start P	Stop P	AVG P
A-3	30.1	30.0	30.0
B-3	30.2	30.0	30.1
C-3	30.1	30.0	30.0
Background-3	30.1	30.0	30.0
Background-3D	30.1	30.0	30.0

	Start Magn	Stop Magn	AVG Magn
A-3	60.0	55.0	57.5
B-3	60.0	52.0	56.0
C-3	60.0	50.0	55.0
Background-3	60.0	52.0	56.0
Background-3Dup.	60.0	59.0	59.5

Tisch Environmental Inc.
PUF Sampler Calibration

SITE

Location:	KMS A-3	Date:	18-Aug-06
Sampler:	TE-1000	Tech:	T Downey

CONDITIONS

Sampler Elevation (feet):	0		
Measured Pressure (in Hg):	30.12	Corrected Pressure (mm Hg):	765
Temperature (deg F):	83	Temperature (deg K):	301
Average Press. (in Hg):	30.00	Corrected Seasonal (mm Hg):	762
Average Temp. (deg F):	83	Seasonal Temp. (deg K):	302

CALIBRATION ORIFICE

Make:	Tisch	Qstd Slope:	8.85214
Model:	TE-5040A	Qstd Intercept:	-0.00699
Serial#:	434	Date Certified:	5/30/2006

CALIBRATION

Plate or Test #	H2O (in)	Qstd (m3/min)	FLOW (magn)	FLOW (corrected)	LINEAR REGRESSION	
1	6.30	0.284	70.0	8.35	Slope =	30.1249
2	5.70	0.270	60.0	7.73	Intercept =	-0.3335
3	4.80	0.248	50.0	7.05	Corr. coeff.=	0.9957
4	3.90	0.223	40.0	6.31		
5	2.80	0.189	30.0	5.46	# of Observations	5

Calculations

Qstd = 1/m[Sqrt(H2O(Pa/Pstd)(Tstd/Ta))-b]
Flow (corrected)=Sqrt((magn)(Pa/Pstd)(Tstd/Ta))

Qstd = standard flow rate
Flow (magn)= reading off of magnehelic gauge
Flow (corrected)= corrected flow rate
m = calibrator Qstd slope
b = calibrator Qstd intercept
Ta = actual temperature during calibration (deg K)
Pa = actual pressure during calibration (mm Hg)
Tstd = 298 deg K
Pstd = 760 mm Hg
For subsequent calculation of sampler flow:
1/m([Sqrt(magn)(Pav/760)(298/Tav)]-b)

m = sampler slope
b = sampler intercept
(magn)= magnehelic reading
Tav = daily average temperature
Pav = daily average pressure

Tisch Environmental Inc.
PUF Sampler Calibration

SITE

Location:	KMS B-3	Date:	18-Aug-06
Sampler:	TE-1000	Tech:	T Downey

CONDITIONS

Sampler Elevation (feet):	0		
Measured Pressure (in Hg):	30.15	Corrected Pressure (mm Hg):	766
Temperature (deg F):	82	Temperature (deg K):	301
Average Press. (in Hg):	30.10	Corrected Seasonal (mm Hg):	765
Average Temp. (deg F):	82	Seasonal Temp. (deg K):	301

CALIBRATION ORIFICE

Make:	Tisch	Qstd Slope:	8.85214
Model:	TE-5040A	Qstd Intercept:	-0.00699
Serial#:	434	Date Certified:	5/30/2006

CALIBRATION

Plate or Test #	H2O (in)	Qstd (m3/min)	FLOW (magn)	FLOW (corrected)	LINEAR REGRESSION	
1	6.20	0.282	70.0	8.36	Slope =	28.7640
2	5.40	0.263	60.0	7.74	Intercept =	0.1558
3	4.80	0.248	50.0	7.06	Corr. coeff.=	0.9917
4	3.40	0.209	40.0	6.32		
5	2.70	0.186	30.0	5.47	# of Observations	5

Calculations

Qstd = 1/m[Sqrt(H2O(Pa/Pstd)(Tstd/Ta))-b]
Flow (corrected)=Sqrt((magn)(Pa/Pstd)(Tstd/Ta))

Qstd = standard flow rate
Flow (magn)= reading off of magnehelic gauge
Flow (corrected)= corrected flow rate
m = calibrator Qstd slope
b = calibrator Qstd intercept
Ta = actual temperature during calibration (deg K)
Pa = actual pressure during calibration (mm Hg)
Tstd = 298 deg K
Pstd = 760 mm Hg
For subsequent calculation of sampler flow:
1/m([Sqrt(magn)(Pav/760)(298/Tav)]-b)

m = sampler slope
b = sampler intercept
(magn)= magnehelic reading
Tav = daily average temperature
Pav = daily average pressure

Tisch Environmental Inc.
PUF Sampler Calibration

SITE

Location:	KMS C-3	Date:	18-Aug-06
Sampler:	TE-1000	Tech:	T Downey

CONDITIONS

Sampler Elevation (feet):	0		
Measured Pressure (in Hg):	30.12	Corrected Pressure (mm Hg):	765
Temperature (deg F):	82	Temperature (deg K):	301
Average Press. (in Hg):	30.00	Corrected Seasonal (mm Hg):	762
Average Temp. (deg F):	82	Seasonal Temp. (deg K):	301

CALIBRATION ORIFICE

Make:	Tisch	Qstd Slope:	8.85214
Model:	TE-5040A	Qstd Intercept:	-0.00699
Serial#:	434	Date Certified:	5/30/2006

CALIBRATION

Plate or Test #	H2O (in)	Qstd (m3/min)	FLOW (magn)	FLOW (corrected)	LINEAR REGRESSION	
1	5.90	0.275	70.0	8.36	Slope =	29.8376
2	5.10	0.256	60.0	7.74	Intercept =	0.0746
3	4.50	0.240	50.0	7.06	Corr. coeff.=	0.9960
4	3.40	0.209	40.0	6.32		
5	2.50	0.179	30.0	5.47	# of Observations	5

Calculations

Qstd = 1/m[Sqrt(H2O(Pa/Pstd)(Tstd/Ta))-b]
Flow (corrected)=Sqrt((magn)(Pa/Pstd)(Tstd/Ta))

Qstd = standard flow rate
Flow (magn)= reading off of magnehelic gauge
Flow (corrected)= corrected flow rate
m = calibrator Qstd slope
b = calibrator Qstd intercept
Ta = actual temperature during calibration (deg K)
Pa = actual pressure during calibration (mm Hg)
Tstd = 298 deg K
Pstd = 760 mm Hg
For subsequent calculation of sampler flow:
1/m([Sqrt(magn)(Pav/760)(298/Tav)]-b)

m = sampler slope
b = sampler intercept
(magn)= magnehelic reading
Tav = daily average temperature
Pav = daily average pressure

Tisch Environmental Inc.
PUF Sampler Calibration

SITE

Location:	KMS Background-3	Date:	18-Aug-06
Sampler:	TE-1000	Tech:	T Downey

CONDITIONS

Sampler Elevation (feet):	0		
Measured Pressure (in Hg):	30.12	Corrected Pressure (mm Hg):	765
Temperature (deg F):	86	Temperature (deg K):	303
Average Press. (in Hg):	30.00	Corrected Seasonal (mm Hg):	762
Average Temp. (deg F):	83	Seasonal Temp. (deg K):	302

CALIBRATION ORIFICE

Make:	Tisch	Qstd Slope:	8.85214
Model:	TE-5040A	Qstd Intercept:	-0.00699
Serial#:	434	Date Certified:	5/30/2006

CALIBRATION

Plate or Test #	H2O (in)	Qstd (m3/min)	FLOW (magn)	FLOW (corrected)	LINEAR REGRESSION	
1	6.30	0.283	70.0	8.33	Slope =	30.7286
2	5.20	0.257	60.0	7.71	Intercept =	-0.3356
3	4.70	0.245	50.0	7.04	Corr. coeff.=	0.9957
4	3.60	0.214	40.0	6.30		
5	2.80	0.189	30.0	5.45	# of Observations	5

Calculations

Qstd = 1/m[Sqrt(H2O(Pa/Pstd)(Tstd/Ta))-b]
Flow (corrected)=Sqrt((magn)(Pa/Pstd)(Tstd/Ta))

Qstd = standard flow rate
Flow (magn)= reading off of magnehelic gauge
Flow (corrected)= corrected flow rate
m = calibrator Qstd slope
b = calibrator Qstd intercept
Ta = actual temperature during calibration (deg K)
Pa = actual pressure during calibration (mm Hg)
Tstd = 298 deg K
Pstd = 760 mm Hg
For subsequent calculation of sampler flow:
1/m([Sqrt(magn)(Pav/760)(298/Tav)]-b)

m = sampler slope
b = sampler intercept
(magn)= magnehelic reading
Tav = daily average temperature
Pav = daily average pressure

Tisch Environmental Inc.
PUF Sampler Calibration

SITE

Location:	KMS Background-3Dup	Date:	18-Aug-06
Sampler:	TE-1000	Tech:	T Downey

CONDITIONS

Sampler Elevation (feet):	0		
Measured Pressure (in Hg):	30.12	Corrected Pressure (mm Hg):	765
Temperature (deg F):	89	Temperature (deg K):	305
Average Press. (in Hg):	30.00	Corrected Seasonal (mm Hg):	762
Average Temp. (deg F):	86	Seasonal Temp. (deg K):	303

CALIBRATION ORIFICE

Make:	Tisch	Qstd Slope:	8.85214
Model:	TE-5040A	Qstd Intercept:	-0.00699
Serial#:	434	Date Certified:	5/30/2006

CALIBRATION

Plate or Test #	H2O (in)	Qstd (m3/min)	FLOW (magn)	FLOW (corrected)	LINEAR REGRESSION	
1	5.60	0.266	70.0	8.30	Slope =	32.0594
2	5.10	0.254	60.0	7.69	Intercept =	-0.4499
3	4.50	0.239	50.0	7.02	Corr. coeff.=	0.9843
4	3.70	0.216	40.0	6.28		
5	2.50	0.178	30.0	5.44	# of Observations	5

Calculations

Qstd = 1/m[Sqrt(H2O(Pa/Pstd)(Tstd/Ta))-b]
Flow (corrected)=Sqrt((magn)(Pa/Pstd)(Tstd/Ta))

Qstd = standard flow rate
Flow (magn)= reading off of magnehelic gauge
Flow (corrected)= corrected flow rate
m = calibrator Qstd slope
b = calibrator Qstd intercept
Ta = actual temperature during calibration (deg K)
Pa = actual pressure during calibration (mm Hg)
Tstd = 298 deg K
Pstd = 760 mm Hg
For subsequent calculation of sampler flow:
1/m([Sqrt(magn)(Pav/760)(298/Tav)]-b)

m = sampler slope
b = sampler intercept
(magn)= magnehelic reading
Tav = daily average temperature
Pav = daily average pressure

Keith Middle School
Indoor Air Sampling PCBs
High Volume Sampling

	Start 9/14/2006	Stop 9/15/2006	Running Time (Min.)	Flow Rate (M^3/Min.)	Total Air Volume (M^3)	Avg. Temp (°K)	Avg. Press. (mm Hg)	Avg. Magnehelic (In.)	Calibration Slope	Calibration Intercept
A-4	1342	1342	1,440	0.2168	312	294.7	763.524	50.0	34.4715	-0.3465
B-4	1403	1403	1,440	0.2594	374	298.2	763.524	59.0	32.7689	-0.8035
C-4	1422	1422	1,440	0.2383	343	296.3	763.524	59.5	33.6232	-0.2574
Background-4	1443	1443	1,440	0.2531	364	295.3	763.524	59.5	32.3069	-0.4082
Background-4 Dup.	1,458	1,458	1,440	0.2580	372	294.6	763.524	60.5	35.0104	-1.1906

	Start T	Stop T	AVG T
A-4	22.0	21.4	21.7
B-4	26.1	24.2	25.2
C-4	24.2	22.3	23.3
Background-4	22.2	22.3	22.3
Background-4Dup.	22.2	20.9	21.6

	Start P	Stop P	AVG P
A-4	30.1	30.1	30.1
B-4	30.1	30.1	30.1
C-4	30.1	30.1	30.1
Background-4	30.1	30.1	30.1
Background-4D	30.1	30.1	30.1

	Start Magn	Stop Magn	AVG Magn
A-4	50.0	50.0	50.0
B-4	60.0	58.0	59.0
C-4	60.0	59.0	59.5
Background-4	59.0	60.0	59.5
Background-4Dup.	60.0	61.0	60.5

Tisch Environmental Inc.
PUF Sampler Calibration

SITE

Location:	KMS A-4	Date:	14-Sep-06
Sampler:	TE-1000	Tech:	T Downey

CONDITIONS

Sampler Elevation (feet):	0		
Measured Pressure (in Hg):	30.06	Corrected Pressure (mm Hg):	764
Temperature (deg F):	72	Temperature (deg K):	295
Average Press. (in Hg):	30.06	Corrected Seasonal (mm Hg):	764
Average Temp. (deg F):	71	Seasonal Temp. (deg K):	295

CALIBRATION ORIFICE

Make:	Tisch	Qstd Slope:	9.22623
Model:	TE-5040A	Qstd Intercept:	-0.06115
Serial#:	373	Date Certified:	9/12/2006

CALIBRATION

Plate or Test #	H2O (in)	Qstd (m3/min)	FLOW (magn)	FLOW (corrected)	LINEAR REGRESSION	
1	5.10	0.253	70.0	8.43	Slope =	34.4715
2	4.40	0.236	60.0	7.80	Intercept =	-0.3465
3	3.80	0.219	50.0	7.12	Corr. coeff.=	0.9985
4	3.00	0.196	40.0	6.37		
5	2.20	0.169	30.0	5.52	# of Observations	5

Calculations

Qstd = 1/m[Sqrt(H2O(Pa/Pstd)(Tstd/Ta))-b]
Flow (corrected)=Sqrt((magn)(Pa/Pstd)(Tstd/Ta))

Qstd = standard flow rate
Flow (magn)= reading off of magnehelic gauge
Flow (corrected)= corrected flow rate
m = calibrator Qstd slope
b = calibrator Qstd intercept
Ta = actual temperature during calibration (deg K)
Pa = actual pressure during calibration (mm Hg)
Tstd = 298 deg K
Pstd = 760 mm Hg
For subsequent calculation of sampler flow:
1/m([Sqrt(magn)(Pav/760)(298/Tav)]-b)

m = sampler slope
b = sampler intercept
(magn)= magnehelic reading
Tav = daily average temperature
Pav = daily average pressure

Tisch Environmental Inc.
PUF Sampler Calibration

SITE

Location:	KMS B-4	Date:	14-Sep-06
Sampler:	TE-1000	Tech:	T Downey

CONDITIONS

Sampler Elevation (feet):	0		
Measured Pressure (in Hg):	30.06	Corrected Pressure (mm Hg):	764
Temperature (deg F):	79	Temperature (deg K):	299
Average Press. (in Hg):	30.06	Corrected Seasonal (mm Hg):	764
Average Temp. (deg F):	77	Seasonal Temp. (deg K):	298

CALIBRATION ORIFICE

Make:	Tisch	Qstd Slope:	9.22623
Model:	TE-5040A	Qstd Intercept:	-0.06115
Serial#:	373	Date Certified:	9/12/2006

CALIBRATION

Plate or Test #	H2O (in)	Qstd (m3/min)	FLOW (magn)	FLOW (corrected)	LINEAR REGRESSION	
1	6.20	0.277	70.0	8.37	Slope =	32.7689
2	5.50	0.261	60.0	7.75	Intercept =	-0.8035
3	4.90	0.247	50.0	7.07	Corr. coeff.=	0.9942
4	3.70	0.215	40.0	6.33		
5	2.90	0.191	30.0	5.48	# of Observations	5

Calculations

Qstd = 1/m[Sqrt(H2O(Pa/Pstd)(Tstd/Ta))-b]
Flow (corrected)=Sqrt((magn)(Pa/Pstd)(Tstd/Ta))

Qstd = standard flow rate
Flow (magn)= reading off of magnehelic gauge
Flow (corrected)= corrected flow rate
m = calibrator Qstd slope
b = calibrator Qstd intercept
Ta = actual temperature during calibration (deg K)
Pa = actual pressure during calibration (mm Hg)
Tstd = 298 deg K
Pstd = 760 mm Hg
For subsequent calculation of sampler flow:
1/m([Sqrt(magn)(Pav/760)(298/Tav)]-b)

m = sampler slope
b = sampler intercept
(magn)= magnehelic reading
Tav = daily average temperature
Pav = daily average pressure

Tisch Environmental Inc.
PUF Sampler Calibration

SITE

Location:	KMS C-4	Date:	14-Sep-06
Sampler:	TE-1000	Tech:	T Downey

CONDITIONS

Sampler Elevation (feet):	0		
Measured Pressure (in Hg):	30.06	Corrected Pressure (mm Hg):	764
Temperature (deg F):	76	Temperature (deg K):	297
Average Press. (in Hg):	30.06	Corrected Seasonal (mm Hg):	764
Average Temp. (deg F):	74	Seasonal Temp. (deg K):	296

CALIBRATION ORIFICE

Make:	Tisch	Qstd Slope:	9.22623
Model:	TE-5040A	Qstd Intercept:	-0.06115
Serial#:	373	Date Certified:	9/12/2006

CALIBRATION

Plate or Test #	H2O (in)	Qstd (m3/min)	FLOW (magn)	FLOW (corrected)	LINEAR REGRESSION	
1	5.10	0.252	70.0	8.40	Slope =	33.6232
2	4.80	0.245	60.0	7.77	Intercept =	-0.2574
3	3.80	0.219	50.0	7.10	Corr. coeff.=	0.9929
4	3.00	0.195	40.0	6.35		
5	2.30	0.172	30.0	5.50	# of Observations	5

Calculations

Qstd = 1/m[Sqrt(H2O(Pa/Pstd)(Tstd/Ta))-b]
Flow (corrected)=Sqrt((magn)(Pa/Pstd)(Tstd/Ta))

Qstd = standard flow rate
Flow (magn)= reading off of magnehelic gauge
Flow (corrected)= corrected flow rate
m = calibrator Qstd slope
b = calibrator Qstd intercept
Ta = actual temperature during calibration (deg K)
Pa = actual pressure during calibration (mm Hg)
Tstd = 298 deg K
Pstd = 760 mm Hg
For subsequent calculation of sampler flow:
1/m([Sqrt(magn)(Pav/760)(298/Tav)]-b)

m = sampler slope
b = sampler intercept
(magn)= magnehelic reading
Tav = daily average temperature
Pav = daily average pressure

Tisch Environmental Inc.
PUF Sampler Calibration

SITE

Location:	KMS Background-4	Date:	14-Sep-06
Sampler:	TE-1000	Tech:	T Downey

CONDITIONS

Sampler Elevation (feet):	0		
Measured Pressure (in Hg):	30.06	Corrected Pressure (mm Hg):	764
Temperature (deg F):	72	Temperature (deg K):	295
Average Press. (in Hg):	30.06	Corrected Seasonal (mm Hg):	764
Average Temp. (deg F):	72	Seasonal Temp. (deg K):	295

CALIBRATION ORIFICE

Make:	Tisch	Qstd Slope:	9.22623
Model:	TE-5040A	Qstd Intercept:	-0.06115
Serial#:	373	Date Certified:	9/12/2006

CALIBRATION

Plate or Test #	H2O (in)	Qstd (m3/min)	FLOW (magn)	FLOW (corrected)	LINEAR REGRESSION	
1	5.80	0.269	70.0	8.43	Slope =	32.3069
2	5.20	0.256	60.0	7.80	Intercept =	-0.4082
3	4.50	0.238	50.0	7.12	Corr. coeff.=	0.9953
4	3.40	0.208	40.0	6.37		
5	2.60	0.183	30.0	5.52	# of Observations	5

Calculations

Qstd = 1/m[Sqrt(H2O(Pa/Pstd)(Tstd/Ta))-b]
Flow (corrected)=Sqrt((magn)(Pa/Pstd)(Tstd/Ta))

Qstd = standard flow rate
Flow (magn)= reading off of magnehelic gauge
Flow (corrected)= corrected flow rate
m = calibrator Qstd slope
b = calibrator Qstd intercept
Ta = actual temperature during calibration (deg K)
Pa = actual pressure during calibration (mm Hg)
Tstd = 298 deg K
Pstd = 760 mm Hg
For subsequent calculation of sampler flow:
1/m([Sqrt(magn)(Pav/760)(298/Tav)]-b)

m = sampler slope
b = sampler intercept
(magn)= magnehelic reading
Tav = daily average temperature
Pav = daily average pressure

Tisch Environmental Inc.
PUF Sampler Calibration

SITE

Location:	KMS Background Dup-4	Date:	14-Sep-06
Sampler:	TE-1000	Tech:	T Downey

CONDITIONS

Sampler Elevation (feet):	0		
Measured Pressure (in Hg):	30.06	Corrected Pressure (mm Hg):	764
Temperature (deg F):	72	Temperature (deg K):	295
Average Press. (in Hg):	30.06	Corrected Seasonal (mm Hg):	764
Average Temp. (deg F):	71	Seasonal Temp. (deg K):	295

CALIBRATION ORIFICE

Make:	Tisch	Qstd Slope:	9.22623
Model:	TE-5040A	Qstd Intercept:	-0.06115
Serial#:	373	Date Certified:	9/12/2006

CALIBRATION

Plate or Test #	H2O (in)	Qstd (m3/min)	FLOW (magn)	FLOW (corrected)	LINEAR REGRESSION	
1	6.00	0.274	70.0	8.43	Slope =	35.0104
2	5.20	0.256	60.0	7.80	Intercept =	-1.1906
3	4.50	0.238	50.0	7.12	Corr. coeff.=	0.9977
4	3.80	0.219	40.0	6.37		
5	2.80	0.189	30.0	5.52	# of Observations	5

Calculations

Qstd = 1/m[Sqrt(H2O(Pa/Pstd)(Tstd/Ta))-b]
Flow (corrected)=Sqrt((magn)(Pa/Pstd)(Tstd/Ta))

Qstd = standard flow rate
Flow (magn)= reading off of magnehelic gauge
Flow (corrected)= corrected flow rate
m = calibrator Qstd slope
b = calibrator Qstd intercept
Ta = actual temperature during calibration (deg K)
Pa = actual pressure during calibration (mm Hg)
Tstd = 298 deg K
Pstd = 760 mm Hg
For subsequent calculation of sampler flow:
1/m([Sqrt(magn)(Pav/760)(298/Tav)]-b)

m = sampler slope
b = sampler intercept
(magn)= magnehelic reading
Tav = daily average temperature
Pav = daily average pressure

Keith Middle School
Indoor Air Sampling PCBs
High Volume Sampling

	Start 10/24/2006	Stop 10/25/2006	Running Time (Min.)	Flow Rate (M^3/Min.)	Total Air Volume (M^3)	Avg. Temp (°K)	Avg. Press. (mm Hg)	Avg. Magnehelic (In.)	Calibration Slope	Calibration Intercept
A-5	830	830	1,440	0.2075	299	291.1	748.538	60.0	52.4557	-3.1069
B-5	1017	1017	1,440	0.2378	342	293.3	749.3	58.0	26.7606	1.2583
C-5	957	957	1,440	0.2414	348	293.9	749.681	57.5	35.6279	-1.0184
Background-5	1129	1129	1,440	0.2503	360	288.3	748.919	56.5	32.0132	-0.4259
Background-5 Dup.	1,144	1,144	1,440	0.2592	373	289.9	748.538	60.0	39.8425	-2.5332

	Start T	Stop T	AVG T °F	AVG T °C
A-5	63.0	66.0	64.5	18.06
B-5	65.0	72.0	68.5	20.28
C-5	68.4	71.0	69.7	20.94
Background-5	59.0	60.0	59.5	15.28
Background-5Dup.	68.0	57.0	62.5	16.94

	Start P	Stop P	AVG P
A-5	29.35	29.59	29.47
B-5	29.38	29.62	29.50
C-5	29.41	29.62	29.52
Background-5	29.44	29.53	29.49
Background-5D	29.44	29.50	29.47

	Start Magn	Stop Magn	AVG Magn
A-5	60.0	60.0	60.0
B-5	60.0	56.0	58.0
C-5	60.0	55.0	57.5
Background-5	59.0	54.0	56.5
Background-5Dup.	60.0	60.0	60.0

Tisch Environmental Inc.
PUF Sampler Calibration

SITE

Location:	KMS A-5	Date:	24-Oct-06
Sampler:	TE-1000	Tech:	T Downey

CONDITIONS

Sampler Elevation (feet):	0		
Measured Pressure (in Hg):	29.35	Corrected Pressure (mm Hg):	745
Temperature (deg F):	63	Temperature (deg K):	290
Average Press. (in Hg):	29.47	Corrected Seasonal (mm Hg):	749
Average Temp. (deg F):	65	Seasonal Temp. (deg K):	291

CALIBRATION ORIFICE

Make:	Tisch	Qstd Slope:	10.41375
Model:	TE-5040A	Qstd Intercept:	0.00106
Serial#:	9833620	Date Certified:	10/22/2005

CALIBRATION

Plate or Test #	H2O (in)	Qstd (m3/min)	FLOW (magn)	FLOW (corrected)	LINEAR REGRESSION	
1	5.20	0.220	70.0	8.40	Slope =	52.4557
2	4.60	0.207	60.0	7.77	Intercept =	-3.1069
3	4.10	0.195	50.0	7.10	Corr. coeff.=	0.9997
4	3.50	0.180	40.0	6.35		
5	2.90	0.164	30.0	5.50	# of Observations	5

Calculations

Qstd = 1/m[Sqrt(H2O(Pa/Pstd)(Tstd/Ta))-b]
Flow (corrected)=Sqrt((magn)(Pa/Pstd)(Tstd/Ta))

Qstd = standard flow rate
Flow (magn)= reading off of magnehelic gauge
Flow (corrected)= corrected flow rate
m = calibrator Qstd slope
b = calibrator Qstd intercept
Ta = actual temperature during calibration (deg K)
Pa = actual pressure during calibration (mm Hg)
Tstd = 298 deg K
Pstd = 760 mm Hg
For subsequent calculation of sampler flow:
1/m([Sqrt(magn)(Pav/760)(298/Tav)]-b)

m = sampler slope
b = sampler intercept
(magn)= magnehelic reading
Tav = daily average temperature
Pav = daily average pressure

Tisch Environmental Inc.
PUF Sampler Calibration

SITE

Location:	KMS B-5	Date:	24-Oct-06
Sampler:	TE-1000	Tech:	T Downey

CONDITIONS

Sampler Elevation (feet):	0		
Measured Pressure (in Hg):	29.38	Corrected Pressure (mm Hg):	746
Temperature (deg F):	65	Temperature (deg K):	291
Average Press. (in Hg):	29.50	Corrected Seasonal (mm Hg):	749
Average Temp. (deg F):	69	Seasonal Temp. (deg K):	293

CALIBRATION ORIFICE

Make:	Tisch	Qstd Slope:	10.41375
Model:	TE-5040A	Qstd Intercept:	0.00106
Serial#:	9833620	Date Certified:	10/22/2005

CALIBRATION

Plate or Test #	H2O (in)	Qstd (m3/min)	FLOW (magn)	FLOW (corrected)	LINEAR REGRESSION	
1	7.10	0.256	70.0	8.38	Slope =	26.7606
2	6.10	0.238	60.0	7.76	Intercept =	1.2583
3	5.30	0.221	50.0	7.09	Corr. coeff.=	0.9535
4	4.80	0.211	40.0	6.34		
5	2.40	0.149	30.0	5.49	# of Observations	5

Calculations

Qstd = 1/m[Sqrt(H2O(Pa/Pstd)(Tstd/Ta))-b]
Flow (corrected)=Sqrt((magn)(Pa/Pstd)(Tstd/Ta))

Qstd = standard flow rate
Flow (magn)= reading off of magnehelic gauge
Flow (corrected)= corrected flow rate
m = calibrator Qstd slope
b = calibrator Qstd intercept
Ta = actual temperature during calibration (deg K)
Pa = actual pressure during calibration (mm Hg)
Tstd = 298 deg K
Pstd = 760 mm Hg
For subsequent calculation of sampler flow:
1/m([Sqrt(magn)(Pav/760)(298/Tav)]-b)

m = sampler slope
b = sampler intercept
(magn)= magnehelic reading
Tav = daily average temperature
Pav = daily average pressure

Tisch Environmental Inc.
PUF Sampler Calibration

SITE

Location:	KMS C-5	Date:	24-Oct-06
Sampler:	TE-1000	Tech:	T Downey

CONDITIONS

Sampler Elevation (feet):	0		
Measured Pressure (in Hg):	29.41	Corrected Pressure (mm Hg):	747
Temperature (deg F):	68	Temperature (deg K):	293
Average Press. (in Hg):	29.52	Corrected Seasonal (mm Hg):	750
Average Temp. (deg F):	70	Seasonal Temp. (deg K):	294

CALIBRATION ORIFICE

Make:	Tisch	Qstd Slope:	10.41375
Model:	TE-5040A	Qstd Intercept:	0.00106
Serial#:	9833620	Date Certified:	10/22/2005

CALIBRATION

Plate or Test #	H2O (in)	Qstd (m3/min)	FLOW (magn)	FLOW (corrected)	LINEAR REGRESSION	
1	7.10	0.256	70.0	8.36	Slope =	35.6279
2	6.70	0.248	60.0	7.74	Intercept =	-1.0184
3	5.70	0.229	50.0	7.07	Corr. coeff.=	0.9790
4	5.00	0.215	40.0	6.32		
5	3.40	0.177	30.0	5.47	# of Observations	5

Calculations

Qstd = 1/m[Sqrt(H2O(Pa/Pstd)(Tstd/Ta))-b]
Flow (corrected)=Sqrt((magn)(Pa/Pstd)(Tstd/Ta))

Qstd = standard flow rate
Flow (magn)= reading off of magnehelic gauge
Flow (corrected)= corrected flow rate
m = calibrator Qstd slope
b = calibrator Qstd intercept
Ta = actual temperature during calibration (deg K)
Pa = actual pressure during calibration (mm Hg)
Tstd = 298 deg K
Pstd = 760 mm Hg
For subsequent calculation of sampler flow:
1/m([Sqrt(magn)(Pav/760)(298/Tav)]-b)

m = sampler slope
b = sampler intercept
(magn)= magnehelic reading
Tav = daily average temperature
Pav = daily average pressure

Tisch Environmental Inc.
PUF Sampler Calibration

SITE

Location:	KMS Background-5	Date:	24-Oct-06
Sampler:	TE-1000	Tech:	T Downey

CONDITIONS

Sampler Elevation (feet):	0		
Measured Pressure (in Hg):	29.44	Corrected Pressure (mm Hg):	748
Temperature (deg F):	60	Temperature (deg K):	288
Average Press. (in Hg):	29.49	Corrected Seasonal (mm Hg):	749
Average Temp. (deg F):	60	Seasonal Temp. (deg K):	288

CALIBRATION ORIFICE

Make:	Tisch	Qstd Slope:	10.41375
Model:	TE-5040A	Qstd Intercept:	0.00106
Serial#:	9833620	Date Certified:	10/22/2005

CALIBRATION

Plate or Test #	H2O (in)	Qstd (m3/min)	FLOW (magn)	FLOW (corrected)	LINEAR REGRESSION	
1	8.10	0.276	70.0	8.44	Slope =	32.0132
2	7.20	0.260	60.0	7.81	Intercept =	-0.4259
3	5.90	0.235	50.0	7.13	Corr. coeff.=	0.9991
4	4.80	0.212	40.0	6.38		
5	3.70	0.186	30.0	5.52	# of Observations	5

Calculations

Qstd = 1/m[Sqrt(H2O(Pa/Pstd)(Tstd/Ta))-b]
Flow (corrected)=Sqrt((magn)(Pa/Pstd)(Tstd/Ta))

Qstd = standard flow rate
Flow (magn)= reading off of magnehelic gauge
Flow (corrected)= corrected flow rate
m = calibrator Qstd slope
b = calibrator Qstd intercept
Ta = actual temperature during calibration (deg K)
Pa = actual pressure during calibration (mm Hg)
Tstd = 298 deg K
Pstd = 760 mm Hg
For subsequent calculation of sampler flow:
1/m([Sqrt(magn)(Pav/760)(298/Tav)]-b)

m = sampler slope
b = sampler intercept
(magn)= magnehelic reading
Tav = daily average temperature
Pav = daily average pressure

Appendix E
Graph - PCBs in Indoor Air

Tisch Environmental Inc.
PUF Sampler Calibration

SITE

Location:	KMS Background-5 Dup	Date:	24-Oct-06
Sampler:	TE-1000	Tech:	T Downey

CONDITIONS

Sampler Elevation (feet):	0		
Measured Pressure (in Hg):	29.44	Corrected Pressure (mm Hg):	748
Temperature (deg F):	68	Temperature (deg K):	293
Average Press. (in Hg):	29.47	Corrected Seasonal (mm Hg):	749
Average Temp. (deg F):	63	Seasonal Temp. (deg K):	290

CALIBRATION ORIFICE

Make:	Tisch	Qstd Slope:	10.41375
Model:	TE-5040A	Qstd Intercept:	0.00106
Serial#:	9833620	Date Certified:	10/22/2005

CALIBRATION

Plate or Test #	H2O (in)	Qstd (m3/min)	FLOW (magn)	FLOW (corrected)	LINEAR REGRESSION	
1	8.10	0.273	70.0	8.37	Slope =	39.8425
2	7.20	0.258	60.0	7.75	Intercept =	-2.5332
3	6.40	0.243	50.0	7.07	Corr. coeff.=	0.9992
4	5.30	0.221	40.0	6.33		
5	4.40	0.201	30.0	5.48	# of Observations	5

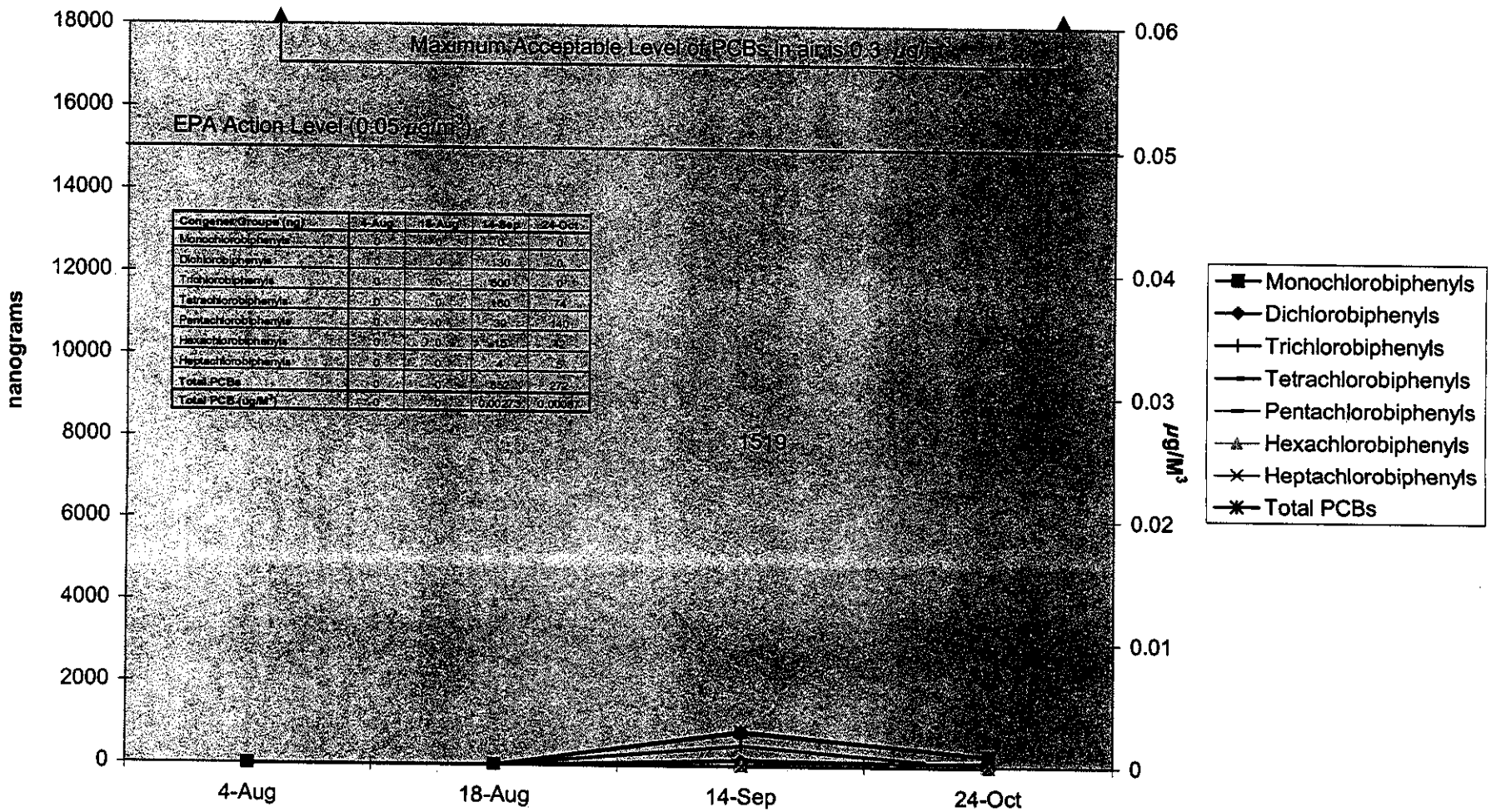
Calculations

Qstd = 1/m[Sqrt(H2O(Pa/Pstd)(Tstd/Ta))-b]
Flow (corrected)=Sqrt((magn)(Pa/Pstd)(Tstd/Ta))

Qstd = standard flow rate
Flow (magn)= reading off of magnehelic gauge
Flow (corrected)= corrected flow rate
m = calibrator Qstd slope
b = calibrator Qstd intercept
Ta = actual temperature during calibration (deg K)
Pa = actual pressure during calibration (mm Hg)
Tstd = 298 deg K
Pstd = 760 mm Hg
For subsequent calculation of sampler flow:
1/m([Sqrt(magn)(Pav/760)(298/Tav)]-b)

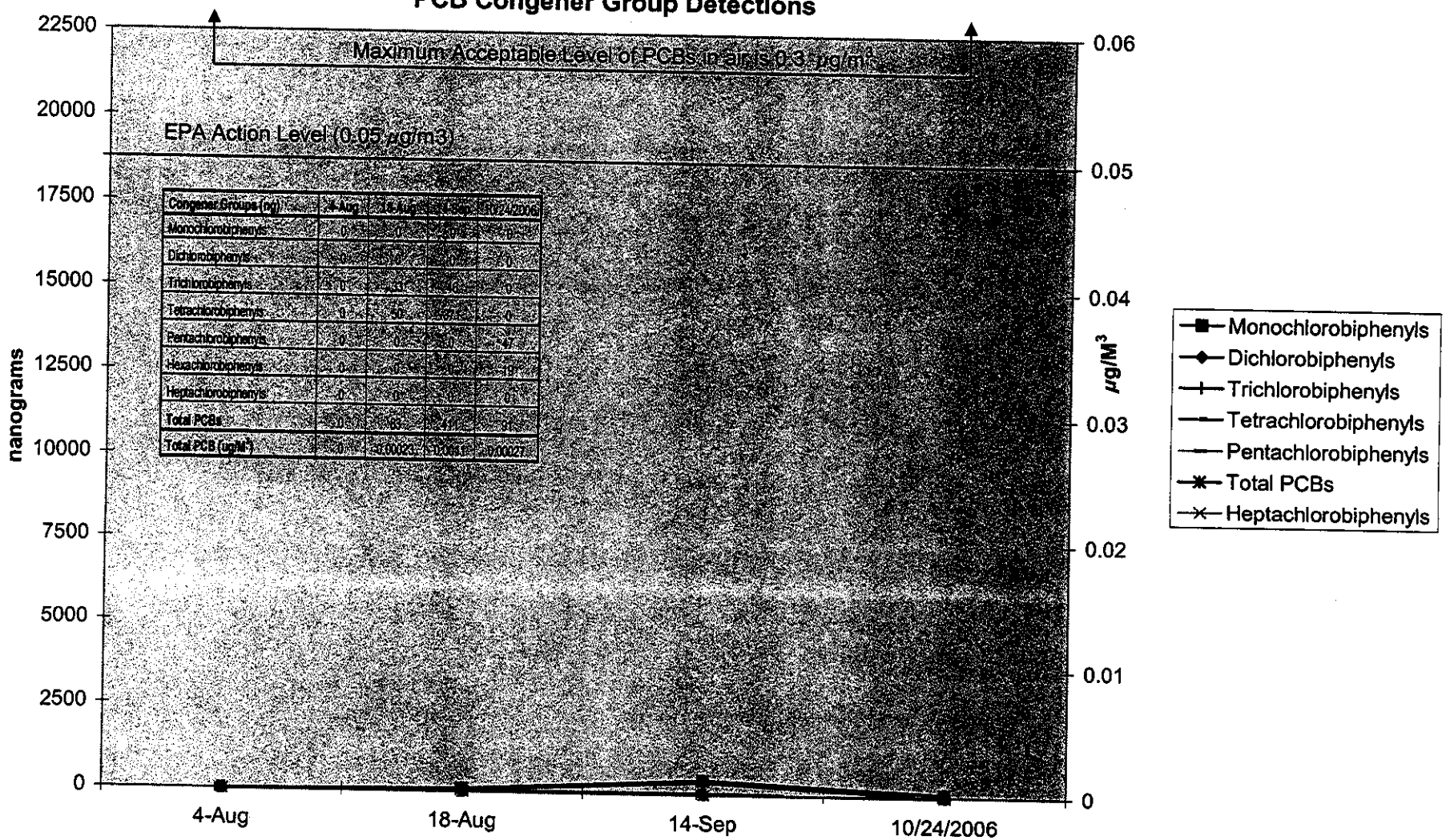
m = sampler slope
b = sampler intercept
(magn)= magnehelic reading
Tav = daily average temperature
Pav = daily average pressure

Keith Middle School
Building A Hallway
Indoor Air
PCB Congener Group Detections



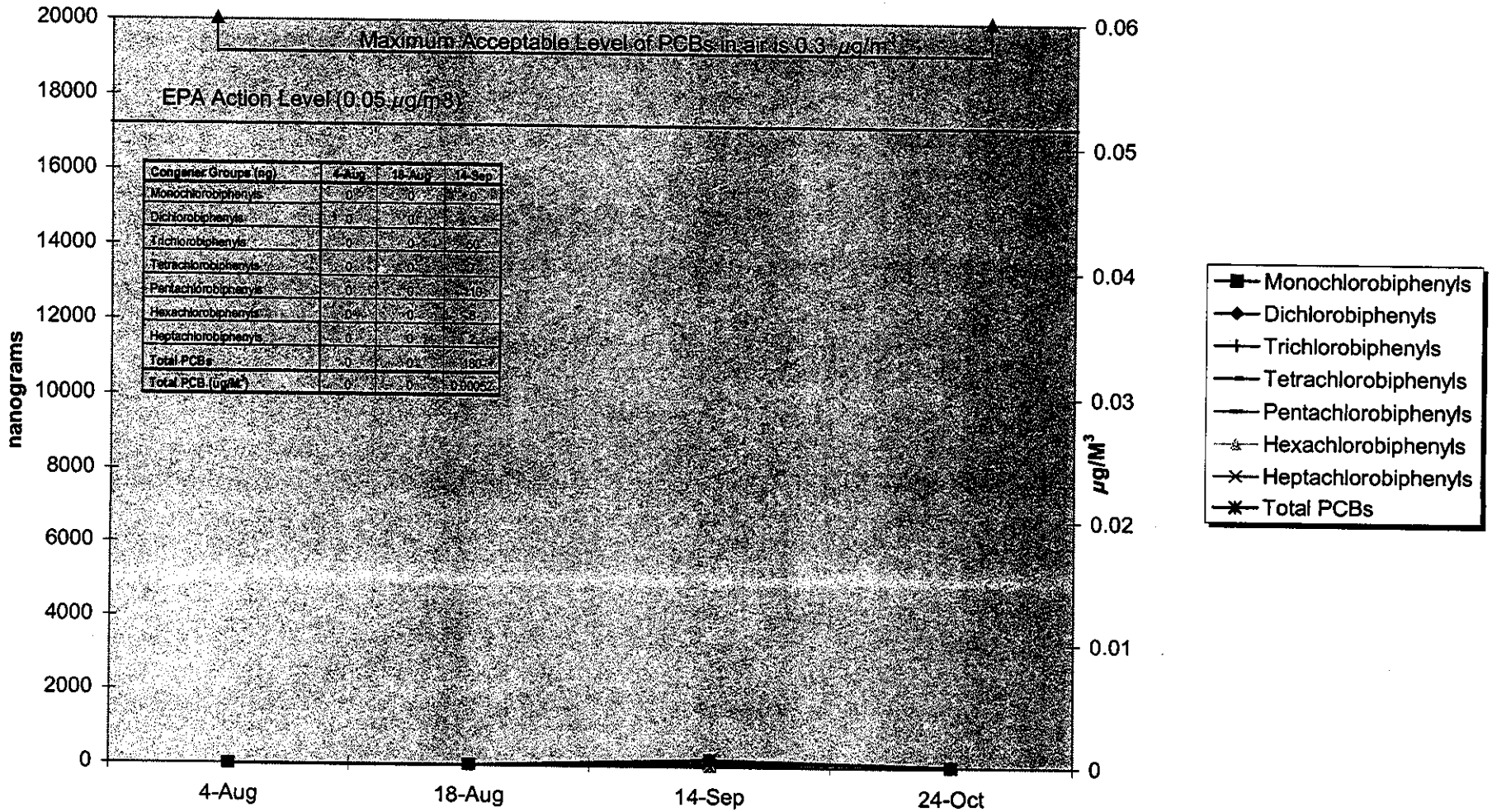
Congener Groups (ng)	4-Aug	18-Aug	14-Sep	24-Oct
Monochlorobiphenyls	0	0	170	0
Dichlorobiphenyls	0	0	130	0
Trichlorobiphenyls	0	0	500	0
Tetrachlorobiphenyls	0	0	160	4
Pentachlorobiphenyls	0	0	30	140
Hexachlorobiphenyls	0	0	15	40
Heptachlorobiphenyls	0	0	4	8
Total PCBs	0	0	850	272
Total PCB (ug/M³)	0	0	0.00273	0.00087

Keith Middle School
Building B - Auditorium
Indoor Air
PCB Congener Group Detections



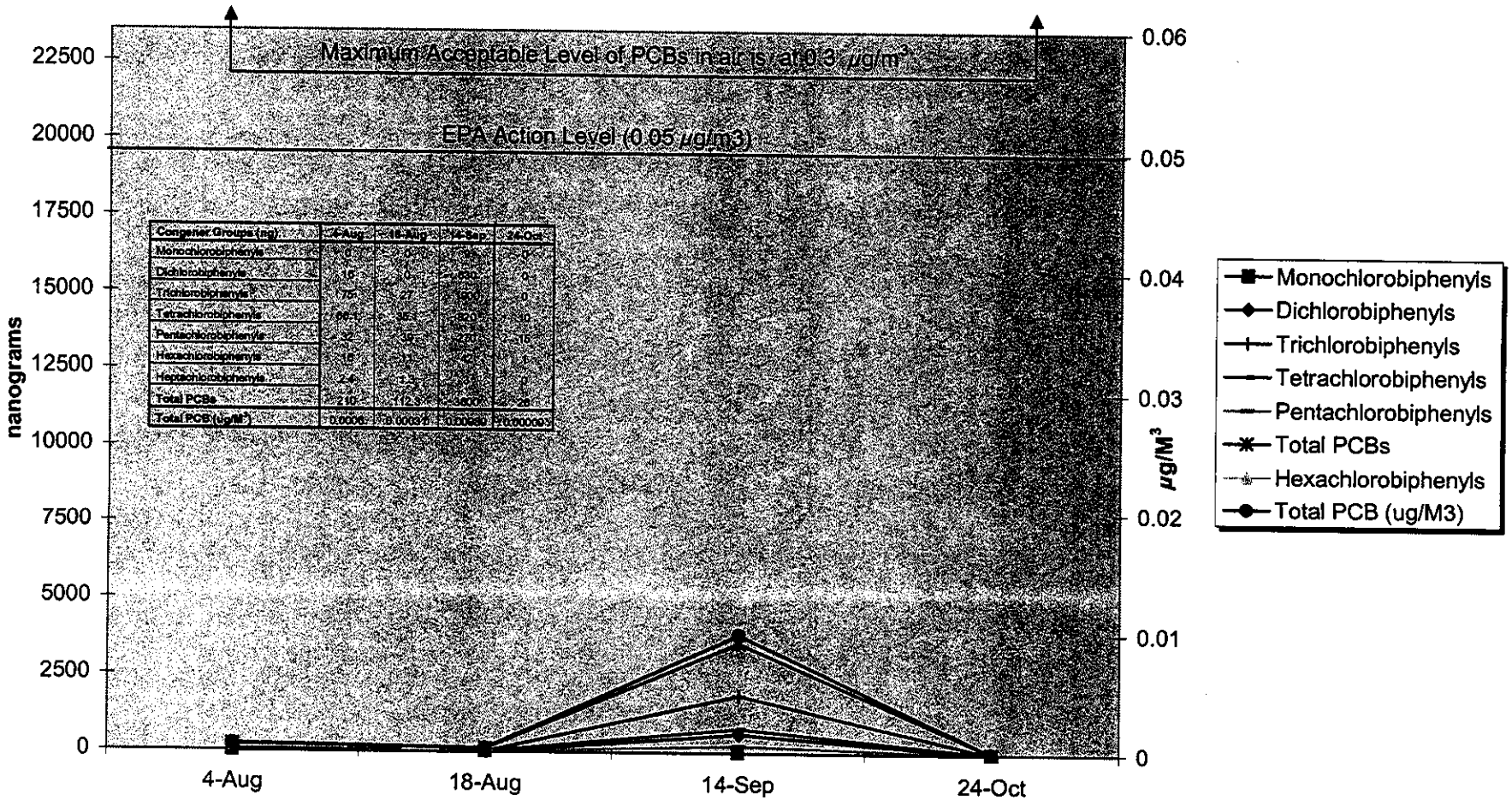
Congener Groups (ng)	4-Aug	18-Aug	14-Sep	10/24/2006
Monochlorobiphenyls	0	0	[illegible]	0
Dichlorobiphenyls	0	0	[illegible]	0
Trichlorobiphenyls	0	0	[illegible]	0
Tetrachlorobiphenyls	0	50	[illegible]	0
Pentachlorobiphenyls	0	0	[illegible]	47
Hexachlorobiphenyls	0	0	[illegible]	19
Heptachlorobiphenyls	0	0	[illegible]	0
Total PCBs	0	50	[illegible]	91
Total PCB (ug/M³)	0	0.00023	0.0011	0.00027

Keith Middle School
Building C Faculty Dining Room
Indoor Air
PCB Congener Group Detections



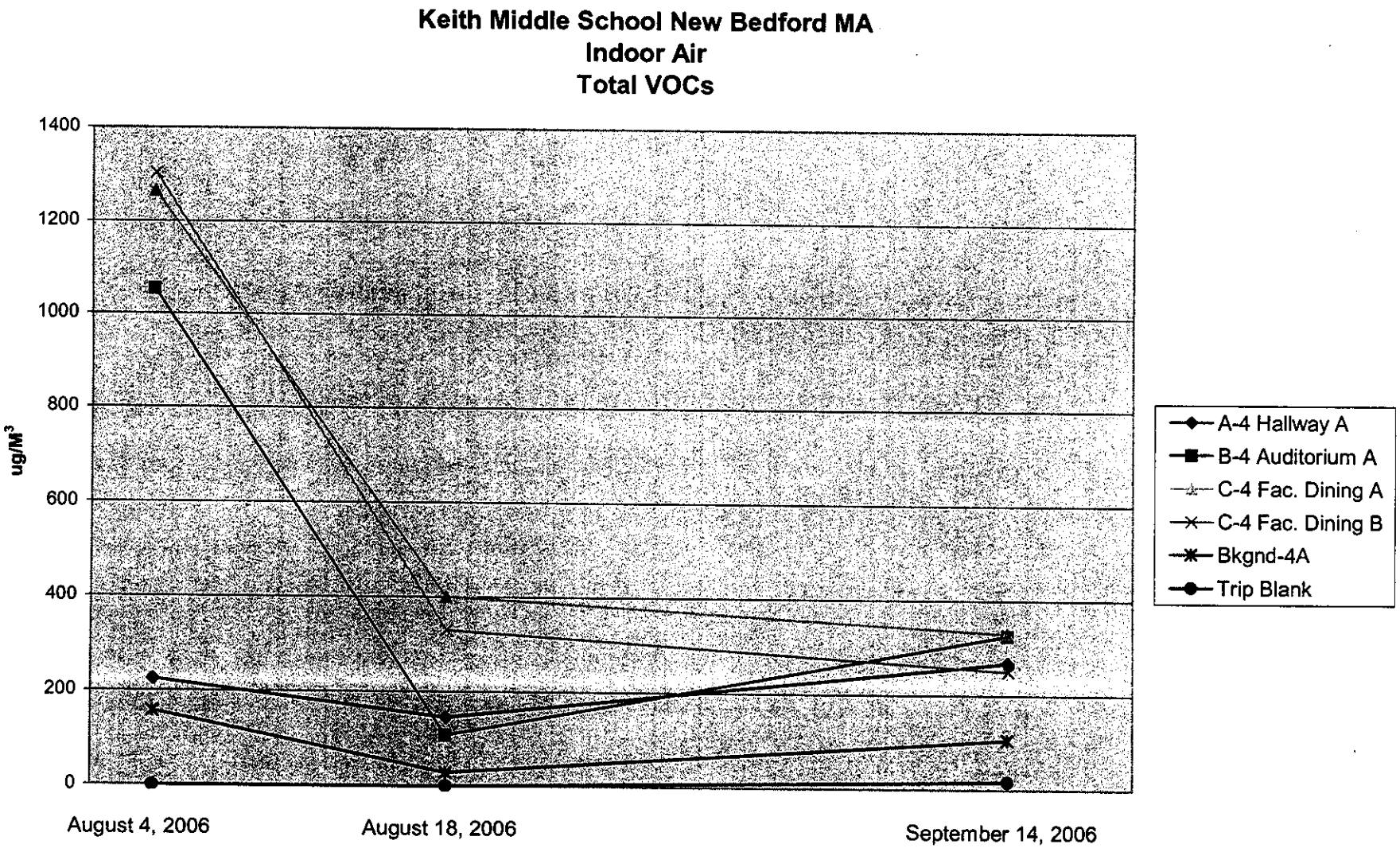
Congener Groups (ng)	4-Aug	18-Aug	14-Sep
Monochlorobiphenyls	0	0	0
Dichlorobiphenyls	0	0	0
Trichlorobiphenyls	0	0	0
Tetrachlorobiphenyls	0	0	0
Pentachlorobiphenyls	0	0	16
Hexachlorobiphenyls	0	0	35
Heptachlorobiphenyls	0	0	2
Total PCBs	0	0	180
Total PCB (ug/M³)	0	0	0.00052

Keith Middle School
Background Outdoor Air
PCB Congener Group Detections

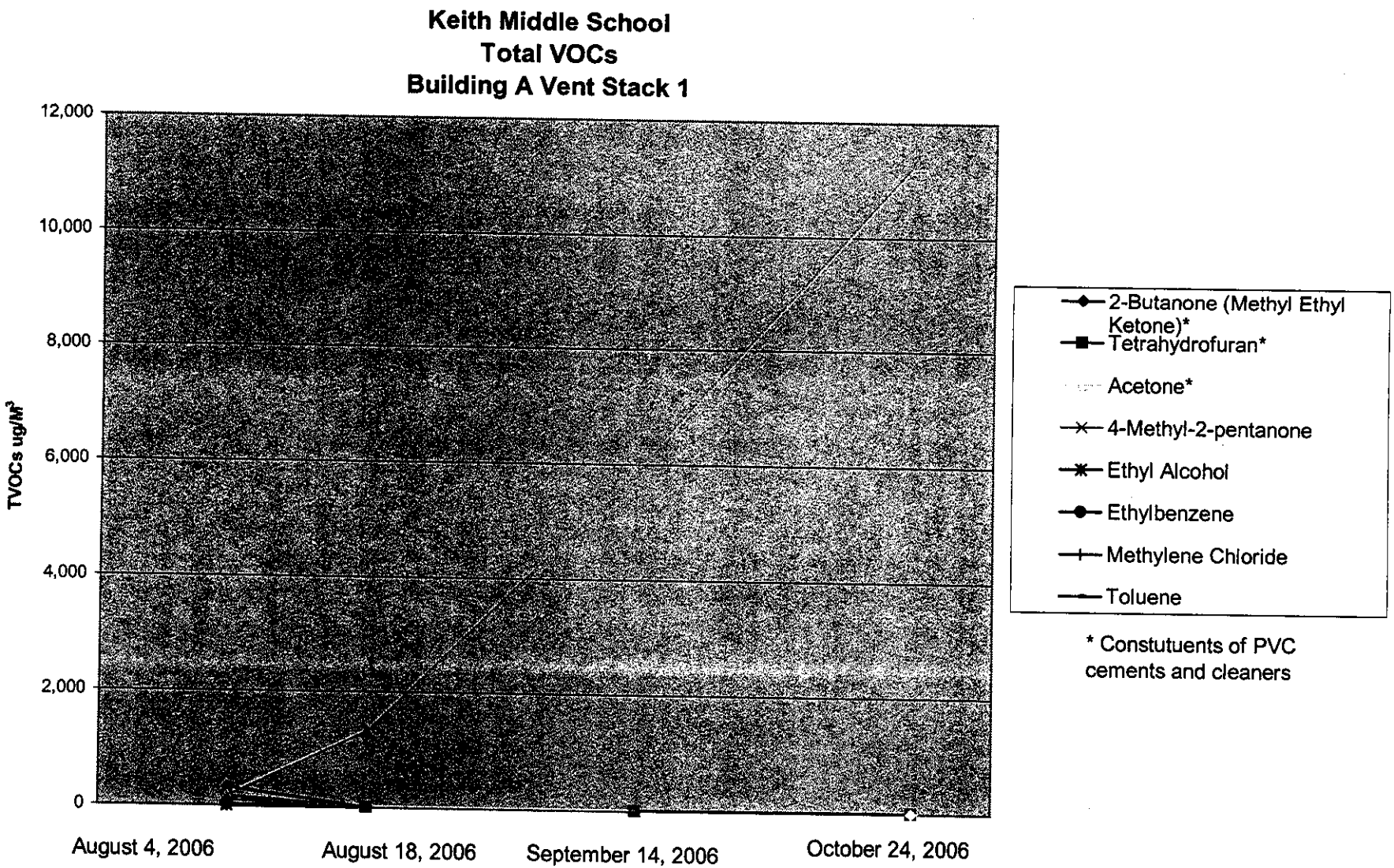


Congener Groups (ng)	4-Aug	18-Aug	14-Sep	24-Oct
Monochlorobiphenyls	0	0	[illegible]	0
Dichlorobiphenyls	15	0	[illegible]	0
Trichlorobiphenyls	75	27	[illegible]	0
Tetrachlorobiphenyls	66.1	35	82.1	10
Pentachlorobiphenyls	32	35	220	15
Hexachlorobiphenyls	15	11	42	1
Heptachlorobiphenyls	24	2.3	[illegible]	1
Total PCBs	210	112.3	600	26
Total PCB (ug/M³)	0.0006	0.00031	0.0066	0.00007

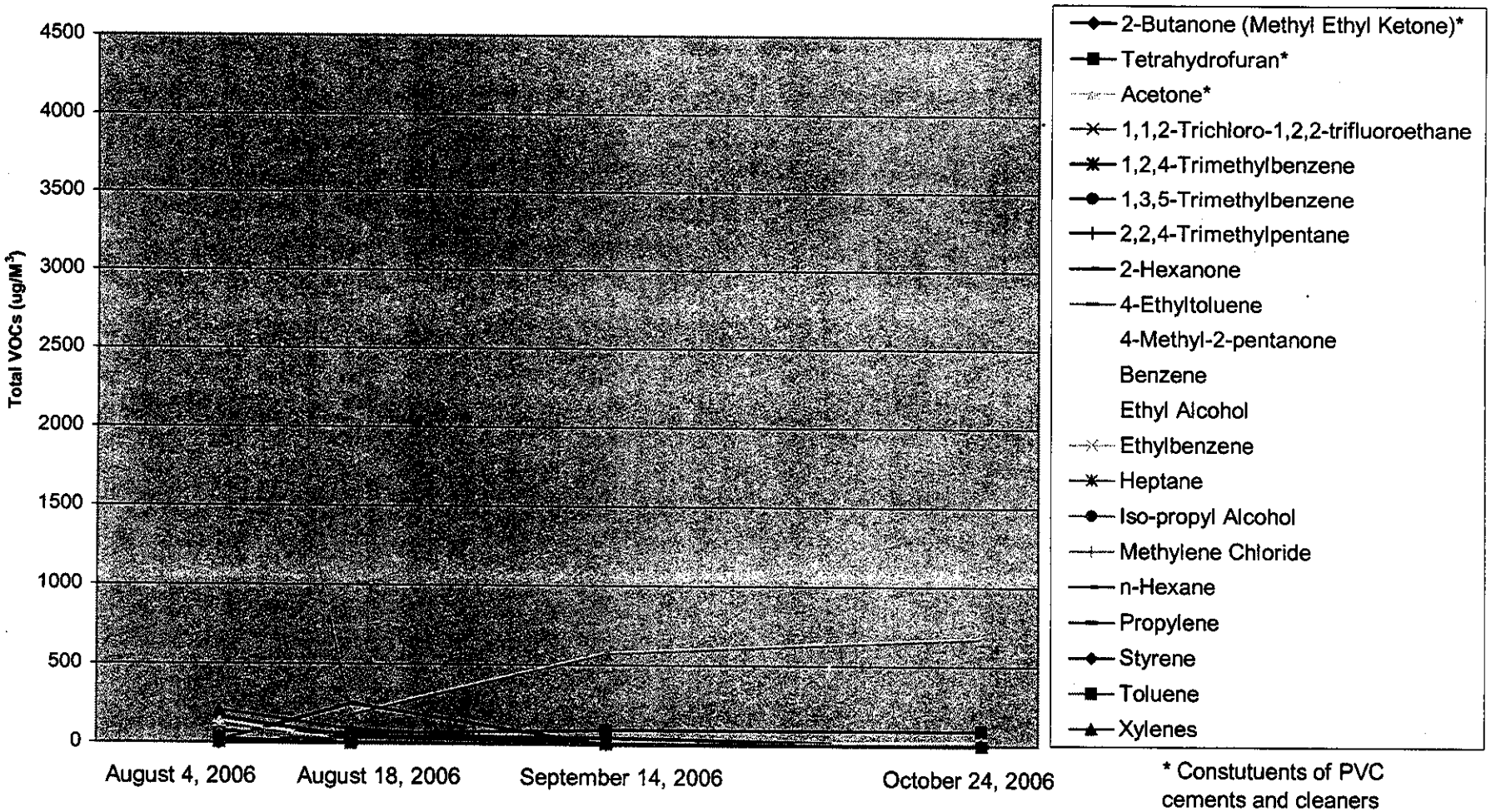
Appendix F
Graph - VOCs in Indoor Air


Keith Middle School New Bedford MA
Indoor Air
Total VOCs
1400
1200
1000
800
600
400
200
0
ug/M3
August 4, 2006
August 18, 2006
September 14, 2006
A-4 Hallway A
B-4 Auditorium A
C-4 Fac. Dining A
C-4 Fac. Dining B
Bkgnd-4A
Trip Blank

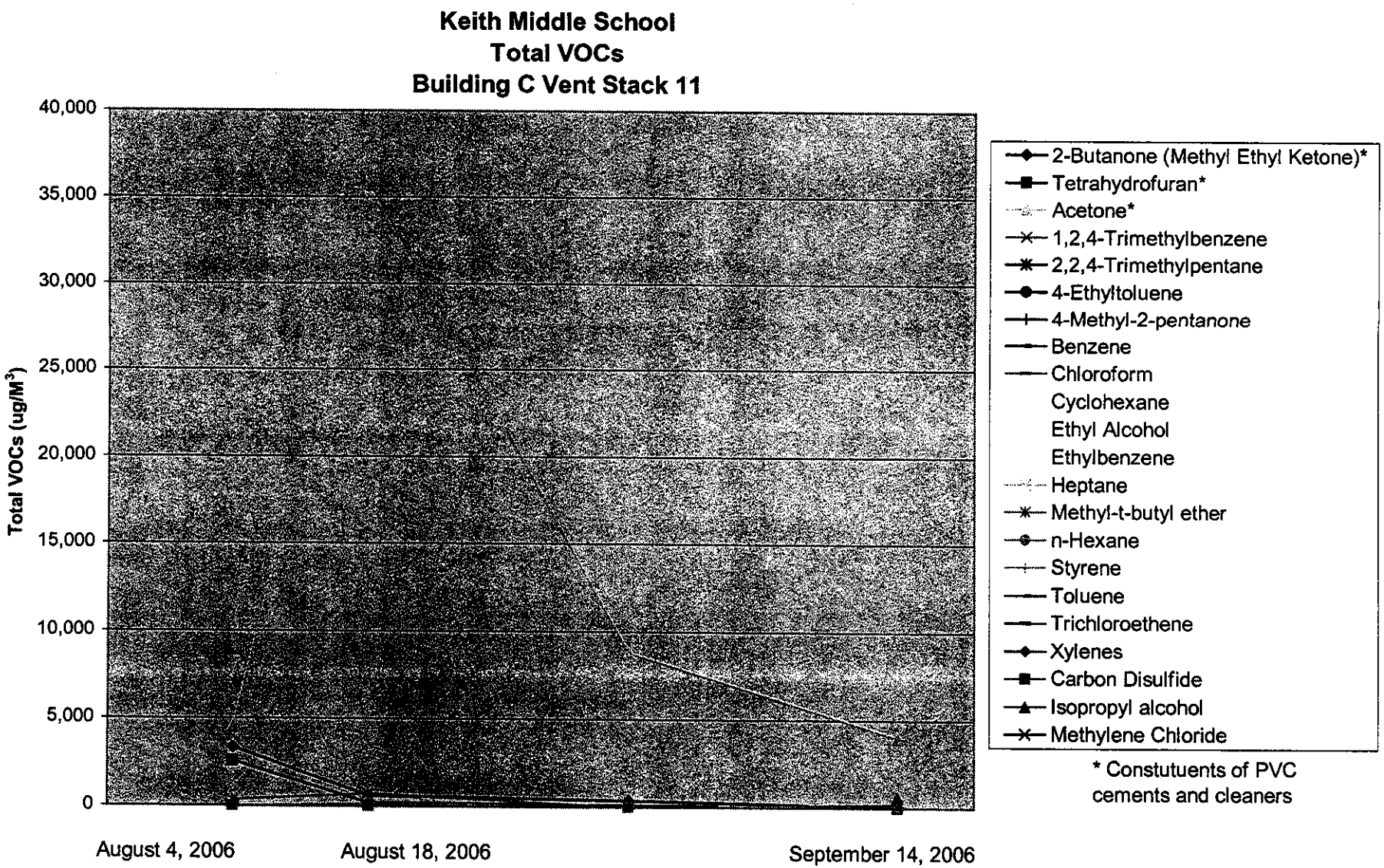
Appendix G
Graph - VOCs in Foundation Vent Stacks

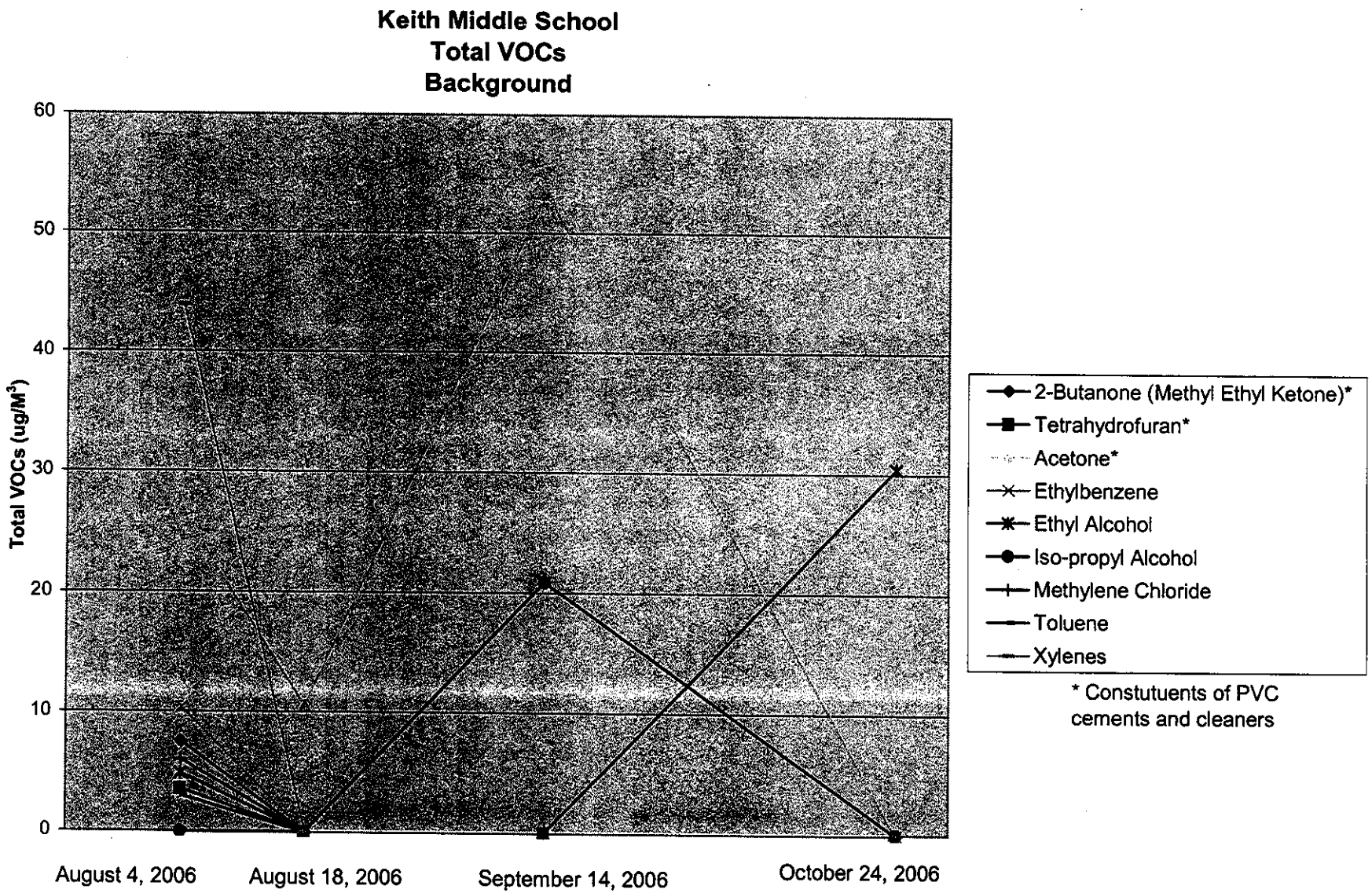

Keith Middle School
Total VOCs
Building A Vent Stack 1
TVOCs ug/M³
12,000
10,000
8,000
6,000
4,000
2,000
0
August 4, 2006
August 18, 2006
September 14, 2006
October 24, 2006
2-Butanone (Methyl Ethyl Ketone)*
Tetrahydrofuran*
Acetone*
4-Methyl-2-pentanone
Ethyl Alcohol
Ethylbenzene
Methylene Chloride
Toluene
* Constutuents of PVC cements and cleaners

Keith Middle School
Total VOCs
Building A Vent Stack 4

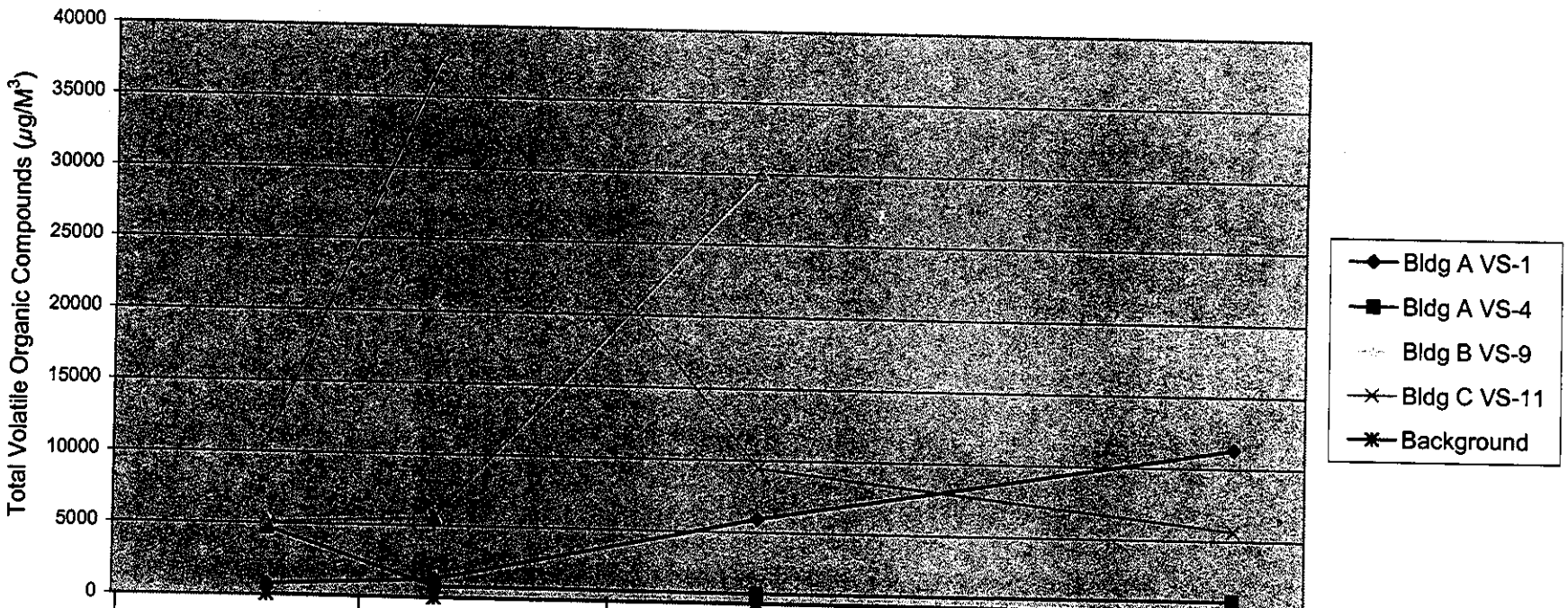


* Constutuents of PVC cements and cleaners


Keith Middle School
Total VOCs
Building C Vent Stack 11
Total VOCs (ug/M³)
40,000
35,000
30,000
25,000
20,000
15,000
10,000
5,000
0
August 4, 2006
August 18, 2006
September 14, 2006
2-Butanone (Methyl Ethyl Ketone)*
Tetrahydrofuran*
Acetone*
1,2,4-Trimethylbenzene
2,2,4-Trimethylpentane
4-Ethyltoluene
4-Methyl-2-pentanone
Benzene
Chloroform
Cyclohexane
Ethyl Alcohol
Ethylbenzene
Heptane
Methyl-t-butyl ether
n-Hexane
Styrene
Toluene
Trichloroethene
Xylenes
Carbon Disulfide
Isopropyl alcohol
Methylene Chloride
* Constutuents of PVC cements and cleaners


Keith Middle School
Total VOCs
Background
Total VOCs (ug/M³)
60
50
40
30
20
10
0
August 4, 2006
August 18, 2006
September 14, 2006
October 24, 2006
2-Butanone (Methyl Ethyl Ketone)*
Tetrahydrofuran*
Acetone*
Ethylbenzene
Ethyl Alcohol
Iso-propyl Alcohol
Methylene Chloride
Toluene
Xylenes
* Constutuents of PVC cements and cleaners

Keith Middle School
Foundation Vent Stack Summary
Total Volatile Organic Compounds



	August 4, 2006	August 18, 2006	September 14, 2006	October 24, 2006
Average Ambient Temp:	29 °C	29 °C	23 °C	7 °C
Barometric Press.:	Steady 29.77 -29.79	Steady 30.22	Steady 30.05 - 30.08	Rising 29.5 -29.7