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TRC Reference No. 115058

May 8, 2009

David J. Fredette, PE
Environmental Planner
Department of Environmental Stewardship
City of New Bedford
133 William Street
New Bedford, Massachusetts 02740

RE: Sampling Results for the Keith Middle School Foundation Vent Stack and Indoor Air for Polychlorinated Biphenyls and Volatile Organic Compounds July 2008 Monitoring Round. Report Dated December 2008

Dear Mr. Fredette:

Enclosed herein are two (2) copies of the above referenced report prepared by TRC. An electronic Portable Document Format (PDF) version is also included that is suitable for posting on the City of New Bedford's website.

We appreciate the opportunity to serve the City on this important project. If you have any questions or comments, please do not hesitate to contact me at 978-656-3565.

Sincerely,

David M. Sullivan, LSP, CHMM
Senior Project Manager

Enclosure

cc. S. Alfonse – City of New Bedford, Dept. of Env. Stewardship (letter only)
L. Oliveira – City of New Bedford, School Department
K. Tisa – United States Environmental Protection Agency
M. Cote – Massachusetts Department of Environmental Protection

Sampling Results for the Keith Middle School Foundation Vent Stack and Indoor Air for Polychlorinated Biphenyls and Volatile Organic Compounds

December 2008/February 2009 Monitoring Round

Prepared for:

Department of Environmental Stewardship
City of New Bedford
133 William Street
New Bedford, Massachusetts 02740

Prepared by:

TRC Environmental Corporation
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EXECUTIVE SUMMARY

TRC Environmental Corporation (TRC) of Lowell, Massachusetts was retained by the City of New Bedford (the City) to provide sampling support in conducting foundation vent stack and indoor air sampling for polychlorinated biphenyls (PCBs) and volatile organic compounds (VOCs) at the Keith Middle School (KMS) in New Bedford, Massachusetts. This report documents the indoor air and vent stack sampling performed by TRC during December 2008 and February 2009. The original sampling event was scheduled for December 2008 only. However, due to laboratory error in analyzing the indoor air PCB samples, indoor air was resampled during February 2009 for the analysis of PCBs.

The sampling and analysis of vent stack and indoor air required for KMS is described in the approved *Long-Term Monitoring and Maintenance Plan* (LTMMIP), revision 4, dated October 20, 2006. The indoor air quality sampling program involved the collection of one indoor air quality sample from the ground floor of each of the three school building sections (Building A, Building B, and Building C). Concurrently with the indoor air quality sampling, air sampling of the sub-slab foundation ventilation system was performed during December 2008 from four selected rooftop vent stacks, including VS-1 and VS-4 which vent building Section A (classrooms), VS-7 which vents building Section B (near the Auditorium), and VS-9 which vents building Section B (the kitchen). The passive sub-slab ventilation system was installed to allow any sub-slab soil gases to migrate from beneath the vapor barrier to the vent stacks, installed through the school building roof. Air samples were also collected immediately outside of the school during each round to provide comparative background results.

Following collection, the samples were analyzed for VOCs according to EPA Method TO-15 (VOCs in Air) by Alpha Woods Hole Labs of Westborough, Massachusetts and PCBs according to EPA Method 680 (PCB Homologues) by Northeast Analytical Labs of Schenectady, New York. Though this PCB method was not specified in the LTMMIP, the homologue analytical method is a reliable analytical method to quantify total PCBs. By quantifying PCB homologues, total PCB air data gathered at the KMS are directly comparable to total PCB air data gathered at the high school.

During the December 2008/February 2009 sampling round, VOCs were detected in indoor air and vent stack air samples, however PCBs were not detected in any of the three indoor air samples or in the vent stack air samples. It should be noted that all PCB detection limits were well below applicable criteria. The presence of VOCs in vent stack air samples is an expected finding for a sub-slab ventilation system and indicates that the passive ventilation system is performing as designed. The presence of VOCs in vent stack air may also be indicative of off-gassing from the venting system components in addition to subsurface VOC release.

VOCs are present in indoor air due to off-gassing from building materials and the storage and use of cleaners, adhesives, paints, and other VOC-containing products indoors at the school. Detection limits for PCBs in indoor air samples were consistent with background levels measured in outdoor ambient environments. Levels of PCBs and VOCs detected in indoor air demonstrate fluctuations in measured concentrations over time due to: 1) the degree of building air exchange that occurs during normal school operation (i.e., open conditions) versus vacation

periods when the school is not in session (i.e., closed conditions); 2) changes in ambient temperatures that may increase or decrease the off-gassing of contaminants from indoor building materials, as well as fugitive releases from VOC-containing products in storage; 3) the degree to which activities within the school building (e.g., cleaning and repairs) are contributing to indoor air concentrations of contaminants; and 4) reductions in building material related VOC emission sources over time.

Because PCBs were not detected in indoor air or vent stack air, PCB indoor air and vent stack air detection limits were compared to site-specific outdoor air concentrations and risk-based air concentrations (RBACs). Two PCB RBACs have been developed for the KMS, assuming occupational exposures within the school (8 hours/day, 250 days/year, for 25 years). The first RBAC is the Action Level (AL; 0.05 ug/m^3), which is used as an initial indicator that PCB air concentrations above background levels have been detected. The second RBAC is the Acceptable Long-Term Average Exposure Concentration (ALTAEC; 0.3 ug/m^3), indicative of the maximum acceptable air concentration that should not be exceeded for an extended time period. Indoor air and vent stack air PCB detection limits were lower than RBACs.

VOC data were compared to MassDEP Threshold Effects Exposure Limits (TELs) and Allowable Ambient Limits (AALs), published in December 1995, consistent with the LTMMIP. TELs are developed to be applicable to short-term exposure concentrations (average 24-hour levels) while AALs are developed to be protective of long-term exposure concentrations (average annual levels over 30 years). Because TELs and AALs have not been updated since 1995, VOC concentrations in excess of AALs and TELs were discussed relative to EPA screening levels (EPA SLs) developed by Oak Ridge National Laboratory (2008) to be protective of continuous long-term residential exposures and shorter-term commercial exposures, using the most current toxicity information available. Because AALs, TELs, and EPA SLs are set at risk levels that are only a portion of the MassDEP risk management criteria, concentrations that slightly exceed (i.e., less than 5-fold) one or more comparison criteria are unlikely to be a cause for concern. VOC concentrations in excess of comparison criteria were also compared to MassDEP indoor air background values, used by MassDEP in the development of the Massachusetts Contingency Plan (MCP) numeric standards.

Among all indoor air samples, two VOCs (benzene and chloroform) exceeded one or more comparison criteria. Both compounds were detected at concentrations below their corresponding MassDEP indoor air background value. The LTMMIP specifies that the LSP-of-Record should submit the indoor air data to a toxicologist/risk assessor for further assessment if indoor air VOC concentrations exceed TELs, AALs, or 150% of outdoor air background concentrations. Further quantitative assessment of the indoor air data indicated that the 95 percent upper confidence limit (95% UCL) on the arithmetic mean or maximum detected VOC concentrations were associated with a condition of no significant risk to potentially exposed individuals.

In vent stack air, six VOCs (1,2-dichloroethane, benzene, chloroform, methylene chloride, tetrachloroethene, and trichloroethene) exceeded risk-based comparison criteria. Even though the LTMMIP specifies that both indoor air and vent stack air VOC concentrations are to be compared to comparison criteria, this comparison is not appropriate for vent stack air results. The vent system is designed to capture VOCs being released from the subsurface beneath the

KMS and transport the gases through PVC piping to outdoor air, limiting migration through the building slab and into indoor air. Little if any human exposure to air within the vent stack system itself takes place. Air from the vent stack is released to outdoor air where the VOCs are quickly diluted and dispersed. Therefore, comparison of vent stack air results to comparison criteria developed assuming short-term (24-hour) and long-term exposure is highly conservative, if not conceptually irrelevant.

Temporal trends show that VOC concentrations have been decreasing in indoor air, suggesting that off-gassing from the newly constructed school building is diminishing over time. The sporadic detection of slightly higher VOC concentrations compared to those typically detected when the school is normally occupied is noted during the spring and summer school vacation periods. During the vacation periods the building is experiencing lower than normal air exchange and the indoor use of VOC-containing cleaning products and repair materials increases. Low-level fluctuations in PCB concentrations in indoor air are representative of background conditions. Measured concentrations of PCBs and VOCs in vent stack air are expected, and indicate that the passive ventilation system is performing as designed. Fluctuations in PCB vent stack air concentrations and decreasing vent stack air VOC concentrations suggest that the range of measured concentrations is representative of typical conditions within the subsurface ventilation system and that off-gassing from the system is diminishing over time. In addition, the human health risk calculations indicate that there is no significant risk associated with the occupancy of KMS.

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1.0 INTRODUCTION

1.1 Overview

TRC Environmental Corporation (TRC) of Lowell, Massachusetts was retained by the City of New Bedford (the City) to provide sampling support in conducting foundation vent stack and indoor air sampling for polychlorinated biphenyls (PCBs) and volatile organic compounds (VOCs) at the Keith Middle School (KMS) in New Bedford, Massachusetts. This report documents the indoor air and vent stack sampling performed by TRC during December 2008/February 2009. The original sampling event was scheduled for December 2008 only. However, due to laboratory error in analyzing the indoor air PCB samples, indoor air was resampled during the February 2009 for the analysis of PCBs.

Soil gas sampling was performed under the location of the KMS building in December 2001. In addition to PCBs present in soil at this location, the primary VOCs detected in the soil gas samples included acetone, 2-butanone, cyclohexane, ethanol, heptane, n-hexane, and toluene. Lesser concentrations of benzene, carbon disulfide, ethylbenzene, methyl tert butyl ether, tetrachloroethene, 1,2,4-trimethylbenzene, and xylenes were also detected in soil gas samples. The results of the December 2001 soil gas sampling event were evaluated for potential adverse impacts on indoor air quality, assuming no vapor barrier was installed. Despite the conclusion that no significant risk to human health is posed by the measured soil gas concentrations, the City and School Department decided to install a vapor barrier on top of the soil beneath the school building concrete floor as an added layer of protection against intrusion of any gases that may accumulate under the building. Passive ventilation has been installed to allow any sub-slab soil gases to migrate from beneath the vapor barrier to the vent stacks, installed through the school building roof. Sampling of indoor air quality and vent stack air is conducted to confirm the proper functioning of the passive ventilation system.

PCBs and VOCs have historically been detected in both indoor air and vent stack air samples. However, concentrations of PCBs and VOCs in indoor air samples are consistently lower than those observed in vent stack air samples. VOCs are present in indoor air due to off-gassing from building materials and the storage and use of cleaners, adhesives, paints, and other VOC-containing products indoors at the school. An inventory of cleaning supplies used at KMS and their ingredients is provided in Appendix A. Concentrations of PCBs detected in indoor air samples are consistent with background levels measured in other outdoor ambient environments. Levels of PCBs and VOCs detected in indoor air fluctuate and demonstrate noticeable trends in measured concentrations over time due to: 1) the degree of building air exchange that occurs during normal school operation (i.e., open conditions) versus vacation periods when the school is not in session (i.e., closed conditions); 2) changes in ambient temperatures that may increase or decrease the off-gassing of contaminants from indoor building materials, as well as fugitive releases from VOC-containing products in storage; 3) the degree to which activities within the school building (e.g., cleaning and repairs) are contributing to indoor air concentrations of contaminants; and 4) reductions in building material related VOC emission sources over time. The presence of higher levels of VOCs and PCBs in vent stack air samples is an expected finding for a sub-slab ventilation system and indicates that the passive ventilation system is performing

as designed. The presence of VOCs in vent stack air may also be indicative of off-gassing from the venting system components in addition to subsurface VOC release.

Although PCBs and VOCs have been measured historically in indoor air and vent stack air samples, the concentrations detected do not pose a significant risk to human health, based on the comparison of concentrations to both background concentrations and applicable risk-based criteria (TRC, 2008a, 2008b, 2008c, and 2008d).

This report presents monitoring data collected during December 2008/February 2009. The remaining sections of the report include Section 2 (Sampling Locations), Section 3 (Quality Assurance), Section 4 (Summary of Results), Section 5 (Comparison of PCB Results to Risk-Based Air Concentrations), Section 6 (Comparison of VOC Results to Comparison Criteria), Section 7 (Conclusions), and Section 8 (References). Supporting appendices include Appendix A (Summary of Field Sampling Program, Analytical Program and Quality Assurance), Appendix B (Field Sampling Data Sheets), Appendix C (Field Reduced Data), Appendix D (Equipment Calibration Sheets), Appendix E (Laboratory Data Reports), Appendix F (Laboratory Data Validation Memoranda), Appendix G (Discussion of Risk-Based Comparison Criteria) and Appendix H (Indoor Air Risk Calculations – Commercial Worker).

1.2 Scope of Work

Sampling and analysis of vent stack and indoor air is required as part of United States Environmental Protection Agency (EPA) approved *Long-Term Monitoring and Maintenance Plan* (LTMMIP), revision 4, dated October 20, 2006. The LTMMIP was prepared by The BETA Group, Incorporated (BETA) in accordance with the August 31, 2005 *Approval for Risk-Based PCB Cleanup and Disposal under 40 CFR §761.6(c)* letter issued by EPA to the City. The LTMMIP set forth a vent stack and indoor air sampling schedule consisting of three monitoring events per year for the first year (July/August, December, April 2007), with the understanding that the City may submit a written request to EPA to reduce the indoor air sampling frequency after the first year of monitoring. However, per the order of the Mayor of the City, vent stack and indoor air monitoring took place monthly during the period of September 2006 to July/August 2007. Following the July/August sampling event, monitoring was reduced to once every four months. The December 2008/February 2009 sampling event was the fourth subsequent event following the July/August 2007 event. Monitoring from September 2006 through February 2007 was conducted by BETA and is reported elsewhere.

The sampling program consisted of the collection of indoor air quality and vent stack samples for the analysis of PCBs and VOCs. Details concerning the sample collection procedures and analytical methods are described in Appendix A. Sampling data sheets are provided in Appendix B and the reduced data are presented in Appendix C. The calibration certifications can be found in Appendix D. Laboratory analytical results are presented in Appendix E.

Field sampling data were validated by the Field Team Leader and/or the Field Quality Control Coordinator based on their review of adherence to each approved sampling protocol and written sample collection procedure. Details concerning quality assurance procedures are described in Appendix A. The laboratory data validation memoranda can be found in Appendix F.

The following sections describe those features of the field sampling program, quality assurance/quality control (QA/QC) program, and data analysis that are specific to the December 2008/February 2009 event. Generic information on the sampling and QA/QC programs and data analysis procedures can be found in Appendices A and G, respectively.

2.0 SAMPLING LOCATIONS

2.1 Indoor Air Quality Sample Locations

During the sampling event, one indoor air quality sample was collected from the ground floor of each of the three school building sections (Building A, Building B, and Building C). Each sampling location was selected to be representative of portions of the school building normally occupied by students and teachers. The Building A sampling location is located within a hallway in an area of student classrooms. The Building B sampling location is located in the school auditorium. The Building C sampling location is in a faculty dining area. These indoor air quality sampling locations have remained consistent throughout TRC's sampling program, with the exception of the December 2007 Building B sample which was collected in the school cafeteria at the request of the City. One sample and a duplicate were also collected immediately outside of the school to provide comparative background results for ambient air.

Figure 2-1 presents the approximate locations of the indoor air quality sample locations. Table 2-1 summarizes the indoor air quality samples collected during the December 2008/February 2009 sampling event. Indoor air quality samples collected during the December 2008/February 2009 sampling event were designated with the letter A, B, or C to identify the building section from which the sample was collected and a unique sample identification suffix, indicating the sampling event number (e.g., A-18).

2.2 Foundation Vent Air Monitoring Sample Locations

The KMS foundation venting system is comprised of six sub-slab vapor collection zones, each vented by two or four vent stacks penetrating the roof. A total of four vent stacks are sampled during each round, including VS-1 and VS-4 which vent from the two collection zones located under building Section A (classrooms), and two other vent stacks which are rotated to cover the remaining collection zones. One air sample is collected immediately outside of the school during each round to provide comparative background results.

Figure 2-2 presents the approximate locations of the vent stack sample locations. Table 2-1 summarizes the vent stack samples collected during the December 2008/February 2009 sampling event. Vent stack samples collected during the December 2008/February 2009 sampling event were designated with the vent stack number (e.g., VS-1) and a unique sample identification suffix indicating the sampling event number (e.g., VS-1-18).

3.0 QUALITY ASSURANCE

This section highlights the results of the QA/QC review for the December 2008/February 2009 sampling event. Please refer to Appendix A for additional QA/QC details.

3.1 Data Validation Summary

In general, the TO-4A data from samples collected February 19, 2009 and TO-10A data from samples collected December 30, 2008 appear to be valid as reported and may be used for decision-making purposes. It is important to note that re-sampling of the TO-4A indoor air quality samples was required on account of a laboratory extraction error. The TO-4A samples (i.e., A-18, B-18, C-18, BG-18 and BG-18-DUP) were extracted with the incorrect solvent during the analytical process. This non-conformance resulted in poor recovery for QA/QC samples as well as poor chromatography in the associated indoor air quality samples. Since the laboratory was unable to provide reliable results for the December 2008 TO-4A indoor air quality samples, resampling of these locations was performed on February 18 and 19, 2009.

The TO-15 data also appear to be valid as reported and may be used for decision-making purposes, with the exception of the nondetect results for ethyl acetate in all samples which were rejected (R) due to calibration non-conformances.

In addition, benzene, cis-1,3-dichloropropene, trans-1,3-dichloropropene, 1,2,4-trimethylbenzene and hexabutadiene Laboratory Control Sample (LCS) results were below acceptance criteria. The LCS is a clean matrix (i.e., air media) spiked with the target analytes. The LCS is prepared and analyzed in the same manner as the samples and the recoveries of the target analytes are measured. The LCS is used to monitor the accuracy of the analytical method. All non-detect and detected results for benzene, cis-1,3-dichloropropene, trans-1,3-dichloropropene, 1,2,4-trimethylbenzene and hexabutadiene should be considered estimated (identified in data summary tables presented herein with a “UJ/J” qualifier) due to this nonconformance.

Benzene, ethanol and isopropanol were detected in the vent stack trip blank and acetone, benzene, ethanol, isopropanol, and methylene chloride were detected in the indoor air quality trip blank. Trip blanks are used as a check on shipping and laboratory-related sources of contamination. The detected concentrations in the trip blanks are due to a technician error in TRC’s laboratory. The trip blank canisters were opened while being packed for shipment; the technician was attempting to obtain an initial vacuum on the canister, which is not required for trip blanks. The trip blanks became contaminated with common contaminants (i.e., ethanol, acetone, and isopropanol) as well as benzene as they are all used in the TRC laboratory. Due to this non-conformance the trip blanks were not considered in the validation process and the results of the trip blanks are not discussed in the following sections. The laboratory method blanks were free of contamination which implies that the analytical process did not introduce those contaminants.

3.2 TO-15 - Persistent Laboratory Contaminants

Based upon review of quality control data, TRC has determined that the results for four compounds reported throughout this report (acetone, ethanol, isopropanol, and methylene chloride) were influenced by laboratory-derived contamination and hence do not reflect actual vent stack and indoor air concentrations at KMS. This conclusion is supported by: 1) the high concentrations of these compounds in contrast to other VOCs within samples; 2) TRC experience with these same compounds when using EPA Method TO-15A on prior programs; and 3) concentrations over time do not follow trends observed for other VOCs known to be associated with products in storage and use at the KMS.

3.3 Collocated Sampler Precision

The collocated sampler data for the two pairs collected at the KMS during the December 2008/February 2009 sampling event are summarized in Tables 3-1 and 3-2 for the indoor air and vent stack air samples, respectively. Results are provided for each of the analytes measured in the sampler pair in units of micrograms per cubic meter (ug/m^3). Method precision is expressed as the relative percent difference (RPD) value derived on a parameter specific basis.

EPA Method TO-15 identifies a data quality goal/objective of +/-25% RPD for analytes measured in replicate or collocated samples. RPDs were calculated for five compounds detected in the indoor air samples, as shown on Table 3-1, and twelve compounds detected in the vent stack air samples, as shown on Table 3-2. RPDs were not calculated for most of the compounds analyzed since the majority of results were reported as non-detects (i.e., very few compounds were detected) and RPDs are not calculated when one or both of the collocated results are non-detect. However, the collocated non-detects show good agreement, although values in both samples could not be quantified (analyte not detected in both samples of collocated pair). For the results for which an RPD could be calculated, the majority of the calculated RPDs were less than 25% for the sampling event conducted in December 2008/February 2009. Five calculated RPDs were slightly greater than 25% : 2-butanone, acetone, benzene and toluene in the vent stack samples, and acetone in the background samples. These RPDs are likely to have little effect on the results of these four compounds, since in most cases low results (below 2 ug/m^3) were reported, and slight differences in low concentration results can lead to elevated RPDs. Acetone, however in the vent stack samples was detected at higher concentrations; the elevated RPD for acetone in the vent stack samples is very likely due to acetone being a common laboratory contaminant. RPD data can be used to identify if differences in measured concentrations are attributable to actual concentration differences or if they are within the precision of the sampling and analytical procedure.

4.0 SUMMARY OF RESULTS

The following section describes the findings from the sampling events conducted by TRC at the KMS during December 2008/February 2009. The December and February sampling occurred during school vacation time periods. Table 2-1 provides a summary of the types, numbers, and locations of the samples collected. Appendices E and F contain the laboratory data reports and data validation memoranda, respectively. Along with the samples, TO-4A, TO-15, and TO-10A trip blanks were analyzed as a quality assurance measure. PCBs were not detected in the trip blank. Benzene, ethanol and isopropanol were detected in the vent stack trip blank and acetone, benzene, ethanol, isopropanol, and methylene chloride were detected in the indoor air quality trip blank. Trip blanks are used as a check on shipping and laboratory-related sources of contamination. The detected concentrations in the trip blanks are due to a technician error in TRC's laboratory. The trip blank canisters were opened while being packed for shipment; the technician was attempting to obtain an initial vacuum on the canister, which is not required for trip blanks. The trip blanks became contaminated with common contaminants (i.e., ethanol, acetone, and isopropanol) as well as benzene as they are all used in the TRC laboratory. Due to this non-conformance the trip blanks were not considered in the validation process and the results of the trip blanks are not discussed in the following sections. The laboratory method blanks were free of contamination which implies that the analytical process did not introduce those contaminants.

TRC believes that the results for four compounds reported throughout this report (acetone, ethanol, methylene chloride and isopropanol) were influenced by laboratory derived contamination and hence do not reflect actual vent stack and indoor air concentrations at the KMS, as previously discussed in more detail in Section 3.2.

A trend analysis of VOC concentrations over time is presented in Section 6.4. VOCs detected in the indoor air samples are believed to be associated with the storage and use of cleaners, adhesives, paint, and other VOC-containing products as well as building construction materials. This finding is based upon sporadic measurements of slightly higher VOC concentrations noted during the spring and summer school vacation periods when the building is experiencing lower than normal air exchange and the indoor use of VOC-containing cleaning products and repair materials increases. Overall, VOC concentrations are decreasing in indoor air suggesting that off-gassing from the newly constructed school building is diminishing over time. Low level fluctuations in PCB concentrations in indoor air are representative of background conditions. Measured concentrations of PCBs and VOCs in vent stack air are expected, and indicate that the passive ventilation system is performing as designed.

4.1 Indoor Air Quality Results

On December 29 and 30, 2008, TRC collected three indoor and one outdoor background (with duplicate) 24-hour TO-4A and TO-15 air samples at the KMS. Due to a laboratory extraction error, results were not available from the original TO-4A samples and the indoor and background locations were sampled again on February 18 and 19, 2009 and submitted for TO-4A analysis. Table 4-1 provides a summary of results for all compounds that have been found one or more times within the indoor air quality samples.

PCBs were not detected in the three indoor air samples collected, or in the background outdoor air samples. Total PCB detection limits ranged from 0.00015 ug/m^3 in the Buildings A and C samples to 0.00038 ug/m^3 in the Building B sample.

A total of 12 VOCs were detected in the three indoor air quality samples and/or outdoor air background samples collected during December 2008/February 2009. Five VOCs (acetone, benzene, chloromethane, difluorodichloromethane, and trichlorofluoromethane) were detected in one or more of the three indoor air samples collected and at the background location. The indoor air concentrations of these VOCs were similar to those detected in the outdoor air background samples. The highest concentrations of acetone, benzene, difluorodichloromethane, and trichlorofluoromethane were observed in the Building C sample while the highest concentration of chloromethane was observed in the background location samples. 2-Butanone and toluene were detected in the three indoor air samples, but not in the background samples. The highest concentration of 2-butanone was observed in the Building B sample while the highest concentration of toluene was observed in the Building A sample. Ethanol and n-hexane were detected in the Building A and Building C samples with the highest concentration of each observed in the Building A samples. Three VOCs were detected in only one of the three indoor air samples. Chloroform, isopropanol, and styrene were observed in the Building A sample.

Acetone, isopropanol, methylene chloride, and ethanol are common laboratory contaminants while all of the other VOCs detected in the indoor air samples are found in cleaning products, adhesives, paints and other VOC-containing products, and as components of building materials. Their presence in indoor air may not be representative of site conditions (i.e., soil, groundwater), but rather a result of off-gassing from building materials, the use of VOC-containing materials within the school, or partially contributed by ambient concentrations in the vicinity of the school.

4.2 Vent Stack Air Results

On December 30, 2008, TRC collected four vent stack air samples (plus one duplicate) and one ground level outdoor background 4-hour TO-10A and TO-15 samples at the KMS. Table 4-2 provides a summary of results for the vent stack samples.

In December 2008, PCBs were not detected in the vent stack samples collected or in the outdoor air background sample.

A total of 16 VOCs were detected in the vent stack air samples and/or background sample, including the common laboratory contaminants acetone, isopropanol, and methylene chloride. Two of the detected VOCs (acetone and trichlorofluoromethane) were detected in the four vent stack air samples and at the outdoor air background sampling location. Three additional VOCs (benzene, chloromethane, and difluorodichloromethane), though detected in less than four of the subsurface collection zones, were also detected at the outdoor air background sampling location. For these five VOCs, similar concentrations (i.e., less than 2-fold different) were observed in the vent stack air and outdoor air samples. Chloroform and tetrachloroethene were detected in the four vent stack air samples collected, but not at the outdoor air background sampling location, which may indicate that this compound is being released from the subsurface ventilation system

and/or uniformly from the subsurface and vented by the system. 1,2-Dichloroethane, 2-butanone, cyclohexane, isopropanol, methylene chloride, n-hexane, tetrahydrofuran, toluene, and trichloroethene were detected in less than four of the subsurface collection zones indicating a more localized subsurface presence.

5.0 COMPARISON OF PCB RESULTS TO RISK-BASED AIR CONCENTRATIONS

This section of the report discusses the PCB indoor air and vent stack air sampling results, relative to site-specific outdoor air concentrations and risk-based air concentrations (RBACs). Air sampling results, background outdoor air results, and RBACs are presented in Tables 5-1 and 5-2 for the December 2008/February 2009 sampling event. Compound-specific results exceeding RBACs are highlighted on these tables. Measured concentrations of compounds exceeding RBACs are discussed in Sections 5.1 and 5.2 for indoor air and vent stack air, respectively. A detailed discussion of the RBACs can be found in Appendix G.

Two PCB RBACs have been developed for the KMS. The first RBAC is the Action Level (AL; 0.05 ug/m^3) used as an initial indicator that PCB air concentrations above background levels have been detected. The second RBAC is the Acceptable Long-Term Average Exposure Concentration (ALTAEC; 0.3 ug/m^3), indicative of the maximum acceptable air concentration that should not be exceeded for an extended time period. The ALTAEC could be exceeded over the short-term and still result in acceptable risk levels.

The LTMMIP specifies that both indoor air and vent stack air total PCB concentrations are to be compared to RBACs. This comparison is appropriate for indoor air results since exposures to indoor air at the KMS are occurring over a similar duration and frequency as that assumed for RBAC development. However, this comparison is less appropriate for vent stack air results since little if any human exposure to air within the vent stack system itself is taking place. Air from the vent stack is released to outdoor air where the PCBs are quickly diluted and dispersed. Therefore, comparison of vent stack air results to RBACs is highly conservative, if not conceptually irrelevant. The results of the comparison of vent stack air results to RBACs should be interpreted with caution due to the significantly reduced degree of exposure to vent stack air that can be experienced by individuals in comparison to indoor air.

5.1 Indoor Air

Indoor air sampling results, outdoor air background results, and RBACs are presented in Table 5-1. PCBs were not detected at the three indoor air sampling locations (Buildings A, B, and C), or in the outdoor air background samples. The highest indoor air total PCB detection limit (Building B sample), was approximately 100-fold lower than the PCB AL and roughly 1000-fold lower than the ALTAEC; the Building A and Building C samples displayed detection limits of PCBs approximately 300-fold lower than the AL and roughly 2000-fold lower than the ALTAEC. Because the PCB AL is used as an initial indicator that PCB air concentrations above background levels have been detected and the detected concentrations of PCBs are significantly less than the AL, concentrations of PCBs in indoor air are consistent with levels associated with ambient conditions. Because there are no indoor air PCB concentrations in excess of the RBACs, no specific follow-up actions are recommended at this time.

Temporal trends for total PCB indoor air concentrations at the sampling locations in Building A (classrooms), Building B (auditorium), and Building C (faculty dining area) are shown in Figure 5-1. Figure 5-1 also shows concentration trends at the outdoor air background sampling

location. Data included on this figure are for the time period August 2006 to February 2009. The highest indoor air total PCB concentration was detected during the July/August 2007 sampling event when the school was likely experiencing lower than normal air exchange (summer use) and the potential for volatilization of PCBs from outdoor ambient sources is greatest due to the warmer weather. The lowest indoor air total PCB concentration was detected during the April 2008 sampling event when ambient temperatures were lower.

No clear trends are noted for total PCB concentrations in indoor air. Measured concentrations fluctuate over time, with slightly higher concentrations noted during the summer school vacation period when the building is experiencing lower than normal air exchange and the potential for volatilization of PCBs from outdoor ambient sources is greatest due to warmer weather. The low level PCB indoor air concentrations are representative of background conditions in outdoor ambient environments.

April 2009 is the date of the next sampling event.

5.2 Vent Stack Air

Vent stack air sampling results, outdoor air background results, and RBACs are presented in Table 5-2. PCBs were not detected in the four vent stack samples. PCBs were also not detected in the outdoor air background sample. Because there are no exceedances of the RBACs, no specific follow-up actions are recommended at this time.

Vent stack air reporting limits were higher than those for indoor air, ranging from <0.018 ug/m^3 to <0.026 ug/m^3. The higher reporting limit could mask the presence of PCBs in the vent stack air system compared to indoor air results. However, reporting limits were 10-fold below the AL indicating that PCBs, even if not detected by the analytical method, were present at concentrations less than the RBACs.

Temporal trends for total PCB vent stack air concentrations are shown in Figure 5-2. Two vent stack locations were consistently sampled on a monthly basis so as to establish concentration trends. The vents selected were VS-1 and VS-4 which were chosen because they both vent from the Building A vapor collection zone and Building A consists of classrooms where children spend most of the day. Figure 5-2 also shows concentration trends at the outdoor air background sampling location. Data included on this figure are for the time period August 2006 to December 2008/February 2009. Many of the vent stack air samples collected during this time period displayed non-detect levels of total PCBs. Total PCB concentrations in VS-1 are consistent over time and similar to levels present at the outdoor air background location. Total PCB concentrations in VS-4 displayed somewhat greater variability with slightly higher concentrations coinciding with warmer ambient temperatures. The low level fluctuations in PCB vent stack air concentrations suggest that the range of measured concentrations is representative of typical conditions within the subsurface ventilation system.

April 2009 is the date of the next sampling event.

6.0 COMPARISON OF VOC RESULTS TO COMPARISON CRITERIA

This section of the report discusses the VOC indoor air and vent stack air sampling results, relative to site-specific outdoor air and generic indoor air background concentrations and available comparison criteria. Air sampling data, background data, and comparison criteria are presented in Tables 6-1 and 6-2. Compound-specific results exceeding comparison criteria are highlighted on these tables. The detected concentrations of compounds exceeding comparison criteria are discussed in Section 6.1 for indoor air quality samples and Section 6.2 for vent stack air samples, followed by a discussion in Section 6.3 of the findings of a risk characterization conducted to evaluate the significance of the comparison criteria exceedances. Risk-based comparison criteria are discussed below, with greater detail provided in Appendix G. Section 6.4 presents the observed trends in contaminant concentrations over time.

Comparison criteria for VOC data include MassDEP Threshold Effects Exposure Limits (TELs) and Allowable Ambient Limits (AALs), published in December 1995, consistent with the LTMMIP. TELs are developed to be applicable to short-term exposure concentrations (average 24-hour levels) while AALs are developed to be protective of long-term exposure concentrations (average annual levels over 30 years). Indoor air and vent stack air VOC concentrations are conservatively compared to both criteria even though it is unlikely that actual exposures to measured air concentrations would occur for either an entire 24-hour day or continually for 30 years.

Because TELs and AALs have not been revised since 1995 and may not include the most up-to-date toxicity information available, VOC concentrations in excess of AALs and TELs are discussed relative to alternate comparison criteria. The alternate comparison criteria are primarily residential and commercial EPA screening levels (EPA SLs) developed by Oak Ridge National Laboratory (September 2008) using the most current toxicity information available. Similar to AALs, residential EPA SLs are applicable to continuous long-term exposures. Commercial EPA SLs are more applicable to the actual exposures occurring at the KMS. In interpreting concentrations in excess of residential EPA SLs, it is important to consider how the frequency and duration of actual exposures may differ from continuous long-term exposures assumed for residential EPA SL development.

Because AALs, TELs, and EPA SLs are set at risk levels that are only a portion of the MassDEP risk management criteria (see Appendix G for additional information on this), concentrations that slightly exceed (i.e., less than 5-fold) one or more comparison criteria may not be cause for concern, especially considering that actual exposures may be of lesser duration and frequency than assumed in comparison criteria development.

For compounds lacking comparison criteria, detected concentrations are discussed relative to available comparison criteria for a surrogate compound, selected based on similarities in chemical structure and/or known toxicity. Surrogate assignments are identified in footnotes on Tables 6-1 and 6-2.

To account for anticipated background conditions at the KMS, VOC concentrations in excess of comparison criteria are framed relative to site-specific outdoor air background concentrations,

indicating ambient conditions in the vicinity of the site. To provide additional perspective, VOC concentrations in excess of comparison criteria are also discussed relative to MassDEP indoor air background values, used by MassDEP in the development of the Massachusetts Contingency Plan (MCP) numeric standards (MassDEP, 2008). Therefore, the presence of one or more VOCs at concentrations that exceed comparison criteria should be interpreted with caution and may not indicate the need for immediate action.

The LTMMIP specifies that both indoor air and vent stack air VOC concentrations are to be compared to comparison criteria. This comparison is appropriate for indoor air results since exposures to indoor air at the KMS are occurring over a similar though lesser duration and frequency as that assumed for comparison criteria development. However, this comparison is less appropriate for vent stack air results since little if any human exposure to air within the vent stack system itself is taking place. Air from the vent stack is released to outdoor air where the VOCs are quickly diluted and dispersed. Therefore, comparison of vent stack air results to comparison criteria is highly conservative, if not conceptually irrelevant. The results of the comparison of vent stack air results to comparison criteria should be interpreted with caution due to the significantly reduced degree of exposure to vent stack air that can be experienced by individuals in comparison to indoor air.

6.1 Indoor Air

As presented in Table 6-1, concentrations of three VOCs in the indoor air samples exceeded one or more comparison criteria. The compounds are benzene, chloroform, and methylene chloride. Methylene chloride was only detected in the trip blank sample and its detection is due to a technician error in the TRC laboratory. Both benzene and chloroform were detected at concentrations below MassDEP indoor air background concentrations, indicating that the presence of these compounds in indoor air is not a site-related finding.

Benzene concentrations detected in the three indoor air samples exceed comparison criteria developed assuming long-term continuous exposure. However, the concentrations do not exceed the TEL and commercial EPA SL, most applicable to actual exposures occurring at the KMS. Therefore, the benzene concentrations in the indoor air samples are unlikely to be of concern. This conclusion is supported by the risk characterization presented in Section 6.3. Furthermore, concentrations of benzene at the outdoor air background location also exceed comparison criteria. The presence of this compound at similar concentrations in both the indoor air and outdoor air background samples indicates that their presence is likely related to ambient conditions in the vicinity of the KMS. Benzene was also detected in the trip blank. However, the contamination found in the trip blank is explained by a technician error in the TRC laboratory and does not affect the indoor air quality VOC samples collected at the middle school.

The concentration of chloroform in the Building A sample exceeds its AALs, but does not exceed the TEL or its EPA SLs based on the most current toxicity information available. Therefore, this compound is unlikely to be of concern, which is further evidenced by the risk characterization presented in Section 6.3.

Isopropanol, which lacks compound-specific comparison criteria, was also detected in the Building A indoor air sample at concentrations above the outdoor air background reporting limit. There are no published comparison criteria for this compound. However, a comparison to the AAL/TEL for isobutyl alcohol can give some perspective on the significance of the detected isopropanol concentrations, based on similarities in chemical structure and toxicity. The detected indoor air concentrations are below the AAL/TEL for isobutyl alcohol suggesting that the detected concentrations are unlikely to be of concern.

6.2 Vent Stack Air

As indicated on Table 6-2, concentrations of six VOCs in vent stack air samples exceeded one or more comparison criteria. The compounds include 1,2-dichloroethane, benzene, chloroform, methylene chloride, tetrachloroethene, and trichloroethene. Comparison of vent stack air results to risk-based comparison criteria assumes that exposures to the air within the vent system are occurring at the same duration and intensity as indoor air, which is unlikely as previously noted. Therefore, VOC concentrations measured in excess of comparison criteria for VOCs in the vent stack system are unlikely to be indicative of a health concern since individuals are experiencing little, if any exposure to vent stack air.

Benzene, methylene chloride and trichloroethene concentrations detected in vent stack air samples only exceed comparison criteria developed assuming continuous exposure (i.e., AALs and residential EPA SLs). Because the benzene, methylene chloride, and trichloroethene concentrations do not exceed TELs and commercial EPA SLs, these concentrations in the vent stack air samples are unlikely to be of concern. Furthermore, the concentration of benzene at the outdoor air background location also exceeds comparison criteria. The presence of benzene at similar concentrations in both the vent stack air and outdoor air background samples indicates that its presence is likely related to ambient conditions in the vicinity of the KMS.

1,2-Dichloroethane, chloroform, and tetrachloroethene vent stack air concentrations do not exceed their TELs, applicable to short-term exposures, though the detected concentrations do exceed their AALs and residential/commercial EPA SLs. Because exposure to vent stack air is negligible or non-existent, the presence of these compounds in vent stack air is unlikely to be of concern.

Seven of the 16 compounds present in vent stack air were detected in the December 2001 subsurface soil gas sampling event conducted by BETA, including benzene and tetrachloroethene. The presence of these compounds in vent stack air indicates that the passive foundation venting system is performing as designed and limiting or preventing the migration of subsurface VOCs to indoor air.

6.3 Risk Characterization for Indoor Air

The LTMMIP specifies that the LSP-of-Record should submit the indoor air data to a toxicologist/risk assessor for further assessment if indoor air VOC concentrations exceed TELs, AALs, or 150% of outdoor air background concentrations. Therefore, non-carcinogenic hazards and excess lifetime cancer risks have been estimated to determine whether a condition of no significant risk exists within the school. All compounds detected in indoor air samples between March 2007 and December 2008/February 2009 were included in the risk characterization. Exposure point concentrations are either maximum detected concentrations or 95 percent upper confidence limits (95% UCLs) on the arithmetic mean, using sampling data for Buildings A through C combined. The use of maximum detected concentrations or 95% UCLs as exposure point concentrations provides a reasonable upper bound of the contaminant concentrations an individual may be exposed to, over the specified time period. A commercial worker scenario was used which assumed exposures for 8 hours/day, 250 days/year for 25 years, consistent with the assumptions used in the development of the site-specific PCB action levels. Appendix H contains a data summary table detailing the derivation of the exposure point concentrations and a calculation spreadsheet presenting the exposure assumptions and toxicity values used in the assessment.

The results presented in Appendix H document that a condition of no significant risk exists associated with commercial worker indoor air exposures at the KMS. Because workers are the most highly exposed individuals at the KMS, exposures of school children and staff would also be associated with a condition of no significant risk. The risk and hazard to the commercial worker is overestimated due to the assumption that a worker would be continuously exposed to the maximum detected concentrations over 25 years. VOC concentrations associated with off-gassing from building materials have been demonstrated to be trending downward (see discussion in Section 6.4).

The LTMMIP also specified that the LSP-of-Record should submit the vent stack air data to a toxicologist/risk assessor for further assessment if vent stack air VOC results exceed TELs and AALs. Because exposures to vent stack air are negligible or non-existent, further quantitative assessment of the vent stack air VOC results was not required.

6.4 Trend Analysis for VOCs

Temporal trends for VOC indoor air concentrations at the sampling location in Building A (classrooms), Building B (auditorium), and Building C (faculty dining area) are shown in Figures 6-1 through 6-3, respectively. Five VOCs were selected for data presentation including 2-butanone, methyl tert butyl ether, tetrahydrofuran, toluene, and total xylenes (the sum of m/p-xylene and o-xylene isomers). These VOCs were selected because they are not common laboratory contaminants, were frequently detected in indoor air samples, and were noted as exceeding one or more comparison criteria. Data included on these figures are for the time period August 2006 to December 2008/February 2009. Bars on the figures outlined in black indicate that the compound was not detected during the specific sampling event, and the value presented on the figure is half the analytical detection limit.

Although some degree of temporal fluctuation is observed, there are clearly decreasing concentration trends for 2-butanone, toluene, and total xylenes over time in the Building B and C indoor air quality samples. The other two indicator compounds, tetrahydrofuran and methyl tert butyl ether, were only detected once in the samples collected from the Building B and C samples, respectively. For the Building A samples, most concentrations for the selected compounds have been consistently low, with the sporadic detection of slightly higher VOC concentrations noted during the spring and summer school vacation periods when the building is experiencing lower than normal air exchange and the indoor use of VOC-containing cleaning products and repair materials increases. These sporadic higher concentrations were also observed within the Building B and C samples. Overall, the decreasing trends in Buildings B and C suggest that off-gassing from the newly constructed school building is diminishing. The trend is less apparent in Building A since concentrations have been consistently low over time with some fluctuations.

Temporal trends for VOC vent stack air concentrations are shown in Figures 6-4 and 6-5 for VS-1 and VS-4, respectively. The same five VOCs selected for trend analysis in indoor air were also used for vent stack air. Data included on these figure are for the time period August 2006 to December 2008/February 2009. All five indicator VOCs display clearly decreasing trends overtime at both vent stack air sampling locations. Though some degree of temporal fluctuation is observed, the sporadic presence of slightly higher vent stack air VOC concentrations is noted during times of warmer ambient temperatures, likely caused by the subsurface release of VOCs or the off-gassing of VOCs from the ventilation system.

6.5 Recommended Modifications to the LTMMIP

The LTMMIP specifies follow-up actions to be taken if VOC air data exceed the comparison criteria. However, the response actions set forth in the LTMMIP are excessive and unnecessary for the December 2008/February 2009 data set for the following reasons:

- Risk calculations presented herein and in prior TRC reports (encompassing nine sampling events of monitoring data collected over 24 months) show that the maximum or 95% UCL on the arithmetic mean concentrations of detected VOCs do not pose a significant risk to human health and further that VOC concentrations are trending downward;
- Most of the VOCs detected in indoor air are associated with the storage and use of cleaners, adhesives, paints, and other VOC-containing products within the KMS; and
- The comparison of vent stack air to comparison criteria (e.g., TELs and AALs) is inappropriate because human exposure to air within the vent stack is highly unlikely, rendering the comparison to such criteria conceptually irrelevant.

The LTMMIP will be revised to reflect TRC's detailed understanding of the site conceptual model (e.g., impacts from indoor use of commercially available cleaners, paints, adhesives, etc.), the relationship between vent measurements and historical soil gas measurements that illustrate the proper functioning of the passive sub-slab ventilation system, and long-term downward

trends for indoor air and passive vent system concentrations for VOCs originating from building materials. The revised LTMMIP will also include more appropriate response actions and response action schedules that reflect TRC's comprehensive understanding of human health risk, sources, and air measurements. In addition, a new methodology for evaluation of vent stack air concentrations is recommended for the proposed revised LTMMIP, which will be more appropriate than the presently required review against comparison criteria. A draft revision to the LTMMIP is planned for regulatory review in 2009.

7.0 CONCLUSIONS

Indoor air quality and vent stack air sampling was conducted at the KMS during December 2008/February 2009 for total PCBs and VOCs. Data were evaluated for quality and reliability, discussed relative to risk-based air concentrations, and analyzed for concentration trends over the period of sampling from August 2006 to December 2008/February 2009. The following summarizes the conclusions of the air sampling data evaluation.

In general, all TO-10A, and TO-15 data collected during December 2008 were determined to be valid as reported and usable for decision-making purposes. During the TO-4A analysis of the December 2008 indoor air quality samples, there was a laboratory extraction error, and resampling of the indoor air sampling locations was conducted in February 2009. The TO-4A data collected during this resampling event were determined to be valid as reported and usable for decision-making purposes.

PCBs were detected in the three indoor air samples collected in December 2008/February 2009. The PCB detection limits for these samples were below risk-based action levels. Detected concentrations of benzene and chloroform in indoor air samples exceeded one or more risk-based comparison criteria. However, further assessment of the indoor air data indicated that the 95% UCL on the arithmetic mean or maximum VOC concentrations measured between March 2007 and December 2008/February 2009 were associated with a condition of no significant risk to exposed individuals at the KMS.

PCBs were not detected in the four vent stack air samples collected in December 2008/February 2009. There were more VOC exceedances of comparison criteria in vent stack samples as compared to indoor air samples. However, the comparison to risk-based criteria is not appropriate for vent stack air results. The vent system is designed to capture VOCs being released from the subsurface beneath the KMS and transport the gases through PVC piping to outdoor air, preventing migration through the building slab and into indoor air. Little if any human exposure to air within the vent stack system itself is taking place. Air from the vent stack is released to outdoor air on the roof of KMS where the VOCs are quickly diluted and dispersed. Therefore, comparison of vent stack air results to comparison criteria developed assuming short-term (24-hour) and long-term exposure is highly conservative, if not conceptually irrelevant.

Some VOCs are likely present in indoor air due to off-gassing from building materials and the storage and use of cleaners, adhesives, paints, and other VOC-containing products indoors at the school. Levels of PCBs and VOCs in indoor air were found to fluctuate overtime likely due to: 1) the degree of building air exchange that occurs during normal school operation (i.e., open conditions) versus vacation periods when the school is not in session (i.e., closed conditions); 2) changes in ambient temperatures that may increase or decrease the off-gassing of contaminants from indoor building materials; 3) the degree to which activities within the school building (e.g., cleaning and repairs) are contributing to indoor air concentrations of VOCs, and 4) reductions in building material related VOC emission sources over time. The PCB indoor air concentrations are representative of background conditions found in outdoor ambient air. Overall, VOC concentrations are decreasing in indoor air suggesting that off-gassing from the aggregate of sources within the newly constructed school building is diminishing. The sporadic

presence of slightly higher VOC concentrations noted during the spring and summer school vacation periods is likely attributable to the building experiencing lower than normal air exchange in combination with increased use of VOC-containing cleaning products and repair materials indoors.

VOCs are consistently detected in the sub-slab passive vent stacks, while PCBs are sporadically detected in the vent stacks. The presence of PCBs and VOCs in vent stack air is expected, and indicates that the passive ventilation system is performing as designed. VOCs detected in vent stack air samples may also have been released from the ventilation system. The low PCB vent stack air concentrations and decreasing vent stack air VOC concentrations are likely representative of typical conditions within the subsurface ventilation system and indicate that off-gassing from the system is diminishing overtime.

It is recommended that the LTMMIP be revised to reflect TRC's detailed understanding of the site conceptual model (e.g., impacts from indoor use of commercially available cleaners, paints, adhesives, etc.), the relationship between vent measurements and historical soil gas measurements that illustrate the proper functioning of the passive sub-slab ventilation system, and long-term downward trends for indoor air and passive vent system concentrations for VOCs originating from building materials. The revised LTMMIP will also include more appropriate response actions and response action schedules that reflect TRC's comprehensive understanding of human health risk, sources, and air measurements. In addition, a new methodology for evaluation of vent stack air concentrations is recommended for the proposed revised LTMMIP, which will be more appropriate than the presently required review against comparison criteria. A draft revision to the LTMMIP is planned for regulatory review in 2009.

8.0 REFERENCES

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TABLES

Table 2-1. December 2008[a] Sample Summary

Keith Middle School
New Bedford, Massachusetts

Sample ID	Sample Location	Sampling Events (suffix) Dec (-18)	Sample Type
A	Building A, center of west hallway	X	IAQ
B	Building B, Auditorium	X	IAQ
C	Building C, Faculty Dining Room	X	IAQ
BG	Background, flagpole area outside main entrance to Building A	XX	IAQ
VS-1	Building A, vent stack 1	X	Vent Stack
VS-4	Building A, vent stack 4	X	Vent Stack
VS-5	Building B, vent stack 5		Vent Stack
VS-7	Building B, vent stack 7	XX	Vent Stack
VS-8	Building B, vent stack 8		Vent Stack
VS-9	Building B, vent stack 9	X	Vent Stack
VS-10	Building B, vent stack 10		Vent Stack
VS-11	Gymnasium , vent stack 11		Vent Stack
VS-12	Gymnasium, vent stack 12		Vent Stack
VS-14	Gymnasium, vent stack 14		Vent Stack
VS-16	Building A , vent stack 16		Vent Stack
VS-BG	On the ground at main entrance to Building A	X	Vent Stack

Notes:

IAQ = Indoor Air Quality
BG = Sample designation for background samples.
VS = Sample designation for vent stack samples.
X = Sample collected at this location during specified event.
XX = Designation indicating duplicate samples collected at specified location.
a = IAQ PCB samples were sampled in February 2009 on account of December IAQ sample loss in laboratory.

Table 3-1. Comparison of VOC Indoor Air Sample Results - Collocated Sampler Precision
Keith Middle School
New Bedford, Massachusetts

Analysis	Analyte	Dec-08 [2] BG-18		Dec-08 [2] BG-18 Dup		RPD (%)
VOCs						
(ug/m^3)	1,2,4-trichlorobenzene	< 1.48		< 1.48		NC
	1,2,4-trimethylbenzene	< 0.982	UJ	< 0.982	UJ	NC
	1.2-dichloroethane	< 0.809		< 0.809		NC
	2,2,4-trimethylpentane	< 0.934		< 0.934		NC
	2-butanone	< 0.589		< 0.589		NC
	acetone [1]	**3.20**		**4.72**		**38.38**
	benzene	**0.548**	**J**	**0.621**	**J**	**12.49**
	carbon disulfide	< 0.622		< 0.622		NC
	chloroform	< 0.098		< 0.098		NC
	chloromethane	**0.872**		**1.01**		**14.67**
	cyclohexane	< 0.688		< 0.688		NC
	difluorodichloromethane	**2.43**		**1.93**		**22.94**
	ethanol [1]	< 4.71		< 4.71		NC
	ethylbenzene	< 0.868		< 0.868		NC
	ethyl acetate	< 1.80	R	< 1.80	R	NC
	freon-113	< 1.53		< 1.53		NC
	isopropanol [1]	< 1.23		< 1.23		NC
	methylene chloride [1]	< 1.74		< 1.74		NC
	methyl isobutyl ketone (MIBK)	< 0.819		< 0.819		NC
	methyl tert butyl ether	< 0.720		< 0.720		NC
	p/m-xylene	< 1.74		< 1.74		NC
	o-xlyene	< 0.868		< 0.868		NC
	heptane	< 0.819		< 0.819		NC
	n-hexane	< 0.704		< 0.704		NC
	styrene	< 0.851		< 0.851		NC
	tetrachloroethene	< 0.136		< 0.136		NC
	tetrahydrofuran	< 0.589		< 0.589		NC
	toluene	< 0.753		< 0.753		NC
	trichloroethene	< 0.107		< 0.107		NC
	trichlorofluoromethane	**1.20**		**1.24**		**3.28**
PCBs						
(ug/m^3)	Total PCBs	< 0.000080		< 0.000078		NC

Notes:

RPD - Relative Percent Difference = ABS(Dup-Sample)/((Dup+Sample)/2)*100

NC - RPD could not be calculated due to a non-detect in one or both of the collocated samples

Detected values are shown in bold

J - Concentration should be considered estimated.

R- Result rejected due to calibration non-conformances.

UJ - Non-detect concentration should be considered estimated.

[1] Compound is a common laboratory contaminant as discussed in Section 3.

[2] IAQ PCB sampling was performed in February 2009 on account of December 2008 sample loss in laboratory.

Table 3-2. Comparison of VOC Vent Stack Air Sample Results - Collocated Sampler Precision
Keith Middle School
New Bedford, Massachusetts

Analysis	Analyte	Dec-08 VS-7-18		Dec-08 VS-7-18-Dup		RPD (%)
VOCs						
(ug/m^3)	1,2,4-trichlorobenzene	< 1.48		< 1.48		NC
	1,2,4-trimethylbenzene	< 0.982	UJ	< 0.982	UJ	NC
	1,2-dichloroethane	**1.49**		**1.62**		**8.36**
	2,2,4-trimethylpentane	< 0.934		< 0.934		NC
	2-butanone	**1.52**		**1.16**		**26.87**
	acetone [1]	**10.2**		**7.11**		**35.70**
	benzene	**0.334**	**J**	**0.230**	**J**	**36.88**
	carbon disulfide	< 0.622		< 0.622		NC
	chloroform	**0.990**		**0.800**		**21.23**
	chloromethane	< 0.413		< 0.413		NC
	cyclohexane	**0.918**		**0.725**		**23.49**
	difluorodichloromethane	**2.22**		**2.57**		**14.61**
	ethanol [1]	< 4.71		< 4.71		NC
	ethylbenzene	< 0.868		< 0.868		NC
	ethyl acetate	< 1.80	R	< 1.80	R	NC
	freon-113	< 1.53		< 1.53		NC
	isopropanol [1]	**2.00**		< 1.23		NC
	methylene chloride [1]	**10.9**		< 1.74		NC
	methyl isobutyl ketone (MIBK)	< 0.819		< 0.819		NC
	methyl tert butyl ether	< 0.720		< 0.720		NC
	p/m-xylene	< 1.74		< 1.74		NC
	o-xlyene	< 0.868		< 0.868		NC
	heptane	< 0.819		< 0.819		NC
	n-hexane	**2.08**		< 0.704		NC
	styrene	< 0.851		< 0.851		NC
	tetrachloroethene	**3.08**		**2.99**		**2.97**
	tetrahydrofuran	**1.57**		**1.65**		**4.97**
	toluene	**1.83**		**1.34**		**30.91**
	trichloroethene	**2.56**		**2.52**		**1.57**
	trichlorofluoromethane	**1.80**		**1.73**		**3.97**
PCBs						
(ug/m^3)	Total PCBs	< 0.018		< 0.026		NC

Notes:
RPD - Relative Percent Difference = ABS(Dup-Sample)/((Dup+Sample)/2)*100
NC - RPD could not be calculated due to a non-detect in one or both of the collocated samples
Detected values are shown in bold
[1] Compound is a common laboratory contaminant as discussed in Section 3.
J - Concentration should be considered estimated.
R- Result rejected due to calibration non-conformances.
UJ - Non-detect concentration should be considered estimated.

Table 4-1. Indoor Air Quality Sample Results - December 2008 [2]
Keith Middle School
New Bedford, Massachusetts

Analysis	Analyte	Sample Locations			Background Locations		QA/QC
		A-18	B-18	C-18	BG-18	BG-18 Dup	Trip Blank
VOCs							
(ug/m^3)	1,2,4-trichlorobenzene	< 1.48	< 1.48	< 1.48	< 1.48	< 1.48	< 1.48
	1,2,4-trimethylbenzene	< 0.982 UJ	< 0.982 UJ	< 0.982 UJ	< 0.982 UJ	< 0.982 UJ	< 0.982 UJ
	1,2-dichloroethane	< 0.809	< 0.809	< 0.809	< 0.809	< 0.809	< 0.809
	2,2,4-trimethylpentane	< 0.934	< 0.934	< 0.934	< 0.934	< 0.934	< 0.934
	2-butanone	**0.744**	**1.39**	**1.01**	< 0.589	< 0.589	< 0.589
	acetone [1]	**5.66**	**3.87**	**6.25**	**3.20**	**4.72**	**4.2**
	benzene	**0.700 J**	**0.647 J**	**0.839 J**	**0.548 J**	**0.621 J**	**0.260 J**
	carbon disulfide	< 0.622	< 0.622	< 0.622	< 0.622	< 0.622	< 0.622
	chloroform	**0.102**	< 0.098	< 0.098	< 0.098	< 0.098	< 0.098
	chloromethane	< 0.413	< 0.413	**0.866**	**0.872**	**1.01**	< 0.413
	cyclohexane	< 0.688	< 0.688	< 0.688	< 0.688	< 0.688	< 0.688
	difluorodichloromethane	**2.30**	**2.30**	**2.57**	**2.43**	**1.93**	< 0.988
	ethanol [1]	**22.8**	< 4.71	**11.3**	< 4.71	< 4.71	**12.7**
	ethylbenzene	< 0.868	< 0.868	< 0.868	< 0.868	< 0.868	< 0.868
	ethyl acetate	< 1.80 R	< 1.80 R	< 1.80 R	< 1.80 R	< 1.80 R	< 1.80 R
	freon-113	< 1.53	< 1.53	< 1.53	< 1.53	< 1.53	< 1.53
	isopropanol [1]	**1.32**	< 1.23	< 1.23	< 1.23	< 1.23	**1.52**
	methylene chloride [1]	< 1.74	< 1.74	< 1.74	< 1.74	< 1.74	**2.00**
	methyl isobutyl ketone (MIBK)	< 0.819	< 0.819	< 0.819	< 0.819	< 0.819	< 0.819
	methyl tert butyl ether	< 0.720	< 0.720	< 0.720	< 0.720	< 0.720	< 0.720
	p/m-xylene	< 1.74	< 1.74	< 1.74	< 1.74	< 1.74	< 1.74
	o-xlyene	< 0.868	< 0.868	< 0.868	< 0.868	< 0.868	< 0.868
	heptane	< 0.819	< 0.819	< 0.819	< 0.819	< 0.819	< 0.819
	n-hexane	**0.917**	< 0.704	**0.862**	< 0.704	< 0.704	< 0.704
	styrene	**0.900**	< 0.851	< 0.851	< 0.851	< 0.851	< 0.851
	tetrachloroethene	< 0.136	< 0.136	< 0.136	< 0.136	< 0.136	< 0.136
	tetrahydrofuran	< 0.589	< 0.589	< 0.589	< 0.589	< 0.589	< 0.589
	toluene	**1.16**	**0.923**	**0.777**	< 0.753	< 0.753	< 0.753
	trichloroethene	< 0.107	< 0.107	< 0.107	< 0.107	< 0.107	< 0.107
	trichlorofluoromethane	< 1.12	< 1.12	**1.47**	**1.20**	**1.24**	< 1.12
PCBs							
(ug/m^3)	Total PCBs	< 0.00038	< 0.00038	< 0.00015	< 0.000080	< 0.000078	< 0.025 ug

Notes:

J - Concentration should be considered estimated.

R- Result rejected due to calibration non-conformances.

UJ - Non-detect concentration should be considered estimated.

ND - Non-detect

µg/m^3 - micrograms per cubic meter

VOCs - volatile organic compounds

PCBs - polychlorinated biphenyls

ug - micrograms; trip blank results are presented in micrograms (ug) since no air volume is collected for the trip blank

[1] Compound is a common laboratory contaminant as discussed in Section 3.

[2] IAQ PCB sampling was performed in February 2009 on account of December 2008 sample loss in laboratory.

* - Results for indoor air are compared to contemporary outdoor air (background) sample

Reporting Limit for Total PCBs is the highest individual homolog PQL (practical quantitation limit) per sample.

Table 4-2. Vent Stack Sample Results - December 2008
Keith Middle School
New Bedford, Massachusetts

Analysis	Analyte	Sample Locations					Background	QA/QC
		VS-9-18	VS-7-18	VS-7-18-Dup	VS-1-18	VS-4-18	VS-BG-18	Trip Blank-VS
VOCs								
(ug/m^3)	1,2,4-trichlorobenzene	< 1.48	< 1.48	< 1.48	< 1.48	< 1.48	< 1.48	< 1.48
	1,2,4-trimethylbenzene	< 0.982 UJ	< 0.982 UJ	< 0.982 UJ	< 0.982 UJ	< 0.982 UJ	< 0.982 UJ	< 0.982 UJ
	1,2-dichloroethane	< 0.809	**1.49**	**1.62**	**1.70**	< 0.809	< 0.809	< 0.809
	2,2,4-trimethylpentane	< 0.934	< 0.934	< 0.934	< 0.934	< 0.934	< 0.934	< 0.934
	2-butanone	< 0.589	**1.52**	**1.16**	**3.39**	**2.29**	< 0.589	< 0.589
	acetone [1]	**4.66**	**10.2**	**7.11**	**4.76**	**4.95**	**5.53**	**2.70**
	benzene	**0.377 J**	**0.334 J**	**0.230 J**	< 0.223 UJ	**0.278 J**	**0.381 J**	**0.239 J**
	carbon disulfide	< 0.622	< 0.622	< 0.622	< 0.622	< 0.622	< 0.622	< 0.622
	chloroform	**0.144**	**0.990**	**0.800**	**5.06**	**39.8**	< 0.098	< 0.098
	chloromethane	**0.460**	< 0.413	< 0.413	< 0.413	< 0.413	**1.34**	< 0.413
	cyclohexane	< 0.688	**0.918**	**0.725**	< 0.688	**0.863**	< 0.688	< 0.688
	difluorodichloromethane	**2.65**	**2.22**	**2.57**	< 0.988	**3.44**	**3.16**	< 0.988
	ethanol [1]	< 4.71	< 4.71	< 4.71	< 4.71	< 4.71	< 4.71	**12.6**
	ethylbenzene	< 0.868	< 0.868	< 0.868	< 0.868	< 0.868	< 0.868	< 0.868
	ethyl acetate	< 1.80 R	< 1.80 R	< 1.80 R	< 1.80 R	< 1.80 R	< 1.80 R	< 1.80 R
	freon-113	< 1.53	< 1.53	< 1.53	< 1.53	< 1.53	< 1.53	< 1.53
	isopropanol [1]	< 1.23	**2.00**	< 1.23	**1.64**	**2.98**	< 1.23	**1.60**
	methylene chloride [1]	**2.49**	**10.9**	< 1.74	**2.54**	< 1.74	< 1.74	< 1.74
	methyl isobutyl ketone (MIBK)	< 0.819	< 0.819	< 0.819	< 0.819	< 0.819	< 0.819	< 0.819
	methyl tert butyl ether	< 0.720	< 0.720	< 0.720	< 0.720	< 0.720	< 0.720	< 0.720
	p/m-xylene	< 1.74	< 1.74	< 1.74	< 1.74	< 1.74	< 1.74	< 1.74
	o-xlycne	< 0.868	< 0.868	< 0.868	< 0.868	< 0.868	< 0.868	< 0.868
	heptane	< 0.819	< 0.819	< 0.819	< 0.819	< 0.819	< 0.819	< 0.819
	n-hexane	< 0.704	**2.08**	< 0.704	< 0.704	**0.770**	< 0.704	< 0.704
	styrene	< 0.851	< 0.851	< 0.851	< 0.851	< 0.851	< 0.851	< 0.851
	tetrachloroethene	**0.561**	**3.08**	**2.99**	**8.81**	**20.1**	< 0.136	< 0.136
	tetrahydrofuran	< 0.589	**1.57**	**1.65**	**9.46**	**8.31**	< 0.589	< 0.589
	toluene	< 0.753	**1.83**	**1.34**	< 0.753	**0.835**	< 0.753	< 0.753
	trichloroethene	< 0.107	**2.56**	**2.52**	**0.482**	**1.70**	< 0.107	< 0.107
	trichlorofluoromethane	**1.57**	**1.80**	**1.73**	**1.40**	**2.72**	**1.72**	< 1.12
PCBs								
(ug/m^3)	Total PCBs	< 0.021	< 0.018	< 0.026	< 0.021	< 0.022	< 0.019	< 0.025

Notes:

J - Concentration should be considered estimated.

R- Result rejected due to calibration non-conformances.

UJ - Non-detect concentration should be considered estimated.

ND - Non-detect

µg/m^3 - micrograms per cubic meter

VOCs - volatile organic compounds

PCBs - polychlorinated biphenyls

[1] Compound is a common laboratory contaminant as discussed in Section 3.

* - Results for vent stack air are compared to contemporary outdoor air (background) sample

Reporting Limit for Total PCBs is the highest individual homolog PQL (practical quantitation limit) per sample.

Table 5-1. Comparison of PCB Indoor Air Quality Sample Results to Risk-Based Air Concentrations - December 2008/February 2009
Keith Middle School
New Bedford, Massachusetts

Analysis	Analyte	Sample Locations			Background Locations		QA/QC Trip Blank	MassDEP Background	Comparison Values	
		A-18	B-18	C-18	BG-18	BG-18 Dup			AL*	ALTAEC*
PCBs (ug/m^3)	Total PCBs	< 0.00038	< 0.00038	< 0.00015	< 0.000080	< 0.000078	< 0.025 ug	--	0.05	0.3

Notes:

$\mu g/m^3$ - micrograms per cubic meter
PCBs - polychlorinated biphenyls
ug - micrograms; trip blank results are presented in micrograms (ug) since no air volume is collected for the trip blank

PCB results for indoor air are compared to contemporary outdoor air (background) sample and MassDEP indoor air background values.
* PCBs are compared to the EPA site specific Action Level (AL) and the Acceptable Long-Term Average Exposure Concentration (ALTAEC).
Reporting Limit for Total PCBs is the highest individual homolog PQL (practical quantitation limit) per sample.

Table 5-2. Comparison of PCB Vent Stack Sample Results to Risk-Based Air Concentrations - December 2008/February 2009
Keith Middle School
New Bedford, Massachusetts

		Sample Locations					Background	QA/QC		
Analysis	Analyte	VS-9-18	VS-7-18	VS-7-18 Dup	VS-1-18	VS-4-18	VS-BG-18	Trip Blank-VS	Comparison Values	
PCBs									AL*	ALTAEC*
(ug/m^3)	Total PCBs	< 0.021	< 0.018	< 0.026	< 0.021	< 0.022	< 0.019	< 0.025 ug	0.05	0.3

Notes:

$\mu g/m^3$ - micrograms per cubic meter

PCBs - polychlorinated biphenyls

ug - micrograms; trip blank results are presented in micrograms (ug) since no air volume is collected for the trip blank

PCB results for vent stack air are compared to contemporary outdoor air (background) sample.

* PCBs are compared to the EPA site specific Action Level (AL) and the Acceptable Long-Term Average Exposure Concentration (ALTAEC).

Reporting Limit for Total PCBs is the highest individual homolog PQL (practical quantitation limit) per sample.

Table 6-1. Comparison of VOC Indoor Air Quality Sample Results to Comparison Criteria - December 2008/February 2009
Keith Middle School
New Bedford, Massachusetts

Analysis	Analyte	Sample Locations			Background Locations		QA/QC	MassDEP	Comparison Values			
		A-18	B-18	C-18	BG-18	BG-18 Dup	Trip Blank	Background	TEL*	AAL*	EPA SL (residential)	EPA SL (commercial)
VOCs												
(ug/m^3)	1,2,4-trichlorobenzene	< 1.48	< 1.48	< 1.48	< 1.48	< 1.48	< 1.48	0.59	--	--	0.22 (e)	1.1 (e)
	1,2,4-trimethylbenzene	< 0.982 UJ	< 0.982 UJ	< 0.982 UJ	< 0.982 UJ	< 0.982 UJ	< 0.982 UJ	--	--	--	1.46 (a)	6.2 (a)
	1,2-dichloroethane	< 0.809	< 0.809	< 0.809	< 0.809	< 0.809	< 0.809	--	11.01	0.04	0.094 (a)	0.47 (a)
	2,2,4-trimethylpentane	< 0.934	< 0.934	< 0.934	< 0.934	< 0.934	< 0.934	--	--	--	146 (b)	620 (b)
	2-butanone	**0.744**	**1.39**	**1.01**	< 0.589	< 0.589	< 0.589	42.18	200	10	1040 (a)	4400 (a)
	acetone [1]	**5.66**	**3.87**	**6.25**	**3.20**	**4.72**	**4.2**	27.04	160.54	160.54	6400 (a)	28000 (a)
	benzene	**0.700 J**	**0.647 J**	**0.839 J**	**0.548 J**	**0.621 J**	**0.260 J**	21	1.74	0.12	0.31 (a)	1.6 (a)
	carbon disulfide	< 0.622	< 0.622	< 0.622	< 0.622	< 0.622	< 0.622	--	0.1	0.1	146 (a)	620 (a)
	chloroform	**0.102**	< 0.098	< 0.098	< 0.098	< 0.098	< 0.098	3.36	132.76	0.04	0.11 (a)	0.53 (a)
	chloromethane	< 0.413	< 0.413	**0.866**	**0.872**	**1.01**	< 0.413	--	--	--	1.4 (a)	6.8 (a)
	cyclohexane	< 0.688	< 0.688	< 0.688	< 0.688	< 0.688	< 0.688	--	280.82	280.82	1260 (a)	5200 (a)
	difluorodichloromethane	**2.30**	**2.30**	**2.57**	**2.43**	**1.93**	< 0.988	--	--	--	42 (a)	176 (a)
	ethanol [1]	**22.8**	< 4.71	**11.3**	< 4.71	< 4.71	**12.7**	--	51.24	51.24	--	--
	ethylbenzene	< 0.868	< 0.868	< 0.868	< 0.868	< 0.868	< 0.868	9.62	300	300	0.97 (a)	4.9 (a)
	ethyl acetate	< 1.80 R	< 1.80 R	< 1.80 R	< 1.80 R	< 1.80 R	< 1.80 R	--	391.84	391.84	--	--
	freon-113	< 1.53	< 1.53	< 1.53	< 1.53	< 1.53	< 1.53	--	--	--	6260 (a)	26000 (a)
	isopropanol [1]	**1.32**	< 1.23	< 1.23	< 1.23	< 1.23	**1.52**	--	--	--	41.22 (c)	41.22 (c)
	methylene chloride [1]	< 1.74	< 1.74	< 1.74	< 1.74	< 1.74	**2.00**	600	9.45	0.24	5.2 (a)	26 (a)
	methyl isobutyl ketone (MIBK)	< 0.819	< 0.819	< 0.819	< 0.819	< 0.819	< 0.819	--	55.7	55.7	620 (a)	2600 (a)
	methyl tert butyl ether	< 0.720	< 0.720	< 0.720	< 0.720	< 0.720	< 0.720	--	--	--	9.4 (a)	47 (a)
	p/m-xylene	< 1.74	< 1.74	< 1.74	< 1.74	< 1.74	< 1.74	72.41**	11.8**	11.8**	146 (a)	620 (a)
	o-xlycne	< 0.868	< 0.868	< 0.868	< 0.868	< 0.868	< 0.868	72.41**	11.8**	11.8**	146 (a)	620 (a)
	heptane	< 0.819	< 0.819	< 0.819	< 0.819	< 0.819	< 0.819	--	--	--	146 (d)	620 (d)
	n-hexane	**0.917**	< 0.704	**0.862**	< 0.704	< 0.704	< 0.704	--	--	--	146 (a)	620 (a)
	styrene	**0.900**	< 0.851	< 0.851	< 0.851	< 0.851	< 0.851	2.79	200	2	200 (a)	880 (a)
	tetrachloroethene	< 0.136	< 0.136	< 0.136	< 0.136	< 0.136	< 0.136	11.01	922.18	0.02	0.41 (a)	2.1 (a)
	tetrahydrofuran	< 0.589	< 0.589	< 0.589	< 0.589	< 0.589	< 0.589	--	160.35	80.18	--	--
	toluene	**1.16**	**0.923**	**0.777**	< 0.753	< 0.753	< 0.753	28.65	80	20	1040 (a)	4400 (a)
	trichloroethene	< 0.107	< 0.107	< 0.107	< 0.107	< 0.107	< 0.107	4.49	36.52	0.61	1.2 (a)	6.1 (a)
	trichlorofluoromethane	< 1.12	< 1.12	**1.47**	**1.20**	**1.24**	< 1.12	--	--	--	146 (a)	620 (a)

Notes:

$\mu g/m^3$ - micrograms per cubic meter

VOCs - volatile organic compounds

EPA SL - EPA Screening Level: September 20, 2008

(a) EPA Screening Level (ELCR of 1E-06 for carcinogens; hazard of 0.2 for noncarcinogens)

(b) EPA SL for n-hexane used as surrogate for 2,2,4-trimethylpentane

(c) AAL/TEL for isobutyl alcohol used as surrogate for isopropanol

(d) EPA SL for n-hexane used as surrogate for heptane

(e) EPA SL for 1,4-dichlorobenzene used as surrogate for 1,2,4-trichlorobenzene

Highlighted values show exceedances of comparison values and the value which was exceeded

[1] Compound is a common laboratory contaminant as discussed in Section 3.

VOC results for indoor air are compared to contemporary outdoor air (background) sample and MassDEP indoor air background values.

* Threshold Effects Exposure Limits (TELs) and Allowable Ambient Limits (AALs) for ambient air currently in effect (December, 1995)

** - Value for xylenes (m-, o-,and p-isomers)

-- - No corresponding comparison criterion.

J - Concentration should be considered estimated.

R- Result rejected due to calibration non-conformances.

UJ - Non-detect concentration should be considered estimated.

Table 6-2. Comparison of VOC Vent Stack Sample Results to Comparison Criteria - December 2008/February 2009
Keith Middle School
New Bedford, Massachusetts

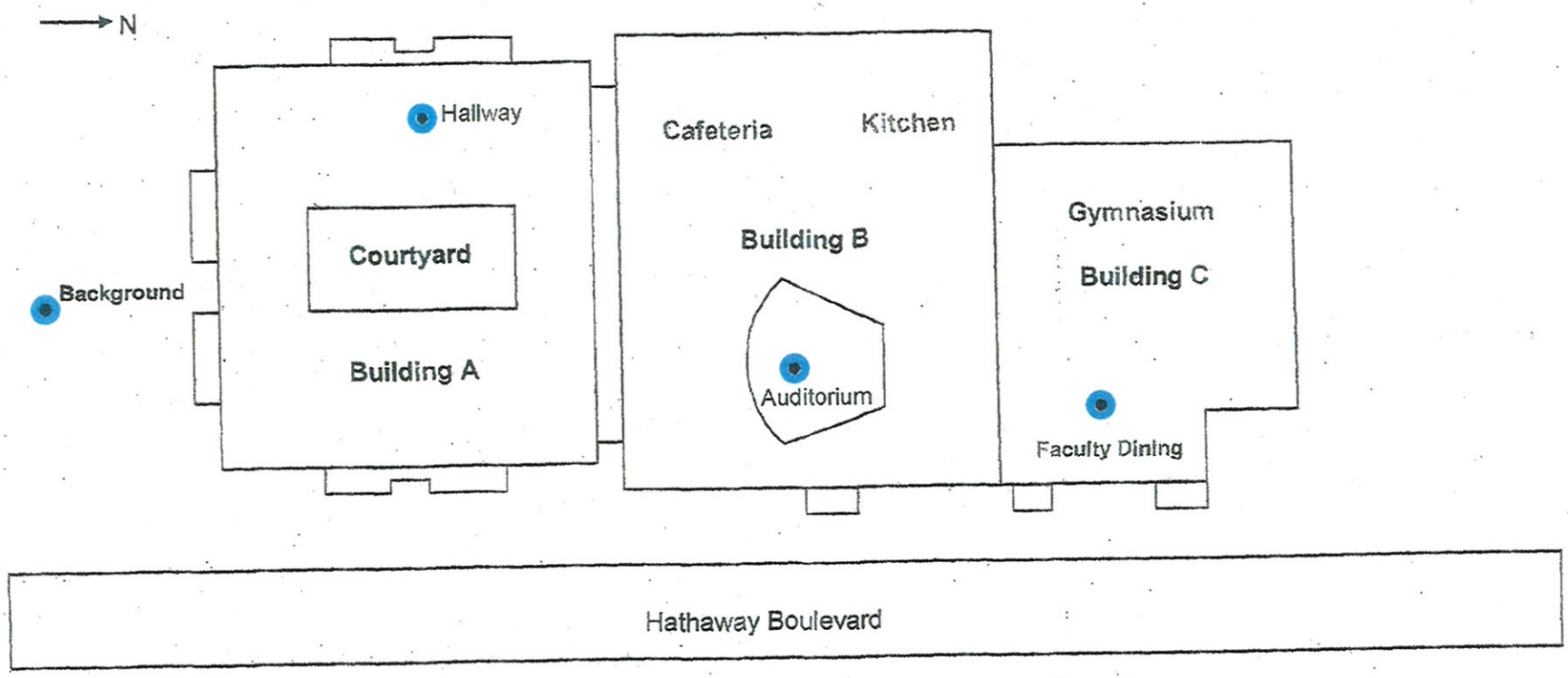
Analysis	Analyte	Sample Locations VS-9-18	VS-7-18	VS-7-18 Dup	VS-1-18	VS-4-18	Background VS-BG-18	QA/QC Trip Blank-VS	Comparison Values TEL*	AAL*	EPA SL (residential)	EPA SL (commercial)
VOCs (ug/m^3)	1,2,4-trichlorobenzene	< 1.48	< 1.48	< 1.48	< 1.48	< 1.48	< 1.48	< 1.48	--	--	0.22 (e)	1.1 (e)
	1,2,4-trimethylbenzene	< 0.982 UJ	< 0.982 UJ	< 0.982 UJ	< 0.982 UJ	< 0.982 UJ	< 0.982 UJ	< 0.982 UJ	--	--	1.46 (a)	6.2 (a)
	1,2-dichloroethane	< 0.809	**1.49**	**1.62**	**1.70**	< 0.809	< 0.809	< 0.809	11.01	0.04	0.094 (a)	0.47 (a)
	2,2,4-trimethylpentane	< 0.934	< 0.934	< 0.934	< 0.934	< 0.934	< 0.934	< 0.934	--	--	146 (b)	620 (b)
	2-butanone	< 0.589	**1.52**	**1.16**	**3.39**	**2.29**	< 0.589	< 0.589	200	10	1040 (a)	4400 (a)
	acetone [1]	**4.66**	**10.2**	**7.11**	**4.76**	**4.95**	**5.53**	**2.70**	160.54	160.54	6400 (a)	28000 (a)
	benzene	**0.377 J**	**0.334 J**	**0.230 J**	< 0.223 UJ	**0.278 J**	**0.381 J**	**0.239 J**	1.74	0.12	0.31 (a)	1.6 (a)
	carbon disulfide	< 0.622	< 0.622	< 0.622	< 0.622	< 0.622	< 0.622	< 0.622	0.1	0.1	146 (a)	620 (a)
	chloroform	**0.144**	**0.990**	**0.800**	**5.06**	**39.8**	< 0.098	< 0.098	132.76	0.04	0.11 (a)	0.53 (a)
	chloromethane	**0.460**	< 0.413	< 0.413	< 0.413	< 0.413	**1.34**	< 0.413	--	--	1.4 (a)	6.8 (a)
	cyclohexane	< 0.688	**0.918**	**0.725**	< 0.688	**0.863**	< 0.688	< 0.688	280.82	280.82	1260 (a)	5200 (a)
	difluorodichloromethane	**2.65**	**2.22**	**2.57**	< 0.988	**3.44**	**3.16**	< 0.988	--	--	42 (a)	176 (a)
	ethanol [1]	< 4.71	< 4.71	< 4.71	< 4.71	< 4.71	< 4.71	**12.6**	51.24	51.24	--	--
	ethylbenzene	< 0.868	< 0.868	< 0.868	< 0.868	< 0.868	< 0.868	< 0.868	300	300	0.97 (a)	4.9 (a)
	ethyl acetate	< 1.80 R	< 1.80 R	< 1.80 R	< 1.80 R	< 1.80 R	< 1.80 R	< 1.80 R	391.84	391.84	--	--
	freon-113	< 1.53	< 1.53	< 1.53	< 1.53	< 1.53	< 1.53	< 1.53	--	--	6260 (a)	26000 (a)
	isopropanol [1]	< 1.23	**2.00**	< 1.23	**1.64**	**2.98**	< 1.23	**1.60**	--	--	41.22 (c)	41.22 (c)
	methylene chloride [1]	**2.49**	**10.9**	< 1.74	**2.54**	< 1.74	< 1.74	< 1.74	9.45	0.24	5.2 (a)	26 (a)
	methyl isobutyl ketone (MIBK)	< 0.819	< 0.819	< 0.819	< 0.819	< 0.819	< 0.819	< 0.819	55.7	55.7	620 (a)	2600 (a)
	methyl tert butyl ether	< 0.720	< 0.720	< 0.720	< 0.720	< 0.720	< 0.720	< 0.720	--	--	9.4 (a)	47 (a)
	p/m-xylene	< 1.74	< 1.74	< 1.74	< 1.74	< 1.74	< 1.74	< 1.74	11.8**	11.8**	146 (a)	620 (a)
	o-xlyene	< 0.868	< 0.868	< 0.868	< 0.868	< 0.868	< 0.868	< 0.868	11.8**	11.8**	146 (a)	620 (a)
	heptane	< 0.819	< 0.819	< 0.819	< 0.819	< 0.819	< 0.819	< 0.819	--	--	146 (d)	620 (d)
	n-hexane	< 0.704	**2.08**	< 0.704	< 0.704	**0.770**	< 0.704	< 0.704	--	--	146 (a)	620 (a)
	styrene	< 0.851	< 0.851	< 0.851	< 0.851	< 0.851	< 0.851	< 0.851	200	2	200 (a)	880 (a)
	tetrachloroethene	**0.561**	**3.08**	**2.99**	**8.81**	**20.1**	< 0.136	< 0.136	922.18	0.02	0.41 (a)	2.1 (a)
	tetrahydrofuran	< 0.589	**1.57**	**1.65**	**9.46**	**8.31**	< 0.589	< 0.589	160.35	80.18	--	--
	toluene	< 0.753	**1.83**	**1.34**	< 0.753	**0.835**	< 0.753	< 0.753	80	20	1040 (a)	4400 (a)
	trichloroethene	< 0.107	**2.56**	**2.52**	**0.482**	**1.70**	< 0.107	< 0.107	36.52	0.61	1.2 (a)	6.1 (a)
	trichlorofluoromethane	**1.57**	**1.80**	**1.73**	**1.40**	**2.72**	**1.72**	< 1.12	--	--	146 (a)	620 (a)

Notes:

$\mu g/m^3$ - micrograms per cubic meter
VOCs - volatile organic compounds
EPA SL - EPA Screening Level; September 20, 2008
(a) EPA Screening Level (ELCR of 1E-06 for carcinogens; hazard of 0.2 for noncarcinogens)
(b) EPA SL for n-hexane used as surrogate for 2,2,4-trimethylpentane
(c) AAL/TEL for isobutyl alcohol used as surrogate for isopropanol
(d) EPA SL for n-hexane used as surrogate for heptane
(e) EPA SL for 1,4-dichlorobenzene used as surrogate for 1,2,4-trichlorobenzene
Highlighted values show exceedances of comparison values and the value which was exceeded
[1] Compound is a common laboratory contaminant as discussed in Section 3.
VOC results for indoor air are compared to contemporary outdoor air (background) sample and MassDEP indoor air background values.
* Threshold Effects Exposure Limits (TELs) and Allowable Ambient Limits (AALs) for ambient air currently in effect (December, 1995)
** - Value for xylenes (m-, o-,and p-isomers)
-- - No corresponding comparison criterion.
J - Concentration should be considered estimated.
R- Result rejected due to calibration non-conformances.
UJ - Non-detect concentration should be considered estimated.

FIGURES

Keith Middle School
Indoor Air Sampling Locations



● = Indoor Air Sampling Point

● = Sample Locations

KEITH MIDDLE SCHOOL
NEW BEDFORD, MASSACHUSETTS

INDOOR AIR SAMPLING LOCATIONS

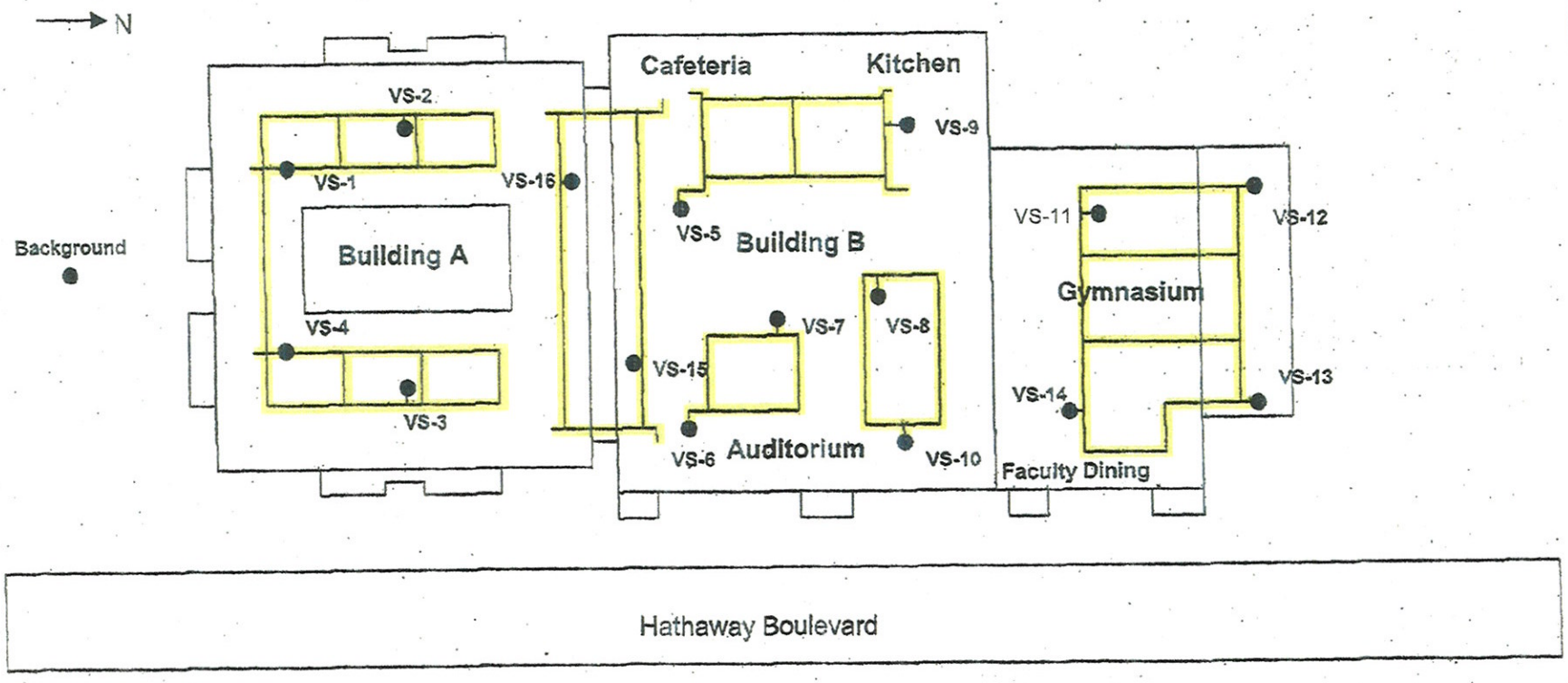
TRC
Wannalancit Mills
650 Suffolk Street
Lowell, MA 01854
(978) 970-5500

FIGURE
2-1

DRAWN BY: ---
CHECKED BY: DMS
DATE:
MAY 2008

FILE: I:\E_CAD\115058\indoorventsys1.dwg

Keith Middle School
Foundation Venting System



● = Vent Riser / Vent Stack Sampling location

——— = Passive Venting and Collection System

KEITH MIDDLE SCHOOL
NEW BEDFORD, MASSACHUSETTS

VENT STACK SAMPLE LOCATIONS

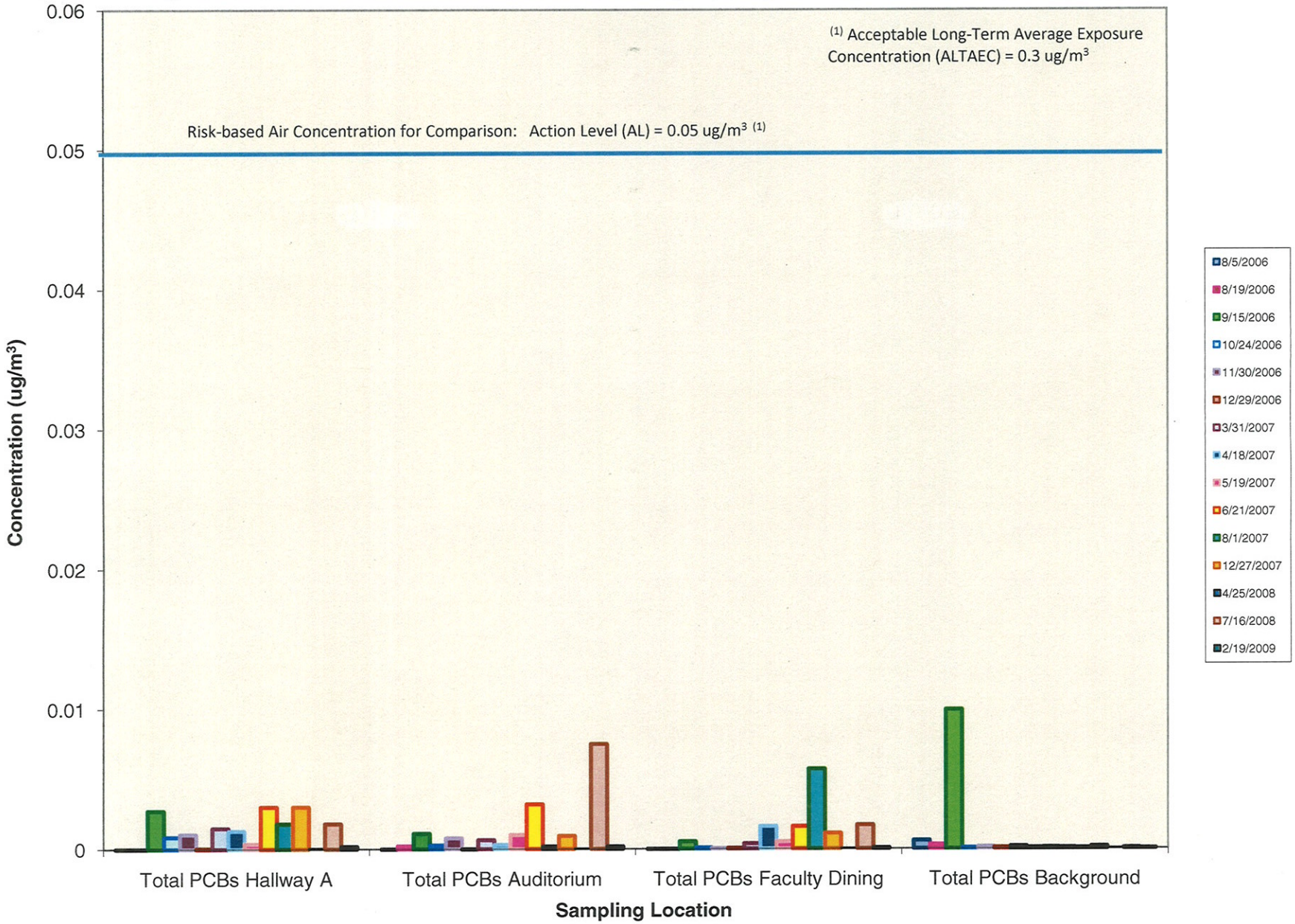
TRC
Wannalancit Mills
650 Suffolk Street
Lowell, MA 01854
(978) 970-5600

FIGURE 2-2

DRAWN BY: ---
CHECKED BY: DMS
DATE: MAY 2008

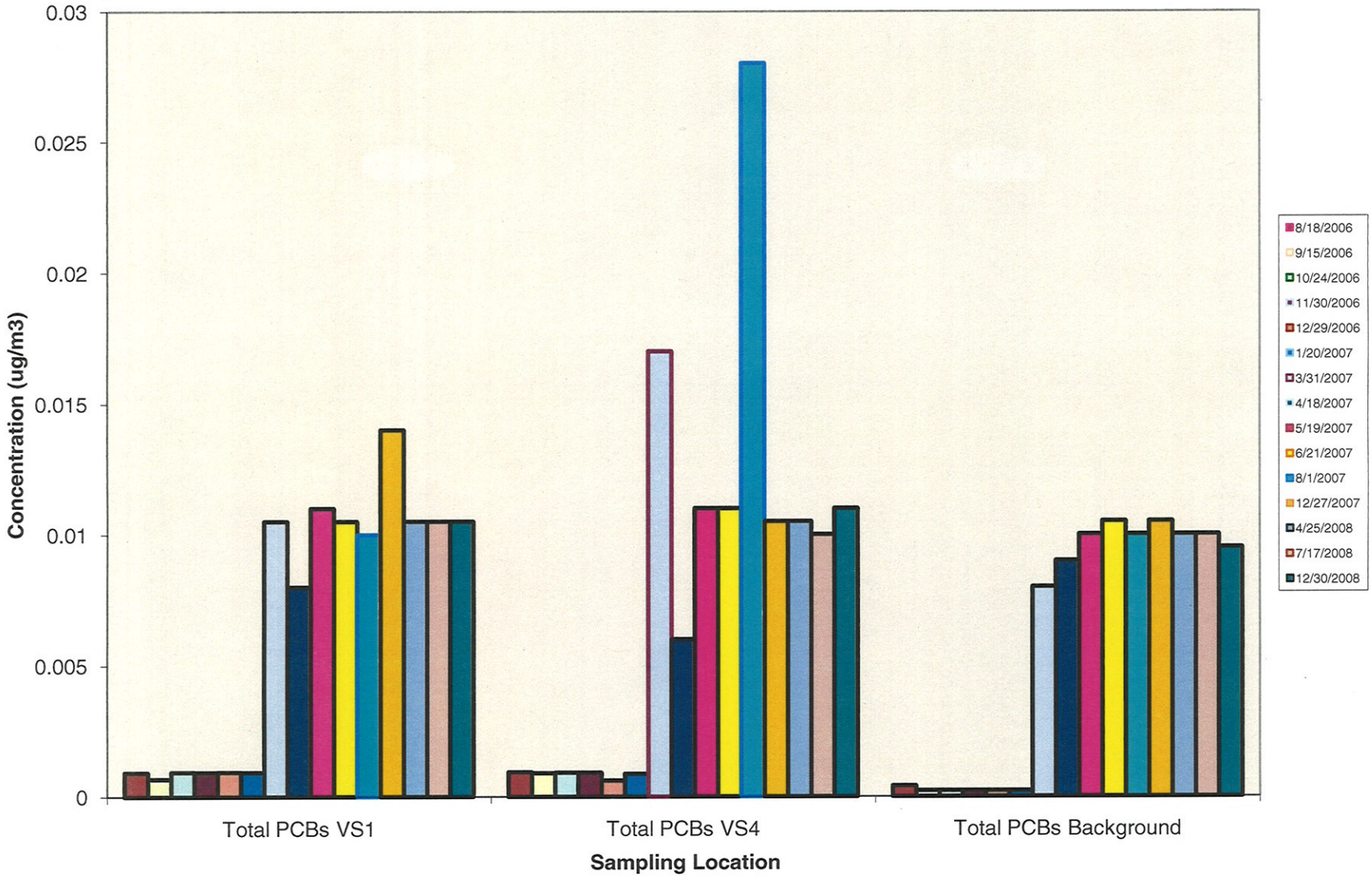
FILE: T:\E_CAD\115058\ventsys1A.dwg

Figure 5-1. Total PCB Trends in KMS Indoor Air Quality (IAQ) Samples - August 2006 through February 2009



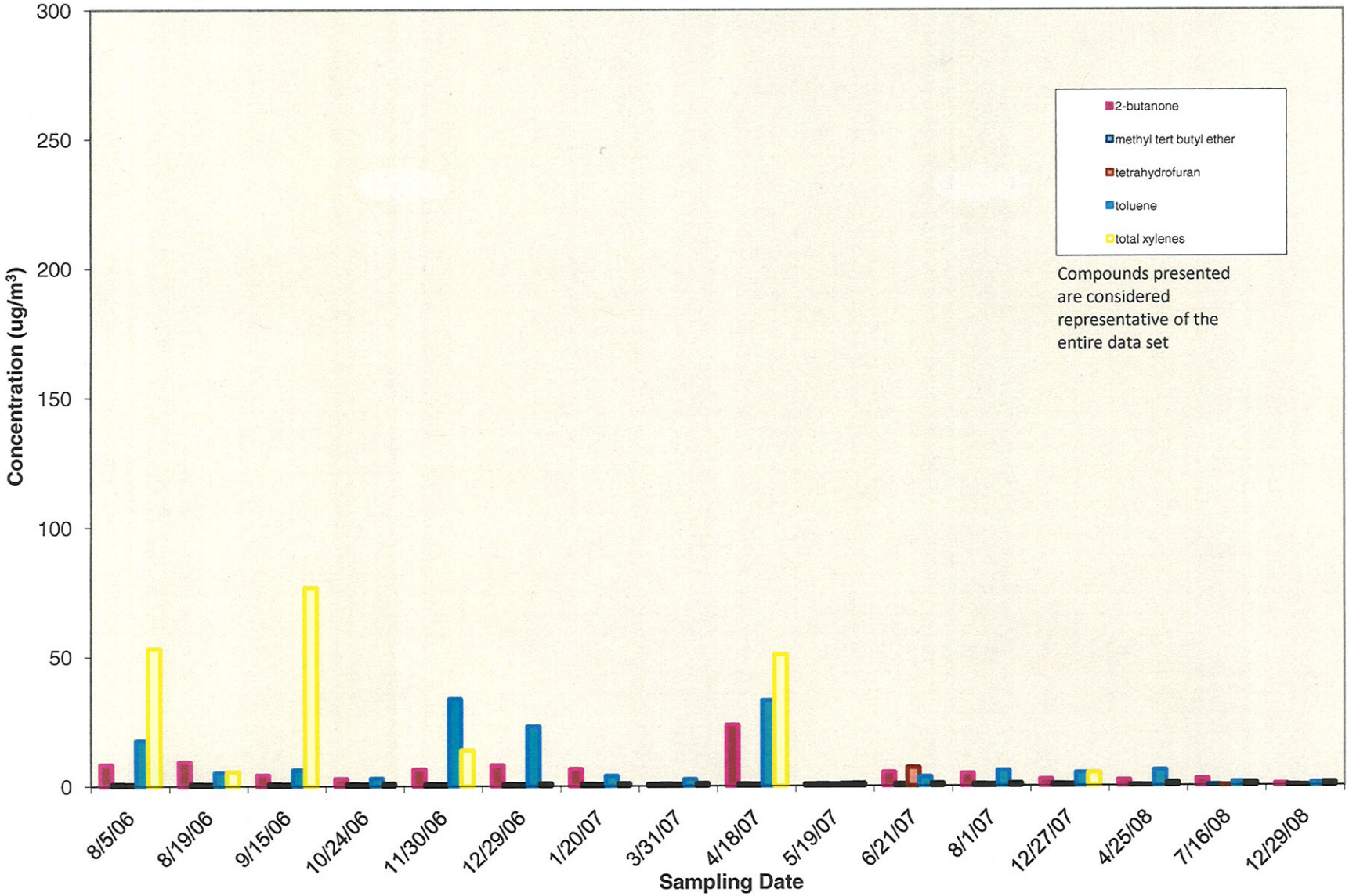
Each bar represents a single measurement. Bars outlined in black represent values reported by the laboratory as nondetect. For charting purposes these nondetect values are plotted as one half the reporting limit.

Figure 5-2. KMS Vent Stack PCB Trends - August 2006 through December 2008



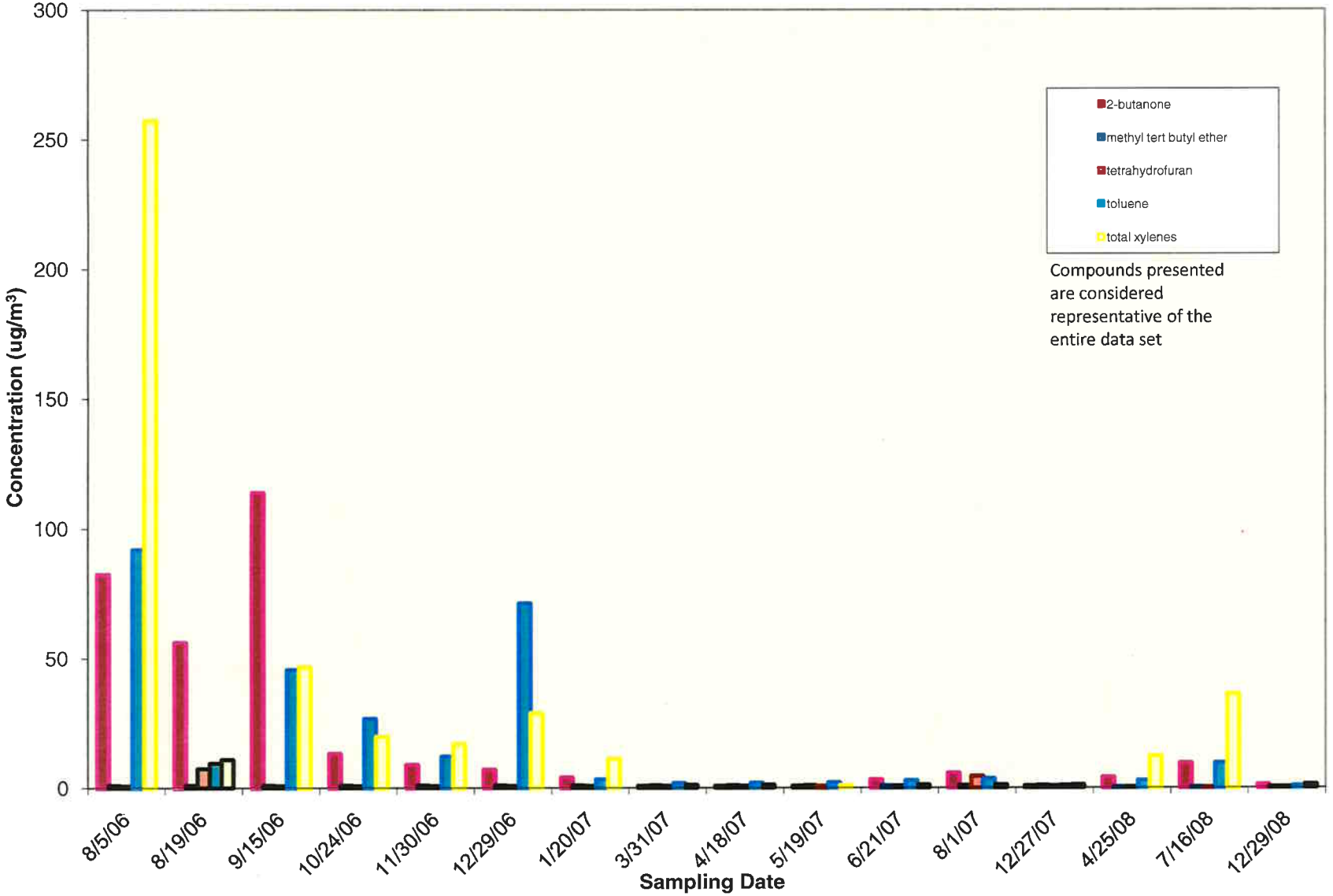
Each bar represents a single measurement. Bars outlined in black represent values reported by the laboratory as nondetect. For charting purposes these nondetect values are plotted as one half the reporting limit.

Figure 6-1. VOC Trends in KMS Building A (IAQ) - August 2006 through December 2008



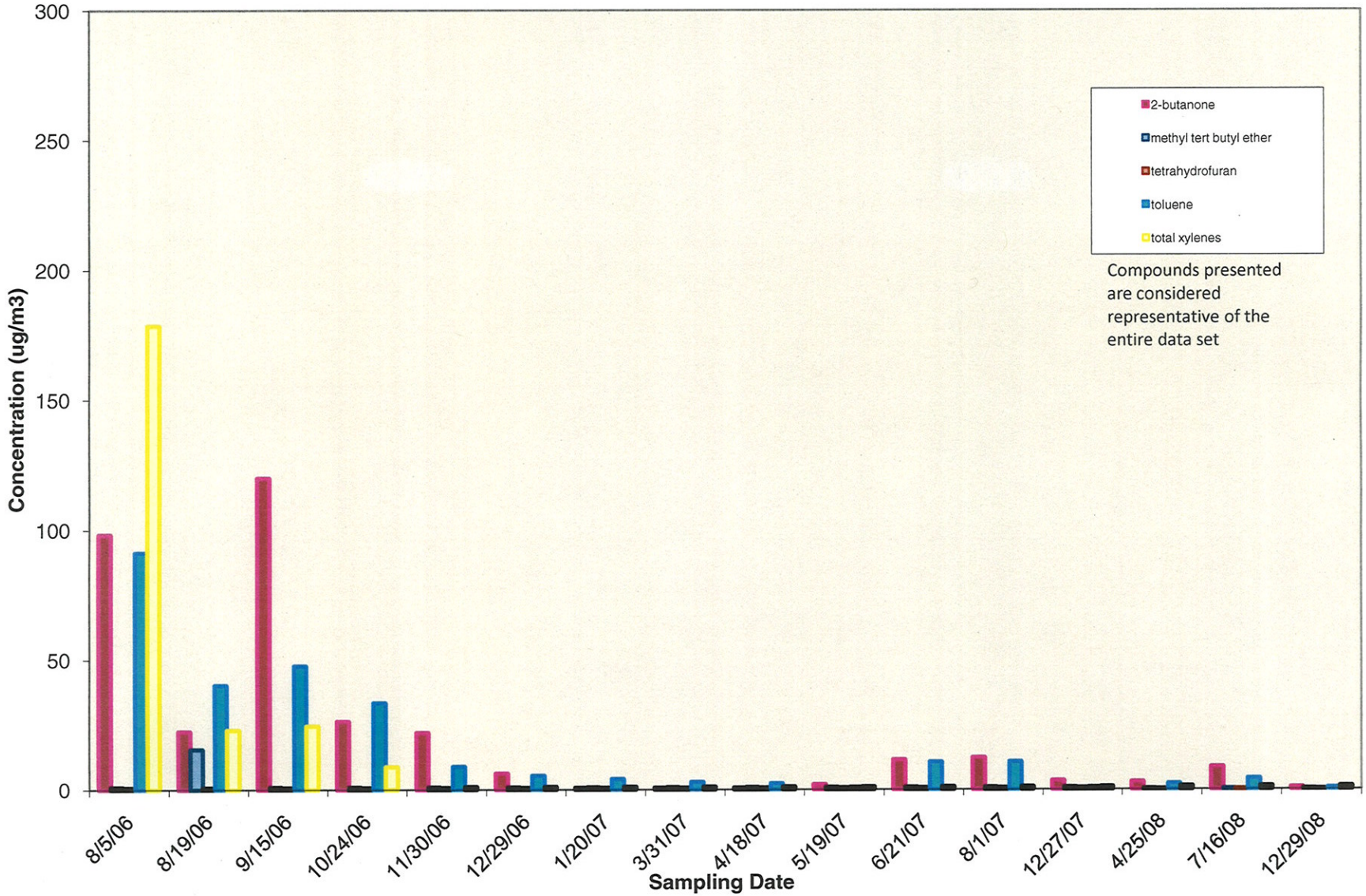
Each bar represents a single measurement. Bars outlined in black represent values reported by the laboratory as nondetect. For charting purposes these nondetect values are plotted as one half the reporting limit.

Figure 6-2. VOC Trends in KMS Building B (IAQ) - August 2006 through December 2008



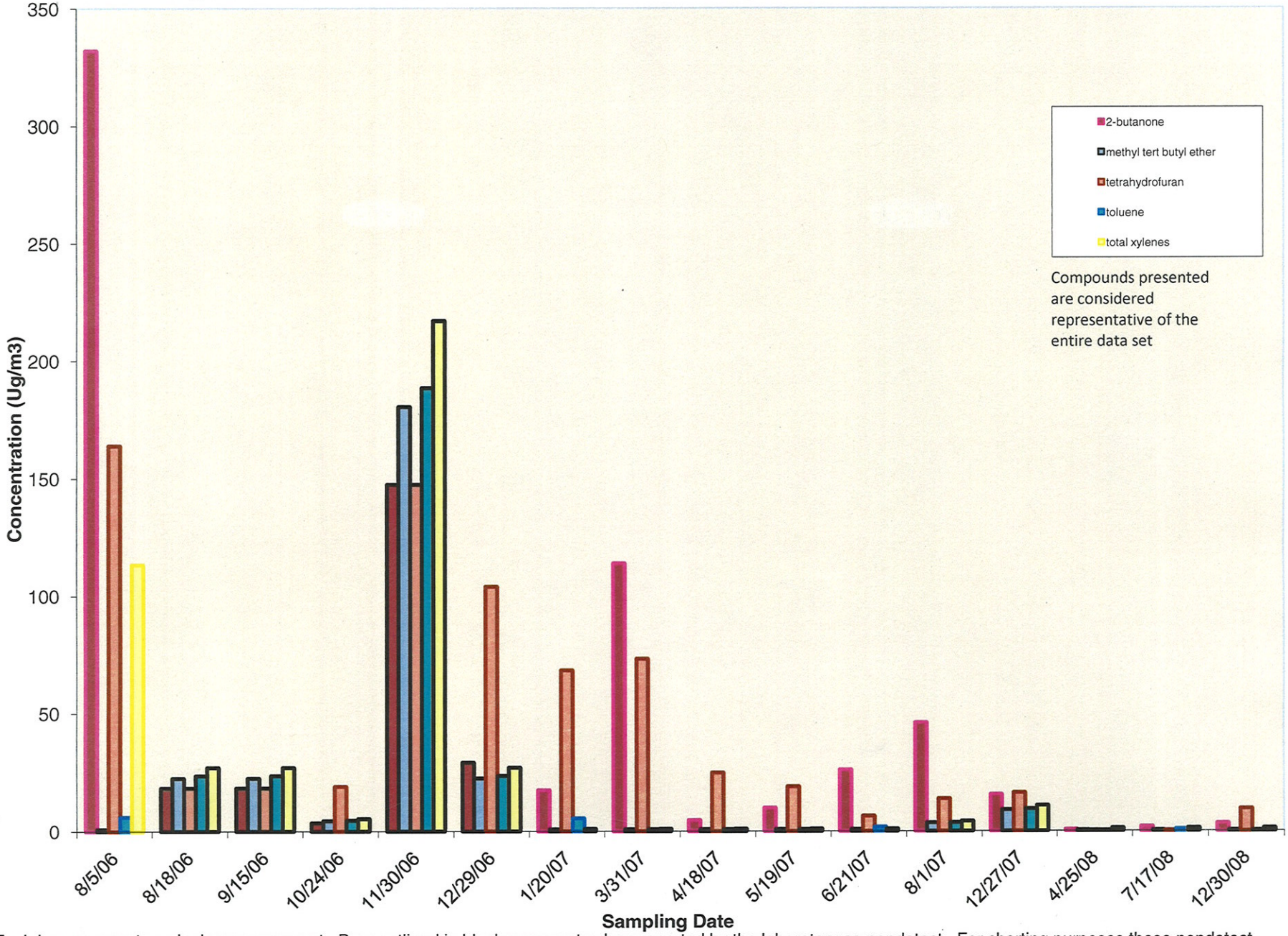
Each bar represents a single measurement. Bars outlined in black represent values reported by the laboratory as nondetect. For charting purposes these nondetect values are plotted as one half the reporting limit.

Figure 6-3. VOC Trends in KMS Building C (IAQ) - August 2006 through December 2008



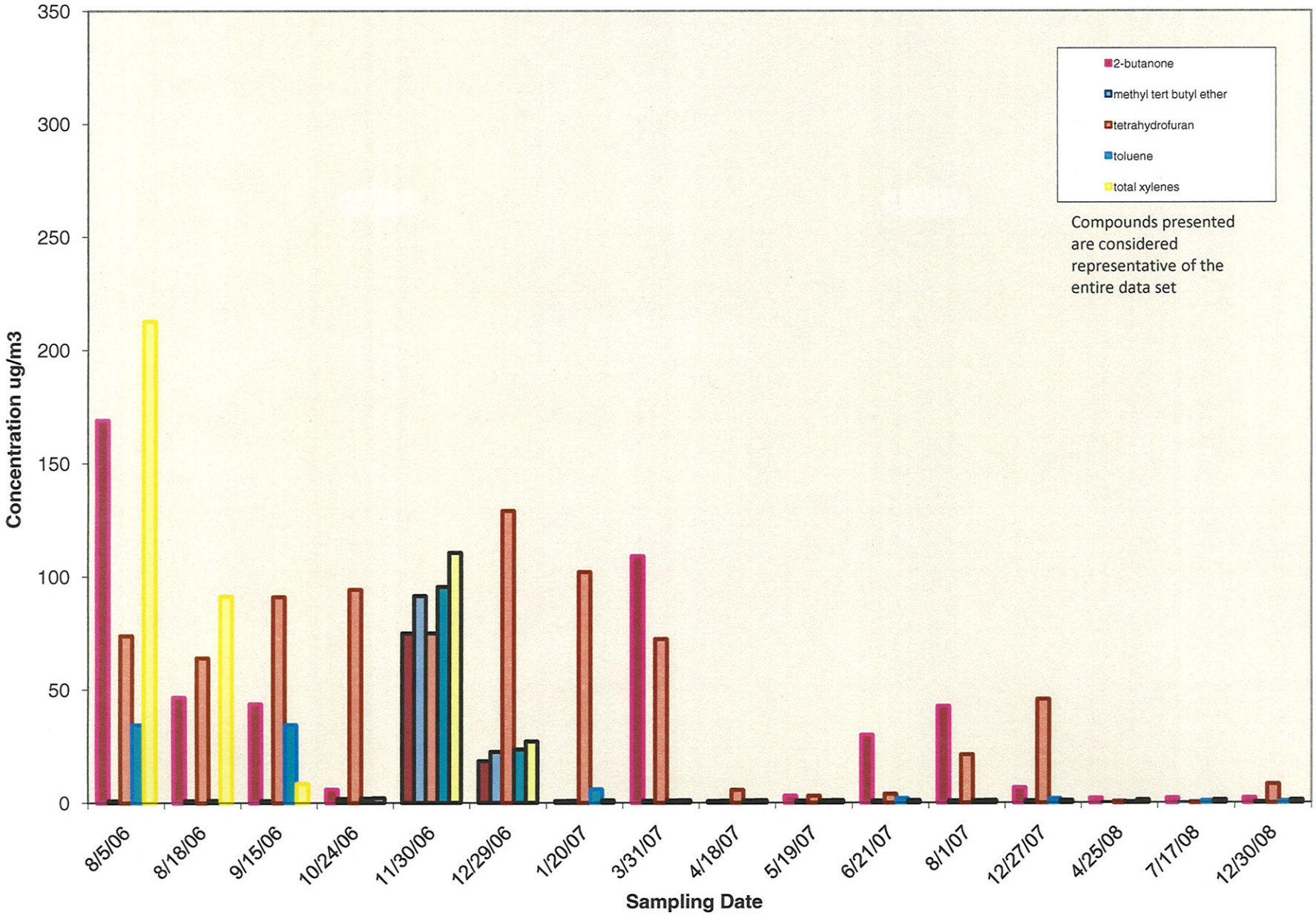
Each bar represents a single measurement. Bars outlined in black represent values reported by the laboratory as nondetect. For charting purposes these nondetect values are plotted as one half the reporting limit.

Figure 6-4. VOC Trends in KMS Vent Stack VS-1 - August 2006 through December 2008



Each bar represents a single measurement. Bars outlined in black represent values reported by the laboratory as nondetect. For charting purposes these nondetect values are plotted as one half the reporting limit.

Figure 6-5. VOC Trends in KMS Vent Stack VS-4 - August 2006 through December 2008



Each bar represents a single measurement. Bars outlined in black represent values reported by the laboratory as nondetect. For charting purposes these nondetect values are plotted as one half the reporting limit.

APPENDIX A

SUMMARY OF FIELD SAMPLING PROGRAM, ANALYTICAL PROGRAM, AND QUALITY ASSURANCE

1.0 FIELD SAMPLING PROGRAM

1.1 Overview

This section describes the procedures that TRC followed during the field sampling program.

1.2 Indoor Air Quality Sampling

Each of the indoor air quality field samples was collected by TRC over the course of one 24-hour test period. Indoor air quality samples were collected for analysis of PCBs by EPA Method TO-4A and VOCs by EPA Method TO-15.

1.2.1 Method TO-4A

Indoor air quality (IAQ) samples were collected for PCBs following the procedures described in the EPA Compendium Method TO-4A, ***Determination of Pesticides and Polychlorinated Biphenyls in Ambient Air Using High Volume Polyurethane Foam (PUF) Sampling followed by Gas Chromatographic/Multi-Detector Detection (GC/MD)***, *Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air, Second Edition*, USEPA, January 1999.

TRC placed a high volume sampler at each PCB indoor air sampling location. A multi-point calibration was performed on each high volume sampler prior to sample collection using a calibrated orifice. A polyurethane foam (PUF) sampling cartridge was then unsealed and inserted into the high volume sampler and the sampler turned on. The start time, elapsed hours counter reading, and flow rate (magnehelic reading) were then recorded on a data sheet. After 24 hours of sampling, the elapsed hours counter reading and flow rate (magnehelic reading) were recorded on a data sheet along with the stop time. The PUF cartridge was then removed from the sampler, sealed, and labeled. A single-point post sampling calibration audit was performed to document that the high volume sampler remained calibrated.

Following the collection of the TO-4A samples, the total volume of ambient air sampled for each cartridge was calculated based on the duration of sampling and the average flow rate, as determined from the initial and final flow rates.

The data sheets are provided in Appendix B and the reduced data are presented in Appendix C. The calibration certifications of the critical orifice can be found in Appendix D.

1.2.2 Method TO-15

IAQ samples were collected for VOCs following the procedures described in the EPA Compendium Method TO-15, ***Determination of Volatile Organic Compounds (VOCs) in Air Collected in Specially-Prepared Canisters And Analyzed By Gas Chromatography/Mass Spectrometry (GC/MS)***, *Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air, Second Edition*, USEPA, January 1999.

At each sampling location a six-liter evacuated SUMMA™ canister was set up with a flow-controller set to collect a sample over a 24-hour sampling period, and the canister valve opened. The flow controllers are pre-set by the laboratory performing the VOC analysis. The start time, SUMMA™ canister and flow-controller serial numbers, and SUMMA™ canister initial vacuum are then recorded on a data sheet. After 24 hours of sampling, the SUMMA™ canister valve was closed and the final SUMMA™ canister vacuum and stop time recorded

The data sheets can be found in Appendix B and the reduced data can be found in Appendix C.

1.3 Foundation Vent Air Sampling

Each of the vent air field samples was collected by TRC over the course of a 4-hour test period. Vent air samples were collected for analysis of PCBs by EPA Method TO-10A and VOCs by EPA Method TO-15. Prior to sampling, all of the foundation vents were temporarily capped for approximately 24 hours. Just prior to sampling, TRC removed the caps from all vent stacks that were not being sampled to allow for the inflow of air. This approach is a modification to the procedure outlined in the LTMMIP to improve representativeness by allowing sample air to be drawn from the entire vent stack zone without potential stagnation of flow impacted by capped vent stacks.

1.3.1 Method TO-10A

Vent stack air samples were collected for PCBs following the procedures described in the EPA Compendium Method TO-10A, ***Determination of Pesticides and Polychlorinated Biphenyls in Ambient Air Using High Volume Polyurethane Foam (PUF) Sampling followed by Gas Chromatographic/Multi-Detector Detection (GC/MD)***, *Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air, Second Edition*, USEPA, January 1999.

In order to sample each vent stack without collecting ambient air, a cap with Teflon™ tubing penetrating through it was placed over the vent stack. Prior to capping the stack, a PUF sampling cartridge was unsealed and connected to the length of tubing that would extend inside the vent stack. The tubing on the opposite side of the cap (that would be outside of the vent stack after the cap was installed) was attached to a Dawson® vacuum pump. A vacuum was applied to the tubing and cartridge using the pump and the vacuum was adjusted so that a flow rate of five liters per minute (LPM) of air was flowing through the PUF. The flow rate was confirmed using a Bios Defender™ 520 primary gas flow calibrator. The cap was then placed over the vent stack with the PUF cartridge suspended in the stack. The start time and flow rate was then recorded on a data sheet. After 4 hours of sampling, the flow rate was confirmed using the bubble meter. The final flow rate and stop time are then recorded on the data sheet. The PUF cartridge was then disconnected from the tubing, sealed with the supplied end caps, placed into a sample jar and labeled.

Following the collection of all the TO-10A samples, the total volume of ambient air sampled for each cartridge was calculated based on the duration of sampling and the average flow rate, as determined from the initial and final flow rates.

The data sheets can be found in Appendix B and the reduced data can be found in Appendix C. The calibration certifications of the Bios Defender™ 520 primary gas flow calibrator can be found in Appendix D.

1.3.2 Method TO-15

Foundation vent stack samples were collected for VOCs following the procedures described in the EPA Compendium Method TO-15, ***Determination of Volatile Organic Compounds (VOCs) in Air Collected in Specially-Prepared Canisters And Analyzed By Gas Chromatography/Mass Spectrometry (GC/MS)***, *Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air, Second Edition*, USEPA, January 1999.

At each sampling location a 2.75-liter evacuated SUMMA™ canister was set up (connected to the vent stack air space via Teflon™ tubing) with a flow-controller set to collect a sample over a 4-hour sampling period, and the canister valve opened. The flow controllers are pre-set by the laboratory performing the VOC analysis. The start time, SUMMA™ canister and flow-controller serial numbers, and SUMMA™ canister initial vacuum are then recorded on a data sheet. After 4 hours of sampling, the SUMMA™ canister valve was closed and the final SUMMA™ canister vacuum and stop time recorded

The data sheets can be found in Appendix B and the reduced data can be found in Appendix C.

2.0 ANALYTICAL PROGRAM

Samples collected by EPA Method TO-10A and TO-4A were prepared by the Soxhlet Extraction Method (EPA Method 3540C/TO-4A) and analyzed by gas chromatography/mass spectroscopy (EPA Method 680) for PCB Homologue distribution. Though the LTMMIP specified that PCBs were to be analyzed by the congener analytical method, the homologue analytical method is as reliable as the congener analytical method in quantifying total PCBs which is the basis for the EPA Action Level (0.05 $\mu g/m^3$) and Acceptable Long-Term Average Exposure Concentration (0.3 $\mu g/m^3$) described in Section 5 and Appendix G. In addition, by quantifying PCB homologues, total PCB air data gathered at the KMS are directly comparable to total PCB air data gathered at the high school since both are based on homologues rather than congeners, which greatly facilitates communication and discussion with the general public on the results of analyses.

Samples collected by EPA Method TO-15 were analyzed by gas chromatography/mass spectroscopy (EPA Method TO-15) for volatile organic compounds. Laboratory analytical results are presented in Appendix E.

3.0 QUALITY ASSURANCE

3.1 Overview

TRC management is fully committed to an effective Quality Assurance/Quality Control (QA/QC) Program whose objective is the delivery of a quality product. For much of TRC's work, that product is data developed from field measurements, sampling and analysis activities, engineering assessments, and the analysis of gathered data for planning purposes. TRC's QA/QC Program works to provide complete, precise, accurate, representative data in a timely manner for each project, considering both the project's needs and budget.

This section highlights the specific QA/QC procedures that were followed during this sampling and analysis program.

3.2 Field Quality Control Summary

Calibrations of the field sampling equipment were performed prior to the field sampling effort. Copies of the calibration sheets were submitted to the Field Team Leader to take onsite and placed in the project file. Calibrations were performed as described in the EPA 40 CFR Part 50 Appendix B. All calibrations were available for review during the test program. Copies of the equipment calibration forms can be found in Appendix D. All instrument calibrations met the performance criteria defined in 40 CFR 50 Appendix B.

3.3 Data Reduction and Validation

Specific QC measures were used to ensure the generation of reliable data from sampling and analysis activities. Proper collection and organization of accurate information followed by clear and concise reporting of the data is a primary goal in all projects.

3.3.1 Field Data Reduction

Appendix B of this document presents the standardized forms that were used to record field sampling data. The data collected was reviewed in the field by the Field Team Leader and at least one other field crewmember. Errors or discrepancies were noted in the field book.

3.3.2 Data Validation

TRC supervisory and QC personnel used validation methods and criteria appropriate to the type of data and the purpose of the measurement. Records of all data were maintained, including that judged as an "outlying" or spurious value. The persons validating the data have sufficient knowledge of the technical work to identify questionable values.

Field sampling data was validated by the Field Team Leader and/or the Field QC Coordinator based on their review of adherence to each approved sampling protocol and written sample collection procedure.

The following criteria were used to evaluate the field sampling data:

- Use of approved test procedures;
- Proper operation of the process being tested;
- Use of properly operating and calibrated equipment;
- Proper chain-of-custody maintained.

Laboratory analytical data was validated by TRC chemists. The sample results were assessed using the EPA New England Data Validation Functional Guidelines for Evaluating Environmental Analyses, revised December 1996. Modification of these guidelines was performed to accommodate the non-CLP methodology.

Sample data were reviewed for the following parameters:

- Agreement of analyses conducted with TRC requests
- Holding times and sample preservation
- Gas chromatography/mass spectrometry (GC/MS) tunes
- Initial and continuing calibrations
- Method blanks
- System Monitoring Compound recoveries
- Laboratory control sample (LCS) and LCS Duplicate (LCSD) results
- Internal standard performance
- Field duplicate results
- Quantitation limits and sample results

The laboratory data validation memoranda can be found in Appendix F. All data are reported in standard units depending on the measurement and the ultimate use of the data.

3.4 Collocated Sampler Precision

Single collocated sampler pairs were included for both indoor and vent stack air (PCBs and VOCs) during each sampling event. Collocated samplers were operated for the same duration at near identical flow rates and were in close proximity to each other so as to represent near identical air space. The data resulting from the analyses of the collocated sampler pairs were used to define the precision of the combined sample collection and analyses scheme.

Precision was determined by the collection and analysis of replicate samples and is expressed as the relative percent difference (RPD), which is determined according to the following equation:

$$RPD = \left[\frac{X_1 - X_2}{\frac{X_1 + X_2}{2}} \right] x\ 100$$

where X_1 and X_2 are the measurement results of each replicate sample expressed as an absolute value (always positive).

4.0 INVENTORY OF CLEANING SUPPLIES AND INGREDIENTS

The following bulleted list provides an inventory of cleaning supplies and their ingredients which are likely contributing to the detection of VOCs in the indoor air quality samples:

- Butchers Heptagon Disinfectant Spray
    - Active ingredients:
        - n-alkyl(60% C_{14}, 30% C_{16}, 5% C_{12}, 5% C_{18})dimethylbenzyl ammonium chlorides
        - n-alkyl(68% C_{12}, 32% C_{14})dimethylbenzyl ammonium chlorides
- Eclipse Neutral All Purpose Cleaner
    - Water
    - modified amine condensate
    - tetrapotassium
    - pyrophosphate
- Rebound Cleaner/Enhancer
    - Water
    - Polyethylene glycol
    - Nonionic surfactant
    - Monoethanol amine
- Concentrate 117 – oxidizing multipurpose cleaner
    - Active ingredient:
        - Hydrogen Peroxide – 3.95%
- Misco Disinfectant cleaner -- mint -- HI-Con 64
    - Active ingredients:
        - Didecyldimethyl ammonium chloride (2.54%)
        - N-alkyl(C_{14} 50%, C_{12} 40%, C_{16} 10%)dimethyldibenzyl ammonium chloride
- Butchers Command Center Breakdown
    - Water
    - Alcohol ethoylate
    - Sodium xylene sulfonate
    - Bacillus spores
- Butchers Command Center Look
    - "see MSDS MS040015"
- Butchers Major Max Spray Buff
    - Water
    - Triethylene glycol
    - Dipropylene glycol
- First Step Sealer Acrylic Floor Sealer
    - Water

    - Aqueous acrylic emulsion
    - Ethanol 2-(2-methoxy ethoxy)
    - Ethanol 2-(2-ethoxy ethoxy)
    - Tributoxy ethyl phosphate
- Simplex Shine Up
    - Water
    - Petroleum distillates
    - Isobutene/propane blend
    - Petroleum solvent

APPENDIX B

SAMPLING DATA

Keith Middle School Sampling Data Sheet
Ambient Air Sampling

Setup Date: 2/18 **Sampler(s):** ML/JR
Recovery Date: 2/19 **Sampler(s):** 4

TO-15						
	Time		Vacuum (in Hg)		SUMMA	Flow Controller
Location	Start	Stop	Start	Finish	Serial No.:	Serial No.:
A-119						
		N				
			A			

TO-4A									
				Sampler					
	Time		PUF	Serial	Counter (Hrs)		Flow Rate (Mag Reading)		
Location	Start	Stop	Number	Number	Start	Finish	Initial	Final	
A-119	1241	1248	1	820	330.50	354.63	58	62	57.7
C-FacDin	1320	1320	5	822	317.21	341.22	56	52	56.4
B-And	1330	1330	4	825	337.71	301.72	55	62	54.7
BG	1349	1349	2	823	317.53	341.54	51	45	51.9
BG-dump	1349	1349	3	821	318.04	342.05	52	49	51.9

TRC

825 - 52.8
822 - 55.8
820 - 55.8
823 - 50.6
821 - 49.6

Keith Middle School Sampling Data Sheet
Ambient Air Sampling

Setup Date: 12/29/08 **Sampler(s):** EF/ML
Recovery Date: _____ **Sampler(s):** _____

TO-15						
	Time		Vacuum (in Hg)		SUMMA	Flow Controller
Location	Start	Stop	Start	Finish	Serial No.:	Serial No.:
facdin	13:28	1331	>30	2	6872	0357
auditorium	13:31	11:24	28.5	0	2834	0403
A-119 hall	13:34	13:42	27.5	0.5	4034	0343
BG	13:38	11:28	30	0.5	7626	0348
BG dup	13:38	11:28	29	0	4017	0358

TO-4A								
				Sampler				
	Time		PUF	Serial	Counter (Hrs)		Flow Rate (Mag Reading)	
Location	Start	Stop	Number	Number	Start	Finish	Initial	Final
facdin	13:29	1332	4	0822	293.07	317.07	51	49
auditorium	13:31	1338	3	0825	306.56	327.64	53	49
A119 hall	13:36	1342	5	0820	306.33	330.47	56	53
BG	13:38 40	1347	2	0821	293.80	317.91	50	49
BG dup	13:40	1347	1	0823	293.30	317.40	50	47

TRC

Keith Middle School Sampling Data Sheet
Vent Air Sampling

Setup Date: 12/30/08 **Sampler(s):** NL/EF/CC

Recovery Date: _____ **Sampler(s):** _____

TO-15						
	Time		Vacuum (in Hg)		SUMMA	Flow Controller
Location	Start	Stop	Start	Finish	Serial No.:	Serial No.:
VS-9	0820	1220	28.5	1	0116	0231
VS 7 dup	0840	1240	29	0	0512	0241
VS-7	0840	1240	25	2	0235	0203
VS 1	903	1303	>30	5	0222	0226
VS-4	911	1311	30	3.5	~~02~~0449	~~04~~ 0247
BG	0929		>30		0395	0168

TO-10A				
	Time		Flow Rate (LPM)	
Location	Start	Stop	Start	Finish
VS 9	820	1220	4.99	4.99
VS-7	840	1240	5.06	6.45 *
VS-7 dup	840	1240	4.96	3.10
VS 1	903	1308	5.04	5.03
VS-4	911	1311	5.06	4.24
BG	929	1328	5.02	5.95

* water sucked-thru.

TRC

APPENDIX C

FIELD REDUCED DATA

INDOOR SAMPLING LOCATIONS

Average Temp (oF/ K): 18.6 265.5

Average Baro. Press ("Hg / mmHg): 30.02 762.5

Tuesday December 30, 2008

Location		Serial #	m_a	b_a	Start Reading ("H2O)	Start Reading (lpm)	Stop Reading ("H2O)	Stop Reading (lpm)	Avg. Reading ("H2O)	RPD of Start and Stop Readings	Avg. Flow (lpm)	Start time (hr)	Stop Time (hr)	Total Sample Time (min)	Total Actual Sample Volume (m^3)
A-16, Hallway Rc	TO-4A	820	0.034	-0.953	56		53		54.5	5.50	231	306.33	330.47	1448	334.2
B-16, Auditorium	TO-4A	825	0.034	-1.177	53		49		51	7.84	228	303.56	327.64	1445	329.5
C-16, Faculty lou	TO-4A	822	0.038	-1.883	56		49		52.5	13.33	225	293.07	317.07	1440	324.0

OUTDOOR SAMPLING LOCATIONS

Average Temp (oF/ K): 8.5 259.9 Average Baro. Press ("Hg / mmHg): 30.02 762.5

Tuesday December 30, 2008

Location		Serial #	m_s	b_s	Start Reading ("H2O)	Start Reading (lpm)	Stop Reading ("H2O)	Stop Reading (lpm)	Avg. Reading ("H2O)	RPD of Start and Stop Readings	Avg. Flow (lpm)	Start time (hr)	Start time (clock)	Stop Time (hr)	Stop Time (clock)	Total Sample Time (min)	Total Actual Sample Volume (m^3)
VS-9-18	TO-10A	-	-	-		4.99		4.99	-	0.00	4.99		8:20		12:20	240	1.20
VS-7-18	TO-10A	-	-	-		5.06		6.45	-	24.15	5.755		8:40		12:40	240	1.38
VS-7-18-DUP	TO-10A	-	-	-		4.96		3.1	-	46.15	4.03		8:40		12:40	240	0.97
VS-1-18	TO-10A	-	-	-		5.04		5.03	-	0.20	5.035		9:03		13:03	240	1.21
VS-4-18	TO-10A	-	-	-		5.06		4.24	-	17.63	4.65		9:11		13:11	240	1.12
VS-BG-18	TO-10A	-	-	-		5.02		5.95	-	16.96	5.485		9:28		13:28	240	1.32
	TO-10A	-	-	-					-		0					0	0.00

Location		Serial #	m_s	b_s	Start Reading ("H2O)	Start Reading (lpm)	Stop Reading ("H2O)	Stop Reading (lpm)	Avg. Reading ("H2O)	RPD of Start and Stop Readings	Avg. Flow (lpm)	Start time (hr)	Stop Time (hr)	Total Sample Time (min)	Total Actual Sample Volume (m^3)
BG-18	TO-4A	821	0.037	-1.974	50		49		49.5	2.02	224	293.8	317.91	1447	324.5
BG-18-DUP	TO-4A	823	0.040	-2.628	50		47		48.5	6.19	221	293.3	317.4	1446	319.1

INDOOR SAMPLING LOCATIONS

Average Temp (oF/ K): 18.6 265.5

Average Baro. Press ("Hg / mmHg): 29.77 756.0

Thursday February 19, 2009

Location		Serial #	m_a	b_a	Start Reading ("H2O)	Start Reading (lpm)	Stop Reading ("H2O)	Stop Reading (lpm)	Avg. Reading ("H2O)	RPD of Start and Stop Readings	Avg. Flow (lpm)	Start time (hr)	Stop Time (hr)	Total Sample Time (min)	Total Actual Sample Volume (m^3)
A-18(2), Hallway Rm 11	TO-4A	820	0.035	-1.143	58		52		55	10.91	229	330.5	354.63	1448	330.9
B-18(2), Auditorium	TO-4A	825	0.033	-0.662	55		52		53.5	5.61	231	337.71	361.72	1441	332.7
C-18(2), Faculty lounge	TO-4A	822	0.036	-1.437	56		52		54	7.41	228	317.21	341.22	1441	328.4

OUTDOOR SAMPLING LOCATIONS

Average Temp (oF/ K): 7.5 259.4

Average Baro. Press ("Hg / mmHg): 29.77 756.0

Thursday February 19, 2009

Location		Serial #	m_a	b_a	Start Reading ("H2O)	Start Reading (lpm)	Stop Reading ("H2O)	Stop Reading (lpm)	Avg. Reading ("H2O)	RPD of Start and Stop Readings	Avg. Flow (lpm)	Start time (hr)	Stop Time (hr)	Total Sample Time (min)	Total Actual Sample Volume (m^3)
BG-DUP-18 (2)	TO-4A	821	0.037	-1.692	52		49		50.5	5.94	222	318.04	342.05	1441	319.3
BG-18(2)	TO-4A	823	0.037	-1.755	51		45		48	12.50	217	317.53	341.54	1441	312.9

APPENDIX D

EQUIPMENT CALIBRATION SHEETS

PS1 Calibration Data Sheet

Network: Keith Middle School Site: New Bedford, MA Serial #: 0823 Station # BG-Dup

Technician: EF/ML Date: 12/29/08 Calibration Orifice S/N: 1125 Orif.Cal.Data: 12/3/07

Reason for Calibration (Circle One): New Instrument Brush Change Motor Change Quarterly Recal

Amb. Temp, T1 (°C): 8.1 Bar.press (in Hg): 30.21

Thermometer Serial #: L001245

ΔH_o ("H2O) Calibration Orifice

Left	Right	Total	I ("H2O) Magnahelic
3.9	3.5	7.4	80.00
3.6	3.1	6.7	70.00
3.2	2.7	5.9	60.00
2.9	2.4	5.3	50.00
2.4	~~1.8~~ 1.9	4.3	40.00

TRC

PS1 Calibration Data Sheet

Network: Keith Middle School Site: New Bedford, MA Serial #: 6821 Station # BG

Technician: EFIML Date: 12/29/08 Calibration Orifice S/N: 1125 Orif.Cal.Data: 12/31/07

Reason for Calibration (Circle One): New Instrument Brush Change Motor Change Quarterly Recal

Amb. Temp, T1 (°C): 8.1 Bar.press (in Hg): 30.21

Thermometer Serial #: L001245

ΔH_o ("H2O) Calibration Orifice

Left	Right	Total	I ("H2O) Magnahelic
4.0	3.6	7.6	80.00
3.7	3.3	7.0	70.00
3.3	2.8	6.1	60.00
2.9	2.4	5.38	50.00
2.4	1.9	4.3	40.00

TRC

PS1 Calibration Data Sheet

Network: Keith Middle School Site: New Bedford, MA Serial #: 0820 Station # A-119 hall

Technician: EF/ML Date: 12/29/08 Calibration Orifice S/N: 1125 Orif.Cal.Data: 12/3/07

Reason for Calibration (Circle One): New Instrument Brush Change Motor Change Quarterly Recal

Amb. Temp, T1 (°C): 20.8 Bar.press (in Hg): 30.21

Thermometer Serial #: L001245

ΔH_o ("H2O) Calibration Orifice

Left	Right	Total	I ("H2O) Magnahelic
3.9	3.7	7.6	80.00
3.5	3.2	6.7	70.00
3.1	2.8	5.9	60.00
2.6	2.4	5.0	50.00
2.1	1.9	4.0	40.00

TRC

PS1 Calibration Data Sheet

Network: Keith Middle School Site: New Bedford, MA Serial #: 0825 Station # auditorium

Technician: EF/ML Date: 12/29/08 Calibration Orifice S/N: 1125 Orif.Cal.Data: 12/3/07

Reason for Calibration (Circle One): New Instrument Brush Change Motor Change Quarterly Recal

Amb. Temp, T1 (°C): ~~16.9~~ 17.3 Bar.press (in Hg): 30.21

Thermometer Serial #: L001245

ΔH_o ("H2O) Calibration Orifice

Left	Right	Total	I ("H2O) Magnahelic
4.0	3.8	7.8	80.00
3.6	3.4	7.0	70.00
3.1	2.9	6.0	60.00
2.7	2.5	5.2	50.00
2.2	2.0	4.2	40.00

TRC

PS1 Calibration Data Sheet

Network: Keith Middle School Site: New Bedford, MA Serial #: 0822 Station # FacDin

Technician: EF/ML Date: 12/29/08 Calibration Orifice S/N: 1125 ~~0822~~ Orif.Cal.Data: 12/3/07

Reason for Calibration (Circle One): New Instrument Brush Change Motor Change Quarterly Recal

Amb. Temp, T1 (°C): Loc 12 45 Bar.press (in Hg): 30.21

Thermometer Serial #: 16.2

ΔH_o ("H2O) Calibration Orifice

Left	Right	Total	I ("H2O) Magnahelic
3.7	3.6	7.3	80.00
3.3	3.1	6.4	70.00
3.0	2.8	5.8	60.00
2.5	2.4	4.9	50.00
2.1	2.0	4.1	40.00

TRC

PS1 Post-Sampling Flow Audit

Network: Keith Middle School Site: New Bedford, MA Serial #: 0823 Station # BG-Dup

Technician: EF/ML/CC Date: 12/30/08 Calibration Orifice S/N: 1125 Orif.Cal.Data: 12/3/07

Amb. Temp, T1 (°C): 8.3°C Bar.press (in Hg): 29.83

Thermometer Serial #: L00 1245

ΔH_o ("H2O) Calibration Orifice

Left	Right	Total	I ("H2O) Magnahelic
2.5	2.3	4.8	50.00

PS1 Post-Sampling Flow Audit

Network: Keith Middle School | Site: New Bedford, MA | Serial #: 0821 | Station # BG

Technician: ML/CC | Date: 12/30/08 | Calibration Orifice S/N: 1125 | Orif.Cal.Data: 12/3/07

Amb. Temp; T1 (°C): 8.7°C | Bar.press (in Hg): 29.83

Thermometer Serial #: 100 1245

ΔH_o ("H2O) Calibration Orifice

Left	Right	Total	I ("H2O) Magnahelic
2.4	2.3	4.7	50.00

TRC

PS1 Post-Sampling Flow Audit

Network: Keith Middle School Site: New Bedford, MA Serial #: 0828 Station # FD

Technician: MC CC EF Date: 12/30/08 Calibration Orifice S/N: 1125 Orif.Cal.Data: 12/3/07

Amb. Temp, T1 (°C): 18.1°C Bar.press (in Hg): 29.83

Thermometer Serial #: L001245

ΔH_o ("H2O) Calibration Orifice

Left	Right	Total	I ("H2O) Magnahelic
2.2	2.8	5.0	50.00

TRC

PS1 Post-Sampling Flow Audit

Network: Keith Middle School Site: New Bedford, MA Serial #: 0825 Station # A, 2

Technician: ML/CC/EF Date: 12/30/08 Calibration Orifice S/N: 1125 Orif.Cal.Data: 12/3/07

Amb. Temp, T1 (°C): 17.8°C Bar.press (in Hg): 29.83

Thermometer Serial #: 1601245

ΔH_o ("H2O) Calibration Orifice

Left	Right	Total	I ("H2O) Magnahelic
2.6	2.5	5.1	50.00

TRC

PS1 Post-Sampling Flow Audit

Network: Keith Middle School Site: New Bedford, MA Serial #: 0820 Station # A119 Hall

Technician: EF Mc, cc Date: 12/30/08 Calibration Orifice S/N: 1125 Orif.Cal.Data: 12/3/07

Amb. Temp, T1 (°C): 21.3°C Bar.press (in Hg): 29.83

Thermometer Serial #: 100245

ΔH_o ("H2O) Calibration Orifice

Left	Right	Total	I ("H2O) Magnahelic
2.4	2.5	4.9	50.00

CTRC

PS1 Calibration Data Sheet

Network: Keith Middle School Site: New Bedford, MA Serial #: 821 Station # BBdup

Technician: NLNR Date: 2/18 Calibration Orifice S/N: ~~821~~ 1125 Orif.Cal.Data: 1/23/04

Reason for Calibration (Circle One): New Instrument Brush Change Motor Change Quarterly Recal

Amb. Temp, T1 (°C): 3.C Bar.press (in Hg): 30.2

Thermometer Serial #: L001247

ΔH_o ("H2O) Calibration Orifice

Left	Right	Total	I ("H2O) Magnahelic
3.8	3.6	7.4	80.00
3.3	3.3	6.6	70.00
3.0	2.8	5.8	60.00
2.6	2.4	5.0	50.00
2.0	2.1	4.1	40.00

TRC

PS1 Calibration Data Sheet

Network: Keith Middle School Site: New Bedford, MA Serial #: 825 Station # Auditorium

Technician: JR/ML Date: 2/18/09 Calibration Orifice S/N: 1125 Orif.Cal.Data: 1/23/09

Reason for Calibration (Circle One): New Instrument Brush Change Motor Change Quarterly Recal

Amb. Temp, T1 (°C): 65°F/18.3°C Bar.press (in Hg): 30.2

Thermometer Serial #: L001247

ΔH_o ("H2O) Calibration Orifice

Left	Right	Total	I ("H2O) Magnahelic
3.9	3.8	7.7	80.00
3.4	3.5	6.9	70.00
3.0	2.9	5.9	60.00
2.5	2.5	5.0	50.00
2.0	2.0	4.0	40.00

TRC

PS1 Calibration Data Sheet

Network: Keith Middle School Site: New Bedford, MA Serial #: 820 Station # A119

Technician: ML/JR Date: 2/18 Calibration Orifice S/N: 1125 Orif.Cal.Data: 1/23/09

Reason for Calibration (Circle One): New Instrument Brush Change Motor Change Quarterly Recal

Amb. Temp, T1 (°C): 66°F / 18.9°C Bar.press (in Hg): 30.2

Thermometer Serial #: L001247

ΔH_o ("H2O) Calibration Orifice

Left	Right	Total	I ("H2O) Magnahelic
3.6	3.7	7.3	80.00
3.2	3.3	6.5	70.00
2.8	2.7	5.5	60.00
2.5	2.4	4.9	50.00
2.0	1.9	3.9	40.00

TRC

PS1 Calibration Data Sheet

Network: Keith Middle School Site: New Bedford, MA Serial #: 822 Station # Fac Din

Technician: MLJR Date: 2/18 Calibration Orifice S/N: 1125 Orif.Cal.Data: 1/23/09

Reason for Calibration (Circle One): New Instrument Brush Change Motor Change Quarterly Recal

Amb. Temp, T1 (°C): 67°F 19.4 °C Bar.press (in Hg): 30.2

Thermometer Serial #: ~~60~~ L001247

ΔH_o ("H2O) Calibration Orifice

Left	Right	Total	I ("H2O) Magnahelic
3.6	3.7	7.3	80.00
3.4	3.3	6.7	70.00
2.9	2.9	5.8	60.00
2.5	2.4	4.9	50.00
2.1	2.0	4.1	40.00

TRC

PS1 Calibration Data Sheet

Network: Keith Middle School Site: New Bedford, MA Serial #: 823 Station # BG

Technician: ML/JR Date: 2/18 Calibration Orifice S/N: 8231125 Orif.Cal.Data: 1/23/09

Reason for Calibration (Circle One): New Instrument Brush Change Motor Change Quarterly Recal

Amb. Temp, T1 (°C): 3° C Bar.press (in Hg): 30.2

Thermometer Serial #: L001247

ΔH_o ("H2O) Calibration Orifice

Left	Right	Total	I ("H2O) Magnahelic
3.7	3.6	7.3	80.00
3.3	3.4	6.7	70.00
2.9	2.9	5.8	60.00
2.50	2.50	5.0	50.00
2.0	2.1	4.1	40.00

TRC

PS1 Post-Sampling Flow Audit

Network: Keith Middle School Site: New Bedford, MA Serial #: 823 Station # BG

Technician: MLJR Date: 2/19 Calibration Orifice S/N: 1125 Orif.Cal.Data: 1/23/09

Amb. Temp, T1 (°C): 12 Bar.press (in Hg): 29.33

Thermometer Serial #: L001247

ΔH_o ("H2O) Calibration Orifice

Left	Right	Total	I ("H2O) Magnahelic
2.7	2.3	5.0	50.00

TRC

PS1 Post-Sampling Flow Audit

Network: Keith Middle School | Site: New Bedford, MA | Serial #: 821 | Station # BG dup

Technician: NL/JR | Date: 2/19 | Calibration Orifice S/N: 1125 | Orif.Cal.Data: 1/23/09

Amb. Temp, T1 (°C): 12 | Bar.press (in Hg): 29.83

Thermometer Serial #: L001247

ΔH_o ("H2O) Calibration Orifice

Left	Right	Total	I ("H2O) Magnahelic
2.7	2.2	4.9	50.00

CTRC

PS1 Post-Sampling Flow Audit

Network: Keith Middle School Site: New Bedford, MA Serial #: 820 Station # A-119

Technician: ML/JR Date: 2/19/09 Calibration Orifice S/N: 1125 Orif.Cal.Data: 1/23/09

Amb. Temp, T1 (°C): 19°C Bar.press (in Hg): 29.33

Thermometer Serial #: L00127

ΔH_o ("H2O) Calibration Orifice

Left	Right	Total	I ("H2O) Magnahelic
2.6	2.5	5.1	50.00

CTRC

PS1 Post-Sampling Flow Audit

Network: Keith Middle School Site: New Bedford, MA Serial #: 822 Station # FacDin

Technician: NL/JR Date: 2/19 Calibration Orifice S/N: 1125 Orif.Cal.Data: 1/23/09

Amb. Temp, T1 (°C): 18°C Bar.press (in Hg): 29.33

Thermometer Serial #: L001247

ΔH_o ("H2O) Calibration Orifice

Left	Right	Total	I ("H2O) Magnahelic
2.6	2.4	5.0	50.00

CTRC

PS1 Post-Sampling Flow Audit

Network: Keith Middle School Site: New Bedford, MA Serial #: 825 Station # Mid

Technician: NL/JR Date: 2/19 Calibration Orifice S/N: ~~825~~ 1125 Orif.Cal.Data: 1/23/09

Amb. Temp, T1 (°C): 18.9C Bar.press (in Hg): 29.33

Thermometer Serial #: L001247

ΔH_o ("H2O) Calibration Orifice

Left	Right	Total	I ("H2O) Magnahelic
2.6	2.5	5.1	50.00

TRC

TISCH ENVIROMENTAL, INC.
145 SOUTH MIAMI AVE.
VILLAGE OF CLEVES, OH 45002
513.467.9000
877.263.7610 TOLL FREE
513.467.9009 FAX
WWW.TISCH-ENV.COM

AIR POLLUTION MONITORING EQUIPMENT

ORIFICE TRANSFER STANDARD CERTIFICATION WORKSHEET TE-5040A

Date - Jan 23, 2009 Rootsmeter S/N 9833620 Ta (K) - 293
Operator Jim Tisch Orifice I.D. - 1125 Pa (mm) - 748.03

PLATE OR VDC #	VOLUME START (m3)	VOLUME STOP (m3)	DIFF VOLUME (m3)	DIFF TIME (min)	METER DIFF Hg (mm)	ORFICE DIFF H2O (in.)
1	NA	NA	1.00	6.6580	3.6	2.00
2	NA	NA	1.00	3.9720	10.0	5.50
3	NA	NA	1.00	3.1970	15.3	8.50
4	NA	NA	1.00	2.7270	20.7	11.50
5	NA	NA	1.00	2.4180	26.1	14.50
6	NA	NA	1.00	2.2590	29.7	16.50

DATA TABULATION

Vstd	(x axis) Qstd	(y axis)		Va	(x axis) Qa	(y axis)
0.9961	0.1496	1.4150		0.9951	0.1494	0.8851
0.9876	0.2486	2.3464		0.9866	0.2483	1.4678
0.9805	0.3067	2.9170		0.9795	0.3063	1.8247
0.9733	0.3569	3.3929		0.9722	0.3565	2.1224
0.9660	0.3995	3.8099		0.9650	0.3991	2.3832
0.9613	0.4255	4.0641		-0.9603	0.4251	2.5422
Qstd slope (m) =		9.60919		Qa slope (m) =		6.01711
intercept (b) =		-0.03116		intercept (b) =		-0.01949
coefficient (r) =		0.99994		coefficient (r) =		0.99994
y axis = SQRT[H2O(Pa/760)(298/Ta)]				y axis = SQRT[H2O(Ta/Pa)]		

CALCULATIONS

Vstd = Diff. Vol[(Pa-Diff. Hg)/760](298/Ta)
Qstd = Vstd/Time

Va = Diff Vol [(Pa-Diff Hg)/Pa]
Qa = Va/Time

For subsequent flow rate calculations:

Qstd = 1/m{[SQRT(H2O(Pa/760)(298/Ta))]- b}
Qa = 1/m{[SQRT H2O(Ta/Pa)]- b}

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513.467.9000
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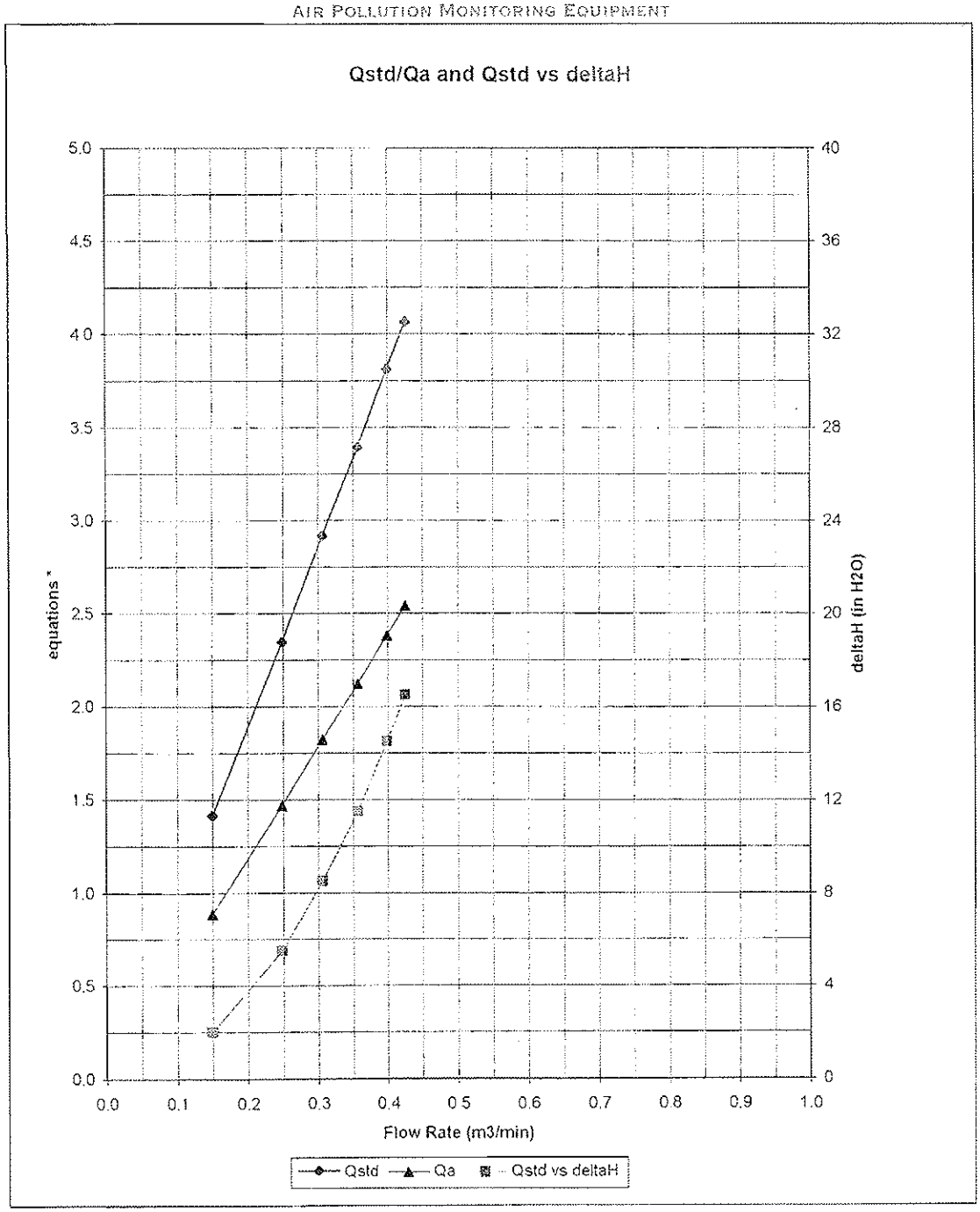
513.467.9009 FAX
WWW.TISCH-ENV.COM

AIR POLLUTION MONITORING EQUIPMENT



* y-axis equations:

Qstd series: $\sqrt{\Delta H \left(\frac{Pa}{Pstd}\right)\left(\frac{Tstd}{Ta}\right)}$

Qa series: $\sqrt{(\Delta H\ (Ta\ /\ Pa))}$

#1125

NVLAP Lab Code 200661

Bios
Driving a Higher Standard in Flow Measurement℠

Calibration Certificate

Certificate No.	34676	Sold to:	TRC Environmental Corporation - Lowell
Product	Defender 520 High Flow		Wannalancit Mills 650 Suffolk Street
Serial No.	112218		Lowell, MA 01854
Cal. Date	12/12/2008		USA

All calibrations are performed in accordance with ISO 17025 at Bios International Corporation, 10 Park Place, Butler, NJ, 07405, 800-663-4977, an ISO 17025:2005 – accredited laboratory through NVLAP. This report shall not be reproduced except in full without the written approval of the laboratory. Results only relate to the items calibrated. This report must not be used to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.

All units tested in accordance with Bios International Corporation test number PR17-13 using high-purity bottled nitrogen or dry

As Received Calibration Data

Technician Sonia Otero

Lab. Pressure 761 mmHg
Lab. Temperature 22.2 °C

Instrument Reading	Lab Standard Reading	Deviation	Allowable Deviation	As Received
502.61 ccm	500.31 ccm	0.46%	1.00%	In Tolerance
5022.3 ccm	5005 ccm	0.35%	1.00%	In Tolerance
29968 ccm	29998 ccm	-0.1%	1.00%	In Tolerance
21.7 °C	22.2 °C	-0.5%	±0.8°C	In Tolerance
759 mmHg	761 mmHg	-2%	±3.5mmHg	In Tolerance

Bios International Standards Used

Description	Standard Serial Number	Calibration Date	Calibration Due Date
ML 500-44	113761	5/1/2008	5/1/2009
Precision Thermometer	305460	8/6/2008	8/6/2009
Precision Barometer	431/98-07	4/8/2008	4/8/2009

Bios

Driving a Higher Standard in Flow Measurement℠

As Shipped Calibration Data

Certificate No. 34676
Technician Sonia Otero

Lab. Pressure 739 mmHg
Lab. Temperature 22.2 °C

Instrument Reading	Lab Standard Reading	Deviation	Allowable Deviation	As Shipped
501.58 ccm	500.035 ccm	0.31%	1.00%	In Tolerance
5004.0 ccm	5001.55 ccm	0.05%	1.00%	In Tolerance
29831 ccm	30022.5 ccm	-0.64%	1.00%	In Tolerance
22.3 °C	22.3 °C	-	±0.8°C	In Tolerance
739 mmHg	739 mmHg	-	±3.5mmHg	In Tolerance

Bios International Standards Used

Description	Standard Serial Number	Calibration Date	Calibration Due Date
ML-500-44	113761	5/1/2008	5/1/2009
Precision Thermometer	305460	8/6/2008	8/6/2009
Precision Barometer	431/98-07	4/8/2008	4/8/2009

Calibration Notes

Bios is an ISO 17025-accredited metrology laboratory. Each Bios primary gas flow standard is dynamically verified by comparing it to one of our laboratory standards, which is a Proven DryCal® Technology volumetric piston prover of much higher accuracy but of similar operating principles. For this purpose, a flow generator of ±0.03% stability is used. Our laboratory standards are qualified by direct measurement of their dimensions (diameter, length and time) using NIST-traceable precision gauges and instruments, such as depth micrometers and laser micrometers. NIST numbers for these gauges and instruments are available upon request. Rigorous analyses of our laboratory standards' uncertainties have been performed, in accordance with The Guide to the Expression of Uncertainty in Measurement (the GUM), assuring their traceable accuracy.

Harvey Padden, President and Chief Metrologist

APPENDIX E

LABORATORY DATA REPORTS (ON CD)

CHAIN OF CUSTODY RECORD

Project Name: Keith Middle School
Project No.: 115058
Sampling Date(s): 12/29/08-12/30/08
Laboratory: NEA
Laboratory P.O.:
Shipping Date(s): ~~12/30/08~~ 1/2/09
Shipper's Name: TRC

<09010017P1>

090100171

Sample Code		Sampled Date	Container Size	Container G/P	MATRIX	Description	ANALYSIS	Comments (volume m^3)
VS-9-18	AM00070	12/29/08-12/30/08	500 ml	G	PUF	ambient air from vent sampling	TO-10A	1.20 m^3
VS-7-18-DUP	AM00071	12/29/08-12/30/08	500 ml	G	PUF	ambient air from vent sampling	TO-10A	0.97 m^3
VS-7-18	AM00072	12/29/08-12/30/08	500 ml	G	PUF	ambient air from vent sampling	TO-10A	1.38 m^3
VS-1-18	AM00073	12/29/08-12/30/08	500 ml	G	PUF	ambient air from vent sampling	TO-10A	1.21 m^3
VS-4-18	AM00074	12/29/08-12/30/08	500 ml	G	PUF	ambient air from vent sampling	TO-10A	1.12 ~~1.32~~ m^3
VS-BG-18	AM00075	12/29/08-12/30/08	500 ml	G	PUF	ambient air from vent sampling	TO-10A	1.32 m^3
VENT -TB	AM00076	12/29/08-12/30/08	500 ml	G	PUF	ambient air from vent sampling	TO-10A	0.00 m^3
C-18	AM00077	12/29/08-12/30/08	1L	G	PUF	ambient air , Faculty Lounge	TO-4A	324.0 m^3
B-18	AM00078	12/29/08-12/30/08	1L	G	PUF	ambient air , Auditorium	TO-4A	329.5 m^3
A-18	AM00079	12/29/08-12/30/08	1L	G	PUF	ambient air , Hallway Outside Rm 119	TO-4A	334.2 m^3
BG-18	AM00080	12/29/08-12/30/08	1L	G	PUF	ambient air	TO-4A	324.5 m^3
BG-18-DUP	AM00081	12/29/08-12/30/08	1L	G	PUF	ambient air	TO-4A	319.1 m^3
TRIP BLANK	AM00082	12/29/08-12/30/08	1L	G	PUF	ambient air	TO-4A	0.00 m^3

Relinquished by: [signature] **Date/Time:** 1/2/09 3:37 **Relinquished by:**
Received by: [signature] **Date/Time:** 1/3/09 1042 **Received by:**
Remarks (*):

Temp → 0.3°C, 1.2°C

TRC

CHAIN OF CUSTODY RECORD

<09010017P2>

090100172

Project Name: Keith Middle School
Project No.: 115058
Sampling Date(s): 12/29/08-12/30/08
Laboratory: NEA
Laboratory P.O.:
Shipping Date(s): ~~12/30/08~~ 1/2/09
Shipper's Name: TRC

Sample Code		Sampled Date	Container Size	Container G/P	MATRIX	Source Description	ANALYSIS	Comments (volume m^3)
C-18-PF	AM00083	12/29/08-12/30/08	bag	P	filter	ambient air , Faculty Lounge	TO-4A	324.0 m^3
B-18-PF	AM00084	12/29/08-12/30/08	bag	P	filter	ambient air , Cafeteria	TO-4A	329.5 m^3
A-18-PF	AM00085	12/29/08-12/30/08	bag	P	filter	ambient air , Hallway Outside Rm 119	TO-4A	334.2 m^3
BG-18-PF	AM00086	12/29/08-12/30/08	bag	P	filter	ambient air	TO-4A	324.5 m^3
BG-18-DUP-PF	AM00087	12/29/08-12/30/08	bag	P	filter	ambient air	TO-4A	319.1 m^3
TRIP BLANK-PF	AM00088	12/29/08-12/30/08	bag	P	filter	ambient air	TO-4A	0.0 m^3

Relinquished by: [signature] **Date/Time:** 1/2/09 3:37
Received by: [signature] **Date/Time:** 1/3/09 1042
Relinquished by:
Received by:
Remarks (*):

Temps → 0.3°C, 1.2°C

TRC

CERTIFICATE OF ANALYSIS
01/19/2009
TRC ENVIRONMENTAL
WANNALANCIT MILLS
650 SUFFOLK ST
LOWELL, MA 01854
CONTACT: DAVID SULLIVAN

CUSTOMER ID:	VS-9-18	**NEA ID:** AM00070	**NEA LRF:** 09010017-01
MATRIX:	AIR	**DATE SAMPLED:** 12/30/2008	**TIME:** N/A
DATE RECEIVED:	01/03/2009 **TIME:** 10:42	**PROJECT:**	115058 KEITH MIDDLE SCHOOL
SAMPLED BY:	N/A	**LOCATION:**	NEW BEDFORD, MA
CUSTOMER PO:	N/A	**LAB ELAP#:**	11078
METHOD:	PCBs by EPA Method TO-10A/680	**DATE ANALYZED:**	01/09/2009

HOMOLOG GROUP	CAS NUMBER	AMOUNT	FLAGS	PQL	UNITS	WEIGHT PERCENT
Monochlorobiphenyl	**27323-18-8**	**ND**	**U**	**0.0042**	**ug/m³**	**ND**
Dichlorobiphenyl	**25512-42-9**	**ND**	**U**	**0.0042**	**ug/m³**	**ND**
Trichlorobiphenyl	**25323-68-6**	**ND**	**U**	**0.0042**	**ug/m³**	**ND**
Tetrachlorobiphenyl	**26914-33-0**	**ND**	**U**	**0.0083**	**ug/m³**	**ND**
Pentachlorobiphenyl	**25429-29-2**	**ND**	**U**	**0.0083**	**ug/m³**	**ND**
Hexachlorobiphenyl	**26601-64-9**	**ND**	**U**	**0.0083**	**ug/m³**	**ND**
Heptachlorobiphenyl	**28655-71-2**	**ND**	**U**	**0.013**	**ug/m³**	**ND**
Octachlorobiphenyl	**55722-26-4**	**ND**	**U**	**0.013**	**ug/m³**	**ND**
Nonachlorobiphenyl	**53742-07-7**	**ND**	**U**	**0.021**	**ug/m³**	**ND**
Decachlorobiphenyl	**2051-24-3**	**ND**	**U**	**0.021**	**ug/m³**	**ND**
Total PCB	**1336-36-3**	**ND**	**U**			**ND**

Notes: ND (Not Detected). Denotes analyte not detected at a concentration greater than the PQL.
PQL (Practical Quantitation Limit). Denotes lowest analyte concentration reportable for the sample.

AUTHORIZED SIGNATURE:

William A. Kotas
Sr. Laboratory Representative

Robert E. Wagner
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CERTIFICATE OF ANALYSIS
01/19/2009
TRC ENVIRONMENTAL
WANNALANCIT MILLS
650 SUFFOLK ST
LOWELL, MA 01854
CONTACT: DAVID SULLIVAN

CUSTOMER ID:	VS-7-18-DUP	**NEA ID:** AM00071	**NEA LRF:** 09010017-02
MATRIX:	AIR	**DATE SAMPLED:** 12/30/2008	**TIME:** N/A
DATE RECEIVED:	01/03/2009 **TIME:** 10:42	**PROJECT:**	115058 KEITH MIDDLE SCHOOL
SAMPLED BY:	N/A	**LOCATION:**	NEW BEDFORD, MA
CUSTOMER PO:	N/A	**LAB ELAP#:**	11078
METHOD:	PCBs by EPA Method TO-10A/680	**DATE ANALYZED:**	01/09/2009

HOMOLOG GROUP	CAS NUMBER	AMOUNT	FLAGS	PQL	UNITS	WEIGHT PERCENT
Monochlorobiphenyl	**27323-18-8**	**ND**	**U**	**0.0052**	**ug/m³**	**ND**
Dichlorobiphenyl	**25512-42-9**	**ND**	**U**	**0.0052**	**ug/m³**	**ND**
Trichlorobiphenyl	**25323-68-6**	**ND**	**U**	**0.0052**	**ug/m³**	**ND**
Tetrachlorobiphenyl	**26914-33-0**	**ND**	**U**	**0.010**	**ug/m³**	**ND**
Pentachlorobiphenyl	**25429-29-2**	**ND**	**U**	**0.010**	**ug/m³**	**ND**
Hexachlorobiphenyl	**26601-64-9**	**ND**	**U**	**0.010**	**ug/m³**	**ND**
Heptachlorobiphenyl	**28655-71-2**	**ND**	**U**	**0.015**	**ug/m³**	**ND**
Octachlorobiphenyl	**55722-26-4**	**ND**	**U**	**0.015**	**ug/m³**	**ND**
Nonachlorobiphenyl	**53742-07-7**	**ND**	**U**	**0.026**	**ug/m³**	**ND**
Decachlorobiphenyl	**2051-24-3**	**ND**	**U**	**0.026**	**ug/m³**	**ND**
Total PCB	**1336-36-3**	**ND**	**U**			**ND**

Notes: ND (Not Detected). Denotes analyte not detected at a concentration greater than the PQL.
PQL (Practical Quantitation Limit). Denotes lowest analyte concentration reportable for the sample.

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01/19/2009
TRC ENVIRONMENTAL
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650 SUFFOLK ST
LOWELL, MA 01854
CONTACT: DAVID SULLIVAN

CUSTOMER ID:	VS-7-18	**NEA ID:** AM00072	**NEA LRF:** 09010017-03
MATRIX:	AIR	**DATE SAMPLED:** 12/30/2008	**TIME:** N/A
DATE RECEIVED:	01/03/2009 **TIME:** 10:42	**PROJECT:**	115058 KEITH MIDDLE SCHOOL
SAMPLED BY:	N/A	**LOCATION:**	NEW BEDFORD, MA
CUSTOMER PO:	N/A	**LAB ELAP#:**	11078
METHOD:	PCBs by EPA Method TO-10A/680	**DATE ANALYZED:**	01/09/2009

HOMOLOG GROUP	CAS NUMBER	AMOUNT	FLAGS	PQL	UNITS	WEIGHT PERCENT
Monochlorobiphenyl	**27323-18-8**	**ND**	**U**	**0.0036**	**ug/m³**	**ND**
Dichlorobiphenyl	**25512-42-9**	**ND**	**U**	**0.0036**	**ug/m³**	**ND**
Trichlorobiphenyl	**25323-68-6**	**ND**	**U**	**0.0036**	**ug/m³**	**ND**
Tetrachlorobiphenyl	**26914-33-0**	**ND**	**U**	**0.0072**	**ug/m³**	**ND**
Pentachlorobiphenyl	**25429-29-2**	**ND**	**U**	**0.0072**	**ug/m³**	**ND**
Hexachlorobiphenyl	**26601-64-9**	**ND**	**U**	**0.0072**	**ug/m³**	**ND**
Heptachlorobiphenyl	**28655-71-2**	**ND**	**U**	**0.011**	**ug/m³**	**ND**
Octachlorobiphenyl	**55722-26-4**	**ND**	**U**	**0.011**	**ug/m³**	**ND**
Nonachlorobiphenyl	**53742-07-7**	**ND**	**U**	**0.018**	**ug/m³**	**ND**
Decachlorobiphenyl	**2051-24-3**	**ND**	**U**	**0.018**	**ug/m³**	**ND**
Total PCB	**1336-36-3**	**ND**	**U**			**ND**

Notes: ND (Not Detected). Denotes analyte not detected at a concentration greater than the PQL.
PQL (Practical Quantitation Limit). Denotes lowest analyte concentration reportable for the sample.

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01/19/2009
TRC ENVIRONMENTAL
WANNALANCIT MILLS
650 SUFFOLK ST
LOWELL, MA 01854
CONTACT: DAVID SULLIVAN

CUSTOMER ID:	VS-1-18	**NEA ID:** AM00073	**NEA LRF:** 09010017-04
MATRIX:	AIR	**DATE SAMPLED:** 12/30/2008	**TIME:** N/A
DATE RECEIVED:	01/03/2009 **TIME:** 10:42	**PROJECT:**	115058 KEITH MIDDLE SCHOOL
SAMPLED BY:	N/A	**LOCATION:**	NEW BEDFORD, MA
CUSTOMER PO:	N/A	**LAB ELAP#:**	11078
METHOD:	PCBs by EPA Method TO-10A/680	**DATE ANALYZED:**	01/09/2009

HOMOLOG GROUP	CAS NUMBER	AMOUNT	FLAGS	PQL	UNITS	WEIGHT PERCENT
Monochlorobiphenyl	**27323-18-8**	**ND**	**U**	**0.0041**	**ug/m³**	**ND**
Dichlorobiphenyl	**25512-42-9**	**ND**	**U**	**0.0041**	**ug/m³**	**ND**
Trichlorobiphenyl	**25323-68-6**	**ND**	**U**	**0.0041**	**ug/m³**	**ND**
Tetrachlorobiphenyl	**26914-33-0**	**ND**	**U**	**0.0083**	**ug/m³**	**ND**
Pentachlorobiphenyl	**25429-29-2**	**ND**	**U**	**0.0083**	**ug/m³**	**ND**
Hexachlorobiphenyl	**26601-64-9**	**ND**	**U**	**0.0083**	**ug/m³**	**ND**
Heptachlorobiphenyl	**28655-71-2**	**ND**	**U**	**0.012**	**ug/m³**	**ND**
Octachlorobiphenyl	**55722-26-4**	**ND**	**U**	**0.012**	**ug/m³**	**ND**
Nonachlorobiphenyl	**53742-07-7**	**ND**	**U**	**0.021**	**ug/m³**	**ND**
Decachlorobiphenyl	**2051-24-3**	**ND**	**U**	**0.021**	**ug/m³**	**ND**
Total PCB	**1336-36-3**	**ND**	**U**			**ND**

Notes: ND (Not Detected). Denotes analyte not detected at a concentration greater than the PQL.
PQL (Practical Quantitation Limit). Denotes lowest analyte concentration reportable for the sample.

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NEA
NORTHEAST ANALYTICAL LABS

CERTIFICATE OF ANALYSIS
01/19/2009
TRC ENVIRONMENTAL
WANNALANCIT MILLS
650 SUFFOLK ST
LOWELL, MA 01854
CONTACT: DAVID SULLIVAN

CUSTOMER ID:	VS-4-18	**NEA ID:** AM00074	**NEA LRF:** 09010017-05
MATRIX:	AIR	**DATE SAMPLED:** 12/30/2008	**TIME:** N/A
DATE RECEIVED:	01/03/2009 **TIME:** 10:42	**PROJECT:**	115058 KEITH MIDDLE SCHOOL
SAMPLED BY:	N/A	**LOCATION:**	NEW BEDFORD, MA
CUSTOMER PO:	N/A	**LAB ELAP#:**	11078
METHOD:	PCBs by EPA Method TO-10A/680	**DATE ANALYZED:**	01/09/2009

HOMOLOG GROUP	CAS NUMBER	AMOUNT	FLAGS	PQL	UNITS	WEIGHT PERCENT
Monochlorobiphenyl	**27323-18-8**	**ND**	**U**	**0.0045**	**ug/m³**	**ND**
Dichlorobiphenyl	**25512-42-9**	**ND**	**U**	**0.0045**	**ug/m³**	**ND**
Trichlorobiphenyl	**25323-68-6**	**ND**	**U**	**0.0045**	**ug/m³**	**ND**
Tetrachlorobiphenyl	**26914-33-0**	**ND**	**U**	**0.0089**	**ug/m³**	**ND**
Pentachlorobiphenyl	**25429-29-2**	**ND**	**U**	**0.0089**	**ug/m³**	**ND**
Hexachlorobiphenyl	**26601-64-9**	**ND**	**U**	**0.0089**	**ug/m³**	**ND**
Heptachlorobiphenyl	**28655-71-2**	**ND**	**U**	**0.013**	**ug/m³**	**ND**
Octachlorobiphenyl	**55722-26-4**	**ND**	**U**	**0.013**	**ug/m³**	**ND**
Nonachlorobiphenyl	**53742-07-7**	**ND**	**U**	**0.022**	**ug/m³**	**ND**
Decachlorobiphenyl	**2051-24-3**	**ND**	**U**	**0.022**	**ug/m³**	**ND**
Total PCB	**1336-36-3**	**ND**	**U**			**ND**

Notes: ND (Not Detected). Denotes analyte not detected at a concentration greater than the PQL.
PQL (Practical Quantitation Limit). Denotes lowest analyte concentration reportable for the sample.

AUTHORIZED SIGNATURE:

William A. Kotas
Sr. Laboratory Representative

Robert E. Wagner
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CERTIFICATE OF ANALYSIS
01/19/2009
TRC ENVIRONMENTAL
WANNALANCIT MILLS
650 SUFFOLK ST
LOWELL, MA 01854
CONTACT: DAVID SULLIVAN

CUSTOMER ID:	VS-BG-18	**NEA ID:** AM00075	**NEA LRF:** 09010017-06
MATRIX:	AIR	**DATE SAMPLED:** 12/30/2008	**TIME:** N/A
DATE RECEIVED:	01/03/2009 **TIME:** 10:42	**PROJECT:**	115058 KEITH MIDDLE SCHOOL
SAMPLED BY:	N/A	**LOCATION:**	NEW BEDFORD, MA
CUSTOMER PO:	N/A	**LAB ELAP#:**	11078
METHOD:	PCBs by EPA Method TO-10A/680	**DATE ANALYZED:**	01/09/2009

HOMOLOG GROUP	CAS NUMBER	AMOUNT	FLAGS	PQL	UNITS	WEIGHT PERCENT
Monochlorobiphenyl	**27323-18-8**	**ND**	**U**	**0.0038**	**ug/m³**	**ND**
Dichlorobiphenyl	**25512-42-9**	**ND**	**U**	**0.0038**	**ug/m³**	**ND**
Trichlorobiphenyl	**25323-68-6**	**ND**	**U**	**0.0038**	**ug/m³**	**ND**
Tetrachlorobiphenyl	**26914-33-0**	**ND**	**U**	**0.0076**	**ug/m³**	**ND**
Pentachlorobiphenyl	**25429-29-2**	**ND**	**U**	**0.0076**	**ug/m³**	**ND**
Hexachlorobiphenyl	**26601-64-9**	**ND**	**U**	**0.0076**	**ug/m³**	**ND**
Heptachlorobiphenyl	**28655-71-2**	**ND**	**U**	**0.011**	**ug/m³**	**ND**
Octachlorobiphenyl	**55722-26-4**	**ND**	**U**	**0.011**	**ug/m³**	**ND**
Nonachlorobiphenyl	**53742-07-7**	**ND**	**U**	**0.019**	**ug/m³**	**ND**
Decachlorobiphenyl	**2051-24-3**	**ND**	**U**	**0.019**	**ug/m³**	**ND**
Total PCB	**1336-36-3**	**ND**	**U**			**ND**

Notes: ND (Not Detected). Denotes analyte not detected at a concentration greater than the PQL.
PQL (Practical Quantitation Limit). Denotes lowest analyte concentration reportable for the sample.

AUTHORIZED SIGNATURE:

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01/19/2009
TRC ENVIRONMENTAL
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650 SUFFOLK ST
LOWELL, MA 01854
CONTACT: DAVID SULLIVAN

CUSTOMER ID:	VENT-TB	**NEA ID:** AM00076	**NEA LRF:** 09010017-07
MATRIX:	AIR	**DATE SAMPLED:** 12/30/2008	**TIME:** N/A
DATE RECEIVED:	01/03/2009 **TIME:** 10:42	**PROJECT:**	115058 KEITH MIDDLE SCHOOL
SAMPLED BY:	N/A	**LOCATION:**	NEW BEDFORD, MA
CUSTOMER PO:	N/A	**LAB ELAP#:**	11078
METHOD:	PCBs by EPA Method TO-10A/680	**DATE ANALYZED:**	01/09/2009

HOMOLOG GROUP	CAS NUMBER	AMOUNT	FLAGS	PQL	UNITS	WEIGHT PERCENT
Monochlorobiphenyl	**27323-18-8**	**ND**	**U**	**0.0050**	**ug**	**ND**
Dichlorobiphenyl	**25512-42-9**	**ND**	**U**	**0.0050**	**ug**	**ND**
Trichlorobiphenyl	**25323-68-6**	**ND**	**U**	**0.0050**	**ug**	**ND**
Tetrachlorobiphenyl	**26914-33-0**	**ND**	**U**	**0.010**	**ug**	**ND**
Pentachlorobiphenyl	**25429-29-2**	**ND**	**U**	**0.010**	**ug**	**ND**
Hexachlorobiphenyl	**26601-64-9**	**ND**	**U**	**0.010**	**ug**	**ND**
Heptachlorobiphenyl	**28655-71-2**	**ND**	**U**	**0.015**	**ug**	**ND**
Octachlorobiphenyl	**55722-26-4**	**ND**	**U**	**0.015**	**ug**	**ND**
Nonachlorobiphenyl	**53742-07-7**	**ND**	**U**	**0.025**	**ug**	**ND**
Decachlorobiphenyl	**2051-24-3**	**ND**	**U**	**0.025**	**ug**	**ND**
Total PCB	**1336-36-3**	**ND**	**U**			**ND**

Notes: ND (Not Detected). Denotes analyte not detected at a concentration greater than the PQL.
PQL (Practical Quantitation Limit). Denotes lowest analyte concentration reportable for the sample.

AUTHORIZED SIGNATURE:

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Robert E. Wagner
Laboratory Director

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ANALYTICAL REPORT

Lab Number:	L0900004
Client:	TRC Environmental Consultants Wannalancit Mills 650 Suffolk Street Lowell, MA 01854
ATTN:	Liz Denly
Project Name:	KEITH MIDDLE SCHOOL
Project Number:	115058
Report Date:	01/15/09

Certifications & Approvals: MA (M-MA030), NY (11627), CT (PH-0141), NH (2206), NJ (MA015), RI (LAO00299), ME (MA0030), PA (Registration #68-02089), LA NELAC (03090), FL NELAC (E87814), US Army Corps of Engineers.

320 Forbes Boulevard, Mansfield, MA 02048-1806
508-822-9300 (Fax) 508-822-3288 800-624-9220 - www.alphalab.com

Project Name: KEITH MIDDLE SCHOOL
Project Number: 115058

Lab Number: L0900004
Report Date: 01/15/09

Alpha Sample ID	Client ID	Sample Location
L0900004-01	VS-9-18	
L0900004-02	VS-7-18-DUP	
L0900004-03	VS-7-18	
L0900004-04	VS-1-18	
L0900004-05	VS-4-18	
L0900004-06	VS-BG-18	
L0900004-07	VENT-TB	
L0900004-08	C-18	
L0900004-09	B-18	
L0900004-10	A-18	
L0900004-11	BG-18	
L0900004-12	BG-18-DUP	
L0900004-13	TRIP BLANK	
L0900004-14	CAN 1622	
L0900004-15	CAN 547	

Project Name: KEITH MIDDLE SCHOOL **Lab Number:** L0900004
Project Number: 115058 **Report Date:** 01/15/09

Case Narrative

The samples were received in accordance with the Chain of Custody and no significant deviations were encountered during the preparation or analysis unless otherwise noted. Sample Receipt, Container Information, and the Chain of Custody are located at the back of the report.

The data presented in this report is organized by parameter (i.e. VOC, SVOC, etc.). Sample specific Quality Control data (i.e. Surrogate Spike Recovery) is reported at the end of the target analyte list for each individual sample, followed by the Laboratory Batch Quality Control at the end of each parameter. If a sample was re-analyzed or re-extracted due to a required quality control corrective action and if both sets of data are reported, the Laboratory ID of the re-analysis or re-extraction is designated with an "R" or "RE", respectively. When multiple Batch Quality Control elements are reported (e.g. more than one LCS), the associated samples for each element are noted in the grey shaded header line of each data table. Any Laboratory Batch, Sample Specific % recovery or RPD value that is outside the listed Acceptance Criteria is bolded in the report.

Please see the associated ADEx data file for a comparison of laboratory reporting limits that were achieved with the regulatory Numerical Standards requested on the Chain of Custody.

TO15-LL

L0900004-01, -08, and -10: results for Chloromethane should be considered estimated due to co-elution with a non-target peak.

L0900004-02 through -05, and -09: The presence of Chlorormethane and Freon 114 could not be determined in these samples due to non-target compounds interfering with the identification and quantification of these compounds.

L0900004-02, -03, -05, -07 through -13: results for Acetone should be considered estimated due to co-elution with a non-target peak.

The WG349061-2 LCS recoveries for trans-1,3-Dichloropropene, 1,2,4-Trichlorobenzene, and Hexachlorobutadiene are outside the 70%-130% acceptance limit. The LCS was within overall method allowances, therefore the analysis proceeded.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature: Kathleen M. O'Brien

Title: Technical Director/Representative Date: 01/15/09

AIR

Project Name: KEITH MIDDLE SCHOOL
Project Number: 115058
Lab Number: L0900004
Report Date: 01/15/09

SAMPLE RESULTS

Lab ID: L0900004-01
Client ID: VS-9-18
Sample Location:
Matrix: Air
Anaytical Method: 48,TO-15
Analytical Date: 01/07/09 00:00
Analyst: RY

Date Collected: 12/30/08 00:00
Date Received: 12/31/08
Field Prep: Not Specified

Parameter	ppbV Results	ppbV RDL	ug/m3 Results	ug/m3 RDL	Qualifier	Dilution Factor
Low Level Volatile Organic Compounds in Air						
1,1,1-Trichloroethane	ND	0.200	ND	1.09		1
1,1,2,2-Tetrachloroethane	ND	0.200	ND	1.37		1
1,1,2-Trichloroethane	ND	0.200	ND	1.09		1
1,1-Dichloroethane	ND	0.200	ND	0.809		1
1,1-Dichloroethene	ND	0.200	ND	0.792		1
1,2,4-Trichlorobenzene	ND	0.200	ND	1.48		1
1,2,4-Trimethylbenzene	ND	0.200	ND	0.982		1
1,2-Dibromoethane	ND	0.200	ND	1.54		1
1,2-Dichlorobenzene	ND	0.200	ND	1.20		1
1,2-Dichloroethane	ND	0.200	ND	0.809		1
1,2-Dichloropropane	ND	0.200	ND	0.924		1
1,3,5-Trimethybenzene	ND	0.200	ND	0.982		1
1,3-Butadiene	ND	0.200	ND	0.442		1
1,3-Dichlorobenzene	ND	0.200	ND	1.20		1
1,4-Dichlorobenzene	ND	0.200	ND	1.20		1
1,4-Dioxane	ND	0.200	ND	0.720		1
2,2,4-Trimethylpentane	ND	0.200	ND	0.934		1
2-Butanone	ND	0.200	ND	0.589		1
2-Hexanone	ND	0.200	ND	0.819		1
3-Chloropropene	ND	0.200	ND	0.626		1
4-Ethyltoluene	ND	0.200	ND	0.982		1
Acetone	1.96	0.500	4.66	1.19		1
Benzyl chloride	ND	0.200	ND	1.03		1
Bromodichloromethane	ND	0.200	ND	1.34		1
Bromoform	ND	0.200	ND	2.06		1

Project Name: KEITH MIDDLE SCHOOL
Project Number: 115058
Lab Number: L0900004
Report Date: 01/15/09

SAMPLE RESULTS

Lab ID: L0900004-01
Client ID: VS-9-18
Sample Location:
Date Collected: 12/30/08 00:00
Date Received: 12/31/08
Field Prep: Not Specified

Parameter	ppbV Results	ppbV RDL	ug/m3 Results	ug/m3 RDL	Qualifier	Dilution Factor
Low Level Volatile Organic Compounds in Air						
Bromomethane	ND	0.200	ND	0.776		1
Carbon disulfide	ND	0.200	ND	0.622		1
Carbon tetrachloride	ND	0.200	ND	1.26		1
Chlorobenzene	ND	0.200	ND	0.920		1
Chloroethane	ND	0.200	ND	0.527		1
Chloromethane	0.223	0.200	0.460	0.413		1
cis-1,2-Dichloroethene	ND	0.200	ND	0.792		1
cis-1,3-Dichloropropene	ND	0.200	ND	0.907		1
Cyclohexane	ND	0.200	ND	0.688		1
Dibromochloromethane	ND	0.200	ND	1.70		1
Dichlorodifluoromethane	0.537	0.200	2.65	0.988		1
Ethanol	ND	2.50	ND	4.71		1
Ethyl Acetate	ND	0.500	ND	1.80		1
Ethylbenzene	ND	0.200	ND	0.868		1
Freon-113	ND	0.200	ND	1.53		1
Freon-114	ND	0.200	ND	1.40		1
Hexachlorobutadiene	ND	0.200	ND	2.13		1
Isopropanol	ND	0.500	ND	1.23		1
Methylene chloride	0.716	0.500	2.49	1.74		1
4-Methyl-2-pentanone	ND	0.200	ND	0.819		1
Methyl tert butyl ether	ND	0.200	ND	0.720		1
p/m-Xylene	ND	0.400	ND	1.74		1
o-Xylene	ND	0.200	ND	0.868		1
Heptane	ND	0.200	ND	0.819		1
n-Hexane	ND	0.200	ND	0.704		1
Propylene	ND	0.200	ND	0.344		1
Styrene	ND	0.200	ND	0.851		1
Tetrahydrofuran	ND	0.200	ND	0.589		1

Project Name: KEITH MIDDLE SCHOOL
Project Number: 115058
Lab Number: L0900004
Report Date: 01/15/09

SAMPLE RESULTS

Lab ID: L0900004-01
Client ID: VS-9-18
Sample Location:
Date Collected: 12/30/08 00:00
Date Received: 12/31/08
Field Prep: Not Specified

Parameter	ppbV Results	ppbV RDL	ug/m3 Results	ug/m3 RDL	Qualifier	Dilution Factor
Low Level Volatile Organic Compounds in Air						
Toluene	ND	0.200	ND	0.753		1
trans-1,2-Dichloroethene	ND	0.200	ND	0.792		1
trans-1,3-Dichloropropene	ND	0.200	ND	0.907		1
Trichlorofluoromethane	0.280	0.200	1.57	1.12		1
Vinyl acetate	ND	0.200	ND	0.704		1
Vinyl bromide	ND	0.200	ND	0.874		1
Vinyl chloride	ND	0.200	ND	0.511		1

Project Name: KEITH MIDDLE SCHOOL
Project Number: 115058
Lab Number: L0900004
Report Date: 01/15/09

SAMPLE RESULTS

Lab ID: L0900004-01
Client ID: VS-9-18
Sample Location:
Matrix: Air
Anaytical Method: 48,TO-15-SIM
Analytical Date: 01/07/09 00:00
Analyst: RY

Date Collected: 12/30/08 00:00
Date Received: 12/31/08
Field Prep: Not Specified

Parameter	ppbV Results	ppbV RDL	ug/m3 Results	ug/m3 RDL	Qualifier	Dilution Factor
Volatile Organic Compounds in Air by SIM						
Benzene	0.118	0.070	0.377	0.223		1
Chloroform	0.030	0.020	0.144	0.098		1
Tetrachloroethene	0.083	0.020	0.561	0.136		1
Trichloroethene	ND	0.020	ND	0.107		1

Project Name: KEITH MIDDLE SCHOOL
Project Number: 115058
Lab Number: L0900004
Report Date: 01/15/09

SAMPLE RESULTS

Lab ID: L0900004-02
Client ID: VS-7-18-DUP
Sample Location:
Matrix: Air
Anaytical Method: 48,TO-15
Analytical Date: 01/07/09 00:37
Analyst: RY

Date Collected: 12/30/08 00:00
Date Received: 12/31/08
Field Prep: Not Specified

Parameter	ppbV Results	ppbV RDL	ug/m3 Results	ug/m3 RDL	Qualifier	Dilution Factor
Low Level Volatile Organic Compounds in Air						
1,1,1-Trichloroethane	ND	0.200	ND	1.09		1
1,1,2,2-Tetrachloroethane	ND	0.200	ND	1.37		1
1,1,2-Trichloroethane	ND	0.200	ND	1.09		1
1,1-Dichloroethane	ND	0.200	ND	0.809		1
1,1-Dichloroethene	ND	0.200	ND	0.792		1
1,2,4-Trichlorobenzene	ND	0.200	ND	1.48		1
1,2,4-Trimethylbenzene	ND	0.200	ND	0.982		1
1,2-Dibromoethane	ND	0.200	ND	1.54		1
1,2-Dichlorobenzene	ND	0.200	ND	1.20		1
1,2-Dichloroethane	0.400	0.200	1.62	0.809		1
1,2-Dichloropropane	ND	0.200	ND	0.924		1
1,3,5-Trimethybenzene	ND	0.200	ND	0.982		1
1,3-Butadiene	ND	0.200	ND	0.442		1
1,3-Dichlorobenzene	ND	0.200	ND	1.20		1
1,4-Dichlorobenzene	ND	0.200	ND	1.20		1
1,4-Dioxane	ND	0.200	ND	0.720		1
2,2,4-Trimethylpentane	ND	0.200	ND	0.934		1
2-Butanone	0.393	0.200	1.16	0.589		1
2-Hexanone	ND	0.200	ND	0.819		1
3-Chloropropene	ND	0.200	ND	0.626		1
4-Ethyltoluene	ND	0.200	ND	0.982		1
Acetone	3.00	0.500	7.11	1.19		1
Benzyl chloride	ND	0.200	ND	1.03		1
Bromodichloromethane	ND	0.200	ND	1.34		1
Bromoform	ND	0.200	ND	2.06		1

Project Name: KEITH MIDDLE SCHOOL
Project Number: 115058
Lab Number: L0900004
Report Date: 01/15/09

SAMPLE RESULTS

Lab ID: L0900004-02
Client ID: VS-7-18-DUP
Sample Location:
Date Collected: 12/30/08 00:00
Date Received: 12/31/08
Field Prep: Not Specified

Parameter	ppbV Results	ppbV RDL	ug/m3 Results	ug/m3 RDL	Qualifier	Dilution Factor
Low Level Volatile Organic Compounds in Air						
Bromomethane	ND	0.200	ND	0.776		1
Carbon disulfide	ND	0.200	ND	0.622		1
Carbon tetrachloride	ND	0.200	ND	1.26		1
Chlorobenzene	ND	0.200	ND	0.920		1
Chloroethane	ND	0.200	ND	0.527		1
Chloromethane	ND	0.200	ND	0.413		1
cis-1,2-Dichloroethene	ND	0.200	ND	0.792		1
cis-1,3-Dichloropropene	ND	0.200	ND	0.907		1
Cyclohexane	0.211	0.200	0.725	0.688		1
Dibromochloromethane	ND	0.200	ND	1.70		1
Dichlorodifluoromethane	0.520	0.200	2.57	0.988		1
Ethanol	ND	2.50	ND	4.71		1
Ethyl Acetate	ND	0.500	ND	1.80		1
Ethylbenzene	ND	0.200	ND	0.868		1
Freon-113	ND	0.200	ND	1.53		1
Freon-114	ND	0.200	ND	1.40		1
Hexachlorobutadiene	ND	0.200	ND	2.13		1
Isopropanol	ND	0.500	ND	1.23		1
Methylene chloride	ND	0.500	ND	1.74		1
4-Methyl-2-pentanone	ND	0.200	ND	0.819		1
Methyl tert butyl ether	ND	0.200	ND	0.720		1
p/m-Xylene	ND	0.400	ND	1.74		1
o-Xylene	ND	0.200	ND	0.868		1
Heptane	ND	0.200	ND	0.819		1
n-Hexane	ND	0.200	ND	0.704		1
Propylene	ND	0.200	ND	0.344		1
Styrene	ND	0.200	ND	0.851		1
Tetrahydrofuran	0.559	0.200	1.65	0.589		1

Project Name: KEITH MIDDLE SCHOOL
Project Number: 115058
Lab Number: L0900004
Report Date: 01/15/09

SAMPLE RESULTS

Lab ID: L0900004-02
Client ID: VS-7-18-DUP
Sample Location:
Date Collected: 12/30/08 00:00
Date Received: 12/31/08
Field Prep: Not Specified

Parameter	ppbV Results	ppbV RDL	ug/m3 Results	ug/m3 RDL	Qualifier	Dilution Factor
Low Level Volatile Organic Compounds in Air						
Toluene	0.357	0.200	1.34	0.753		1
trans-1,2-Dichloroethene	ND	0.200	ND	0.792		1
trans-1,3-Dichloropropene	ND	0.200	ND	0.907		1
Trichlorofluoromethane	0.308	0.200	1.73	1.12		1
Vinyl acetate	ND	0.200	ND	0.704		1
Vinyl bromide	ND	0.200	ND	0.874		1
Vinyl chloride	ND	0.200	ND	0.511		1

Project Name: KEITH MIDDLE SCHOOL
Project Number: 115058
Lab Number: L0900004
Report Date: 01/15/09

SAMPLE RESULTS

Lab ID: L0900004-02
Client ID: VS-7-18-DUP
Sample Location:
Matrix: Air
Anaytical Method: 48,TO-15-SIM
Analytical Date: 01/07/09 00:37
Analyst: RY

Date Collected: 12/30/08 00:00
Date Received: 12/31/08
Field Prep: Not Specified

Parameter	ppbV Results	ppbV RDL	ug/m3 Results	ug/m3 RDL	Qualifier	Dilution Factor
Volatile Organic Compounds in Air by SIM						
Benzene	0.072	0.070	0.230	0.223		1
Chloroform	0.164	0.020	0.800	0.098		1
Tetrachloroethene	0.442	0.020	2.99	0.136		1
Trichloroethene	0.470	0.020	2.52	0.107		1

Project Name: KEITH MIDDLE SCHOOL
Project Number: 115058
Lab Number: L0900004
Report Date: 01/15/09

SAMPLE RESULTS

Lab ID: L0900004-03
Client ID: VS-7-18
Sample Location:
Matrix: Air
Anaytical Method: 48,TO-15
Analytical Date: 01/07/09 01:14
Analyst: RY

Date Collected: 12/30/08 00:00
Date Received: 12/31/08
Field Prep: Not Specified

Parameter	ppbV Results	ppbV RDL	ug/m3 Results	ug/m3 RDL	Qualifier	Dilution Factor
Low Level Volatile Organic Compounds in Air						
1,1,1-Trichloroethane	ND	0.200	ND	1.09		1
1,1,2,2-Tetrachloroethane	ND	0.200	ND	1.37		1
1,1,2-Trichloroethane	ND	0.200	ND	1.09		1
1,1-Dichloroethane	ND	0.200	ND	0.809		1
1,1-Dichloroethene	ND	0.200	ND	0.792		1
1,2,4-Trichlorobenzene	ND	0.200	ND	1.48		1
1,2,4-Trimethylbenzene	ND	0.200	ND	0.982		1
1,2-Dibromoethane	ND	0.200	ND	1.54		1
1,2-Dichlorobenzene	ND	0.200	ND	1.20		1
1,2-Dichloroethane	0.370	0.200	1.49	0.809		1
1,2-Dichloropropane	ND	0.200	ND	0.924		1
1,3,5-Trimethybenzene	ND	0.200	ND	0.982		1
1,3-Butadiene	ND	0.200	ND	0.442		1
1,3-Dichlorobenzene	ND	0.200	ND	1.20		1
1,4-Dichlorobenzene	ND	0.200	ND	1.20		1
1,4-Dioxane	ND	0.200	ND	0.720		1
2,2,4-Trimethylpentane	ND	0.200	ND	0.934		1
2-Butanone	0.514	0.200	1.52	0.589		1
2-Hexanone	ND	0.200	ND	0.819		1
3-Chloropropene	ND	0.200	ND	0.626		1
4-Ethyltoluene	ND	0.200	ND	0.982		1
Acetone	4.30	0.500	10.2	1.19		1
Benzyl chloride	ND	0.200	ND	1.03		1
Bromodichloromethane	ND	0.200	ND	1.34		1
Bromoform	ND	0.200	ND	2.06		1

Project Name: KEITH MIDDLE SCHOOL
Project Number: 115058
Lab Number: L0900004
Report Date: 01/15/09

SAMPLE RESULTS

Lab ID: L0900004-03
Client ID: VS-7-18
Sample Location:
Date Collected: 12/30/08 00:00
Date Received: 12/31/08
Field Prep: Not Specified

Parameter	ppbV Results	ppbV RDL	ug/m3 Results	ug/m3 RDL	Qualifier	Dilution Factor
Low Level Volatile Organic Compounds in Air						
Bromomethane	ND	0.200	ND	0.776		1
Carbon disulfide	ND	0.200	ND	0.622		1
Carbon tetrachloride	ND	0.200	ND	1.26		1
Chlorobenzene	ND	0.200	ND	0.920		1
Chloroethane	ND	0.200	ND	0.527		1
Chloromethane	ND	0.200	ND	0.413		1
cis-1,2-Dichloroethene	ND	0.200	ND	0.792		1
cis-1,3-Dichloropropene	ND	0.200	ND	0.907		1
Cyclohexane	0.267	0.200	0.918	0.688		1
Dibromochloromethane	ND	0.200	ND	1.70		1
Dichlorodifluoromethane	0.450	0.200	2.22	0.988		1
Ethanol	ND	2.50	ND	4.71		1
Ethyl Acetate	ND	0.500	ND	1.80		1
Ethylbenzene	ND	0.200	ND	0.868		1
Freon-113	ND	0.200	ND	1.53		1
Freon-114	ND	0.200	ND	1.40		1
Hexachlorobutadiene	ND	0.200	ND	2.13		1
Isopropanol	0.815	0.500	2.00	1.23		1
Methylene chloride	3.13	0.500	10.9	1.74		1
4-Methyl-2-pentanone	ND	0.200	ND	0.819		1
Methyl tert butyl ether	ND	0.200	ND	0.720		1
p/m-Xylene	ND	0.400	ND	1.74		1
o-Xylene	ND	0.200	ND	0.868		1
Heptane	ND	0.200	ND	0.819		1
n-Hexane	0.591	0.200	2.08	0.704		1
Propylene	ND	0.200	ND	0.344		1
Styrene	ND	0.200	ND	0.851		1
Tetrahydrofuran	0.532	0.200	1.57	0.589		1

Project Name: KEITH MIDDLE SCHOOL
Project Number: 115058
Lab Number: L0900004
Report Date: 01/15/09

SAMPLE RESULTS

Lab ID: L0900004-03
Client ID: VS-7-18
Sample Location:
Date Collected: 12/30/08 00:00
Date Received: 12/31/08
Field Prep: Not Specified

Parameter	ppbV Results	ppbV RDL	ug/m3 Results	ug/m3 RDL	Qualifier	Dilution Factor
Low Level Volatile Organic Compounds in Air						
Toluene	0.487	0.200	1.83	0.753		1
trans-1,2-Dichloroethene	ND	0.200	ND	0.792		1
trans-1,3-Dichloropropene	ND	0.200	ND	0.907		1
Trichlorofluoromethane	0.321	0.200	1.80	1.12		1
Vinyl acetate	ND	0.200	ND	0.704		1
Vinyl bromide	ND	0.200	ND	0.874		1
Vinyl chloride	ND	0.200	ND	0.511		1

Project Name: KEITH MIDDLE SCHOOL
Project Number: 115058
Lab Number: L0900004
Report Date: 01/15/09

SAMPLE RESULTS

Lab ID: L0900004-03
Client ID: VS-7-18
Sample Location:
Matrix: Air
Anaytical Method: 48,TO-15-SIM
Analytical Date: 01/07/09 01:14
Analyst: RY

Date Collected: 12/30/08 00:00
Date Received: 12/31/08
Field Prep: Not Specified

Parameter	ppbV Results	ppbV RDL	ug/m3 Results	ug/m3 RDL	Qualifier	Dilution Factor
Volatile Organic Compounds in Air by SIM						
Benzene	0.105	0.070	0.334	0.223		1
Chloroform	0.203	0.020	0.990	0.098		1
Tetrachloroethene	0.454	0.020	3.08	0.136		1
Trichloroethene	0.477	0.020	2.56	0.107		1

Project Name: KEITH MIDDLE SCHOOL
Project Number: 115058
Lab Number: L0900004
Report Date: 01/15/09

SAMPLE RESULTS

Lab ID: L0900004-04
Client ID: VS-1-18
Sample Location:
Matrix: Air
Anaytical Method: 48,TO-15
Analytical Date: 01/06/09 21:31
Analyst: RY

Date Collected: 12/30/08 00:00
Date Received: 12/31/08
Field Prep: Not Specified

Parameter	ppbV Results	ppbV RDL	ug/m3 Results	ug/m3 RDL	Qualifier	Dilution Factor
Low Level Volatile Organic Compounds in Air						
1,1,1-Trichloroethane	ND	0.200	ND	1.09		1
1,1,2,2-Tetrachloroethane	ND	0.200	ND	1.37		1
1,1,2-Trichloroethane	ND	0.200	ND	1.09		1
1,1-Dichloroethane	ND	0.200	ND	0.809		1
1,1-Dichloroethene	ND	0.200	ND	0.792		1
1,2,4-Trichlorobenzene	ND	0.200	ND	1.48		1
1,2,4-Trimethylbenzene	ND	0.200	ND	0.982		1
1,2-Dibromoethane	ND	0.200	ND	1.54		1
1,2-Dichlorobenzene	ND	0.200	ND	1.20		1
1,2-Dichloroethane	0.420	0.200	1.70	0.809		1
1,2-Dichloropropane	ND	0.200	ND	0.924		1
1,3,5-Trimethybenzene	ND	0.200	ND	0.982		1
1,3-Butadiene	ND	0.200	ND	0.442		1
1,3-Dichlorobenzene	ND	0.200	ND	1.20		1
1,4-Dichlorobenzene	ND	0.200	ND	1.20		1
1,4-Dioxane	ND	0.200	ND	0.720		1
2,2,4-Trimethylpentane	ND	0.200	ND	0.934		1
2-Butanone	1.15	0.200	3.39	0.589		1
2-Hexanone	ND	0.200	ND	0.819		1
3-Chloropropene	ND	0.200	ND	0.626		1
4-Ethyltoluene	ND	0.200	ND	0.982		1
Acetone	2.01	0.500	4.76	1.19		1
Benzyl chloride	ND	0.200	ND	1.03		1
Bromodichloromethane	ND	0.200	ND	1.34		1
Bromoform	ND	0.200	ND	2.06		1

Project Name: KEITH MIDDLE SCHOOL
Project Number: 115058
Lab Number: L0900004
Report Date: 01/15/09

SAMPLE RESULTS

Lab ID: L0900004-04
Client ID: VS-1-18
Sample Location:
Date Collected: 12/30/08 00:00
Date Received: 12/31/08
Field Prep: Not Specified

Parameter	ppbV Results	ppbV RDL	ug/m3 Results	ug/m3 RDL	Qualifier	Dilution Factor
Low Level Volatile Organic Compounds in Air						
Bromomethane	ND	0.200	ND	0.776		1
Carbon disulfide	ND	0.200	ND	0.622		1
Carbon tetrachloride	ND	0.200	ND	1.26		1
Chlorobenzene	ND	0.200	ND	0.920		1
Chloroethane	ND	0.200	ND	0.527		1
Chloromethane	ND	0.200	ND	0.413		1
cis-1,2-Dichloroethene	ND	0.200	ND	0.792		1
cis-1,3-Dichloropropene	ND	0.200	ND	0.907		1
Cyclohexane	ND	0.200	ND	0.688		1
Dibromochloromethane	ND	0.200	ND	1.70		1
Dichlorodifluoromethane	ND	0.200	ND	0.988		1
Ethanol	ND	2.50	ND	4.71		1
Ethyl Acetate	ND	0.500	ND	1.80		1
Ethylbenzene	ND	0.200	ND	0.868		1
Freon-113	ND	0.200	ND	1.53		1
Freon-114	ND	0.200	ND	1.40		1
Hexachlorobutadiene	ND	0.200	ND	2.13		1
Isopropanol	0.666	0.500	1.64	1.23		1
Methylene chloride	0.732	0.500	2.54	1.74		1
4-Methyl-2-pentanone	ND	0.200	ND	0.819		1
Methyl tert butyl ether	ND	0.200	ND	0.720		1
p/m-Xylene	ND	0.400	ND	1.74		1
o-Xylene	ND	0.200	ND	0.868		1
Heptane	ND	0.200	ND	0.819		1
n-Hexane	ND	0.200	ND	0.704		1
Propylene	ND	0.200	ND	0.344		1
Styrene	ND	0.200	ND	0.851		1
Tetrahydrofuran	3.21	0.200	9.46	0.589		1

Project Name: KEITH MIDDLE SCHOOL
Project Number: 115058
Lab Number: L0900004
Report Date: 01/15/09

SAMPLE RESULTS

Lab ID: L0900004-04
Client ID: VS-1-18
Sample Location:
Date Collected: 12/30/08 00:00
Date Received: 12/31/08
Field Prep: Not Specified

Parameter	ppbV Results	ppbV RDL	ug/m3 Results	ug/m3 RDL	Qualifier	Dilution Factor
Low Level Volatile Organic Compounds in Air						
Toluene	ND	0.200	ND	0.753		1
trans-1,2-Dichloroethene	ND	0.200	ND	0.792		1
trans-1,3-Dichloropropene	ND	0.200	ND	0.907		1
Trichlorofluoromethane	0.249	0.200	1.40	1.12		1
Vinyl acetate	ND	0.200	ND	0.704		1
Vinyl bromide	ND	0.200	ND	0.874		1
Vinyl chloride	ND	0.200	ND	0.511		1

Project Name: KEITH MIDDLE SCHOOL
Project Number: 115058
Lab Number: L0900004
Report Date: 01/15/09

SAMPLE RESULTS

Lab ID: L0900004-04
Client ID: VS-1-18
Sample Location:
Matrix: Air
Anaytical Method: 48,TO-15-SIM
Analytical Date: 01/06/09 21:31
Analyst: RY

Date Collected: 12/30/08 00:00
Date Received: 12/31/08
Field Prep: Not Specified

Parameter	ppbV Results	ppbV RDL	ug/m3 Results	ug/m3 RDL	Qualifier	Dilution Factor
Volatile Organic Compounds in Air by SIM						
Benzene	ND	0.070	ND	0.223		1
Chloroform	1.04	0.020	5.06	0.098		1
Tetrachloroethene	1.30	0.020	8.81	0.136		1
Trichloroethene	0.090	0.020	0.482	0.107		1

Project Name: KEITH MIDDLE SCHOOL
Project Number: 115058
Lab Number: L0900004
Report Date: 01/15/09

SAMPLE RESULTS

Lab ID: L0900004-05
Client ID: VS-4-18
Sample Location:
Matrix: Air
Anaytical Method: 48,TO-15
Analytical Date: 01/06/09 22:46
Analyst: RY

Date Collected: 12/30/08 00:00
Date Received: 12/31/08
Field Prep: Not Specified

Parameter	ppbV Results	ppbV RDL	ug/m3 Results	ug/m3 RDL	Qualifier	Dilution Factor
Low Level Volatile Organic Compounds in Air						
1,1,1-Trichloroethane	ND	0.200	ND	1.09		1
1,1,2,2-Tetrachloroethane	ND	0.200	ND	1.37		1
1,1,2-Trichloroethane	ND	0.200	ND	1.09		1
1,1-Dichloroethane	ND	0.200	ND	0.809		1
1,1-Dichloroethene	ND	0.200	ND	0.792		1
1,2,4-Trichlorobenzene	ND	0.200	ND	1.48		1
1,2,4-Trimethylbenzene	ND	0.200	ND	0.982		1
1,2-Dibromoethane	ND	0.200	ND	1.54		1
1,2-Dichlorobenzene	ND	0.200	ND	1.20		1
1,2-Dichloroethane	ND	0.200	ND	0.809		1
1,2-Dichloropropane	ND	0.200	ND	0.924		1
1,3,5-Trimethybenzene	ND	0.200	ND	0.982		1
1,3-Butadiene	ND	0.200	ND	0.442		1
1,3-Dichlorobenzene	ND	0.200	ND	1.20		1
1,4-Dichlorobenzene	ND	0.200	ND	1.20		1
1,4-Dioxane	ND	0.200	ND	0.720		1
2,2,4-Trimethylpentane	ND	0.200	ND	0.934		1
2-Butanone	0.778	0.200	2.29	0.589		1
2-Hexanone	ND	0.200	ND	0.819		1
3-Chloropropene	ND	0.200	ND	0.626		1
4-Ethyltoluene	ND	0.200	ND	0.982		1
Acetone	2.08	0.500	4.95	1.19		1
Benzyl chloride	ND	0.200	ND	1.03		1
Bromodichloromethane	ND	0.200	ND	1.34		1
Bromoform	ND	0.200	ND	2.06		1

Project Name: KEITH MIDDLE SCHOOL
Project Number: 115058
Lab Number: L0900004
Report Date: 01/15/09

SAMPLE RESULTS

Lab ID: L0900004-05
Client ID: VS-4-18
Sample Location:
Date Collected: 12/30/08 00:00
Date Received: 12/31/08
Field Prep: Not Specified

Parameter	ppbV Results	ppbV RDL	ug/m3 Results	ug/m3 RDL	Qualifier	Dilution Factor
Low Level Volatile Organic Compounds in Air						
Bromomethane	ND	0.200	ND	0.776		1
Carbon disulfide	ND	0.200	ND	0.622		1
Carbon tetrachloride	ND	0.200	ND	1.26		1
Chlorobenzene	ND	0.200	ND	0.920		1
Chloroethane	ND	0.200	ND	0.527		1
Chloromethane	ND	0.200	ND	0.413		1
cis-1,2-Dichloroethene	ND	0.200	ND	0.792		1
cis-1,3-Dichloropropene	ND	0.200	ND	0.907		1
Cyclohexane	0.251	0.200	0.863	0.688		1
Dibromochloromethane	ND	0.200	ND	1.70		1
Dichlorodifluoromethane	0.695	0.200	3.44	0.988		1
Ethanol	ND	2.50	ND	4.71		1
Ethyl Acetate	ND	0.500	ND	1.80		1
Ethylbenzene	ND	0.200	ND	0.868		1
Freon-113	ND	0.200	ND	1.53		1
Freon-114	ND	0.200	ND	1.40		1
Hexachlorobutadiene	ND	0.200	ND	2.13		1
Isopropanol	1.22	0.500	2.98	1.23		1
Methylene chloride	ND	0.500	ND	1.74		1
4-Methyl-2-pentanone	ND	0.200	ND	0.819		1
Methyl tert butyl ether	ND	0.200	ND	0.720		1
p/m-Xylene	ND	0.400	ND	1.74		1
o-Xylene	ND	0.200	ND	0.868		1
Heptane	ND	0.200	ND	0.819		1
n-Hexane	0.219	0.200	0.770	0.704		1
Propylene	ND	0.200	ND	0.344		1
Styrene	ND	0.200	ND	0.851		1
Tetrahydrofuran	2.82	0.200	8.31	0.589		1

Project Name: KEITH MIDDLE SCHOOL
Project Number: 115058
Lab Number: L0900004
Report Date: 01/15/09

SAMPLE RESULTS

Lab ID: L0900004-05
Client ID: VS-4-18
Sample Location:
Date Collected: 12/30/08 00:00
Date Received: 12/31/08
Field Prep: Not Specified

Parameter	ppbV Results	ppbV RDL	ug/m3 Results	ug/m3 RDL	Qualifier	Dilution Factor
Low Level Volatile Organic Compounds in Air						
Toluene	0.222	0.200	0.835	0.753		1
trans-1,2-Dichloroethene	ND	0.200	ND	0.792		1
trans-1,3-Dichloropropene	ND	0.200	ND	0.907		1
Trichlorofluoromethane	0.484	0.200	2.72	1.12		1
Vinyl acetate	ND	0.200	ND	0.704		1
Vinyl bromide	ND	0.200	ND	0.874		1
Vinyl chloride	ND	0.200	ND	0.511		1

Project Name: KEITH MIDDLE SCHOOL
Project Number: 115058
Lab Number: L0900004
Report Date: 01/15/09

SAMPLE RESULTS

Lab ID: L0900004-05
Client ID: VS-4-18
Sample Location:
Matrix: Air
Anaytical Method: 48,TO-15-SIM
Analytical Date: 01/06/09 22:46
Analyst: RY

Date Collected: 12/30/08 00:00
Date Received: 12/31/08
Field Prep: Not Specified

Parameter	ppbV Results	ppbV RDL	ug/m3 Results	ug/m3 RDL	Qualifier	Dilution Factor
Volatile Organic Compounds in Air by SIM						
Benzene	0.087	0.070	0.278	0.223		1
Chloroform	8.16	0.020	39.8	0.098		1
Tetrachloroethene	2.97	0.020	20.1	0.136		1
Trichloroethene	0.317	0.020	1.70	0.107		1

Project Name: KEITH MIDDLE SCHOOL
Project Number: 115058
Lab Number: L0900004
Report Date: 01/15/09

SAMPLE RESULTS

Lab ID: L0900004-06
Client ID: VS-BG-18
Sample Location:
Matrix: Air
Anaytical Method: 48,TO-15
Analytical Date: 01/06/09 23:23
Analyst: RY

Date Collected: 12/30/08 00:00
Date Received: 12/31/08
Field Prep: Not Specified

Parameter	ppbV Results	ppbV RDL	ug/m3 Results	ug/m3 RDL	Qualifier	Dilution Factor
Low Level Volatile Organic Compounds in Air						
1,1,1-Trichloroethane	ND	0.200	ND	1.09		1
1,1,2,2-Tetrachloroethane	ND	0.200	ND	1.37		1
1,1,2-Trichloroethane	ND	0.200	ND	1.09		1
1,1-Dichloroethane	ND	0.200	ND	0.809		1
1,1-Dichloroethene	ND	0.200	ND	0.792		1
1,2,4-Trichlorobenzene	ND	0.200	ND	1.48		1
1,2,4-Trimethylbenzene	ND	0.200	ND	0.982		1
1,2-Dibromoethane	ND	0.200	ND	1.54		1
1,2-Dichlorobenzene	ND	0.200	ND	1.20		1
1,2-Dichloroethane	ND	0.200	ND	0.809		1
1,2-Dichloropropane	ND	0.200	ND	0.924		1
1,3,5-Trimethybenzene	ND	0.200	ND	0.982		1
1,3-Butadiene	ND	0.200	ND	0.442		1
1,3-Dichlorobenzene	ND	0.200	ND	1.20		1
1,4-Dichlorobenzene	ND	0.200	ND	1.20		1
1,4-Dioxane	ND	0.200	ND	0.720		1
2,2,4-Trimethylpentane	ND	0.200	ND	0.934		1
2-Butanone	ND	0.200	ND	0.589		1
2-Hexanone	ND	0.200	ND	0.819		1
3-Chloropropene	ND	0.200	ND	0.626		1
4-Ethyltoluene	ND	0.200	ND	0.982		1
Acetone	2.33	0.500	5.53	1.19		1
Benzyl chloride	ND	0.200	ND	1.03		1
Bromodichloromethane	ND	0.200	ND	1.34		1
Bromoform	ND	0.200	ND	2.06		1

Project Name: KEITH MIDDLE SCHOOL
Project Number: 115058
Lab Number: L0900004
Report Date: 01/15/09

SAMPLE RESULTS

Lab ID: L0900004-06
Client ID: VS-BG-18
Sample Location:
Date Collected: 12/30/08 00:00
Date Received: 12/31/08
Field Prep: Not Specified

Parameter	ppbV Results	ppbV RDL	ug/m3 Results	ug/m3 RDL	Qualifier	Dilution Factor
Low Level Volatile Organic Compounds in Air						
Bromomethane	ND	0.200	ND	0.776		1
Carbon disulfide	ND	0.200	ND	0.622		1
Carbon tetrachloride	ND	0.200	ND	1.26		1
Chlorobenzene	ND	0.200	ND	0.920		1
Chloroethane	ND	0.200	ND	0.527		1
Chloromethane	0.650	0.200	1.34	0.413		1
cis-1,2-Dichloroethene	ND	0.200	ND	0.792		1
cis-1,3-Dichloropropene	ND	0.200	ND	0.907		1
Cyclohexane	ND	0.200	ND	0.688		1
Dibromochloromethane	ND	0.200	ND	1.70		1
Dichlorodifluoromethane	0.640	0.200	3.16	0.988		1
Ethanol	ND	2.50	ND	4.71		1
Ethyl Acetate	ND	0.500	ND	1.80		1
Ethylbenzene	ND	0.200	ND	0.868		1
Freon-113	ND	0.200	ND	1.53		1
Freon-114	ND	0.200	ND	1.40		1
Hexachlorobutadiene	ND	0.200	ND	2.13		1
Isopropanol	ND	0.500	ND	1.23		1
Methylene chloride	ND	0.500	ND	1.74		1
4-Methyl-2-pentanone	ND	0.200	ND	0.819		1
Methyl tert butyl ether	ND	0.200	ND	0.720		1
p/m-Xylene	ND	0.400	ND	1.74		1
o-Xylene	ND	0.200	ND	0.868		1
Heptane	ND	0.200	ND	0.819		1
n-Hexane	ND	0.200	ND	0.704		1
Propylene	ND	0.200	ND	0.344		1
Styrene	ND	0.200	ND	0.851		1
Tetrahydrofuran	ND	0.200	ND	0.589		1

Project Name: KEITH MIDDLE SCHOOL
Project Number: 115058
Lab Number: L0900004
Report Date: 01/15/09

SAMPLE RESULTS

Lab ID: L0900004-06
Client ID: VS-BG-18
Sample Location:
Date Collected: 12/30/08 00:00
Date Received: 12/31/08
Field Prep: Not Specified

Parameter	ppbV Results	ppbV RDL	ug/m3 Results	ug/m3 RDL	Qualifier	Dilution Factor
Low Level Volatile Organic Compounds in Air						
Toluene	ND	0.200	ND	0.753		1
trans-1,2-Dichloroethene	ND	0.200	ND	0.792		1
trans-1,3-Dichloropropene	ND	0.200	ND	0.907		1
Trichlorofluoromethane	0.306	0.200	1.72	1.12		1
Vinyl acetate	ND	0.200	ND	0.704		1
Vinyl bromide	ND	0.200	ND	0.874		1
Vinyl chloride	ND	0.200	ND	0.511		1

Project Name: KEITH MIDDLE SCHOOL
Project Number: 115058
Lab Number: L0900004
Report Date: 01/15/09

SAMPLE RESULTS

Lab ID: L0900004-06
Client ID: VS-BG-18
Sample Location:
Matrix: Air
Anaytical Method: 48,TO-15-SIM
Analytical Date: 01/06/09 23:23
Analyst: RY

Date Collected: 12/30/08 00:00
Date Received: 12/31/08
Field Prep: Not Specified

Parameter	ppbV Results	ppbV RDL	ug/m3 Results	ug/m3 RDL	Qualifier	Dilution Factor
Volatile Organic Compounds in Air by SIM						
Benzene	0.119	0.070	0.381	0.223		1
Chloroform	ND	0.020	ND	0.098		1
Tetrachloroethene	ND	0.020	ND	0.136		1
Trichloroethene	ND	0.020	ND	0.107		1

Project Name: KEITH MIDDLE SCHOOL
Project Number: 115058
Lab Number: L0900004
Report Date: 01/15/09

SAMPLE RESULTS

Lab ID: L0900004-07
Client ID: VENT-TB
Sample Location:
Matrix: Air
Anaytical Method: 48,TO-15
Analytical Date: 01/06/09 17:07
Analyst: RY

Date Collected: 12/30/08 00:00
Date Received: 12/31/08
Field Prep: Not Specified

Parameter	ppbV Results	ppbV RDL	ug/m3 Results	ug/m3 RDL	Qualifier	Dilution Factor
Low Level Volatile Organic Compounds in Air						
1,1,1-Trichloroethane	ND	0.200	ND	1.09		1
1,1,2,2-Tetrachloroethane	ND	0.200	ND	1.37		1
1,1,2-Trichloroethane	ND	0.200	ND	1.09		1
1,1-Dichloroethane	ND	0.200	ND	0.809		1
1,1-Dichloroethene	ND	0.200	ND	0.792		1
1,2,4-Trichlorobenzene	ND	0.200	ND	1.48		1
1,2,4-Trimethylbenzene	ND	0.200	ND	0.982		1
1,2-Dibromoethane	ND	0.200	ND	1.54		1
1,2-Dichlorobenzene	ND	0.200	ND	1.20		1
1,2-Dichloroethane	ND	0.200	ND	0.809		1
1,2-Dichloropropane	ND	0.200	ND	0.924		1
1,3,5-Trimethybenzene	ND	0.200	ND	0.982		1
1,3-Butadiene	ND	0.200	ND	0.442		1
1,3-Dichlorobenzene	ND	0.200	ND	1.20		1
1,4-Dichlorobenzene	ND	0.200	ND	1.20		1
1,4-Dioxane	ND	0.200	ND	0.720		1
2,2,4-Trimethylpentane	ND	0.200	ND	0.934		1
2-Butanone	ND	0.200	ND	0.589		1
2-Hexanone	ND	0.200	ND	0.819		1
3-Chloropropene	ND	0.200	ND	0.626		1
4-Ethyltoluene	ND	0.200	ND	0.982		1
Acetone	1.14	0.500	2.70	1.19		1
Benzyl chloride	ND	0.200	ND	1.03		1
Bromodichloromethane	ND	0.200	ND	1.34		1
Bromoform	ND	0.200	ND	2.06		1

Project Name: KEITH MIDDLE SCHOOL
Project Number: 115058
Lab Number: L0900004
Report Date: 01/15/09

SAMPLE RESULTS

Lab ID: L0900004-07
Client ID: VENT-TB
Sample Location:
Date Collected: 12/30/08 00:00
Date Received: 12/31/08
Field Prep: Not Specified

Parameter	ppbV Results	ppbV RDL	ug/m3 Results	ug/m3 RDL	Qualifier	Dilution Factor
Low Level Volatile Organic Compounds in Air						
Bromomethane	ND	0.200	ND	0.776		1
Carbon disulfide	ND	0.200	ND	0.622		1
Carbon tetrachloride	ND	0.200	ND	1.26		1
Chlorobenzene	ND	0.200	ND	0.920		1
Chloroethane	ND	0.200	ND	0.527		1
Chloromethane	ND	0.200	ND	0.413		1
cis-1,2-Dichloroethene	ND	0.200	ND	0.792		1
cis-1,3-Dichloropropene	ND	0.200	ND	0.907		1
Cyclohexane	ND	0.200	ND	0.688		1
Dibromochloromethane	ND	0.200	ND	1.70		1
Dichlorodifluoromethane	ND	0.200	ND	0.988		1
Ethanol	6.67	2.50	12.6	4.71		1
Ethyl Acetate	ND	0.500	ND	1.80		1
Ethylbenzene	ND	0.200	ND	0.868		1
Freon-113	ND	0.200	ND	1.53		1
Freon-114	ND	0.200	ND	1.40		1
Hexachlorobutadiene	ND	0.200	ND	2.13		1
Isopropanol	0.652	0.500	1.60	1.23		1
Methylene chloride	ND	0.500	ND	1.74		1
4-Methyl-2-pentanone	ND	0.200	ND	0.819		1
Methyl tert butyl ether	ND	0.200	ND	0.720		1
p/m-Xylene	ND	0.400	ND	1.74		1
o-Xylene	ND	0.200	ND	0.868		1
Heptane	ND	0.200	ND	0.819		1
n-Hexane	ND	0.200	ND	0.704		1
Propylene	ND	0.200	ND	0.344		1
Styrene	ND	0.200	ND	0.851		1
Tetrahydrofuran	ND	0.200	ND	0.589		1

Project Name: KEITH MIDDLE SCHOOL
Project Number: 115058
Lab Number: L0900004
Report Date: 01/15/09

SAMPLE RESULTS

Lab ID: L0900004-07
Client ID: VENT-TB
Sample Location:
Date Collected: 12/30/08 00:00
Date Received: 12/31/08
Field Prep: Not Specified

Parameter	ppbV Results	ppbV RDL	ug/m3 Results	ug/m3 RDL	Qualifier	Dilution Factor
Low Level Volatile Organic Compounds in Air						
Toluene	ND	0.200	ND	0.753		1
trans-1,2-Dichloroethene	ND	0.200	ND	0.792		1
trans-1,3-Dichloropropene	ND	0.200	ND	0.907		1
Trichlorofluoromethane	ND	0.200	ND	1.12		1
Vinyl acetate	ND	0.200	ND	0.704		1
Vinyl bromide	ND	0.200	ND	0.874		1
Vinyl chloride	ND	0.200	ND	0.511		1

Project Name: KEITH MIDDLE SCHOOL
Project Number: 115058
Lab Number: L0900004
Report Date: 01/15/09

SAMPLE RESULTS

Lab ID: L0900004-07
Client ID: VENT-TB
Sample Location:
Matrix: Air
Anaytical Method: 48,TO-15-SIM
Analytical Date: 01/06/09 17:07
Analyst: RY

Date Collected: 12/30/08 00:00
Date Received: 12/31/08
Field Prep: Not Specified

Parameter	ppbV Results	ppbV RDL	ug/m3 Results	ug/m3 RDL	Qualifier	Dilution Factor
Volatile Organic Compounds in Air by SIM						
Benzene	0.075	0.070	0.239	0.223		1
Chloroform	ND	0.020	ND	0.098		1
Tetrachloroethene	ND	0.020	ND	0.136		1
Trichloroethene	ND	0.020	ND	0.107		1

Project Name: KEITH MIDDLE SCHOOL
Project Number: 115058
Lab Number: L0900004
Report Date: 01/15/09

SAMPLE RESULTS

Lab ID: L0900004-08
Client ID: C-18
Sample Location:
Matrix: Air
Anaytical Method: 48,TO-15
Analytical Date: 01/06/09 18:21
Analyst: RY

Date Collected: 12/30/08 00:00
Date Received: 12/31/08
Field Prep: Not Specified

Parameter	ppbV Results	ppbV RDL	ug/m3 Results	ug/m3 RDL	Qualifier	Dilution Factor
Low Level Volatile Organic Compounds in Air						
1,1,1-Trichloroethane	ND	0.200	ND	1.09		1
1,1,2,2-Tetrachloroethane	ND	0.200	ND	1.37		1
1,1,2-Trichloroethane	ND	0.200	ND	1.09		1
1,1-Dichloroethane	ND	0.200	ND	0.809		1
1,1-Dichloroethene	ND	0.200	ND	0.792		1
1,2,4-Trichlorobenzene	ND	0.200	ND	1.48		1
1,2,4-Trimethylbenzene	ND	0.200	ND	0.982		1
1,2-Dibromoethane	ND	0.200	ND	1.54		1
1,2-Dichlorobenzene	ND	0.200	ND	1.20		1
1,2-Dichloroethane	ND	0.200	ND	0.809		1
1,2-Dichloropropane	ND	0.200	ND	0.924		1
1,3,5-Trimethybenzene	ND	0.200	ND	0.982		1
1,3-Butadiene	ND	0.200	ND	0.442		1
1,3-Dichlorobenzene	ND	0.200	ND	1.20		1
1,4-Dichlorobenzene	ND	0.200	ND	1.20		1
1,4-Dioxane	ND	0.200	ND	0.720		1
2,2,4-Trimethylpentane	ND	0.200	ND	0.934		1
2-Butanone	0.343	0.200	1.01	0.589		1
2-Hexanone	ND	0.200	ND	0.819		1
3-Chloropropene	ND	0.200	ND	0.626		1
4-Ethyltoluene	ND	0.200	ND	0.982		1
Acetone	2.63	0.500	6.25	1.19		1
Benzyl chloride	ND	0.200	ND	1.03		1
Bromodichloromethane	ND	0.200	ND	1.34		1
Bromoform	ND	0.200	ND	2.06		1

Project Name: KEITH MIDDLE SCHOOL
Project Number: 115058
Lab Number: L0900004
Report Date: 01/15/09

SAMPLE RESULTS

Lab ID: L0900004-08
Client ID: C-18
Sample Location:
Date Collected: 12/30/08 00:00
Date Received: 12/31/08
Field Prep: Not Specified

Parameter	ppbV Results	ppbV RDL	ug/m3 Results	ug/m3 RDL	Qualifier	Dilution Factor
Low Level Volatile Organic Compounds in Air						
Bromomethane	ND	0.200	ND	0.776		1
Carbon disulfide	ND	0.200	ND	0.622		1
Carbon tetrachloride	ND	0.200	ND	1.26		1
Chlorobenzene	ND	0.200	ND	0.920		1
Chloroethane	ND	0.200	ND	0.527		1
Chloromethane	0.420	0.200	0.866	0.413		1
cis-1,2-Dichloroethene	ND	0.200	ND	0.792		1
cis-1,3-Dichloropropene	ND	0.200	ND	0.907		1
Cyclohexane	ND	0.200	ND	0.688		1
Dibromochloromethane	ND	0.200	ND	1.70		1
Dichlorodifluoromethane	0.520	0.200	2.57	0.988		1
Ethanol	6.03	2.50	11.3	4.71		1
Ethyl Acetate	ND	0.500	ND	1.80		1
Ethylbenzene	ND	0.200	ND	0.868		1
Freon-113	ND	0.200	ND	1.53		1
Freon-114	ND	0.200	ND	1.40		1
Hexachlorobutadiene	ND	0.200	ND	2.13		1
Isopropanol	ND	0.500	ND	1.23		1
Methylene chloride	ND	0.500	ND	1.74		1
4-Methyl-2-pentanone	ND	0.200	ND	0.819		1
Methyl tert butyl ether	ND	0.200	ND	0.720		1
p/m-Xylene	ND	0.400	ND	1.74		1
o-Xylene	ND	0.200	ND	0.868		1
Heptane	ND	0.200	ND	0.819		1
n-Hexane	0.245	0.200	0.862	0.704		1
Propylene	ND	0.200	ND	0.344		1
Styrene	ND	0.200	ND	0.851		1
Tetrahydrofuran	ND	0.200	ND	0.589		1

Project Name: KEITH MIDDLE SCHOOL
Project Number: 115058
Lab Number: L0900004
Report Date: 01/15/09

SAMPLE RESULTS

Lab ID: L0900004-08
Client ID: C-18
Sample Location:
Date Collected: 12/30/08 00:00
Date Received: 12/31/08
Field Prep: Not Specified

Parameter	ppbV Results	ppbV RDL	ug/m3 Results	ug/m3 RDL	Qualifier	Dilution Factor
Low Level Volatile Organic Compounds in Air						
Toluene	0.206	0.200	0.777	0.753		1
trans-1,2-Dichloroethene	ND	0.200	ND	0.792		1
trans-1,3-Dichloropropene	ND	0.200	ND	0.907		1
Trichlorofluoromethane	0.262	0.200	1.47	1.12		1
Vinyl acetate	ND	0.200	ND	0.704		1
Vinyl bromide	ND	0.200	ND	0.874		1
Vinyl chloride	ND	0.200	ND	0.511		1

Project Name: KEITH MIDDLE SCHOOL
Project Number: 115058
Lab Number: L0900004
Report Date: 01/15/09

SAMPLE RESULTS

Lab ID: L0900004-08
Client ID: C-18
Sample Location:
Matrix: Air
Anaytical Method: 48,TO-15-SIM
Analytical Date: 01/06/09 18:21
Analyst: RY

Date Collected: 12/30/08 00:00
Date Received: 12/31/08
Field Prep: Not Specified

Parameter	ppbV Results	ppbV RDL	ug/m3 Results	ug/m3 RDL	Qualifier	Dilution Factor
Volatile Organic Compounds in Air by SIM						
Benzene	0.263	0.070	0.839	0.223		1
Chloroform	ND	0.020	ND	0.098		1
Tetrachloroethene	ND	0.020	ND	0.136		1
Trichloroethene	ND	0.020	ND	0.107		1

Project Name: KEITH MIDDLE SCHOOL
Project Number: 115058
Lab Number: L0900004
Report Date: 01/15/09

SAMPLE RESULTS

Lab ID: L0900004-09
Client ID: B-18
Sample Location:
Matrix: Air
Anaytical Method: 48,TO-15
Analytical Date: 01/06/09 18:59
Analyst: RY

Date Collected: 12/30/08 00:00
Date Received: 12/31/08
Field Prep: Not Specified

Parameter	ppbV Results	ppbV RDL	ug/m3 Results	ug/m3 RDL	Qualifier	Dilution Factor
Low Level Volatile Organic Compounds in Air						
1,1,1-Trichloroethane	ND	0.200	ND	1.09		1
1,1,2,2-Tetrachloroethane	ND	0.200	ND	1.37		1
1,1,2-Trichloroethane	ND	0.200	ND	1.09		1
1,1-Dichloroethane	ND	0.200	ND	0.809		1
1,1-Dichloroethene	ND	0.200	ND	0.792		1
1,2,4-Trichlorobenzene	ND	0.200	ND	1.48		1
1,2,4-Trimethylbenzene	ND	0.200	ND	0.982		1
1,2-Dibromoethane	ND	0.200	ND	1.54		1
1,2-Dichlorobenzene	ND	0.200	ND	1.20		1
1,2-Dichloroethane	ND	0.200	ND	0.809		1
1,2-Dichloropropane	ND	0.200	ND	0.924		1
1,3,5-Trimethybenzene	ND	0.200	ND	0.982		1
1,3-Butadiene	ND	0.200	ND	0.442		1
1,3-Dichlorobenzene	ND	0.200	ND	1.20		1
1,4-Dichlorobenzene	ND	0.200	ND	1.20		1
1,4-Dioxane	ND	0.200	ND	0.720		1
2,2,4-Trimethylpentane	ND	0.200	ND	0.934		1
2-Butanone	0.472	0.200	1.39	0.589		1
2-Hexanone	ND	0.200	ND	0.819		1
3-Chloropropene	ND	0.200	ND	0.626		1
4-Ethyltoluene	ND	0.200	ND	0.982		1
Acetone	1.63	0.500	3.87	1.19		1
Benzyl chloride	ND	0.200	ND	1.03		1
Bromodichloromethane	ND	0.200	ND	1.34		1
Bromoform	ND	0.200	ND	2.06		1

Project Name: KEITH MIDDLE SCHOOL
Project Number: 115058
Lab Number: L0900004
Report Date: 01/15/09

SAMPLE RESULTS

Lab ID: L0900004-09
Client ID: B-18
Sample Location:
Date Collected: 12/30/08 00:00
Date Received: 12/31/08
Field Prep: Not Specified

Parameter	ppbV Results	ppbV RDL	ug/m3 Results	ug/m3 RDL	Qualifier	Dilution Factor
Low Level Volatile Organic Compounds in Air						
Bromomethane	ND	0.200	ND	0.776		1
Carbon disulfide	ND	0.200	ND	0.622		1
Carbon tetrachloride	ND	0.200	ND	1.26		1
Chlorobenzene	ND	0.200	ND	0.920		1
Chloroethane	ND	0.200	ND	0.527		1
Chloromethane	ND	0.200	ND	0.413		1
cis-1,2-Dichloroethene	ND	0.200	ND	0.792		1
cis-1,3-Dichloropropene	ND	0.200	ND	0.907		1
Cyclohexane	ND	0.200	ND	0.688		1
Dibromochloromethane	ND	0.200	ND	1.70		1
Dichlorodifluoromethane	0.466	0.200	2.30	0.988		1
Ethanol	ND	2.50	ND	4.71		1
Ethyl Acetate	ND	0.500	ND	1.80		1
Ethylbenzene	ND	0.200	ND	0.868		1
Freon-113	ND	0.200	ND	1.53		1
Freon-114	ND	0.200	ND	1.40		1
Hexachlorobutadiene	ND	0.200	ND	2.13		1
Isopropanol	ND	0.500	ND	1.23		1
Methylene chloride	ND	0.500	ND	1.74		1
4-Methyl-2-pentanone	ND	0.200	ND	0.819		1
Methyl tert butyl ether	ND	0.200	ND	0.720		1
p/m-Xylene	ND	0.400	ND	1.74		1
o-Xylene	ND	0.200	ND	0.868		1
Heptane	ND	0.200	ND	0.819		1
n-Hexane	ND	0.200	ND	0.704		1
Propylene	ND	0.200	ND	0.344		1
Styrene	ND	0.200	ND	0.851		1
Tetrahydrofuran	ND	0.200	ND	0.589		1

Project Name: KEITH MIDDLE SCHOOL
Project Number: 115058
Lab Number: L0900004
Report Date: 01/15/09

SAMPLE RESULTS

Lab ID: L0900004-09
Client ID: B-18
Sample Location:
Date Collected: 12/30/08 00:00
Date Received: 12/31/08
Field Prep: Not Specified

Parameter	ppbV Results	ppbV RDL	ug/m3 Results	ug/m3 RDL	Qualifier	Dilution Factor
Low Level Volatile Organic Compounds in Air						
Toluene	0.245	0.200	0.923	0.753		1
trans-1,2-Dichloroethene	ND	0.200	ND	0.792		1
trans-1,3-Dichloropropene	ND	0.200	ND	0.907		1
Trichlorofluoromethane	ND	0.200	ND	1.12		1
Vinyl acetate	ND	0.200	ND	0.704		1
Vinyl bromide	ND	0.200	ND	0.874		1
Vinyl chloride	ND	0.200	ND	0.511		1

Project Name: KEITH MIDDLE SCHOOL
Project Number: 115058
Lab Number: L0900004
Report Date: 01/15/09

SAMPLE RESULTS

Lab ID: L0900004-09
Client ID: B-18
Sample Location:
Matrix: Air
Anaytical Method: 48,TO-15-SIM
Analytical Date: 01/06/09 18:59
Analyst: RY

Date Collected: 12/30/08 00:00
Date Received: 12/31/08
Field Prep: Not Specified

Parameter	ppbV Results	ppbV RDL	ug/m3 Results	ug/m3 RDL	Qualifier	Dilution Factor
Volatile Organic Compounds in Air by SIM						
Benzene	0.203	0.070	0.647	0.223		1
Chloroform	ND	0.020	ND	0.098		1
Tetrachloroethene	ND	0.020	ND	0.136		1
Trichloroethene	ND	0.020	ND	0.107		1

Project Name: KEITH MIDDLE SCHOOL
Project Number: 115058
Lab Number: L0900004
Report Date: 01/15/09

SAMPLE RESULTS

Lab ID: L0900004-10
Client ID: A-18
Sample Location:
Matrix: Air
Anaytical Method: 48,TO-15
Analytical Date: 01/06/09 19:36
Analyst: RY

Date Collected: 12/30/08 00:00
Date Received: 12/31/08
Field Prep: Not Specified

Parameter	ppbV Results	ppbV RDL	ug/m3 Results	ug/m3 RDL	Qualifier	Dilution Factor
Low Level Volatile Organic Compounds in Air						
1,1,1-Trichloroethane	ND	0.200	ND	1.09		1
1,1,2,2-Tetrachloroethane	ND	0.200	ND	1.37		1
1,1,2-Trichloroethane	ND	0.200	ND	1.09		1
1,1-Dichloroethane	ND	0.200	ND	0.809		1
1,1-Dichloroethene	ND	0.200	ND	0.792		1
1,2,4-Trichlorobenzene	ND	0.200	ND	1.48		1
1,2,4-Trimethylbenzene	ND	0.200	ND	0.982		1
1,2-Dibromoethane	ND	0.200	ND	1.54		1
1,2-Dichlorobenzene	ND	0.200	ND	1.20		1
1,2-Dichloroethane	ND	0.200	ND	0.809		1
1,2-Dichloropropane	ND	0.200	ND	0.924		1
1,3,5-Trimethybenzene	ND	0.200	ND	0.982		1
1,3-Butadiene	ND	0.200	ND	0.442		1
1,3-Dichlorobenzene	ND	0.200	ND	1.20		1
1,4-Dichlorobenzene	ND	0.200	ND	1.20		1
1,4-Dioxane	ND	0.200	ND	0.720		1
2,2,4-Trimethylpentane	ND	0.200	ND	0.934		1
2-Butanone	0.252	0.200	0.744	0.589		1
2-Hexanone	ND	0.200	ND	0.819		1
3-Chloropropene	ND	0.200	ND	0.626		1
4-Ethyltoluene	ND	0.200	ND	0.982		1
Acetone	2.39	0.500	5.66	1.19		1
Benzyl chloride	ND	0.200	ND	1.03		1
Bromodichloromethane	ND	0.200	ND	1.34		1
Bromoform	ND	0.200	ND	2.06		1

Project Name: KEITH MIDDLE SCHOOL
Project Number: 115058
Lab Number: L0900004
Report Date: 01/15/09

SAMPLE RESULTS

Lab ID: L0900004-10
Client ID: A-18
Sample Location:
Date Collected: 12/30/08 00:00
Date Received: 12/31/08
Field Prep: Not Specified

Parameter	ppbV Results	ppbV RDL	ug/m3 Results	ug/m3 RDL	Qualifier	Dilution Factor
Low Level Volatile Organic Compounds in Air						
Bromomethane	ND	0.200	ND	0.776		1
Carbon disulfide	ND	0.200	ND	0.622		1
Carbon tetrachloride	ND	0.200	ND	1.26		1
Chlorobenzene	ND	0.200	ND	0.920		1
Chloroethane	ND	0.200	ND	0.527		1
Chloromethane	ND	0.200	ND	0.413		1
cis-1,2-Dichloroethene	ND	0.200	ND	0.792		1
cis-1,3-Dichloropropene	ND	0.200	ND	0.907		1
Cyclohexane	ND	0.200	ND	0.688		1
Dibromochloromethane	ND	0.200	ND	1.70		1
Dichlorodifluoromethane	0.466	0.200	2.30	0.988		1
Ethanol	12.1	2.50	22.8	4.71		1
Ethyl Acetate	ND	0.500	ND	1.80		1
Ethylbenzene	ND	0.200	ND	0.868		1
Freon-113	ND	0.200	ND	1.53		1
Freon-114	ND	0.200	ND	1.40		1
Hexachlorobutadiene	ND	0.200	ND	2.13		1
Isopropanol	0.537	0.500	1.32	1.23		1
Methylene chloride	ND	0.500	ND	1.74		1
4-Methyl-2-pentanone	ND	0.200	ND	0.819		1
Methyl tert butyl ether	ND	0.200	ND	0.720		1
p/m-Xylene	ND	0.400	ND	1.74		1
o-Xylene	ND	0.200	ND	0.868		1
Heptane	ND	0.200	ND	0.819		1
n-Hexane	0.260	0.200	0.917	0.704		1
Propylene	ND	0.200	ND	0.344		1
Styrene	0.211	0.200	0.900	0.851		1
Tetrahydrofuran	ND	0.200	ND	0.589		1

Project Name: KEITH MIDDLE SCHOOL
Project Number: 115058
Lab Number: L0900004
Report Date: 01/15/09

SAMPLE RESULTS

Lab ID: L0900004-10
Client ID: A-18
Sample Location:
Date Collected: 12/30/08 00:00
Date Received: 12/31/08
Field Prep: Not Specified

Parameter	ppbV Results	ppbV RDL	ug/m3 Results	ug/m3 RDL	Qualifier	Dilution Factor
Low Level Volatile Organic Compounds in Air						
Toluene	0.307	0.200	1.16	0.753		1
trans-1,2-Dichloroethene	ND	0.200	ND	0.792		1
trans-1,3-Dichloropropene	ND	0.200	ND	0.907		1
Trichlorofluoromethane	ND	0.200	ND	1.12		1
Vinyl acetate	ND	0.200	ND	0.704		1
Vinyl bromide	ND	0.200	ND	0.874		1
Vinyl chloride	ND	0.200	ND	0.511		1

Project Name: KEITH MIDDLE SCHOOL
Project Number: 115058
Lab Number: L0900004
Report Date: 01/15/09

SAMPLE RESULTS

Lab ID: L0900004-10
Client ID: A-18
Sample Location:
Matrix: Air
Anaytical Method: 48,TO-15-SIM
Analytical Date: 01/06/09 19:36
Analyst: RY

Date Collected: 12/30/08 00:00
Date Received: 12/31/08
Field Prep: Not Specified

Parameter	ppbV Results	ppbV RDL	ug/m3 Results	ug/m3 RDL	Qualifier	Dilution Factor
Volatile Organic Compounds in Air by SIM						
Benzene	0.219	0.070	0.700	0.223		1
Chloroform	0.021	0.020	0.102	0.098		1
Tetrachloroethene	ND	0.020	ND	0.136		1
Trichloroethene	ND	0.020	ND	0.107		1

Project Name: KEITH MIDDLE SCHOOL
Project Number: 115058
Lab Number: L0900004
Report Date: 01/15/09

SAMPLE RESULTS

Lab ID: L0900004-11
Client ID: BG-18
Sample Location:
Matrix: Air
Anaytical Method: 48,TO-15
Analytical Date: 01/06/09 20:14
Analyst: RY

Date Collected: 12/30/08 00:00
Date Received: 12/31/08
Field Prep: Not Specified

Parameter	ppbV Results	ppbV RDL	ug/m3 Results	ug/m3 RDL	Qualifier	Dilution Factor
Low Level Volatile Organic Compounds in Air						
1,1,1-Trichloroethane	ND	0.200	ND	1.09		1
1,1,2,2-Tetrachloroethane	ND	0.200	ND	1.37		1
1,1,2-Trichloroethane	ND	0.200	ND	1.09		1
1,1-Dichloroethane	ND	0.200	ND	0.809		1
1,1-Dichloroethene	ND	0.200	ND	0.792		1
1,2,4-Trichlorobenzene	ND	0.200	ND	1.48		1
1,2,4-Trimethylbenzene	ND	0.200	ND	0.982		1
1,2-Dibromoethane	ND	0.200	ND	1.54		1
1,2-Dichlorobenzene	ND	0.200	ND	1.20		1
1,2-Dichloroethane	ND	0.200	ND	0.809		1
1,2-Dichloropropane	ND	0.200	ND	0.924		1
1,3,5-Trimethybenzene	ND	0.200	ND	0.982		1
1,3-Butadiene	ND	0.200	ND	0.442		1
1,3-Dichlorobenzene	ND	0.200	ND	1.20		1
1,4-Dichlorobenzene	ND	0.200	ND	1.20		1
1,4-Dioxane	ND	0.200	ND	0.720		1
2,2,4-Trimethylpentane	ND	0.200	ND	0.934		1
2-Butanone	ND	0.200	ND	0.589		1
2-Hexanone	ND	0.200	ND	0.819		1
3-Chloropropene	ND	0.200	ND	0.626		1
4-Ethyltoluene	ND	0.200	ND	0.982		1
Acetone	1.35	0.500	3.20	1.19		1
Benzyl chloride	ND	0.200	ND	1.03		1
Bromodichloromethane	ND	0.200	ND	1.34		1
Bromoform	ND	0.200	ND	2.06		1

Project Name: KEITH MIDDLE SCHOOL
Project Number: 115058
Lab Number: L0900004
Report Date: 01/15/09

SAMPLE RESULTS

Lab ID: L0900004-11
Client ID: BG-18
Sample Location:
Date Collected: 12/30/08 00:00
Date Received: 12/31/08
Field Prep: Not Specified

Parameter	ppbV Results	ppbV RDL	ug/m3 Results	ug/m3 RDL	Qualifier	Dilution Factor
Low Level Volatile Organic Compounds in Air						
Bromomethane	ND	0.200	ND	0.776		1
Carbon disulfide	ND	0.200	ND	0.622		1
Carbon tetrachloride	ND	0.200	ND	1.26		1
Chlorobenzene	ND	0.200	ND	0.920		1
Chloroethane	ND	0.200	ND	0.527		1
Chloromethane	0.423	0.200	0.872	0.413		1
cis-1,2-Dichloroethene	ND	0.200	ND	0.792		1
cis-1,3-Dichloropropene	ND	0.200	ND	0.907		1
Cyclohexane	ND	0.200	ND	0.688		1
Dibromochloromethane	ND	0.200	ND	1.70		1
Dichlorodifluoromethane	0.491	0.200	2.43	0.988		1
Ethanol	ND	2.50	ND	4.71		1
Ethyl Acetate	ND	0.500	ND	1.80		1
Ethylbenzene	ND	0.200	ND	0.868		1
Freon-113	ND	0.200	ND	1.53		1
Freon-114	ND	0.200	ND	1.40		1
Hexachlorobutadiene	ND	0.200	ND	2.13		1
Isopropanol	ND	0.500	ND	1.23		1
Methylene chloride	ND	0.500	ND	1.74		1
4-Methyl-2-pentanone	ND	0.200	ND	0.819		1
Methyl tert butyl ether	ND	0.200	ND	0.720		1
p/m-Xylene	ND	0.400	ND	1.74		1
o-Xylene	ND	0.200	ND	0.868		1
Heptane	ND	0.200	ND	0.819		1
n-Hexane	ND	0.200	ND	0.704		1
Propylene	ND	0.200	ND	0.344		1
Styrene	ND	0.200	ND	0.851		1
Tetrahydrofuran	ND	0.200	ND	0.589		1

Project Name: KEITH MIDDLE SCHOOL
Project Number: 115058
Lab Number: L0900004
Report Date: 01/15/09

SAMPLE RESULTS

Lab ID: L0900004-11
Client ID: BG-18
Sample Location:
Date Collected: 12/30/08 00:00
Date Received: 12/31/08
Field Prep: Not Specified

Parameter	ppbV Results	ppbV RDL	ug/m3 Results	ug/m3 RDL	Qualifier	Dilution Factor
Low Level Volatile Organic Compounds in Air						
Toluene	ND	0.200	ND	0.753		1
trans-1,2-Dichloroethene	ND	0.200	ND	0.792		1
trans-1,3-Dichloropropene	ND	0.200	ND	0.907		1
Trichlorofluoromethane	0.213	0.200	1.20	1.12		1
Vinyl acetate	ND	0.200	ND	0.704		1
Vinyl bromide	ND	0.200	ND	0.874		1
Vinyl chloride	ND	0.200	ND	0.511		1

Project Name: KEITH MIDDLE SCHOOL
Project Number: 115058
Lab Number: L0900004
Report Date: 01/15/09

SAMPLE RESULTS

Lab ID: L0900004-11
Client ID: BG-18
Sample Location:
Matrix: Air
Anaytical Method: 48,TO-15-SIM
Analytical Date: 01/06/09 20:14
Analyst: RY

Date Collected: 12/30/08 00:00
Date Received: 12/31/08
Field Prep: Not Specified

Parameter	ppbV Results	ppbV RDL	ug/m3 Results	ug/m3 RDL	Qualifier	Dilution Factor
Volatile Organic Compounds in Air by SIM						
Benzene	0.172	0.070	0.548	0.223		1
Chloroform	ND	0.020	ND	0.098		1
Tetrachloroethene	ND	0.020	ND	0.136		1
Trichloroethene	ND	0.020	ND	0.107		1

Project Name: KEITH MIDDLE SCHOOL
Project Number: 115058
Lab Number: L0900004
Report Date: 01/15/09

SAMPLE RESULTS

Lab ID: L0900004-12
Client ID: BG-18-DUP
Sample Location:
Matrix: Air
Anaytical Method: 48,TO-15
Analytical Date: 01/06/09 20:53
Analyst: RY

Date Collected: 12/30/08 00:00
Date Received: 12/31/08
Field Prep: Not Specified

Parameter	ppbV Results	ppbV RDL	ug/m3 Results	ug/m3 RDL	Qualifier	Dilution Factor
Low Level Volatile Organic Compounds in Air						
1,1,1-Trichloroethane	ND	0.200	ND	1.09		1
1,1,2,2-Tetrachloroethane	ND	0.200	ND	1.37		1
1,1,2-Trichloroethane	ND	0.200	ND	1.09		1
1,1-Dichloroethane	ND	0.200	ND	0.809		1
1,1-Dichloroethene	ND	0.200	ND	0.792		1
1,2,4-Trichlorobenzene	ND	0.200	ND	1.48		1
1,2,4-Trimethylbenzene	ND	0.200	ND	0.982		1
1,2-Dibromoethane	ND	0.200	ND	1.54		1
1,2-Dichlorobenzene	ND	0.200	ND	1.20		1
1,2-Dichloroethane	ND	0.200	ND	0.809		1
1,2-Dichloropropane	ND	0.200	ND	0.924		1
1,3,5-Trimethybenzene	ND	0.200	ND	0.982		1
1,3-Butadiene	ND	0.200	ND	0.442		1
1,3-Dichlorobenzene	ND	0.200	ND	1.20		1
1,4-Dichlorobenzene	ND	0.200	ND	1.20		1
1,4-Dioxane	ND	0.200	ND	0.720		1
2,2,4-Trimethylpentane	ND	0.200	ND	0.934		1
2-Butanone	ND	0.200	ND	0.589		1
2-Hexanone	ND	0.200	ND	0.819		1
3-Chloropropene	ND	0.200	ND	0.626		1
4-Ethyltoluene	ND	0.200	ND	0.982		1
Acetone	1.99	0.500	4.72	1.19		1
Benzyl chloride	ND	0.200	ND	1.03		1
Bromodichloromethane	ND	0.200	ND	1.34		1
Bromoform	ND	0.200	ND	2.06		1

Project Name: KEITH MIDDLE SCHOOL
Project Number: 115058
Lab Number: L0900004
Report Date: 01/15/09

SAMPLE RESULTS

Lab ID: L0900004-12
Client ID: BG-18-DUP
Sample Location:
Date Collected: 12/30/08 00:00
Date Received: 12/31/08
Field Prep: Not Specified

Parameter	ppbV Results	ppbV RDL	ug/m3 Results	ug/m3 RDL	Qualifier	Dilution Factor
Low Level Volatile Organic Compounds in Air						
Bromomethane	ND	0.200	ND	0.776		1
Carbon disulfide	ND	0.200	ND	0.622		1
Carbon tetrachloride	ND	0.200	ND	1.26		1
Chlorobenzene	ND	0.200	ND	0.920		1
Chloroethane	ND	0.200	ND	0.527		1
Chloromethane	0.488	0.200	1.01	0.413		1
cis-1,2-Dichloroethene	ND	0.200	ND	0.792		1
cis-1,3-Dichloropropene	ND	0.200	ND	0.907		1
Cyclohexane	ND	0.200	ND	0.688		1
Dibromochloromethane	ND	0.200	ND	1.70		1
Dichlorodifluoromethane	0.391	0.200	1.93	0.988		1
Ethanol	ND	2.50	ND	4.71		1
Ethyl Acetate	ND	0.500	ND	1.80		1
Ethylbenzene	ND	0.200	ND	0.868		1
Freon-113	ND	0.200	ND	1.53		1
Freon-114	ND	0.200	ND	1.40		1
Hexachlorobutadiene	ND	0.200	ND	2.13		1
Isopropanol	ND	0.500	ND	1.23		1
Methylene chloride	ND	0.500	ND	1.74		1
4-Methyl-2-pentanone	ND	0.200	ND	0.819		1
Methyl tert butyl ether	ND	0.200	ND	0.720		1
p/m-Xylene	ND	0.400	ND	1.74		1
o-Xylene	ND	0.200	ND	0.868		1
Heptane	ND	0.200	ND	0.819		1
n-Hexane	ND	0.200	ND	0.704		1
Propylene	ND	0.200	ND	0.344		1
Styrene	ND	0.200	ND	0.851		1
Tetrahydrofuran	ND	0.200	ND	0.589		1

Project Name: KEITH MIDDLE SCHOOL
Project Number: 115058
Lab Number: L0900004
Report Date: 01/15/09

SAMPLE RESULTS

Lab ID: L0900004-12
Client ID: BG-18-DUP
Sample Location:
Date Collected: 12/30/08 00:00
Date Received: 12/31/08
Field Prep: Not Specified

Parameter	ppbV Results	ppbV RDL	ug/m3 Results	ug/m3 RDL	Qualifier	Dilution Factor
Low Level Volatile Organic Compounds in Air						
Toluene	ND	0.200	ND	0.753		1
trans-1,2-Dichloroethene	ND	0.200	ND	0.792		1
trans-1,3-Dichloropropene	ND	0.200	ND	0.907		1
Trichlorofluoromethane	0.220	0.200	1.24	1.12		1
Vinyl acetate	ND	0.200	ND	0.704		1
Vinyl bromide	ND	0.200	ND	0.874		1
Vinyl chloride	ND	0.200	ND	0.511		1

Project Name: KEITH MIDDLE SCHOOL
Project Number: 115058
Lab Number: L0900004
Report Date: 01/15/09

SAMPLE RESULTS

Lab ID: L0900004-12
Client ID: BG-18-DUP
Sample Location:
Matrix: Air
Anaytical Method: 48,TO-15-SIM
Analytical Date: 01/06/09 20:53
Analyst: RY

Date Collected: 12/30/08 00:00
Date Received: 12/31/08
Field Prep: Not Specified

Parameter	ppbV Results	ppbV RDL	ug/m3 Results	ug/m3 RDL	Qualifier	Dilution Factor
Volatile Organic Compounds in Air by SIM						
Benzene	0.194	0.070	0.621	0.223		1
Chloroform	ND	0.020	ND	0.098		1
Tetrachloroethene	ND	0.020	ND	0.136		1
Trichloroethene	ND	0.020	ND	0.107		1

Project Name: KEITH MIDDLE SCHOOL
Project Number: 115058
Lab Number: L0900004
Report Date: 01/15/09

SAMPLE RESULTS

Lab ID: L0900004-13
Client ID: TRIP BLANK
Sample Location:
Matrix: Air
Anaytical Method: 48,TO-15
Analytical Date: 01/06/09 17:44
Analyst: RY

Date Collected: 12/30/08 00:00
Date Received: 12/31/08
Field Prep: Not Specified

Parameter	ppbV Results	ppbV RDL	ug/m3 Results	ug/m3 RDL	Qualifier	Dilution Factor
Low Level Volatile Organic Compounds in Air						
1,1,1-Trichloroethane	ND	0.200	ND	1.09		1
1,1,2,2-Tetrachloroethane	ND	0.200	ND	1.37		1
1,1,2-Trichloroethane	ND	0.200	ND	1.09		1
1,1-Dichloroethane	ND	0.200	ND	0.809		1
1,1-Dichloroethene	ND	0.200	ND	0.792		1
1,2,4-Trichlorobenzene	ND	0.200	ND	1.48		1
1,2,4-Trimethylbenzene	ND	0.200	ND	0.982		1
1,2-Dibromoethane	ND	0.200	ND	1.54		1
1,2-Dichlorobenzene	ND	0.200	ND	1.20		1
1,2-Dichloroethane	ND	0.200	ND	0.809		1
1,2-Dichloropropane	ND	0.200	ND	0.924		1
1,3,5-Trimethybenzene	ND	0.200	ND	0.982		1
1,3-Butadiene	ND	0.200	ND	0.442		1
1,3-Dichlorobenzene	ND	0.200	ND	1.20		1
1,4-Dichlorobenzene	ND	0.200	ND	1.20		1
1,4-Dioxane	ND	0.200	ND	0.720		1
2,2,4-Trimethylpentane	ND	0.200	ND	0.934		1
2-Butanone	ND	0.200	ND	0.589		1
2-Hexanone	ND	0.200	ND	0.819		1
3-Chloropropene	ND	0.200	ND	0.626		1
4-Ethyltoluene	ND	0.200	ND	0.982		1
Acetone	1.77	0.500	4.20	1.19		1
Benzyl chloride	ND	0.200	ND	1.03		1
Bromodichloromethane	ND	0.200	ND	1.34		1
Bromoform	ND	0.200	ND	2.06		1

Project Name: KEITH MIDDLE SCHOOL
Project Number: 115058
Lab Number: L0900004
Report Date: 01/15/09

SAMPLE RESULTS

Lab ID: L0900004-13
Client ID: TRIP BLANK
Sample Location:
Date Collected: 12/30/08 00:00
Date Received: 12/31/08
Field Prep: Not Specified

Parameter	ppbV Results	ppbV RDL	ug/m3 Results	ug/m3 RDL	Qualifier	Dilution Factor
Low Level Volatile Organic Compounds in Air						
Bromomethane	ND	0.200	ND	0.776		1
Carbon disulfide	ND	0.200	ND	0.622		1
Carbon tetrachloride	ND	0.200	ND	1.26		1
Chlorobenzene	ND	0.200	ND	0.920		1
Chloroethane	ND	0.200	ND	0.527		1
Chloromethane	ND	0.200	ND	0.413		1
cis-1,2-Dichloroethene	ND	0.200	ND	0.792		1
cis-1,3-Dichloropropene	ND	0.200	ND	0.907		1
Cyclohexane	ND	0.200	ND	0.688		1
Dibromochloromethane	ND	0.200	ND	1.70		1
Dichlorodifluoromethane	ND	0.200	ND	0.988		1
Ethanol	6.76	2.50	12.7	4.71		1
Ethyl Acetate	ND	0.500	ND	1.80		1
Ethylbenzene	ND	0.200	ND	0.868		1
Freon-113	ND	0.200	ND	1.53		1
Freon-114	ND	0.200	ND	1.40		1
Hexachlorobutadiene	ND	0.200	ND	2.13		1
Isopropanol	0.619	0.500	1.52	1.23		1
Methylene chloride	0.578	0.500	2.00	1.74		1
4-Methyl-2-pentanone	ND	0.200	ND	0.819		1
Methyl tert butyl ether	ND	0.200	ND	0.720		1
p/m-Xylene	ND	0.400	ND	1.74		1
o-Xylene	ND	0.200	ND	0.868		1
Heptane	ND	0.200	ND	0.819		1
n-Hexane	ND	0.200	ND	0.704		1
Propylene	ND	0.200	ND	0.344		1
Styrene	ND	0.200	ND	0.851		1
Tetrahydrofuran	ND	0.200	ND	0.589		1

Project Name: KEITH MIDDLE SCHOOL
Project Number: 115058
Lab Number: L0900004
Report Date: 01/15/09

SAMPLE RESULTS

Lab ID: L0900004-13
Client ID: TRIP BLANK
Sample Location:
Date Collected: 12/30/08 00:00
Date Received: 12/31/08
Field Prep: Not Specified

Parameter	ppbV Results	ppbV RDL	ug/m3 Results	ug/m3 RDL	Qualifier	Dilution Factor
Low Level Volatile Organic Compounds in Air						
Toluene	ND	0.200	ND	0.753		1
trans-1,2-Dichloroethene	ND	0.200	ND	0.792		1
trans-1,3-Dichloropropene	ND	0.200	ND	0.907		1
Trichlorofluoromethane	ND	0.200	ND	1.12		1
Vinyl acetate	ND	0.200	ND	0.704		1
Vinyl bromide	ND	0.200	ND	0.874		1
Vinyl chloride	ND	0.200	ND	0.511		1

Project Name: KEITH MIDDLE SCHOOL
Project Number: 115058
Lab Number: L0900004
Report Date: 01/15/09

SAMPLE RESULTS

Lab ID: L0900004-13
Client ID: TRIP BLANK
Sample Location:
Matrix: Air
Anaytical Method: 48,TO-15-SIM
Analytical Date: 01/06/09 17:44
Analyst: RY

Date Collected: 12/30/08 00:00
Date Received: 12/31/08
Field Prep: Not Specified

Parameter	ppbV Results	ppbV RDL	ug/m3 Results	ug/m3 RDL	Qualifier	Dilution Factor
Volatile Organic Compounds in Air by SIM						
Benzene	0.081	0.070	0.260	0.223		1
Chloroform	ND	0.020	ND	0.098		1
Tetrachloroethene	ND	0.020	ND	0.136		1
Trichloroethene	ND	0.020	ND	0.107		1

Project Name: KEITH MIDDLE SCHOOL **Lab Number:** L0900004

Project Number: 115058 **Report Date:** 01/15/09

Method Blank Analysis
Batch Quality Control

Analytical Method: 48,TO-15
Analytical Date: 01/06/09 15:16

Parameter	ppbV Results	ppbV RDL	ug/m3 Results	ug/m3 RDL	Qualifier	Dilution Factor
Low Level Volatile Organic Compounds in Air for sample(s): 01-13 Batch: WG349061-3						
1,1,1-Trichloroethane	ND	0.200	ND	1.09		1
1,1,2,2-Tetrachloroethane	ND	0.200	ND	1.37		1
1,1,2-Trichloroethane	ND	0.200	ND	1.09		1
1,1-Dichloroethane	ND	0.200	ND	0.809		1
1,1-Dichloroethene	ND	0.200	ND	0.792		1
1,2,4-Trichlorobenzene	ND	0.200	ND	1.48		1
1,2,4-Trimethylbenzene	ND	0.200	ND	0.982		1
1,2-Dibromoethane	ND	0.200	ND	1.54		1
1,2-Dichlorobenzene	ND	0.200	ND	1.20		1
1,2-Dichloroethane	ND	0.200	ND	0.809		1
1,2-Dichloropropane	ND	0.200	ND	0.924		1
1,3,5-Trimethybenzene	ND	0.200	ND	0.982		1
1,3-Butadiene	ND	0.200	ND	0.442		1
1,3-Dichlorobenzene	ND	0.200	ND	1.20		1
1,4-Dichlorobenzene	ND	0.200	ND	1.20		1
1,4-Dioxane	ND	0.200	ND	0.720		1
2,2,4-Trimethylpentane	ND	0.200	ND	0.934		1
2-Butanone	ND	0.200	ND	0.589		1
2-Hexanone	ND	0.200	ND	0.819		1
3-Chloropropene	ND	0.200	ND	0.626		1
4-Ethyltoluene	ND	0.200	ND	0.982		1
Acetone	ND	0.500	ND	1.19		1
Benzyl chloride	ND	0.200	ND	1.03		1
Bromodichloromethane	ND	0.200	ND	1.34		1
Bromoform	ND	0.200	ND	2.06		1

Project Name: KEITH MIDDLE SCHOOL **Lab Number:** L0900004

Project Number: 115058 **Report Date:** 01/15/09

Method Blank Analysis
Batch Quality Control

Analytical Method: 48,TO-15
Analytical Date: 01/06/09 15:16

Parameter	ppbV Results	ppbV RDL	ug/m3 Results	ug/m3 RDL	Qualifier	Dilution Factor
Low Level Volatile Organic Compounds in Air for sample(s): 01-13 Batch: WG349061-3						
Bromomethane	ND	0.200	ND	0.776		1
Carbon disulfide	ND	0.200	ND	0.622		1
Carbon tetrachloride	ND	0.200	ND	1.26		1
Chlorobenzene	ND	0.200	ND	0.920		1
Chloroethane	ND	0.200	ND	0.527		1
Chloromethane	ND	0.200	ND	0.413		1
cis-1,2-Dichloroethene	ND	0.200	ND	0.792		1
cis-1,3-Dichloropropene	ND	0.200	ND	0.907		1
Cyclohexane	ND	0.200	ND	0.688		1
Dibromochloromethane	ND	0.200	ND	1.70		1
Dichlorodifluoromethane	ND	0.200	ND	0.988		1
Ethanol	ND	2.50	ND	4.71		1
Ethyl Acetate	ND	0.500	ND	1.80		1
Ethylbenzene	ND	0.200	ND	0.868		1
Freon-113	ND	0.200	ND	1.53		1
Freon-114	ND	0.200	ND	1.40		1
Hexachlorobutadiene	ND	0.200	ND	2.13		1
Isopropanol	ND	0.500	ND	1.23		1
Methylene chloride	ND	0.500	ND	1.74		1
4-Methyl-2-pentanone	ND	0.200	ND	0.819		1
Methyl tert butyl ether	ND	0.200	ND	0.720		1
p/m-Xylene	ND	0.400	ND	1.74		1
o-Xylene	ND	0.200	ND	0.868		1
Heptane	ND	0.200	ND	0.819		1
n-Hexane	ND	0.200	ND	0.704		1

Project Name: KEITH MIDDLE SCHOOL **Lab Number:** L0900004

Project Number: 115058 **Report Date:** 01/15/09

Method Blank Analysis
Batch Quality Control

Analytical Method: 48,TO-15
Analytical Date: 01/06/09 15:16

Parameter	ppbV Results	ppbV RDL	ug/m3 Results	ug/m3 RDL	Qualifier	Dilution Factor
Low Level Volatile Organic Compounds in Air for sample(s): 01-13 Batch: WG349061-3						
Propylene	ND	0.200	ND	0.344		1
Styrene	ND	0.200	ND	0.851		1
Tetrahydrofuran	ND	0.200	ND	0.589		1
Toluene	ND	0.200	ND	0.753		1
trans-1,2-Dichloroethene	ND	0.200	ND	0.792		1
trans-1,3-Dichloropropene	ND	0.200	ND	0.907		1
Trichlorofluoromethane	ND	0.200	ND	1.12		1
Vinyl acetate	ND	0.200	ND	0.704		1
Vinyl bromide	ND	0.200	ND	0.874		1
Vinyl chloride	ND	0.200	ND	0.511		1

Project Name: KEITH MIDDLE SCHOOL **Lab Number:** L0900004

Project Number: 115058 **Report Date:** 01/15/09

Method Blank Analysis
Batch Quality Control

Analytical Method: 48,TO-15-SIM
Analytical Date: 01/06/09 15:16

Parameter	ppbV Results	ppbV RDL	ug/m3 Results	ug/m3 RDL	Qualifier	Dilution Factor
Volatile Organic Compounds in Air by SIM for sample(s): 01-13 Batch: WG349359-3						
Benzene	ND	0.070	ND	0.223		1
Chloroform	ND	0.020	ND	0.098		1
Tetrachloroethene	ND	0.020	ND	0.136		1
Trichloroethene	ND	0.020	ND	0.107		1

Lab Control Sample Analysis

Batch Quality Control

Project Name: KEITH MIDDLE SCHOOL

Project Number: 115058

Lab Number: L0900004

Report Date: 01/15/09

Parameter	LCS %Recovery	LCSD %Recovery	%Recovery Limits	RPD	RPD Limits
Low Level Volatile Organic Compounds in Air	Associated sample(s): 01-13	Batch: WG349061-2			
1,1,1-Trichloroethane	99	-	70-130	-	
1,1,2,2-Tetrachloroethane	100	-	70-130	-	
1,1,2-Trichloroethane	82	-	70-130	-	
1,1-Dichloroethane	93	-	70-130	-	
1,1-Dichloroethene	98	-	70-130	-	
1,2,4-Trichlorobenzene	**137**	-	70-130	-	
1,2,4-Trimethylbenzene	95	-	70-130	-	
1,2-Dibromoethane	84	-	70-130	-	
1,2-Dichlorobenzene	97	-	70-130	-	
1,2-Dichloroethane	88	-	70-130	-	
1,2-Dichloropropane	86	-	70-130	-	
1,3,5-Trimethylbenzene	92	-	70-130	-	
1,3-Butadiene	90	-	70-130	-	
1,3-Dichlorobenzene	95	-	70-130	-	
1,4-Dichlorobenzene	97	-	70-130	-	
1,4-Dioxane	109	-	70-130	-	
2,2,4-Trimethylpentane	92	-	70-130	-	
2-Butanone	95	-	70-130	-	
2-Hexanone	108	-	70-130	-	
3-Chloropropene	87	-	70-130	-	
4-Ethyltoluene	94	-	70-130	-	

Lab Control Sample Analysis

Batch Quality Control

Project Name: KEITH MIDDLE SCHOOL

Project Number: 115058

Lab Number: L0900004

Report Date: 01/15/09

Parameter	LCS %Recovery	LCSD %Recovery	%Recovery Limits	RPD	RPD Limits
Low Level Volatile Organic Compounds in Air	Associated sample(s): 01-13	Batch: WG349061-2			
Acetone	94	-	70-130	-	
Benzene	84	-	70-130	-	
Benzyl chloride	95	-	70-130	-	
Bromodichloromethane	92	-	70-130	-	
Bromoform	90	-	70-130	-	
Bromomethane	88	-	70-130	-	
Carbon disulfide	97	-	70-130	-	
Carbon tetrachloride	101	-	70-130	-	
Chlorobenzene	90	-	70-130	-	
Chloroethane	98	-	70-130	-	
Chloroform	99	-	70-130	-	
Chloromethane	90	-	70-130	-	
cis-1,2-Dichloroethene	93	-	70-130	-	
cis-1,3-Dichloropropene	72	-	70-130	-	
Cyclohexane	88	-	70-130	-	
Dibromochloromethane	95	-	70-130	-	
Dichlorodifluoromethane	97	-	70-130	-	
Ethyl Alcohol	92	-	70-130	-	
Ethyl Acetate	114	-	70-130	-	
Ethylbenzene	88	-	70-130	-	
1,1,2-Trichloro-1,2,2-Trifluoroethane	98	-	70-130	-	

Lab Control Sample Analysis

Batch Quality Control

Project Name: KEITH MIDDLE SCHOOL

Project Number: 115058

Lab Number: L0900004

Report Date: 01/15/09

Parameter	LCS %Recovery	LCSD %Recovery	%Recovery Limits	RPD	RPD Limits
Low Level Volatile Organic Compounds in Air	Associated sample(s): 01-13 Batch: WG349061-2				
1,2-Dichloro-1,1,2,2-tetrafluoroethane	96	-	70-130	-	
Hexachlorobutadiene	**134**	-	70-130	-	
iso-Propyl Alcohol	93	-	70-130	-	
Methylene chloride	92	-	70-130	-	
4-Methyl-2-pentanone	103	-	70-130	-	
Methyl tert butyl ether	92	-	70-130	-	
p/m-Xylene	84	-	70-130	-	
o-Xylene	93	-	70-130	-	
Heptane	93	-	70-130	-	
n-Hexane	93	-	70-130	-	
Propylene	80	-	70-130	-	
Styrene	87	-	70-130	-	
Tetrachloroethene	98	-	70-130	-	
Tetrahydrofuran	98	-	70-130	-	
Toluene	91	-	70-130	-	
trans-1,2-Dichloroethene	94	-	70-130	-	
trans-1,3-Dichloropropene	**63**	-	70-130	-	
Trichloroethene	97	-	70-130	-	
Trichlorofluoromethane	107	-	70-130	-	
Vinyl acetate	90	-	70-130	-	
Vinyl bromide	98	-	70-130	-	

Lab Control Sample Analysis

Batch Quality Control

Project Name: KEITH MIDDLE SCHOOL

Project Number: 115058

Lab Number: L0900004

Report Date: 01/15/09

Parameter	LCS %Recovery	LCSD %Recovery	%Recovery Limits	RPD	RPD Limits
Low Level Volatile Organic Compounds in Air Associated sample(s): 01-13 Batch: WG349061-2					
Vinyl chloride	91	-	70-130	-	
Volatile Organic Compounds in Air by SIM Associated sample(s): 01-13 Batch: WG349359-2					
Benzene	70	-	70-130	-	
Chloroform	88	-	70-130	-	
Tetrachloroethene	93	-	70-130	-	
Trichloroethene	83	-	70-130	-	

Lab Duplicate Analysis
Batch Quality Control

Project Name: KEITH MIDDLE SCHOOL
Project Number: 115058

Lab Number: L0900004
Report Date: 01/15/09

Parameter	Native Sample	Duplicate Sample	Units	RPD	RPD Limits
Low Level Volatile Organic Compounds in Air Associated sample(s): 01-13 QC Batch ID: WG349061-4 QC Sample: L0900004-04 Client ID: VS-1-18					
1,1,1-Trichloroethane	ND	ND	ppbV	NC	25
1,1,2,2-Tetrachloroethane	ND	ND	ppbV	NC	25
1,1,2-Trichloroethane	ND	ND	ppbV	NC	25
1,1-Dichloroethane	ND	ND	ppbV	NC	25
1,1-Dichloroethene	ND	ND	ppbV	NC	25
1,2,4-Trichlorobenzene	ND	ND	ppbV	NC	25
1,2,4-Trimethylbenzene	ND	ND	ppbV	NC	25
1,2-Dibromoethane	ND	ND	ppbV	NC	25
1,2-Dichlorobenzene	ND	ND	ppbV	NC	25
1,2-Dichloroethane	0.420	0.428	ppbV	2	25
1,2-Dichloropropane	ND	ND	ppbV	NC	25
1,3,5-Trimethybenzene	ND	ND	ppbV	NC	25
1,3-Butadiene	ND	ND	ppbV	NC	25
1,3-Dichlorobenzene	ND	ND	ppbV	NC	25
1,4-Dichlorobenzene	ND	ND	ppbV	NC	25
1,4-Dioxane	ND	ND	ppbV	NC	25
2,2,4-Trimethylpentane	ND	ND	ppbV	NC	25
2-Butanone	1.15	1.12	ppbV	3	25
2-Hexanone	ND	ND	ppbV	NC	25

Lab Duplicate Analysis
Batch Quality Control

Project Name: KEITH MIDDLE SCHOOL
Project Number: 115058

Lab Number: L0900004
Report Date: 01/15/09

Parameter	Native Sample	Duplicate Sample	Units	RPD	RPD Limits
Low Level Volatile Organic Compounds in Air Associated sample(s): 01-13 QC Batch ID: WG349061-4 QC Sample: L0900004-04 Client ID: VS-1-18					
3-Chloropropene	ND	ND	ppbV	NC	25
4-Ethyltoluene	ND	ND	ppbV	NC	25
Acetone	2.01	2.08	ppbV	3	25
Benzyl chloride	ND	ND	ppbV	NC	25
Bromodichloromethane	ND	ND	ppbV	NC	25
Bromoform	ND	ND	ppbV	NC	25
Bromomethane	ND	ND	ppbV	NC	25
Carbon disulfide	ND	ND	ppbV	NC	25
Carbon tetrachloride	ND	ND	ppbV	NC	25
Chlorobenzene	ND	ND	ppbV	NC	25
Chloroethane	ND	ND	ppbV	NC	25
Chloromethane	ND	ND	ppbV	NC	25
cis-1,2-Dichloroethene	ND	ND	ppbV	NC	25
cis-1,3-Dichloropropene	ND	ND	ppbV	NC	25
Cyclohexane	ND	ND	ppbV	NC	25
Dibromochloromethane	ND	ND	ppbV	NC	25
Dichlorodifluoromethane	ND	ND	ppbV	NC	25
Ethanol	ND	ND	ppbV	NC	25
Ethyl Acetate	ND	ND	ppbV	NC	25

Lab Duplicate Analysis
Batch Quality Control

Project Name: KEITH MIDDLE SCHOOL
Project Number: 115058

Lab Number: L0900004
Report Date: 01/15/09

Parameter	Native Sample	Duplicate Sample	Units	RPD	RPD Limits
Low Level Volatile Organic Compounds in Air Associated sample(s): 01-13 QC Batch ID: WG349061-4 QC Sample: L0900004-04 Client ID: VS-1-18					
Ethylbenzene	ND	ND	ppbV	NC	25
Freon-113	ND	ND	ppbV	NC	25
Freon-114	ND	ND	ppbV	NC	25
Hexachlorobutadiene	ND	ND	ppbV	NC	25
Isopropanol	0.666	0.594	ppbV	11	25
Methylene chloride	0.732	0.743	ppbV	1	25
4-Methyl-2-pentanone	ND	ND	ppbV	NC	25
Methyl tert butyl ether	ND	ND	ppbV	NC	25
p/m-Xylene	ND	ND	ppbV	NC	25
o-Xylene	ND	ND	ppbV	NC	25
Heptane	ND	ND	ppbV	NC	25
n-Hexane	ND	ND	ppbV	NC	25
Propylene	ND	ND	ppbV	NC	25
Styrene	ND	ND	ppbV	NC	25
Tetrahydrofuran	3.21	3.12	ppbV	3	25
Toluene	ND	ND	ppbV	NC	25
trans-1,2-Dichloroethene	ND	ND	ppbV	NC	25
trans-1,3-Dichloropropene	ND	ND	ppbV	NC	25
Trichlorofluoromethane	0.249	0.247	ppbV	1	25

Lab Duplicate Analysis
Batch Quality Control

Project Name: KEITH MIDDLE SCHOOL
Project Number: 115058

Lab Number: L0900004
Report Date: 01/15/09

Parameter	Native Sample	Duplicate Sample	Units	RPD	RPD Limits
Low Level Volatile Organic Compounds in Air Associated sample(s): 01-13 QC Batch ID: WG349061-4 QC Sample: L0900004-04 Client ID: VS-1-18					
Vinyl acetate	ND	ND	ppbV	NC	25
Vinyl bromide	ND	ND	ppbV	NC	25
Vinyl chloride	ND	ND	ppbV	NC	25
Volatile Organic Compounds in Air by SIM Associated sample(s): 01-13 QC Batch ID: WG349359-4 QC Sample: L0900004-04 Client ID: VS-1-18					
Benzene	ND	ND	ppbV	NC	25
Chloroform	1.04	1.04	ppbV	0	25
Tetrachloroethene	1.30	1.26	ppbV	3	25
Trichloroethene	0.090	0.088	ppbV	2	25

Project Name: KEITH MIDDLE SCHOOL **Lab Number:** L0900004

Project Number: 115058 **Report Date:** 01/15/09

Canister and Flow Controller Information

Samplenum	Client ID	Media ID	Media Type	Cleaning Batch ID	Initial Pressure (in. Hg)	Pressure on Receipt (in. Hg)	Flow Out mL/min	Flow In mL/min	% RSD
L0900004-01	VS-9-18	116	2.7L Can	I0818351	-28.9	0	-	-	-
L0900004-02	VS-7-18-DUP	512	2.7L Can	I0818351	-29.3	-0.7	-	-	-
L0900004-03	VS-7-18	235	2.7L Can	I0818351	-29.3	-2.2	-	-	-
L0900004-04	VS-1-18	222	2.7L Can	I0818351	-29.1	-0.7	-	-	-
L0900004-05	VS-4-18	449	2.7L Can	I0818351	-29.3	-0.9	-	-	-
L0900004-06	VS-BG-18	395	2.7L Can	I0818351	-29.2	-0.7	-	-	-
L0900004-07	VENT-TB	220	2.7L Can	L0817882	-29.2	-22.0	-	-	-
L0900004-08	C-18	969	6.0L Can	I0817101	-29.3	-0.8	-	-	-
L0900004-09	B-18	583	6.0L Can	L0817708	-29.4	-1.3	-	-	-
L0900004-10	A-18	691	6.0L Can	L0817708	-29.2	-3.0	-	-	-
L0900004-11	BG-18	1610	6.0L Can	L0817708	-29.4	-0.1	-	-	-
L0900004-12	BG-18-DUP	742	6.0L Can	L0817708	-29.2	-1.3	-	-	-
L0900004-13	TRIP BLANK	937	6.0L Can	L0817708	-29.0	-22.3	-	-	-

Project Name: KEITH MIDDLE SCHOOL
Project Number: 115058

Lab Number: L0900004
Report Date: 01/15/09

Sample Receipt and Container Information

Were project specific reporting limits specified? YES

Cooler Information

Cooler	Custody Seal
N/A	Absent

Container Information

Container ID	Container Type	Cooler	pH	Temp	Pres	Seal	Analysis
L0900004-01A	Canister - 2.7 Liter	N/A	NA		NA	Absent	TO15-LL(30),TO15-SIM(30)
L0900004-02A	Canister - 2.7 Liter	N/A	NA		NA	Absent	TO15-LL(30),TO15-SIM(30)
L0900004-03A	Canister - 2.7 Liter	N/A	NA		NA	Absent	TO15-LL(30),TO15-SIM(30)
L0900004-04A	Canister - 2.7 Liter	N/A	NA		NA	Absent	TO15-LL(30),TO15-SIM(30)
L0900004-05A	Canister - 2.7 Liter	N/A	NA		NA	Absent	TO15-LL(30),TO15-SIM(30)
L0900004-06A	Canister - 2.7 Liter	N/A	NA		NA	Absent	TO15-LL(30),TO15-SIM(30)
L0900004-07A	Canister - 2.7 Liter	N/A	NA		NA	Absent	TO15-LL(30),TO15-SIM(30)
L0900004-08A	Canister - 6 Liter	N/A	NA		NA	Absent	TO15-LL(30),TO15-SIM(30)
L0900004-09A	Canister - 6 Liter	N/A	NA		NA	Absent	TO15-LL(30),TO15-SIM(30)
L0900004-10A	Canister - 6 Liter	N/A	NA		NA	Absent	TO15-LL(30),TO15-SIM(30)
L0900004-11A	Canister - 6 Liter	N/A	NA		NA	Absent	TO15-LL(30),TO15-SIM(30)
L0900004-12A	Canister - 6 Liter	N/A	NA		NA	Absent	TO15-LL(30),TO15-SIM(30)
L0900004-13A	Canister - 6 Liter	N/A	NA		NA	Absent	TO15-LL(30),TO15-SIM(30)
L0900004-14A	Canister - 6 Liter	N/A	NA		NA	Absent	CLEAN-FEE()
L0900004-15A	Canister - 6 Liter	N/A	NA		NA	Absent	CLEAN-FEE()

*Hold days indicated by values in parentheses

Project Name:	KEITH MIDDLE SCHOOL	**Lab Number:**	L0900004
Project Number:	115058	**Report Date:**	01/15/09

GLOSSARY

Acronyms

EPA - Environmental Protection Agency.

LCS - Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.

LCSD - Laboratory Control Sample Duplicate: Refer to LCS.

MS - Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available.

MSD - Matrix Spike Sample Duplicate: Refer to MS.

NA - Not Applicable.

NI - Not Ignitable.

NC - Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.

ND - Not detected at the reported detection limit for the sample.

RDL - Reported Detection Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.

RPD - Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.

Terms

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

Data Qualifiers

The following data qualifiers have been identified for use under the CT DEP Reasonable Confidence Protocols.

A - Spectra identified as "Aldol Condensation Product".

B - The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte.

E - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.

J - Estimated value. The analyte was tentatively identified; the quantitation is an estimation. (Tentatively identified compounds only.)

Standard Qualifiers

H - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.

Report Format: Data Usability Report

REFERENCES

48 Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air. Second Edition. EPA/625/R-96/010b, January 1999.

LIMITATION OF LIABILITIES

Alpha Analytical performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Woods Hole Labs shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Woods Hole Labs.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.

Certificate/Approval Program Summary

Last revised January 7, 2009

The following list includes only those analytes/methods for which certification/approval is held.

For a complete listing of analytes for the referenced methods, please contact your Alpha Customer Service Representative.

Connecticut Department of Public Health Certificate/Lab ID: PH-0141.

Wastewater/Non-Potable Water (Inorganic Parameters: pH, Turbidity, Conductivity, Alkalinity, Chloride, Fluoride, Sulfate, Sulfite, Nitrate, Nitrite, O-Phosphate, Total Phosphorus, Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Mercury, Molybdenum, Nickel, Potassium, Selenium, Silver, Sodium, Strontium, Thallium, Tin, Vanadium, Zinc, Total Residue (Solids), Total Dissolved Solids, Total Suspended Solids (non-filterable), Total Cyanide, Bromide. Organic Parameters: PCBs, Organochlorine Pesticides, Technical Chlordane, Toxaphene, Acid Extractables, Benzidines, Phthalate Esters, Nitrosamines, Nitroaromatics & Isophorone, PAHs, Haloethers, Chlorinated Hydrocarbons, Volatile Organics.)

Solid Waste/Soil (Inorganic Parameters: pH, Aluminum, Antimony, Arsenic, Barium, Beryllium, Cadmium, Calcium, Chromium, Hexavalent Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Mercury, Molybdenum, Nickel, Potassium, Selenium, Silver, Sodium, Thallium, Vanadium, Zinc, Total Organic Carbon, Total Cyanide, Ignitability, Corrosivity, TCLP 1311, Reactivity. Organic Parameters: PCBs, Organochlorine Pesticides, Technical Chlordane, Toxaphene, Volatile Organics, Acid Extractables, Benzidines, Phthalates, Nitrosamines, Nitroaromatics & Cyclic Ketones, PAHs, Haloethers, Chlorinated Hydrocarbons.)

Florida Department of Health Certificate/Lab ID: E87814.

Non-Potable Water (Inorganic Parameters: SM2320B, 4500NH3-F, EPA 120.1, SM2510B, 2340B, EPA 245.1, EPA 365.2, EPA 150.1, 160.1, SM2540C, EPA 160.2, SM2540D, EPA 335.2, 420.1, SM2540G, EPA 180.1. Organic Parameters: EPA 624, 625, 608.)

Solid & Chemical Materials (Inorganic Parameters: 6020, 9050, 7470, 7471, 9045, EPA 7.3.3.2, EPA 7.3.4.2, 9014, 9065. Organic Parameters: EPA 8260, 8270, 8082, 8081.)

Air & Emissions (EPA TO-15.)

Louisiana Department of Environmental Quality Certificate/Lab ID: 03090.

Non-Potable Water (Inorganic Parameters: EPA 120.1, 150.1, 160.2, 180.1, 200.8, 245.1, 310.1, 335.2, 608, 625, 1631, 3010, 3015, 3020, 6020, 9010, 9014, 9040, SM2320B, 2510B, 2540D, 2540G, 4500CN-E, 4500H-B, Organic Parameters: EPA 3510, 3580, 3630, 3640, 3660, 3665, 5030, 8015 (mod), 3570, 8081, 8082, 8260, 8270,)

Solid & Chemical Materials (Inorganic Parameters: 6020, 7196, 7470, 7471, 7474, 9010, 9014, 9040, 9045, 9060. Organic Parameters: EPA 8015 (mod), EPA 3570, 1311, 3050, 3051, 3060, 3580, 3630, 3640, 3660, 3665, 5035, 8081, 8082, 8260, 8270.)

Biological Tissue (Inorganic Parameters: EPA 6020. Organic Parameters: EPA 3570, 3510, 3610, 3630, 3640, 8270.)

Maine Department of Human Services Certificate/Lab ID: MA0030.

Wastewater (Inorganic Parameters: EPA 120.1, 300.0, SM 2320, 2510B, 2540C, 2540D, EPA 245.1. Organic Parameters: 608, 624.)

Massachusetts Department of Environmental Protection Certificate/Lab ID: M-MA030.

Non-Potable Water (Inorganic Parameters: SM4500H+B. Organic Parameters: EPA 624.)

New Hampshire Department of Environmental Services Certificate/Lab ID: 2206.

Non-Potable Water (Inorganic Parameters: EPA 200.8, 245.1, 1631E, 120.1, 150.1, 180.1, 310.1, 335.2, 160.2, SM2540D, 2540G, 4500CN-E, 4500H+B, 2320B, 2510B. Organic Parameters: EPA 625, 608.)

New Jersey Department of Environmental Protection Certificate/Lab ID: MA015.

Non-Potable Water (Inorganic Parameters: SW-846 3010, 3020A, 3015, 6020, SM2320B, EPA 200.8, SM2540C, 2540D, 2540G, EPA 120.1, SM2510B, EPA 180.1, 245.1, SW-846 9040B, 6020, 9010B, 9014 Organic Parameters: EPA 608, 625, SW-846 3510C, 3580A, 5030B, 3035L, 5035H, 3630C, 3640A, 3660B, 3665A, 8081A, 8082 8260B, 8270C)

Solid & Chemical Materials (Inorganic Parameters: SW-846 6020, 9010B, 9014, 1311, 3050B, 3051, 3060A, 7196A, 7470A, 7471A, 9045C, 9060. Organic Parameters: SW-846 3580A, 5030B, 3035L, 5035H, 3630C, 3640A, 3660B, 3665A, 8081A, 8082, 8260B, 8270C, 3570, 8015B.)

Atmospheric Organic Parameters (EPA TO-15)

New York Department of Health Certificate/Lab ID: 11627.

Non-Potable Water (Inorganic Parameters: EPA 310.1, SM2320B, EPA 365.2, 160.1, SM2540C, EPA 160.2, SM2540D, EPA 200.8, 6020, 1631E, 245.1, 335.2, 9014, 150.1, 9040B, 120.1, SM2510B, EPA 376.2, 180.1, 9010B. Organic Parameters: EPA 624, 8260B, 8270C, 608, 8081A, 625, 8082, 3510C, 3511, 5030B.)

Solid & Hazardous Waste (Inorganic Parameters: EPA 9040B, 9045C, SW-846 Ch7 Sec 7.3, EPA 6020, 7196A, 7471A, 7474, 9014, 9040B, 9045C, 9010B. Organic Parameters: EPA 8260B, 8270C, 8081A, DRO 8015B, 8082, 1311, 3050B, 3580, 3050B, 3035.)

Air & Emissions (EPA TO-15.)

Rhode Island Department of Health Certificate/Lab ID: LAO00299.

Refer to MA-DEP Certificate for Non-Potable Water.

Refer to LA-DEQ Certificate for Non-Potable Water.

Texas Commission of Environmental Quality Certificate/Lab ID: T104704419-08-TX.

Solid & Chemical Materials (Inorganic Parameters: EPA 6020, 7471. Organic Parameters: EPA 8015, 8270.)

Pennsylvania Department of Environmental Protection Certificate/Lab ID: 68-02089. Registered Laboratory.

U.S. Army Corps of Engineers

Department of the Navy

L0900004

CHAIN OF CUSTODY RECORD

Project Name: Keith Middle School

Project No.: 115058

Sampling Date(s): 12/30/08

Laboratory: ALPHA

Laboratory P.O.:

Shipping Date(s): 12/31/08

Shipper's Name: TRC

Box No.: 0

	Sample Code	Sampled Date	Container Size	Container G/P	MATRIX	Description	ANALYSIS	Summa vacuum Comments
1	VS-9-18	12/30/08	2 L	steel	Air	ambient air from vent sampling	TO-15	P_i = 28.5 in Hg P_F = 1 in Hg
2	VS-7-18-DUP	12/30/08	2 L	steel	Air	ambient air from vent sampling	TO-15	P_i = 29.0 in Hg P_F = 0 in Hg
3	VS-7-18	12/30/08	2 L	steel	Air	ambient air from vent sampling	TO-15	P_i = 25 in Hg P_F = 2 in Hg
4	VS-1-18	12/30/08	2 L	steel	Air	ambient air from vent sampling	TO-15	P_i = >30 in Hg P_F = 5 in Hg
5	VS-4-18	12/30/08	2 L	steel	Air	ambient air from vent sampling	TO-15	P_i = 30 in Hg P_F = 3.5 in Hg
6	VS-BG-18	12/30/08	2 L	steel	Air	ambient air from vent sampling	TO-15	P_i = >30 in Hg P_F = 0.5 in Hg
7	VENT -TB	12/30/08	2 L	steel	Air	Trip blank	TO-15	N/A
8	C-18	12/30/08	6 L	steel	Air	ambient air , Faculty Lounge	TO-15	P_i = >30 in Hg P_F = 2 in Hg
9	B-18	12/30/08	6 L	steel	Air	ambient air , Auditorium	TO-15	P_i = 28.5 in Hg P_F = 0 in Hg
10	A-18	12/30/08	6 L	steel	Air	ambient air , Hallway Outside Rm 119	TO-15	P_i = 27.5 in Hg P_F = 0.5 in Hg
11	BG-18	12/30/08	6 L	steel	Air	ambient air	TO-15	P_i = 30 in Hg P_F = 0.5 in Hg
12	BG-18-DUP	12/30/08	6 L	steel	Air	ambient air	TO-15	P_i = 29 in Hg P_F = 0 in Hg
13	TRIP BLANK	12/30/08	6 L	steel	Air	trip blank	TO-15	N/A

Relinquished by: Eric Fitzy **Date/Time:** 12/31/08 13:45 **Relinquished by:** M Hoover 12/31 5:30 **Recd:** Paul Gilbert 1-5-09 11:05

Received by: [signature] **Date/Time:** 12/31 13:45 **Received by:** Paul Gilbert 1-5-09 10:15 [signature] 1/5/09 1105

Remarks (*):

TRC

CHAIN OF CUSTODY RECORD

Project Name: Keith Middle School
Project No.: 115058
Sampling Date(s): 2/18/09 - 2/19/09
Laboratory: NEA
Laboratory P.O.:
Shipping Date(s): 02/20/09
Shipper's Name: TRC

<09020157P1>

Sample Code	Sampled Date	Container Size	Container G/P	MATRIX	Description	ANALYSIS	Comments (volume m^3)
C-18(2) AM01739	2/18/09 - 2/19/09	1L	G	PUF	ambient air , Faculty Lounge	TO-4A	328.4
B-18(2) AM01740	2/18/09 - 2/19/09	1L	G	PUF	ambient air , Auditorium	TO-4A	332.7
A-18(2) AM01741	2/18/09 - 2/19/09	1L	G	PUF	ambient air , Hallway Outside Rm 119	TO-4A	330.9
BG-18(2) AM01742	2/18/09 - 2/19/09	1L	G	PUF	ambient air	TO-4A	312.9
BG-18-DUP(2) AM01743	2/18/09 - 2/19/09	1L	G	PUF	ambient air	TO-4A	319.3
TRIP BLANK AM01744	2/18/09 - 2/19/09	1L	G	PUF	ambient air	TO-4A	0

Relinquished by: [signature] **Date/Time:** 2/20/09 1430 **Relinquished by:**
Received by: [signature] **Date/Time:** 2/21/09 1116 **Received by:**
Remarks (*):

Temp → 0.2°C

TRC

CHAIN OF CUSTODY RECORD

Project Name: Keith Middle School
Project No.: 115058
Sampling Date(s): 2/18/09 - 2/19/09
Laboratory: NEA
Laboratory P.O.:
Shipping Date(s): 02/20/09
Shipper's Name: TRC

<09020157P2>

Sample Code	Sampled Date	Container Size	Container G/P	MATRIX	Source Description	ANALYSIS	Comments (volume m^3)
C-18-PF(2) AM01745	2/18/09 - 2/19/09	bag	P	filter	ambient air , Faculty Lounge	TO-4A	328.4
B-18-PF(2) AM01746	2/18/09 - 2/19/09	bag	P	filter	ambient air , Cafeteria	TO-4A	332.7
A-18-PF(2) AM01747	2/18/09 - 2/19/09	bag	P	filter	ambient air , Hallway Outside Rm 119	TO-4A	330.9
BG-18-PF(2) AM01748	2/18/09 - 2/19/09	bag	P	filter	ambient air	TO-4A	312.9
BG-18-DUP-PF(2) AM01749	2/18/09 - 2/19/09	bag	P	filter	ambient air	TO-4A	319.3
TRIP BLANK-PF AM01750	2/18/09 - 2/19/09	bag	P	filter	ambient air	TO-4A	0

Relinquished by: [signature] **Date/Time:** 2/20/09 1430 **Relinquished by:**
Received by: [signature] **Date/Time:** 2/21/09 1116 **Received by:**
Remarks (*):

Temp → 0.2°c

TRC

CERTIFICATE OF ANALYSIS
03/04/2009
TRC ENVIRONMENTAL
WANNALANCIT MILLS
650 SUFFOLK ST
LOWELL, MA 01854
CONTACT: DAVID SULLIVAN

CUSTOMER ID:	C-18(2)	**NEA ID:** AM01739	**NEA LRF:** 09020157-01
MATRIX:	POLYURETHANE FOAM	**DATE SAMPLED:** 02/19/2009	**TIME:** N/A
DATE RECEIVED:	02/21/2009 **TIME:** 11:16	**PROJECT:**	115058 KEITH MIDDLE SCHOOL
SAMPLED BY:	N/A	**LOCATION:**	NEW BEDFORD, MA
CUSTOMER PO:	N/A	**LAB ELAP#:**	11078
METHOD:	PCBs by EPA Method TO-4A/680	**DATE ANALYZED:**	02/25/2009

HOMOLOG GROUP	CAS NUMBER	AMOUNT	FLAGS	PQL	UNITS	WEIGHT PERCENT
Monochlorobiphenyl	**27323-18-8**	**ND**	**U**	**0.000030**	**ug/m³**	**ND**
Dichlorobiphenyl	**25512-42-9**	**ND**	**U**	**0.000030**	**ug/m³**	**ND**
Trichlorobiphenyl	**25323-68-6**	**ND**	**U**	**0.000030**	**ug/m³**	**ND**
Tetrachlorobiphenyl	**26914-33-0**	**ND**	**U**	**0.000061**	**ug/m³**	**ND**
Pentachlorobiphenyl	**25429-29-2**	**ND**	**U**	**0.000061**	**ug/m³**	**ND**
Hexachlorobiphenyl	**26601-64-9**	**ND**	**U**	**0.000061**	**ug/m³**	**ND**
Heptachlorobiphenyl	**28655-71-2**	**ND**	**U**	**0.000091**	**ug/m³**	**ND**
Octachlorobiphenyl	**55722-26-4**	**ND**	**U**	**0.000091**	**ug/m³**	**ND**
Nonachlorobiphenyl	**53742-07-7**	**ND**	**U**	**0.00015**	**ug/m³**	**ND**
Decachlorobiphenyl	**2051-24-3**	**ND**	**U**	**0.00015**	**ug/m³**	**ND**
Total PCB	**1336-36-3**	**ND**	**U**			**ND**

Notes: ND (Not Detected). Denotes analyte not detected at a concentration greater than the PQL.
PQL (Practical Quantitation Limit). Denotes lowest analyte concentration reportable for the sample.

AUTHORIZED SIGNATURE:

William A. Kotas
Sr. Laboratory Representative

Robert E. Wagner
Laboratory Director

2190 Technology Drive Schenectady, NY 12308 Phone 518.346.4592 Fax 518.381.6055 Email : information@nealab.com

CERTIFICATE OF ANALYSIS
03/04/2009
TRC ENVIRONMENTAL
WANNALANCIT MILLS
650 SUFFOLK ST
LOWELL, MA 01854
CONTACT: DAVID SULLIVAN

CUSTOMER ID:	B-18(2)	**NEA ID:** AM01740	**NEA LRF:** 09020157-02
MATRIX:	POLYURETHANE FOAM	**DATE SAMPLED:** 02/19/2009	**TIME:** N/A
DATE RECEIVED:	02/21/2009 **TIME:** 11:16	**PROJECT:**	115058 KEITH MIDDLE SCHOOL
SAMPLED BY:	N/A	**LOCATION:**	NEW BEDFORD, MA
CUSTOMER PO:	N/A	**LAB ELAP#:**	11078
METHOD:	PCBs by EPA Method TO-4A/680	**DATE ANALYZED:**	02/26/2009

HOMOLOG GROUP	CAS NUMBER	AMOUNT	FLAGS	PQL	UNITS	WEIGHT PERCENT
Monochlorobiphenyl	**27323-18-8**	**ND**	**U**	**0.000075**	**ug/m³**	**ND**
Dichlorobiphenyl	**25512-42-9**	**ND**	**U**	**0.000075**	**ug/m³**	**ND**
Trichlorobiphenyl	**25323-68-6**	**ND**	**U**	**0.000075**	**ug/m³**	**ND**
Tetrachlorobiphenyl	**26914-33-0**	**ND**	**U**	**0.00015**	**ug/m³**	**ND**
Pentachlorobiphenyl	**25429-29-2**	**ND**	**U**	**0.00015**	**ug/m³**	**ND**
Hexachlorobiphenyl	**26601-64-9**	**ND**	**U**	**0.00015**	**ug/m³**	**ND**
Heptachlorobiphenyl	**28655-71-2**	**ND**	**U**	**0.00023**	**ug/m³**	**ND**
Octachlorobiphenyl	**55722-26-4**	**ND**	**U**	**0.00023**	**ug/m³**	**ND**
Nonachlorobiphenyl	**53742-07-7**	**ND**	**U**	**0.00038**	**ug/m³**	**ND**
Decachlorobiphenyl	**2051-24-3**	**ND**	**U**	**0.00038**	**ug/m³**	**ND**
Total PCB	**1336-36-3**	**ND**	**U**			**ND**

Notes: ND (Not Detected). Denotes analyte not detected at a concentration greater than the PQL.
PQL (Practical Quantitation Limit). Denotes lowest analyte concentration reportable for the sample.

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CERTIFICATE OF ANALYSIS
03/04/2009
TRC ENVIRONMENTAL
WANNALANCIT MILLS
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CONTACT: DAVID SULLIVAN

CUSTOMER ID:	A-18(2)	**NEA ID:** AM01741	**NEA LRF:** 09020157-03
MATRIX:	POLYURETHANE FOAM	**DATE SAMPLED:** 02/19/2009	**TIME:** N/A
DATE RECEIVED:	02/21/2009 **TIME:** 11:16	**PROJECT:**	115058 KEITH MIDDLE SCHOOL
SAMPLED BY:	N/A	**LOCATION:**	NEW BEDFORD, MA
CUSTOMER PO:	N/A	**LAB ELAP#:**	11078
METHOD:	PCBs by EPA Method TO-4A/680	**DATE ANALYZED:**	02/25/2009

HOMOLOG GROUP	CAS NUMBER	AMOUNT	FLAGS	PQL	UNITS	WEIGHT PERCENT
Monochlorobiphenyl	**27323-18-8**	**ND**	**U**	**0.000030**	**ug/m³**	**ND**
Dichlorobiphenyl	**25512-42-9**	**ND**	**U**	**0.000030**	**ug/m³**	**ND**
Trichlorobiphenyl	**25323-68-6**	**ND**	**U**	**0.000030**	**ug/m³**	**ND**
Tetrachlorobiphenyl	**26914-33-0**	**ND**	**U**	**0.000060**	**ug/m³**	**ND**
Pentachlorobiphenyl	**25429-29-2**	**ND**	**U**	**0.000060**	**ug/m³**	**ND**
Hexachlorobiphenyl	**26601-64-9**	**ND**	**U**	**0.000060**	**ug/m³**	**ND**
Heptachlorobiphenyl	**28655-71-2**	**ND**	**U**	**0.000091**	**ug/m³**	**ND**
Octachlorobiphenyl	**55722-26-4**	**ND**	**U**	**0.000091**	**ug/m³**	**ND**
Nonachlorobiphenyl	**53742-07-7**	**ND**	**U**	**0.00015**	**ug/m³**	**ND**
Decachlorobiphenyl	**2051-24-3**	**ND**	**U**	**0.00015**	**ug/m³**	**ND**
Total PCB	**1336-36-3**	**ND**	**U**			**ND**

Notes: ND (Not Detected). Denotes analyte not detected at a concentration greater than the PQL.
PQL (Practical Quantitation Limit). Denotes lowest analyte concentration reportable for the sample.

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CUSTOMER ID:	BG-18(2)	**NEA ID:** AM01742	**NEA LRF:** 09020157-04
MATRIX:	POLYURETHANE FOAM	**DATE SAMPLED:** 02/19/2009	**TIME:** N/A
DATE RECEIVED:	02/21/2009 **TIME:** 11:16	**PROJECT:**	115058 KEITH MIDDLE SCHOOL
SAMPLED BY:	N/A	**LOCATION:**	NEW BEDFORD, MA
CUSTOMER PO:	N/A	**LAB ELAP#:**	11078
METHOD:	PCBs by EPA Method TO-4A/680	**DATE ANALYZED:**	02/25/2009

HOMOLOG GROUP	CAS NUMBER	AMOUNT	FLAGS	PQL	UNITS	WEIGHT PERCENT
Monochlorobiphenyl	**27323-18-8**	**ND**	**U**	**0.000016**	**ug/m³**	**ND**
Dichlorobiphenyl	**25512-42-9**	**ND**	**U**	**0.000016**	**ug/m³**	**ND**
Trichlorobiphenyl	**25323-68-6**	**ND**	**U**	**0.000016**	**ug/m³**	**ND**
Tetrachlorobiphenyl	**26914-33-0**	**ND**	**U**	**0.000032**	**ug/m³**	**ND**
Pentachlorobiphenyl	**25429-29-2**	**ND**	**U**	**0.000032**	**ug/m³**	**ND**
Hexachlorobiphenyl	**26601-64-9**	**ND**	**U**	**0.000032**	**ug/m³**	**ND**
Heptachlorobiphenyl	**28655-71-2**	**ND**	**U**	**0.000048**	**ug/m³**	**ND**
Octachlorobiphenyl	**55722-26-4**	**ND**	**U**	**0.000048**	**ug/m³**	**ND**
Nonachlorobiphenyl	**53742-07-7**	**ND**	**U**	**0.000080**	**ug/m³**	**ND**
Decachlorobiphenyl	**2051-24-3**	**ND**	**U**	**0.000080**	**ug/m³**	**ND**
Total PCB	**1336-36-3**	**ND**	**U**			**ND**

Notes: ND (Not Detected). Denotes analyte not detected at a concentration greater than the PQL.
PQL (Practical Quantitation Limit). Denotes lowest analyte concentration reportable for the sample.

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CUSTOMER ID:	BG-18-DUP(2)	**NEA ID:** AM01743	**NEA LRF:** 09020157-05
MATRIX:	POLYURETHANE FOAM	**DATE SAMPLED:** 02/19/2009	**TIME:** N/A
DATE RECEIVED:	02/21/2009 **TIME:** 11:16	**PROJECT:**	115058 KEITH MIDDLE SCHOOL
SAMPLED BY:	N/A	**LOCATION:**	NEW BEDFORD, MA
CUSTOMER PO:	N/A	**LAB ELAP#:**	11078
METHOD:	PCBs by EPA Method TO-4A/680	**DATE ANALYZED:**	02/25/2009

HOMOLOG GROUP	CAS NUMBER	AMOUNT	FLAGS	PQL	UNITS	WEIGHT PERCENT
Monochlorobiphenyl	**27323-18-8**	**ND**	**U**	**0.000016**	**ug/m³**	**ND**
Dichlorobiphenyl	**25512-42-9**	**ND**	**U**	**0.000016**	**ug/m³**	**ND**
Trichlorobiphenyl	**25323-68-6**	**ND**	**U**	**0.000016**	**ug/m³**	**ND**
Tetrachlorobiphenyl	**26914-33-0**	**ND**	**U**	**0.000031**	**ug/m³**	**ND**
Pentachlorobiphenyl	**25429-29-2**	**ND**	**U**	**0.000031**	**ug/m³**	**ND**
Hexachlorobiphenyl	**26601-64-9**	**ND**	**U**	**0.000031**	**ug/m³**	**ND**
Heptachlorobiphenyl	**28655-71-2**	**ND**	**U**	**0.000047**	**ug/m³**	**ND**
Octachlorobiphenyl	**55722-26-4**	**ND**	**U**	**0.000047**	**ug/m³**	**ND**
Nonachlorobiphenyl	**53742-07-7**	**ND**	**U**	**0.000078**	**ug/m³**	**ND**
Decachlorobiphenyl	**2051-24-3**	**ND**	**U**	**0.000078**	**ug/m³**	**ND**
Total PCB	**1336-36-3**	**ND**	**U**			**ND**

Notes: ND (Not Detected). Denotes analyte not detected at a concentration greater than the PQL.
PQL (Practical Quantitation Limit). Denotes lowest analyte concentration reportable for the sample.

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CUSTOMER ID:	TRIP BLANK	**NEA ID:** AM01744	**NEA LRF:** 09020157-06
MATRIX:	POLYURETHANE FOAM	**DATE SAMPLED:** 02/19/2009	**TIME:** N/A
DATE RECEIVED:	02/21/2009 **TIME:** 11:16	**PROJECT:**	115058 KEITH MIDDLE SCHOOL
SAMPLED BY:	N/A	**LOCATION:**	NEW BEDFORD, MA
CUSTOMER PO:	N/A	**LAB ELAP#:**	11078
METHOD:	PCBs by EPA Method TO-4A/680	**DATE ANALYZED:**	02/25/2009

HOMOLOG GROUP	CAS NUMBER	AMOUNT	FLAGS	PQL	UNITS	WEIGHT PERCENT
Monochlorobiphenyl	**27323-18-8**	**ND**	**U**	**0.0050**	**ug**	**ND**
Dichlorobiphenyl	**25512-42-9**	**ND**	**U**	**0.0050**	**ug**	**ND**
Trichlorobiphenyl	**25323-68-6**	**ND**	**U**	**0.0050**	**ug**	**ND**
Tetrachlorobiphenyl	**26914-33-0**	**ND**	**U**	**0.010**	**ug**	**ND**
Pentachlorobiphenyl	**25429-29-2**	**ND**	**U**	**0.010**	**ug**	**ND**
Hexachlorobiphenyl	**26601-64-9**	**ND**	**U**	**0.010**	**ug**	**ND**
Heptachlorobiphenyl	**28655-71-2**	**ND**	**U**	**0.015**	**ug**	**ND**
Octachlorobiphenyl	**55722-26-4**	**ND**	**U**	**0.015**	**ug**	**ND**
Nonachlorobiphenyl	**53742-07-7**	**ND**	**U**	**0.025**	**ug**	**ND**
Decachlorobiphenyl	**2051-24-3**	**ND**	**U**	**0.025**	**ug**	**ND**
Total PCB	**1336-36-3**	**ND**	**U**			**ND**

Notes: ND (Not Detected). Denotes analyte not detected at a concentration greater than the PQL.
PQL (Practical Quantitation Limit). Denotes lowest analyte concentration reportable for the sample.

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CUSTOMER ID:	C-18-PF(2)	**NEA ID:** AM01745	**NEA LRF:** 09020157-07
MATRIX:	FILTER	**DATE SAMPLED:** 02/19/2009	**TIME:** N/A
DATE RECEIVED:	02/21/2009 **TIME:** 11:16	**PROJECT:**	115058 KEITH MIDDLE SCHOOL
SAMPLED BY:	N/A	**LOCATION:**	NEW BEDFORD, MA
CUSTOMER PO:	N/A	**LAB ELAP#:**	11078
METHOD:	PCBs by EPA Method TO-4A/680	**DATE ANALYZED:**	02/25/2009

HOMOLOG GROUP	CAS NUMBER	AMOUNT	FLAGS	PQL	UNITS	WEIGHT PERCENT
Monochlorobiphenyl	**27323-18-8**	**ND**	**U**	**0.000030**	**ug/m³**	**ND**
Dichlorobiphenyl	**25512-42-9**	**ND**	**U**	**0.000030**	**ug/m³**	**ND**
Trichlorobiphenyl	**25323-68-6**	**ND**	**U**	**0.000030**	**ug/m³**	**ND**
Tetrachlorobiphenyl	**26914-33-0**	**ND**	**U**	**0.000061**	**ug/m³**	**ND**
Pentachlorobiphenyl	**25429-29-2**	**ND**	**U**	**0.000061**	**ug/m³**	**ND**
Hexachlorobiphenyl	**26601-64-9**	**ND**	**U**	**0.000061**	**ug/m³**	**ND**
Heptachlorobiphenyl	**28655-71-2**	**ND**	**U**	**0.000091**	**ug/m³**	**ND**
Octachlorobiphenyl	**55722-26-4**	**ND**	**U**	**0.000091**	**ug/m³**	**ND**
Nonachlorobiphenyl	**53742-07-7**	**ND**	**U**	**0.00015**	**ug/m³**	**ND**
Decachlorobiphenyl	**2051-24-3**	**ND**	**U**	**0.00015**	**ug/m³**	**ND**
Total PCB	**1336-36-3**	**ND**	**U**			**ND**

Notes: ND (Not Detected). Denotes analyte not detected at a concentration greater than the PQL.
PQL (Practical Quantitation Limit). Denotes lowest analyte concentration reportable for the sample.

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CONTACT: DAVID SULLIVAN

CUSTOMER ID:	B-18-PF(2)	**NEA ID:** AM01746	**NEA LRF:** 09020157-08
MATRIX:	FILTER	**DATE SAMPLED:** 02/19/2009	**TIME:** N/A
DATE RECEIVED:	02/21/2009 **TIME:** 11:16	**PROJECT:**	115058 KEITH MIDDLE SCHOOL
SAMPLED BY:	N/A	**LOCATION:**	NEW BEDFORD, MA
CUSTOMER PO:	N/A	**LAB ELAP#:**	11078
METHOD:	PCBs by EPA Method TO-4A/680	**DATE ANALYZED:**	02/26/2009

HOMOLOG GROUP	CAS NUMBER	AMOUNT	FLAGS	PQL	UNITS	WEIGHT PERCENT
Monochlorobiphenyl	**27323-18-8**	**ND**	**U**	**0.000075**	**ug/m³**	**ND**
Dichlorobiphenyl	**25512-42-9**	**ND**	**U**	**0.000075**	**ug/m³**	**ND**
Trichlorobiphenyl	**25323-68-6**	**ND**	**U**	**0.000075**	**ug/m³**	**ND**
Tetrachlorobiphenyl	**26914-33-0**	**ND**	**U**	**0.00015**	**ug/m³**	**ND**
Pentachlorobiphenyl	**25429-29-2**	**ND**	**U**	**0.00015**	**ug/m³**	**ND**
Hexachlorobiphenyl	**26601-64-9**	**ND**	**U**	**0.00015**	**ug/m³**	**ND**
Heptachlorobiphenyl	**28655-71-2**	**ND**	**U**	**0.00023**	**ug/m³**	**ND**
Octachlorobiphenyl	**55722-26-4**	**ND**	**U**	**0.00023**	**ug/m³**	**ND**
Nonachlorobiphenyl	**53742-07-7**	**ND**	**U**	**0.00038**	**ug/m³**	**ND**
Decachlorobiphenyl	**2051-24-3**	**ND**	**U**	**0.00038**	**ug/m³**	**ND**
Total PCB	**1336-36-3**	**ND**	**U**			**ND**

Notes: ND (Not Detected). Denotes analyte not detected at a concentration greater than the PQL.
PQL (Practical Quantitation Limit). Denotes lowest analyte concentration reportable for the sample.

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CUSTOMER ID:	A-18-PF(2)	**NEA ID:** AM01747	**NEA LRF:** 09020157-09
MATRIX:	FILTER	**DATE SAMPLED:** 02/19/2009	**TIME:** N/A
DATE RECEIVED:	02/21/2009 **TIME:** 11:16	**PROJECT:**	115058 KEITH MIDDLE SCHOOL
SAMPLED BY:	N/A	**LOCATION:**	NEW BEDFORD, MA
CUSTOMER PO:	N/A	**LAB ELAP#:**	11078
METHOD:	PCBs by EPA Method TO-4A/680	**DATE ANALYZED:**	02/26/2009

HOMOLOG GROUP	CAS NUMBER	AMOUNT	FLAGS	PQL	UNITS	WEIGHT PERCENT
Monochlorobiphenyl	**27323-18-8**	**ND**	**U**	**0.000076**	**ug/m³**	**ND**
Dichlorobiphenyl	**25512-42-9**	**ND**	**U**	**0.000076**	**ug/m³**	**ND**
Trichlorobiphenyl	**25323-68-6**	**ND**	**U**	**0.000076**	**ug/m³**	**ND**
Tetrachlorobiphenyl	**26914-33-0**	**ND**	**U**	**0.00015**	**ug/m³**	**ND**
Pentachlorobiphenyl	**25429-29-2**	**ND**	**U**	**0.00015**	**ug/m³**	**ND**
Hexachlorobiphenyl	**26601-64-9**	**ND**	**U**	**0.00015**	**ug/m³**	**ND**
Heptachlorobiphenyl	**28655-71-2**	**ND**	**U**	**0.00023**	**ug/m³**	**ND**
Octachlorobiphenyl	**55722-26-4**	**ND**	**U**	**0.00023**	**ug/m³**	**ND**
Nonachlorobiphenyl	**53742-07-7**	**ND**	**U**	**0.00038**	**ug/m³**	**ND**
Decachlorobiphenyl	**2051-24-3**	**ND**	**U**	**0.00038**	**ug/m³**	**ND**
Total PCB	**1336-36-3**	**ND**	**U**			**ND**

Notes: ND (Not Detected). Denotes analyte not detected at a concentration greater than the PQL.
PQL (Practical Quantitation Limit). Denotes lowest analyte concentration reportable for the sample.

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CUSTOMER ID:	BG-18-PF(2)	**NEA ID:** AM01748	**NEA LRF:** 09020157-10
MATRIX:	FILTER	**DATE SAMPLED:** 02/19/2009	**TIME:** N/A
DATE RECEIVED:	02/21/2009 **TIME:** 11:16	**PROJECT:**	115058 KEITH MIDDLE SCHOOL
SAMPLED BY:	N/A	**LOCATION:**	NEW BEDFORD, MA
CUSTOMER PO:	N/A	**LAB ELAP#:**	11078
METHOD:	PCBs by EPA Method TO-4A/680	**DATE ANALYZED:**	02/24/2009

HOMOLOG GROUP	CAS NUMBER	AMOUNT	FLAGS	PQL	UNITS	WEIGHT PERCENT
Monochlorobiphenyl	**27323-18-8**	**ND**	**U**	**0.000016**	**ug/m³**	**ND**
Dichlorobiphenyl	**25512-42-9**	**ND**	**U**	**0.000016**	**ug/m³**	**ND**
Trichlorobiphenyl	**25323-68-6**	**ND**	**U**	**0.000016**	**ug/m³**	**ND**
Tetrachlorobiphenyl	**26914-33-0**	**ND**	**U**	**0.000032**	**ug/m³**	**ND**
Pentachlorobiphenyl	**25429-29-2**	**ND**	**U**	**0.000032**	**ug/m³**	**ND**
Hexachlorobiphenyl	**26601-64-9**	**ND**	**U**	**0.000032**	**ug/m³**	**ND**
Heptachlorobiphenyl	**28655-71-2**	**ND**	**U**	**0.000048**	**ug/m³**	**ND**
Octachlorobiphenyl	**55722-26-4**	**ND**	**U**	**0.000048**	**ug/m³**	**ND**
Nonachlorobiphenyl	**53742-07-7**	**ND**	**U**	**0.000080**	**ug/m³**	**ND**
Decachlorobiphenyl	**2051-24-3**	**ND**	**U**	**0.000080**	**ug/m³**	**ND**
Total PCB	**1336-36-3**	**ND**	**U**			**ND**

Notes: ND (Not Detected). Denotes analyte not detected at a concentration greater than the PQL.
PQL (Practical Quantitation Limit). Denotes lowest analyte concentration reportable for the sample.

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CUSTOMER ID:	BG-18-DUP-PF(2)	**NEA ID:** AM01749	**NEA LRF:** 09020157-11
MATRIX:	FILTER	**DATE SAMPLED:** 02/19/2009	**TIME:** N/A
DATE RECEIVED:	02/21/2009 **TIME:** 11:16	**PROJECT:**	115058 KEITH MIDDLE SCHOOL
SAMPLED BY:	N/A	**LOCATION:**	NEW BEDFORD, MA
CUSTOMER PO:	N/A	**LAB ELAP#:**	11078
METHOD:	PCBs by EPA Method TO-4A/680	**DATE ANALYZED:**	02/24/2009

HOMOLOG GROUP	CAS NUMBER	AMOUNT	FLAGS	PQL	UNITS	WEIGHT PERCENT
Monochlorobiphenyl	**27323-18-8**	**ND**	**U**	**0.000016**	**ug/m³**	**ND**
Dichlorobiphenyl	**25512-42-9**	**ND**	**U**	**0.000016**	**ug/m³**	**ND**
Trichlorobiphenyl	**25323-68-6**	**ND**	**U**	**0.000016**	**ug/m³**	**ND**
Tetrachlorobiphenyl	**26914-33-0**	**ND**	**U**	**0.000031**	**ug/m³**	**ND**
Pentachlorobiphenyl	**25429-29-2**	**ND**	**U**	**0.000031**	**ug/m³**	**ND**
Hexachlorobiphenyl	**26601-64-9**	**ND**	**U**	**0.000031**	**ug/m³**	**ND**
Heptachlorobiphenyl	**28655-71-2**	**ND**	**U**	**0.000047**	**ug/m³**	**ND**
Octachlorobiphenyl	**55722-26-4**	**ND**	**U**	**0.000047**	**ug/m³**	**ND**
Nonachlorobiphenyl	**53742-07-7**	**ND**	**U**	**0.000078**	**ug/m³**	**ND**
Decachlorobiphenyl	**2051-24-3**	**ND**	**U**	**0.000078**	**ug/m³**	**ND**
Total PCB	**1336-36-3**	**ND**	**U**			**ND**

Notes: ND (Not Detected). Denotes analyte not detected at a concentration greater than the PQL.
PQL (Practical Quantitation Limit). Denotes lowest analyte concentration reportable for the sample.

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LOWELL, MA 01854
CONTACT: DAVID SULLIVAN

CUSTOMER ID:	TRIP BLANK-PF	**NEA ID:** AM01750	**NEA LRF:** 09020157-12
MATRIX:	FILTER	**DATE SAMPLED:** 02/19/2009	**TIME:** N/A
DATE RECEIVED:	02/21/2009 **TIME:** 11:16	**PROJECT:**	115058 KEITH MIDDLE SCHOOL
SAMPLED BY:	N/A	**LOCATION:**	NEW BEDFORD, MA
CUSTOMER PO:	N/A	**LAB ELAP#:**	11078
METHOD:	PCBs by EPA Method TO-4A/680	**DATE ANALYZED:**	02/24/2009

HOMOLOG GROUP	CAS NUMBER	AMOUNT	FLAGS	PQL	UNITS	WEIGHT PERCENT
Monochlorobiphenyl	**27323-18-8**	**ND**	**U**	**0.0050**	**ug**	**ND**
Dichlorobiphenyl	**25512-42-9**	**ND**	**U**	**0.0050**	**ug**	**ND**
Trichlorobiphenyl	**25323-68-6**	**ND**	**U**	**0.0050**	**ug**	**ND**
Tetrachlorobiphenyl	**26914-33-0**	**ND**	**U**	**0.010**	**ug**	**ND**
Pentachlorobiphenyl	**25429-29-2**	**ND**	**U**	**0.010**	**ug**	**ND**
Hexachlorobiphenyl	**26601-64-9**	**ND**	**U**	**0.010**	**ug**	**ND**
Heptachlorobiphenyl	**28655-71-2**	**ND**	**U**	**0.015**	**ug**	**ND**
Octachlorobiphenyl	**55722-26-4**	**ND**	**U**	**0.015**	**ug**	**ND**
Nonachlorobiphenyl	**53742-07-7**	**ND**	**U**	**0.025**	**ug**	**ND**
Decachlorobiphenyl	**2051-24-3**	**ND**	**U**	**0.025**	**ug**	**ND**
Total PCB	**1336-36-3**	**ND**	**U**			**ND**

Notes: ND (Not Detected). Denotes analyte not detected at a concentration greater than the PQL.
PQL (Practical Quantitation Limit). Denotes lowest analyte concentration reportable for the sample.

AUTHORIZED SIGNATURE:

William A. Kotas
Sr. Laboratory Representative

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Laboratory Director

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APPENDIX F

LABORATORY DATA VALIDATION MEMORANDA

TRC

Memo

To: David Sullivan

From: Lorie MacKinnon

Date: 02/26/09

Re: Data Validation Review: Air Samples: Keith Middle School/New Bedford, MA: SDG 09010017

SUMMARY

Limited (Tier II) validation was performed on the data for six air samples and one trip blank sample collected at the Keith Middle School in New Bedford, Massachusetts. The samples were collected on December 30, 2008 and submitted to Northeast Analytical, Inc. (NEA) in Schenectady, New York for analysis. All air vent samples were collected on polyurethane foam (PUF) cartridges in accordance with EPA method TO-10A. The samples were analyzed for polychlorinated biphenyl (PCB) homologues using EPA method 680. NEA reported the results under job number 09010017.

The sample results were assessed using the *EPA New England Data Validation Functional Guidelines for Evaluating Environmental Analyses*, revised December 1996. Modification of these guidelines was performed to accommodate the non-CLP methodology.

In general, the data appear to be valid as reported and may be used for decision-making purposes.

SAMPLES

Samples included in this review are listed below:

VS-9-18	VS-9-18 -DUP (1)	VS-7-18
VS-1-18	VS-4-18	VS-BG-18
VENT-TB		

(1) Field duplicate of VS-9-18

REVIEW ELEMENTS

Sample data were reviewed for the following parameters:

- Agreement of analyses conducted with TRC requests
- Holding times and sample preservation

- Gas chromatography/mass spectrometry (GC/MS) tunes
- Initial and continuing calibrations
- Blanks
- Surrogate spike recoveries
- Laboratory control sample (LCS) results
- Internal standard performance
- Field duplicate results
- Quantitation limits and sample results

DISCUSSION

Agreement of Analyses Conducted with TRC Requests

Sample reports were checked to verify that the results corresponded to analytical requests as designated on the chain-of-custody and any correspondence between TRC and the laboratory. There were no discrepancies noted.

Holding Times and Sample Preservation

All samples were extracted and analyzed within the method-specified holding time.

GC/MS Tunes

The frequency and abundance of all decafluorotriphenylphosphine (DFTPP) tunes were within the acceptance criteria. The samples were analyzed within 12 hours from the DFTPP tunes. Window defining mixtures were analyzed following each DFTPP tune.

Initial and Continuing Calibrations

The %RSDs and %Ds of all PCB congeners used in the initial and continuing calibrations were within the acceptance criteria.

Blanks

Target compounds were not detected in the laboratory method blanks or trip blanks associated with the PCB homologue analyses.

Surrogate Spike Recoveries

All criteria were met.

LCS Results

The recoveries for 2-chlorobiphenyl (79.1% and 79.8%) were above the control limits in the LCS samples associated with samples VS-9-18, VS-7-18, VS-7-18 DUP, VS-1-18, VS-4-18, VS-BG-18, and VENT-TB. All recovery criteria were met in the LCSD samples. Validation action was not required on this basis as dichlorobiphenyl was not detected in the associated samples and therefore was not affected by the potential high bias.

Internal Standard Performance

All criteria were met.

Field Duplicate Results

Samples VS-9-18/VS-9-18-DUP were submitted as the field duplicate (collocated) pair with this sample set. No PCBs were detected in these samples.

Quantitation Limits and Sample Results

The quantitation limits met the requirements in the Sampling Plan for this program.

Memo

To: David Sullivan

From: Lorie MacKinnon

CC:

Date: 03/18/09

Re: Data Validation Review: Air Samples: Keith Middle School/New Bedford, MA: SDG L0900004

SUMMARY

Limited (Tier II) validation was performed on the data for 11 air samples and two trip blank samples collected at the Keith Middle School, Massachusetts. The samples were collected on December 30, 2008 and submitted to Alpha Woods Hole Labs (Alpha) in Westborough, MA for analysis. All air vent samples were collected in 2 liter SUMMA® canisters in accordance with EPA method TO-15A; all ambient air samples were collected in 6 liter SUMMA® canisters in accordance with EPA method TO-15A. The samples were analyzed for volatile organic compounds using EPA method TO-15A.

The sample results were assessed using the *EPA New England Data Validation Functional Guidelines for Evaluating Environmental Analyses*, revised December 1996. Modification of these guidelines was performed to accommodate the non-CLP methodology.

In general, the data appear to be valid as reported and may be used for decision-making purposes, with the exception of the nondetect results for ethyl acetate in all samples which were rejected (R) due to calibration nonconformances. The results for benzene, cis-1,3-dichloropropene, trans-1,3-dichloropropene, 1,2,4-trichlorobenzene, and hexachlorobutadiene in all samples should be qualified as estimated (J/UJ) due to calibration nonconformances. The results for trans-1,3-dichloropropene in all samples should be qualified as estimated (UJ) due to low recovery in the LCS sample.

SAMPLES

Samples included in this review are listed below:

VS-9-18	VS-7-18 DUP (1)	VS-7-18
VS-1-18	VS-4-18	VS-BG-18
Vent-TB	C-18	B-18
A-18	BG-18	BG-18-DUP (2)
Trip Blank		

1) Field duplicate of VS-7-18
2) Field duplicate of BG-18

REVIEW ELEMENTS

Sample data were reviewed for the following parameters:

- Agreement of analyses conducted with TRC requests
- Holding times and sample preservation
- Gas chromatography/mass spectrometry (GC/MS) tunes
- Initial and continuing calibrations
- Method blanks
- System Monitoring Compound recoveries
- Laboratory Duplicate results
- Laboratory control sample (LCS) results
- Internal standard performance
- Field duplicate results
- Quantitation limits and sample results

DISCUSSION

Agreement of Analyses Conducted with TRC Requests

Sample reports were checked to verify that the results corresponded to analytical requests as designated on the chain-of-custody and any correspondence between TRC and the laboratory.

Holding Times and Sample Preservation

All samples were extracted and analyzed within the method-specified holding time.

GC/MS Tunes

The frequency and abundance of all bromofluorobenzene (BFB) tunes were within the acceptance criteria.

Initial and Continuing Calibrations

The percent relative standard deviation (%RSD) for 1,2,4-trichlorobenzene (39.6) was outside of the acceptance criteria in the low level calibration associated with all samples. The nondetect results for 1,2,4-trichlorobenzene in all samples were estimated (UJ) due to initial calibration nonconformances.

The response factor for ethyl acetate (0.044) was outside of the acceptance criteria in the initial calibration associated with all samples. The nondetect results for ethyl acetate in all samples were rejected (R).

The percent differences (%Ds) for benzene (29.6), cis-1,3-dichloropropene (28.2), trans-1,3-dichloropropene (37.0), 1,2,4-trichlorobenzene (36.6), and hexachlorobutadiene (34.1) were outside of the acceptance criteria in the continuing calibration associated with all samples. The positive and nondetect results for benzene, cis-1,3-dichloropropene, trans-1,3-dichloropropene, 1,2,4-trichlorobenzene, and hexachlorobutadiene were estimated (J/UJ) in these samples due to continuing calibration nonconformances.

Blanks

Target compounds were not detected in the laboratory method blanks associated with the volatile organic compound analyses.

Acetone, ethanol, isopropanol, benzene, and methylene chloride were detected in the trip blank samples. The laboratory noted that the trip blank canisters were received at approximately 22 inches Hg. It was discovered that due to a sampling error, the canisters were opened in the TRC air laboratory. Alternate trip blank samples were not available. As several of the contaminants are not typical of those detected in a trip blank sample and the samples were collected incorrectly, professional judgement was taken and the trip blank results were not used to qualify the field samples.

System Monitoring Compound Recoveries

System monitoring compounds were not introduced to these samples. Evaluation of the samples based on system monitoring compound recovery was not performed.

Laboratory Duplicate Results

The laboratory performed a duplicate analysis on sample VS-1-18. All relative percent differences (RPDs) were within the laboratory control limit of 25.

LCS Results

LCS samples were analyzed along with the field samples. The recoveries for 1,2,4-trichlorobenzene (137), hexachlorobutadiene (134), and trans-1,3-dichloropropene (63) were outside the acceptance criteria of 70–130% in the LCS associated with all samples. The nondetect results for trans-1,3-dichloropropene in all samples were estimated (UJ). Validation action was not required for 1,2,4-trichlorobenzene and hexachlorobutadiene as the associated compound results were nondetect and therefore not affected by the potential high bias.

Internal Standard Performance

Internal standards were within the acceptance criteria in all sample analyses.

Field Duplicate Results

Samples VS-7-18/VS-7-18 DUP and BG-18/BG-18 DUP were submitted as the field duplicate (collocated) pairs with this sample set. The following table summarizes the relative percent differences (RPDs) of the target VOCs detected in either sample, all of which were within the acceptance criteria of 20%RPD or the difference of <2 times the reporting limit (RL).

VOCs	BG-18 ($\mu g/m^3$)	BG-18-DUP ($\mu g/m^3$)	RPD (%)
Chloromethane	0.87	1.01	14.9
Dichlorodifluoromethane	2.43	1.93	22.9, Within 2xRL
Trichlorofluoromethane	1.20	1.24	3.3

VOCs	VS-7-18 ($\mu g/m^3$)	VS-7-18-9 DUP ($\mu g/m^3$)	RPD (%)
1,2-Dichloroethane	1.49	1.62	8.4
2-Butanone	1.52	1.16	26.9, Within 2xRL
Cyclohexane	0.918	0.725	23.5, Within 2xRL
Dichlorodifluoromethane	2.22	2.57	14.6
Tetrahydrofuran	1.57	1.65	5.0
Toluene	1.83	1.34	30.9, Within 2xRL
Trichlorofluoromethane	1.80	1.73	4.0
Chloroform	0.99	0.80	21.2, Within 2xRL
Tetrachloroethene	3.08	2.99	3.0
Trichloroethene	2.56	2.52	1.6
n-Hexane	2.08	0.704 U	NC, Within 2xRL

NC – Not calculable

Quantitation Limits and Sample Results

The quantitation limits met the requirements in the Sampling Plan for this program.

Memo

To: David Sullivan

From: Lorie MacKinnon

Date: 04/09/09

Re: Data Validation Review: Air Samples: Keith Middle School/New Bedford, MA: SDG 09020157

SUMMARY

Limited (Tier II) validation was performed on the data for 10 air samples and two trip blank samples collected at the Keith Middle School in New Bedford, Massachusetts. The samples were collected on February 19, 2009 and submitted to Northeast Analytical, Inc. (NEA) in Schenectady, New York for analysis. All ambient air samples were collected on particulate filters and PUF cartridges in accordance with EPA method TO-4A. The samples were analyzed for polychlorinated biphenyl (PCB) homologues using EPA method 680. NEA reported the results under job number 09010017.

The sample results were assessed using the *EPA New England Data Validation Functional Guidelines for Evaluating Environmental Analyses*, revised December 1996. Modification of these guidelines was performed to accommodate the non-CLP methodology.

In general, the data appear to be valid as reported and may be used for decision-making purposes.

SAMPLES

Samples included in this review are listed below:

C-18 (2)	B-18 (2)	A-18 (2)
BG-18 (2)	BG-18-DUP (2)	Trip Blank
C-18-PF (2)	B-18-PF (2)	A-18-PF (2)
BG-18-PF (2)	BG-18-DUP-PF (2)	Trip Blank-PF

REVIEW ELEMENTS

Sample data were reviewed for the following parameters:

- Agreement of analyses conducted with TRC requests
- Holding times and sample preservation

- Gas chromatography/mass spectrometry (GC/MS) tunes
- Initial and continuing calibrations
- Blanks
- Surrogate spike recoveries
- Laboratory control sample (LCS) results
- Internal standard performance
- Field duplicate results
- Quantitation limits and sample results

DISCUSSION

Agreement of Analyses Conducted with TRC Requests

Sample reports were checked to verify that the results corresponded to analytical requests as designated on the chain-of-custody and any correspondence between TRC and the laboratory. There were no discrepancies noted.

Holding Times and Sample Preservation

All samples were extracted and analyzed within the method-specified holding time.

GC/MS Tunes

The frequency and abundance of all decafluorotriphenylphosphine (DFTPP) tunes were within the acceptance criteria. The samples were analyzed within 12 hours from the DFTPP tunes. Window defining mixtures were analyzed following each DFTPP tune.

Initial and Continuing Calibrations

The %RSDs and %Ds of all PCB congeners used in the initial and continuing calibrations were within the acceptance criteria.

Blanks

Target compounds were not detected in the laboratory method blanks or trip blanks associated with the PCB homologue analyses.

Surrogate Spike Recoveries

Surrogate tetrachloro-meta-xylene was recovered above the control limits in sample A-18 (2). Validation actions were not required on this basis as the sample results were nondetect and therefore not affected by the potential high bias.

LCS Results

All criteria were met.

Internal Standard Performance

The following table lists the internal standards recovered outside of control limits and the resulting validation actions. It should be noted that phenanthrene-d10 was not used for compound quantitation.

Sample	Internal Standard	Recovery (%)	Validation Actions
BG-18-PF (2)	Phenanthrene-d10	131	Validation action was not required on this basis as this IS was not used for compound quantitation.
BG-18 (2)	Phenanthrene-d10	146.4	Validation action was not required on this basis as this IS was not used for compound quantitation.
C-18 –PF (2)	Chrysene-d12	132.1	Validation action was not required on this basis as sample results were nondetect and therefore not affected by the potential high IS bias.
C-18 (2)	Chrysene-d12	180.5	Validation action was not required on this basis as sample results were nondetect and therefore not affected by the potential high IS bias.
	Phenanthrene-d10	179.5	
A-18 (2)	Chrysene-d12	182.9	Validation action was not required on this basis as sample results were nondetect and therefore not affected by the potential high IS bias.
	Phenanthrene-d10	184.2	

Field Duplicate Results

Samples BG-18 (2)/BG-18-DUP (2) and BG-18-PF (2)/BG-18-DUP-PF (2) were submitted as the field duplicate (collocated) pairs with this sample set. No PCBs were detected in these samples.

Quantitation Limits and Sample Results

The quantitation limits met the requirements in the Sampling Plan for this program.

APPENDIX G

DISCUSSION OF RISK-BASED COMPARISON CRITERIA

DISCUSSION OF RISK-BASED COMPARISON CRITERIA

PCBs

Two PCB risk-based air concentrations (RBACs) have been developed for the KMS, assuming occupational exposures within the school (8 hours/day, 250 days/year, for 25 years). Both non-carcinogenic and carcinogenic health endpoints were considered in the calculation of the RBACs; however, RBACs are based on noncarcinogenic effects as the most sensitive endpoint. The first RBAC is the Action Level (AL; 0.05 ug/m^3) used as an initial indicator that PCB air concentrations above background levels have been detected. The risk basis for the AL is a noncarcinogenic hazard index of approximately 0.2. The second RBAC is the Acceptable Long-Term Average Exposure Concentration (ALTAEC; 0.3 ug/m^3), indicative of the maximum acceptable air concentration that should not be exceeded for an extended time period. The ALTAEC could be exceeded over the short-term and still result in acceptable risk levels. The risk basis for the ALTAEC is a noncarcinogenic hazard index of one.

Both RBACs were developed to be applied to a total PCB air concentration. PCB homologues have been quantified and summed to generate total PCB air concentrations. By quantifying PCB homologues, total PCB air data gathered at the KMS are directly comparable to total PCB air data gathered at the high school since both are based on homologues rather than congeners, which greatly facilitates communication and discussion with the general public on the results of analyses.

The LTMMIP specifies that both indoor air and vent stack air gas-phase total PCB concentrations are to be compared to RBACs. This comparison is appropriate for indoor air results since exposures to indoor air at the KMS are occurring over a similar duration and frequency as that assumed for RBAC development (8 hours/day, 250 days/year for 25 years). However, this comparison is less appropriate for vent stack air results. The vent system is designed to capture gas-phase PCBs being released from the subsurface beneath the KMS and transport the gases through PVC piping to outdoor air, limiting migration through the building slab and into indoor air. Little if any human exposure to air within the vent stack system itself is taking place. Air from the vent stack is released to outdoor air where the PCBs are quickly diluted and dispersed. Therefore, comparison of vent stack air results to RBACs developed assuming exposures of 8 hours/day, 250 days/year for 25 years is highly conservative, if not conceptually irrelevant. The results of the comparison of vent stack air results to RBACs should be interpreted with caution due to the significantly reduced degree of exposure to vent stack air that can be experienced by individuals in comparison to indoor air.

VOCs

Comparison criteria for VOC data include MassDEP Threshold Effects Exposure Limits (TELs) and Allowable Ambient Limits (AALs), published in December 1995, consistent with the LTMMIP. TELs are developed to be applicable to short-term exposure concentrations (average

24-hour levels) while AALs are developed to be protective of long-term exposure concentrations (average annual levels over 30 years). AALs and TELs are risk-based values, corresponding to the lower of a non-carcinogenic hazard of 0.2 or an excess lifetime cancer risk of one in one million (1×10^{-6}) for potentially carcinogenic compounds. Indoor air and vent stack air VOC concentrations are conservatively compared to both criteria even though it is unlikely that actual exposures to measured air concentrations would occur for either an entire 24-hour day or continually for 30 years. Short-term exposures at the KMS are likely to occur for approximately 8 hours per day, while long-term exposures are likely to occur for approximately 250 days/year for an exposure duration of 25 years.

Because TELs and AALs have not been revised since 1995 and may not include the most up-to-date toxicity information available, VOC concentrations in excess of AALs and TELs are discussed relative to alternate comparison criteria. The alternate comparison criteria are primarily residential and commercial EPA screening levels (EPA SLs) developed by Oak Ridge National Laboratory (June 2008) using the most current toxicity information available. Similar to AALs, residential EPA SLs are applicable to continuous long-term exposures. Commercial EPA SLs are more applicable to the actual exposures occurring at the KMS (8 hours/day, 250 days/year for 25 years). Residential and commercial EPA SLs are associated with the same cancer risk threshold used in establishing AALs and TELs. However, EPA SLs are based on a hazard of 1 for non-carcinogenic endpoints. Therefore, EPA SLs provided on Tables 8-1 and 8-2 have been adjusted to a non-carcinogenic hazard of 0.2 to be consistent with AALs and TELs based on non-carcinogenic effects. In interpreting concentrations in excess of residential EPA SLs, it is important to consider how the frequency and duration of actual exposures may differ from continuous long-term exposures assumed for residential EPA SL development.

Because AALs, TELs, and EPA SLs are set at risk levels (i.e., non-carcinogenic hazard of 0.2 and excess lifetime cancer risk of 1×10^{-6}) that are only a portion of the MassDEP risk management criteria of a non-carcinogenic hazard of 1 and an excess lifetime cancer risk of one in one-hundred thousand (1×10^{-5}), concentrations that slightly exceed (i.e., less than 5-fold) one or more comparison criteria may not be cause for concern, especially considering that actual exposures may be of lesser duration and frequency than assumed in comparison criteria development.

For compounds lacking comparison criteria, detected concentrations are discussed relative to available comparison criteria for a surrogate compound, selected based on similarities in chemical structure and/or known toxicity. Compounds lacking comparison criteria are also discussed relative to site-specific outdoor and indoor air background concentrations, as available.

Levels of VOCs in air present as a result of background or ambient conditions were not factored into the establishment of comparison criteria. Therefore, comparison criteria may be set at values that are below typical background levels of VOCs in indoor air, present as a result of off-gassing from building materials or indoor activities unrelated to site-specific releases. To account for anticipated background conditions at the KMS, VOC concentrations in excess of comparison criteria are framed relative to site-specific outdoor air background concentrations, indicating ambient conditions in the vicinity of site. To provide additional perspective, VOC

concentrations in excess of comparison criteria are also discussed relative to MassDEP indoor air background values, used by MassDEP in the development of the Massachusetts Contingency Plan (MCP) numeric standards. Therefore, the presence of one or more VOCs at concentrations that exceed comparison criteria should be interpreted with caution and may not indicate the need for immediate action.

There are a small number of compounds in indoor air, vent air, and outdoor air background samples for which reporting limits exceed comparison criteria set at very low values, which are not readily achievable with standard analytical methods. The comparison criteria for each of the affected compounds (i.e., benzene, chloroform, methylene chloride, styrene, tetrachloroethene, and trichloroethene) are based on an excess lifetime cancer risk of 1×10^{-6} for continuous lifetime exposure. For these compounds, the reporting limit typically exceeds the comparison criteria by 10-fold or less, indicating that the reporting limit is associated with an excess lifetime cancer risk of up to 1×10^{-5} for long-term exposures. However, because the development of comparison criteria does not consider airborne levels present as a result of background or ambient activities, it is important to note that comparison criteria for these compounds are set at levels that are below typical indoor air background levels and cannot be distinguished from levels in site-specific outdoor air samples.

APPENDIX H

INDOOR AIR RISK CALCULATIONS – COMMERCIAL WORKER

Table 1. Statistics of Detected Analytical Results for Indoor Air Samples - 2007 and 2008
Keith Middle School
New Bedford, Massachusetts

Analysis	Analyte	# of Samples	# of Detects	Freq. of Detects	Min. of Detects (ug/m3)	Max. of Detects (ug/m3)	Location of Max. Detected	Min. of Non-Detects (ug/m3)	Max. of Non-Detects (ug/m3)	Mean Concentration (ug/m3)	EPC (ug/m3)	EPC Basis
VOCs												
	1,2,4-trichlorobenzene	27	2	7.4%	11.7	12.2	A-11	1.48	3.71	2.355	1.2E+01	Max. of Detects
	1,2,4-trimethylbenzene	27	4	14.8%	1.06	4.85	C-13	0.982	2.46	1.21	1.9E+00	95% Chebyshev (Mean, Sd) UCL
	2-butanone	27	19	70.4%	0.744	23.6	A-11	1.47	1.47	4.253	8.6E+00	95% Chebyshev(Mean, Sd) UCL
	acetone(1)	27	26	96.3%	3.87	134	A-13	4.75	4.75	29.92	4.2E+01	95% Approximate Gamma UCL
	Benzene	9	9	100.0%	0.459	1.08	C-16	--	--	0.773	1.1E+00	Max. of Detects
	Carbon Disulfide	12	1	8.3%	0.688	0.688	B-17	0.622	1.56	0.46	6.9E-01	Max. of Detects
	Chloroform	9	6	66.7%	0.101	0.245	C-17	0.098	0.098	0.12	2.5E-01	Max. of Detects
	chloromethane	21	4	19.0%	0.866	15	C-13	0.413	1.03	1.53	4.6E+00	95% Chebyshev(Mean, Sd) UCL
	cyclohexane	27	6	22.2%	0.713	7.36	C-13	0.688	1.72	1.182	2.4E+00	95% Chebyshev (Mean, Sd) UCL
	Dichlorodifluoromethane	9	9	100.0%	1.99	2.57	C-18	--	--	2.188	2.6E+00	Max. of Detects
	ethanol(1)	27	26	96.3%	4.16	191	C-17	4.71	4.71	33.45	4.7E+01	95% Approximate Gamma UCL
	ethylbenzene	27	3	11.1%	2.53	9.94	A-11	0.868	2.17	1.466	3.1E+00	95% Chebyshev (Mean, Sd) UCL
	Ethyl Acetate	6	1	16.7%	1.94	1.94	C-17	1.8	1.8	1.016	1.9E+00	Max. of Detects
	Freon-113	9	1	11.1%	2.02	2.02	C-17	1.53	1.53	0.904	2.0E+00	Max. of Detects
	isopropanol(1)	27	15	55.6%	1.32	13.4	A-14	1.23	1.23	3.566	6.9E+00	95% Chebyshev(Mean, Sd) UCL
	methylene chloride(1)	21	6	28.6%	3.48	318	C-14	1.74	3.47	18.54	8.4E+01	95% Chebyshev(Mean, Sd) UCL
	Methyl Isobutyl Ketone	9	2	22.2%	3.14	18.8	B-17	0.819	0.819	2.756	1.9E+01	Max. of Detects
	p/m-xylene	27	4	14.8%	5.06	37.4	A-11	1.74	4.34	4.251	1.1E+01	95% Chebyshev (Mean, Sd) UCL
	o-xlyene	27	3	11.1%	3.23	14	B-17	0.868	2.17	1.93	4.8E+00	95% Chebyshev (Mean, Sd) UCL
	n-heptane	27	2	7.4%	0.86	16.5	A-11	0.819	2.05	1.41	1.7E+01	Max. of Detects
	n-hexane	27	7	25.9%	0.862	145	C-14	0.704	3.52	7	3.0E+01	95% Chebyshev(Mean, Sd) UCL
	styrene	27	12	44.4%	0.868	7.26	A-14	0.851	2.13	2.038	3.7E+00	95% Chebyshev (Mean, Sd) UCL
	Tetrachloroethylene	9	1	11.1%	0.136	0.136	A-16	0.136	0.136	0.0756	1.4E-01	Max. of Detects
	tetrahydrofuran	21	2	9.5%	4.52	7.05	A-13	0.589	1.47	1.153	7.1E+00	Max. of Detects
	toluene	27	23	85.2%	0.777	33.1	A-11	1.88	1.88	4.558	6.4E+00	95% Approximate Gamma UCL
	Trichloroethylene	9	1	11.1%	0.138	0.138	C-16	0.107	0.107	0.0629	1.4E-01	Max. of Detects
	trichlorofluoromethane	27	8	29.6%	1.18	3.08	C-14	1.12	2.81	1.378	1.5E+00	95% Student's-t UCL
PCBs												
	Total PCBs	27	20	74.1%	0.00031	0.0075	B-17	0.000071	0.00038	0.00147	2.3E-03	95% Approximate Gamma UCL

Notes:
ug/m3 - micrograms per cubic meter.
Values in **Bold** indicate the compound was detected.
VOCs - Volatile Organic Compounds.
PCBs - polychlorinated biphenyls.
(1) Compound is a common laboratory contaminant and detects may be associated with laboratory contamination for 2007 samples.
EPC - Exposure point concentration.
UCL - Upper concentration limit.

Table 2
Commercial Worker Risk Evaluation
Inhalation of Air Exposure Pathway
Keith Middle School
New Bedford, MA

	EPC	Estimated Dose		Toxicity Values				Risk Estimates	
Constituent	Indoor Air Concentration µg/m3	ADEcancer (Cancer) µg/m3	ADEnon-cancer (Non-cancer) µg/m3	Unit Risk (µg/m3)-1		Chronic Noncancer Reference Concentration µg/m3		Cancer Risk (--)	Hazard Quotient (--)
1,2,4-Trichlorobenzene	1.2E+01	9.9E-01	2.8E+00	NA	(1)	2.0E+02	(1)	NA	1.E-02
2-Butanone	8.6E+00	7.0E-01	2.0E+00	NA	(1)	5.0E+03	(1)	NA	4.E-04
Acetone	4.2E+01	3.4E+00	9.5E+00	NA	(1)	8.0E+02	(1)	NA	1.E-02
Carbon disulfide	6.9E-01	5.6E-02	1.6E-01	NA		7.0E+02	(2)	NA	2.E-04
Ethyl acetate	1.9E+00	1.6E-01	4.4E-01	NA		3.0E+03	(8)	NA	1.E-04
Benzene	1.1E+00	8.8E-02	2.5E-01	7.8E-06	(1)	3.0E+01	(1)	7.E-07	8.E-03
Chloroform	2.5E-01	2.0E-02	5.6E-02	2.3E-05	(1)	6.6E+02	(1)	5.E-07	8.E-05
Chloromethane	4.6E+00	3.8E-01	1.1E+00	NA	(2)	9.0E+01	(2)	NA	1.E-02
Difluorodichloromethane	2.6E+00	2.1E-01	5.9E-01	NA		2.0E+02	(3)	NA	3.E-03
Ethylbenzene	3.1E+00	2.5E-01	7.1E-01	NA	(1)	1.0E+03	(1)	NA	7.E-04
Freon 113	2.0E+00	1.6E-01	4.6E-01	NA		3.0E+04	(3)	NA	2.E-05
Methylene chloride	8.4E+01	6.8E+00	1.9E+01	4.7E-07	(1)	3.0E+03	(1)	3.E-06	6.E-03
Methyl isobutyl ketone	1.9E+01	1.5E+00	4.3E+00	NA	(1)	3.0E+03	(1)	NA	1.E-03
Styrene	3.7E+00	3.0E-01	8.4E-01	5.7E-07	(1)	1.0E+03	(1)	2.E-07	8.E-04
Tetrachloroethene	1.4E-01	1.1E-02	3.1E-02	5.5E-05	(1)	4.6E+03	(1)	6.E-07	7.E-06
Tetrahydrofuran	7.1E+00	5.7E-01	1.6E+00	1.9E-06	(7)	3.0E+02	(7)	1.E-06	5.E-03
Toluene	6.4E+00	5.2E-01	1.5E+00	NA	(1)	5.0E+03	(1)	NA	3.E-04
Trichlorofluoromethane	1.5E+00	1.2E-01	3.5E-01	NA		7.0E+02	(3)	NA	5.E-04
Trichloroethene	1.4E-01	1.1E-02	3.2E-02	1.7E-06	(1)	1.8E+02	(1)	2.E-08	2.E-04
Xylenes	1.6E+01	1.3E+00	3.6E+00	NA	(1)	1.0E+02	(1)	NA	4.E-02
n-Hexane	3.0E+01	2.5E+00	6.9E+00	NA	(4)	2.0E+02	(4)	NA	3.E-02
n-Heptane	1.7E+01	1.3E+00	3.8E+00	NA	(4)	2.0E+02	(4)	NA	2.E-02
Cyclohexane	2.4E+00	1.9E-01	5.4E-01	NA	(4)	2.0E+02	(4)	NA	3.E-03
1,2,4-Trimethylbenzene	1.9E+00	1.6E-01	4.4E-01	NA	(5)	5.0E+01	(5)	NA	9.E-03
Ethanol	4.7E+01	3.8E+00	1.1E+01	NA		4.0E+03	(6)	NA	3.E-03
Isopropanol	6.9E+00	5.6E-01	1.6E+00	NA		4.0E+03	(6)	NA	4.E-04
PCBs	2.3E-03	1.8E-04	5.2E-04	1.0E-04	(1)	2.0E-02	(1)	2.E-08	3.E-02

Where:

LADEcancer = IAC x EFx ED x EP/APcancer
ADEnon-cancer = IAC x EF x ED x EP / APnon-cancer
Cancer Risk = LADEcancer x UR
Hazard Quotient = ADEnon-cancer / Inhalation Reference Concentration

	Cancer Risk	Hazard Index
TOTAL:.	6E-06	2.E-01

Bold = Cancer Risk >1.0E-05 or Hazard Quotient > 1.0E+01

LADE = Life Time Average Daily Exposure
ADE = Average Daily Exposure
EPC = Exposure Point Concentration
$\mu g/m^3$ = micrograms per cubic meter

Sources of Toxicity Values:
(1) MassDEP 2008; MCP standards derivation
(2) IRIS, 2008
(3) HEAST, 1997
(4) Used C5-C8 aliphatic value from MassDEP 2008
(5) Used C9-C10 aromatic value from MassDEP 2008
(6) California EPA Reference Exposure Level for methanol
(7) EPA provisional value from the Superfund Technical Support Center
(8) Converted from IRIS RfD (0.9 mg/kg-day x 70 kg x 1/20 m3/day x 1000)

And where:

Exposure Frequency (EF) =	250	days/year (5 days a week for 50 weeks of exposure)
Exposure Duration (ED) =	8	hrs/event [1]
Exposure Period (EP) =	25	yr [1]
Unit Conversion (UC) =	0.04	days/hr
Averaging Period (APcancer) =	25550	days [1]
Averaging Period (APnon-cancer) =	9125	days [1]

[1] MADEP, 2008