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Donald A. Robinson, P.E., Ph.D.  
Director, Environmental Health and Safety  
University of Massachusetts Amherst  
117 Draper Hall  
Amherst, MA 01003-9244

**RE: Additional Air and Wipe Sample Results from the Low-Rise Building at Lederle Graduate Research Center, University of Massachusetts, Amherst, Massachusetts (EH&E 15066)**

Dear Dr. Robinson:

As requested by the University of Massachusetts Amherst (UMass), Environmental Health & Engineering, Inc. (EH&E) presents this summary letter of the air and wipe sampling of the secured computer facilities (the computer room) on the first floor for the Office of Information Technology (OIT). This sampling was conducted at the request of occupants of the computer room who were concerned about their individual exposures from the identified exterior caulking known to contain building-related polychlorinated biphenyl (PCBs) in excess of 50 parts per million (ppm). The sampling was conducted by EH&E personnel on June 5 and 6, 2007.

Sample results collected by EH&E indicate the following:

- The air sample results for the computer room and the hallway (comparison sample) were well below the National Institute for Occupational Safety and Health (NIOSH) recommended exposure limit (REL) at 1 microgram per cubic meter ( $\mu\text{g}/\text{m}^3$ ). The sample results from the computer room are consistent with air samples collected from other similar areas in the low-rise prior to any removal and abatement of PCB caulking from the exterior of building.
- The wipe samples collected from horizontal work surfaces within the computer room were non-detect for PCBs ( $< 0.1$  and  $< 0.2$  micrograms per 100 square centimeters [ $\mu\text{g}/100 \text{ cm}^2$ ]).

- Detectable levels of PCBs were found in wipe samples collected in the computer room from rarely used ledges where evidence of pressure washing residue was observed. The results from one sample were slightly above the U.S. Environmental Protection Agency (EPA) recommended limit of 10  $\mu\text{g}/100\text{ cm}^2$  for this type of surface (16.4 and 7  $\mu\text{g}/100\text{ cm}^2$ ).
- PCBs were not detected in wipe samples collected at the intake of the air handler that serves the computer room (< 0.98  $\mu\text{g}/100\text{ cm}^2$ ). One sample collected from an access port upstream of the filter banks for the air handling unit had detectable levels of PCBs below the EPA recommended level of 100 $\mu\text{g}/100\text{ cm}^2$  for this type of surface (86  $\mu\text{g}/100\text{ cm}^2$ ). The wipe sample downstream of the filter banks detected traces of PCBs well below EPA's most protective standard for surfaces of 10  $\mu\text{g}/100\text{ cm}^2$  (3.6  $\mu\text{g}/100\text{ cm}^2$ ).

## **BACKGROUND**

In the Summer of 2006, EH&E identified exterior caulking from Tower A and the low-rise building containing PCBs in concentrations in excess of 50 ppm. As a result, an abatement plan to remove caulking has been submitted for EPA approval. As part of ongoing monitoring efforts in preparation for an approved abatement, EH&E has collected additional air, wipe, and dust thimble samples from the Engineering library. In response to concerns from occupants of the computer room just downstream of the air handling unit (AC-1), UMass requested that EH&E conduct air and wipe samples in the computer room.

## **AIR SAMPLES**

Air samples were collected in a representative location of the computer room to characterize airborne levels of PCBs. Additional samples were collected outdoors and from an adjacent hallway of the low-rise for comparison purposes.

For samples collected on June 5, 2007, air was drawn through the sampling train by a calibrated pump. The sampling train consisted of a polyurethane foam (PUF) tube that captures both particulate and vapor phase PCBs. In order to characterize potential occupant inhalation exposures, samples were generally collected on desktops and at working levels (three to five feet above the floor). Field blank and duplicate samples were collected for quality control purposes. All samples were collected and analyzed in accordance with the EPA Method

Number TO-10A. EH&E sent the collected samples under chain of custody to Alpha Analytical Laboratories (Westborough, Massachusetts) for analysis.

Air sample results are presented in Table 1.

<b>Table 1</b> Air Sample Results from Low-rise Building at the Lederle Graduate Research Center, University of Massachusetts, Amherst, Massachusetts, June 5, 2007			
<b>Sample ID</b>	<b>Location, Description</b>	<b>Air Volume (liters)</b>	<b>Concentration (<math>\mu\text{g}/\text{m}^3</math>)</b>
83933	Room A155/ 157	4,326	0.39
83934	Duplicate of 83933	4,290	0.44
83935	Hallway outside A-141	4,404	0.32
83936	Outdoor, main entrance	4,368	0.05
83937	Field blank	NA	0.06 $\mu\text{g}$

$\mu\text{g}/\text{m}^3$  micrograms per cubic meter  
 NA not applicable  
 $\mu\text{g}$  micrograms

National Institute for Occupational Safety and Health (NIOSH) recommended exposure limit (REL) for total PCBs is 1  $\mu\text{g}/\text{m}^3$ .

Samples analyzed by Alpha Analytical Laboratories (Westborough, MA) following EPA Method TO-10A.

Air sample results collected from the computer room are slightly lower than air sample results collected from the rest of the low-rise in August 2006. These results are lower than the National Institute of Occupational Health (NIOSH) Relative Exposure Limit (REL) of 1.0  $\mu\text{g}/\text{m}^3$ . However, these results from the computer room are still reflective of pre-abatement conditions. Upon completion of the abatement work, air concentrations in the low-rise are proposed to remain below 0.29  $\mu\text{g}/\text{m}^3$  to maintain potential indoor exposures well below health risk guidelines developed for this specific work environment.

## WIPE SAMPLES

Wipe samples were collected from locations within the computer room and AC-1, the air handling unit that supplies the computer room, to assess PCB concentrations in settled dust. Each wipe sample was obtained by wiping a prescribed, controlled surface area (e.g., one square foot). Method blanks and field blanks were collected for quality control purposes. Wipe samples were collected using sterile gauze soaked in hexane. Analysis for PCBs was conducted by Groundwater Analytical, Inc. using gas chromatography/electron capture detection (GC/ECD) following EPA Method 8082.

Wipe sample results are presented in Table 2.

<b>Table 2</b> Calculated Wipe Sample Results Collected from Low-rise Building, Lederle Graduate Research Center, University of Massachusetts, Amherst, Massachusetts, June 6, 2007					
<b>Sample ID</b>	<b>Floor</b>	<b>Location</b>	<b>Sample Description</b>	<b>Total Aroclors* (<math>\mu\text{g}/100\text{ cm}^2</math>)</b>	<b>Wipe Area (<math>\text{ft}^2</math>)</b>
83945	1	Room A-155	Desktop	<0.1	1.0
83946	1	Room A-155	Window ledge behind desk	16.4	1.0
83947	1	Room A-157	Desktop	<0.2	0.5
83948	1	Room A-157	Window ledge	7.8	0.6
83949	B	AC-1	Downstream of filters	3.6	0.3
83950	B	AC-1	Access port upstream of filters	86	0.03
83951	1	AC-1	Outdoor air intake	<0.9	0.1
83952	NA	Field blank	Field blank	ND < 1.0 $\mu\text{g}$	NA
83944	NA	Media blank	Media blank	ND < 1.0 $\mu\text{g}$	NA

$\mu\text{g}/100\text{ cm}^2$  micrograms per 100 square centimeters  
 $\text{ft}^2$  square feet  
 ND non-detect  
 NA not applicable

\* Aroclor 1016, 1221, 1232, 1242, 1248, 1254, and 1260 were analyzed.

Concentrations calculated based on wipe surface area.

Analysis performed by Groundwater Analytical (Buzzards Bay, Massachusetts) following U.S. Environmental Protection Agency (EPA) Method 8082 (GC/ECD).

Samples collected from accessible desktops in the computer room were below the reporting limits for PCBs (non-detect for PCBs). However, on window ledge surfaces that were generally hard to access, EH&E noted the presence of debris that may be related to the pressure washing activities (Photographs in Appendix B). Samples collected from two window ledges indicated the presence of PCBs in the wipe. The concentration of sample 83946 at 16.4  $\mu\text{g}/100\text{ cm}^2$  slightly exceeds the EPA's non-porous wipe standard for this type of surface (10  $\mu\text{g}/100\text{ cm}^2$ ). This window ledge is located behind a desk in room A-155 and it is generally not accessible.

Samples collected from AC-1, the air handling unit serving the computer room, showed limited impact from PCBs downstream of the filters and at the intake grills. One sample collected from the upstream access port for the air handling unit had concentrations of 86  $\mu\text{g}/100\text{ cm}^2$ , below the EPA standard of 100  $\mu\text{g}/100\text{ cm}^2$  for this type of surface. This access port has a small surface area with a high amount of accumulated dust. At the time of sampling, EH&E did not

want to shut down the air handling unit in order to access the fan box, which would be more indicative of dust accumulation within the air flow of the unit. Nonetheless, the air sampling data which shows that the levels of PCBs were below the NIOSH REL would have detected any elevated levels of PCBs from the air handling unit.

If you have any questions concerning this report, please contact either of us at 1-800-TALK EHE (1-800-825-5343).

Sincerely,



Maximilian P. Chang, M.S.  
Senior Scientist



Matt A. Fragala, M.S.  
Staff Scientist/Project Manager

Appendix A: Limitations  
Appendix B: Wipe Sample Photographs

cc: Brian Fitzpatrick, UMass  
Stephen Lobik, UMass

## **APPENDIX A**

### **LIMITATIONS**

1. Environmental Health & Engineering, Inc.'s (EH&E) indoor environmental quality assessment described in the attached report number 15066, *Additional Air and Wipe Sample Results from the Low-Rise Building at Lederle Graduate Research Center, University of Massachusetts, Amherst, Massachusetts* (hereafter "the Report"), was performed in accordance with generally accepted practices employed by other consultants undertaking similar studies at the same time and in the same geographical area; and EH&E observed that degree of care and skill generally exercised by such other consultants under similar circumstances and conditions. The observations described in the Report were made under the conditions stated therein. The conclusions presented in the Report were based solely upon the services described therein, and not on scientific tasks or procedures beyond the scope of described services.
2. Observations were made of the site as indicated within the Report. Where access to portions of the site was unavailable or limited, EH&E renders no opinion as to the condition of that portion of the site.
3. The observations and recommendations contained in the Report are based on limited environmental sampling and visual observation and were arrived at in accordance with generally accepted standards of industrial hygiene practice. The sampling and observations conducted at the site were limited in scope and, therefore, cannot be considered representative of areas not sampled or observed.
4. When an outside laboratory conducted sample analyses, EH&E relied upon the data provided and did not conduct an independent evaluation of the reliability of these data.
5. The purpose of the Report was to assess the characteristics of the subject site as stated within the Report. No specific attempt was made to verify compliance by any party with all federal, state, or local laws and regulations.

**APPENDIX B**  
**WIPE SAMPLE PHOTOGRAPHS**



**Photograph C.1** Room A-155, Sample 83945



**Photograph C.2** Room A-155, Sample 83946



**Photograph C.3** Room A-157, Sample 83947



**Photograph C.4** Room A-155, Sample 83948