PRELIMINARY REPORT OF BUILDING-RELATED POLYCHLORINATED BIPHENYLS ASSESSMENT LEDERLE GRADUATE RESEARCH COMPLEX, UNIVERSITY OF MASSACHUSETTS, AMHERST, MASSACHUSETTS

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LIST OF ABBREVIATIONS & ACRONYMS

Conte building	Conte National Center for Polymer Research
EH&E	Environmental Health & Engineering, Inc.
EPA	U.S. Environmental Protection Agency
LGRC	Lederle Graduate Research Complex
MCP	Massachusetts Contingency Plan
NIOSH	National Institute for Occupational Safety and Health
OSHA	U.S. Occupational Safety and Health Administration
PCB	polychlorinated biphenyl
ppm	parts per million
REL	recommended exposure limit
TSCA	Toxic Substances Control Act
TWA	time-weighted average
UMass Amherst	University of Massachusetts Amherst
$\mu g/m^3$	micrograms per cubic meter
$\mu g/100\ cm^2$	micrograms per 100 square centimeters

1.0 INTRODUCTION

Environmental Health & Engineering, Inc. (EH&E) is pleased to present this preliminary report for the ongoing building investigation of the Lederle Graduate Research Complex (LGRC) in Amherst, Massachusetts. At the request of the University of Massachusetts (UMass Amherst) EH&E conducted a preliminary sampling program to characterize and document the extent building-related sources of polychlorinated biphenyls (PCBs) in support of the exterior renovations and waterproofing project (the Renovation Project) for the LGRC. The LGRC address encompasses Tower A, Tower B, Tower C, the low-rise, and the Conte National Center for Polymer Research building (Conte building) that are referenced specifically throughout this report.

2.0 EXECUTIVE SUMMARY

As requested by UMass Amherst EH&E executed a detailed sampling program to characterize the nature and extent of PCB-containing (e.g., greater than [>] 50 parts per million [ppm]) exterior caulking on the façade of Towers A, B, C, and the low-rise identified during recent façade work. In addition, EH&E collected wipe and air samples from the LGRC to assess potential occupant exposures from exterior building-related products.

Sample results collected by EH&E indicate the following:

- PCBs found along the original exterior panel caulking materials from Towers B and C do *not* exceed EPA's regulatory threshold of 50 ppm. Panel caulking from Tower B and C ranged from less than 1.0 to 4.0 ppm. Caulking from both Towers B and C would be classified as excluded PCB containing materials by the U.S. Environmental Protection Agency (EPA). EH&E has provided the EPA with documentation of the sample results for Towers B and C and has notified the EPA that ongoing work may continue for those two towers provided UMass Amherst employs prudent and practical measures to control the release of caulking and caulking residues to the environment (see Appendix D).

- Wipe samples collected from Tower A and the low-rise were generally well below the EPA's clean-up acceptance criterion of 10 micrograms per 100 square centimeters ($\mu g/100\ cm^2$). One sample taken from a window ledge in the library of the low-rise tested at 34 $\mu g/\ 100\ cm^2$. This area may have been impacted by pressure washing activities associated with the Renovation Project. EH&E has recommended and has undertaken additional sampling to verify the sample results.

- Subsequent samples were taken from five additional window ledges and other work surfaces in the library on September 6, 2006. Sample results from the five window ledges ranged from 2.0 to 27.6 $\mu g/100\ cm^2$. Sample results from other surfaces in the library and ventilation systems serving the library ranged from below detection limit to 1.0 $\mu g/100\ cm^2$. Immediately following the sampling, UMass Amherst

contracted the services of Clean Harbors Inc. to conduct a thorough cleaning of the library as a precaution.

- Air samples taken from the Conte building, Tower A, Tower B, and Tower C were well below the National Institute for Occupational Safety and Health (NIOSH) recommended exposure limit (REL) of 1.0 microgram per cubic meter ($\mu g/m^3$). Sample results from these areas ranged from below the detection limit to 0.24 $\mu g/m^3$.

- Air samples taken from the low-rise were generally below the NIOSH REL. Samples from the north side of the low-rise ranged from 0.44 to 0.69 $\mu g/m^3$. Two samples collected from the library were above 1.0 $\mu g/m^3$. One sample from the first floor of the library was at 1.1 $\mu g/m^3$ and one sample on the second floor was at 1.2 $\mu g/m^3$. Unlike the north side of the low-rise, the library façade on the south side has exposed panel joints open to the exterior due to the removal of exterior caulking in the area. EH&E recommended increasing ventilation rates in the library for outdoor air and total supply air to increase air exchange and pressurize the library as an interim measure. On September 6, 2006, EH&E collected additional air samples from the library.

- Library air sample results from September 6, 2006, ranged from 0.22 to 0.64 $\mu g/m^3$. These results indicate that the increase in ventilation was successful in reducing the air concentration of PCBs seen in the library. EH&E will conduct periodic air sampling in the library to monitor air concentrations until implementation of an approved abatement plan to address the exterior caulking.

- Exterior panel caulking collected from Tower A and the low-rise was confirmed to contain PCBs in excess of 50 ppm. Pilot tests collected from three locations indicated that PCBs are found at 1.0 ppm at a depth of two inches in the concrete panels.

- Ashphalt stained by runoff from the dumpster that contained the PCB caulking contains PCBs in excess of 140 ppm. This stained area will need to be removed and disposed of as PCB remediation waste. In addition, the soil underneath this section

of asphalt will need to be tested to determine if PCB residues leached through the asphalt.

Please note that this Report is subject to the Limitations in Appendix A. Appendix B provides Sample Results and Appendix C provides Selected Photographs.

3.0 BACKGROUND

The LGRC consists of three towers (Towers A, B, and C), a low-rise building, and the Conte building. Tower A and the low-rise were completed in 1972 and Towers B and C were completed in 1974. The Conte building was constructed in the 1990s. Towers A, B, and C are each 17 stories and the low-rise building is three stories.

The three towers house Astronomy, Biochemistry, Chemistry, and Mathematics departments. The low-rise houses the Physical Sciences library and the Office of Information Technology for UMass Amherst. Undergraduate classrooms are interspersed throughout the LGRC.

EH&E understands that UMass Amherst has undertaken an exterior renovation and rehabilitation project for the towers and the low-rise that involves securing existing concrete panels to address current structural safety concerns. The structural renovation work also includes upgrading the existing sealants associated with the exterior façade. All work will be conducted from the outside and does not include the replacement of existing window frames, although glass windows may be replaced in some locations on the three towers.

As part of the project, a number of samples were taken in June 2006 to identify possible hazardous materials that may be disturbed during the scheduled work. Specifically, panel sealant materials from the LGRC were tested for PCBs. PCBs were detected in concentrations above 50 ppm from caulking from Tower A and the low-rise. In July the project team collected additional samples from LGRC to confirm the presence of PCBs in caulking from LGRC. These samples appeared to confirm that samples from Tower A and the low-rise contained PCBs in excess of 50 ppm, but results from Towers B and C were inconclusive.

UMass Amherst has requested that EH&E collect additional samples from the LGRC to:

- Address occupant safety concerns
- Refine the nature and extent of the PCB caulking in the LGRC

- Collect additional samples needed to prepare for federal and/or state regulatory requirements

EH&E understands that both federal and state regulatory agencies have been notified of the presence of building-related PCBs associated with the exterior caulking. Federal Toxic Substances Control Act (TSCA) legislation regulates the presence of unauthorized PCBs (e.g., caulking with a concentration of > 50 ppm). Because the caulking came into contact with the soils surrounding the complex; state regulators under the authority of the Massachusetts Contingency Plan (MCP) have been notified that there may be soil contamination.

Under TSCA legislation, UMass Amherst will need to develop an approved abatement plan to remove regulated exterior caulking. This report covers the findings related to federal requirements. Under the MCP, UMass Amherst will need to develop an approved soil remediation plan to identify and remove contaminated soils. Soil reports and MCP filing have been and will be submitted to UMass Amherst under separate covers.

4.0 SAMPLING PROGRAM

Based on observations of the LGRC and discussions with UMass Amherst personnel, EH&E's samples were categorized into five homogenous types of exterior caulking and bulk materials for the LGRC as outlined in Table 4.1. The wipe samples were categorized into three groups, as outlined in Table 4.2.

Table 4.1 Bulk Sampling Plan and Results Summary, Lederle Graduate Research Complex, Amherst, Massachusetts

Homogenous Unit	Bulk Sampling Category	Number of Samples[1]	PCBs > 50 ppm
Tower B	Exterior panel caulking	11	No
Tower C	Exterior panel caulking	11	No
Low-rise	Exterior panel caulking and core samples	13	Yes
Tower A	Exterior panel caulking and core samples	14	Yes
Asphalt sample	Bulk asphalt	3	Yes

PCB polychlorinated biphenyl
> greater than
ppm parts per million

[1] Includes control samples

Table 4.2 Wipe Sampling Plan and Results Summary, Lederle Graduate Research Complex, Amherst, Massachusetts

Homogenous Unit	Wipe Sampling Category	Number of Samples[1]	PCBs > 10 µg/100 cm^2
Low-rise	Work surface areas and ventilation surfaces	11	No
Low-rise	Window ledges	4	Yes
Tower A	Work surface areas and ventilation surfaces	15	No

PCB polychlorinated biphenyl
> greater than
ppm parts per million
µg/100 cm^2 micrograms per 100 square centimeters

[1] Includes control samples

Air sample numbers and results are summarized in Table 4.3.

Table 4.3 Air Sampling Plan and Results Summary, Lederle Graduate Research Complex, Amherst, Massachusetts

Homogenous Unit	Samples[1]	PCBs > 1.0 µg/m^3
Conte Building	3	No
Towers B and C	4	No
Tower A	4	No
Low-rise (August 21, 2006)	5	Yes
Library (September 6, 2006)	8	No

PCB polychlorinated biphenyl
> greater than
µg/m^3 micrograms per cubic meter

[1] Includes duplicate samples, but does not include other quality control samples

As requested by UMass Amherst, EH&E's sampling strategy focused on the following priorities:

- Determine if panel caulking from Towers B and C contain PCBs in excess of regulatory threshold of 50ppm.
- Determine indoor air concentrations of PCBs in the LGRC to address occupant health concerns.
- Conduct wipe samples of work surfaces in Tower A and the low-rise to address occupant health concerns.
- Determine migration depth of PCBs in concrete panels from Tower A and the low-rise.
- Assess if additional remediation work may be required from the construction dumpster location.
- Assess soil conditions as applicable to MCP requirements (report to be filed under separate cover).

5.0 SAMPLE RESULTS

On August 21 and 22, 2006, EH&E conducted a sampling program to satisfy the goals of the proposed sampling strategy. Based on initial sampling results, EH&E collected additional air and wipe samples from the physical sciences library on September 6 and 7, 2006. Complete sample results are presented in Appendix B.

5.1 TOWER B AND C CAULKING RESULTS

EH&E collected 22 bulk samples of caulking from Towers B and C. All of the sample results were well below 50 ppm, the regulatory threshold for an unauthorized non-liquid PCB product as defined by the EPA. The 22 samples ranged from 0.2 to 3.3 ppm for both towers. Sample results are summarized in Appendix B of this report. On September 19, 2006, EH&E communicated the Towers B and C sample results in a summary letter to Kimberly Tisa, the U.S. Region One PCB Coordinator, that included some practical, reasonable, precautionary measures that UMass Amherst were to follow to reduce the potential release of caulking or caulking residues to the environment (see Appendix D).

5.2 AIR SAMPLE RESULTS

In order to assess occupant concerns about building related caulking, EH&E collected air samples from all five buildings of the LGRC. EH&E sampled the Conte building to control for building age, since the Conte building was constructed well after PCBs were phased out of commercial use. Complete air sample results are presented in Appendix B. Sample results indicate that air concentrations seen in the Conte building and in Towers B and C were generally below reporting limits or were generally very low.

Sample results from the August 21, 2006, sampling are as follows:

- Conte Building: All three samples were below reporting limits (reporting limits ranged between 0.08 and 0.09 $\mu g/m^3$).
- Towers B and C: All four samples were below reporting limits (reporting limits ranged from 0.05 to 0.28 $\mu g/m^3$).
- Tower A: The three samples from Tower A ranged from 0.18 to 0.24 $\mu g/m^3$).

- Low-rise (excluding library): The three samples from the low-rise, excluding the library ranged from 0.44 to 0.69 $\mu g/m^3$).

Air sample results from the library location showed slightly elevated airborne concentrations of PCBs relative to the NIOSH REL; however, the air concentrations seen in the library were 500 times lower than the U.S. Occupational Safety and Health Administration (OSHA) time-weighted average (TWA). EH&E understands that in July 2006 contractors had removed some, but not all, of the old caulking on the south side of the low-rise building. The removed caulking exposed voids between the concrete panels in the low-rise, potentially allowing air to infiltrate the building. This air would have passed over the exposed caulking residues. In communications with the EPA, EH&E and UMass Amherst have requested to place foam backer rods into these voids as an interim measure to prevent air infiltration until an approved abatement plan can be implemented. Along the north side of the low-rise, where the building is weather-tight, air concentrations were lower than the south side.

Based on the two air sample results, EH&E recommended that UMass Amherst increase ventilation rates and increase outdoor air to flush the library area and pressurize the space, thereby reducing air concentrations. In addition, EH&E recommended that additional air sampling be conducted within the library to verify that the increased ventilation rates and space pressurization were effective in reducing the air concentrations seen in the library. On September 6, 2006, EH&E conducted additional air sampling in the library. Results of the air sampling are presented in Table B.2 of Appendix B.

Air samples results from the sampling on September 6, 2006, were lower than the sample results taken on August 21, 2006. Concentrations from the sampling on September 6, 2006, ranged from 0.22 to 0.64 $\mu g/m^3$, similar to the previous results for the north side of the low-rise. Additional air samples were collected in the library on September 22, 2006, to evaluate if the additional cleaning in the library had an effect in further reducing air concentrations in the library. The results will be presented in a follow-up report.

5.3 WIPE SAMPLE RESULTS

Wipe samples collected from the low-rise and Tower A were generally well below the EPA PCB clean-up standard acceptance criterion of 10 μg/100 cm^2. Sample results are presented in Table B.7 of Appendix B. Sample locations were photographed by EH&E and are included as Appendix C. Samples generally ranged from non-detect (nominal detection limit of 0.1 μg/100 cm^2) to 3 μg/100 cm^2. One sample collected in the library was at 34 μg/100 cm^2. EH&E collected this sample from a low window ledge in the main reading room of the library. On September 6, 2006, EH&E collected additional wipe samples from the library to determine if the single sample was an aberration or indicative of interior contamination possibly from power washing activities that occurred around the windows and panels.

Sample results from September 6, 2006, are presented in Table B.8 of Appendix B. Window ledge samples ranged from 7.9 to 22.6 μg/100 cm^2, indicating that power washing activities may have forced caulking residues onto ledge surfaces. Samples from work surfaces in the library and the ventilation system serving the library ranged from below the detection limit of 0.06 μg/100 cm^2 to 3.1 μg/100 cm^2. One sample from an exterior concrete surface was at 5.6 μg/100 cm^2. Immediately following EH&E's sampling on September 6, 2006, UMass Amherst contracted the services of Clean Harbors to conduct an intensive cleaning of the library. On September 22, 2006, EH&E collected additional wipe samples from the library to verify the effectiveness of the cleaning effort. Results from the sampling on September 22 will be submitted under a separate cover.

5.4 CONCRETE SAMPLE RESULTS

As part of EH&E's sampling strategy, EH&E collected bulk caulking samples from the pre-cast concrete panels, followed by drilling core holes at specific distances away from the caulking joint. The goal of this sampling regime was to assess the depth the amount of lateral migration of PCB residues potentially associated with the caulking. The following photograph taken from the low-rise illustrates the sampling holes drilled as part of the migration study.

Photograph 5.1 Photograph of Core Holes Taken at Various Distance Away from Caulking Edge

Sample results are presented in Table B.3 of Appendix B. Sample Results indicated that porous materials in contact with the panel caulking from Tower A and the low-rise contain PCBs in excess of 50 ppm at least 0.25 inches away from the caulking. Samples at 0.25 inches away ranged from 12 to 92 ppm from the three locations. At a distance of one and one-half inches away from the panel joint, sample results ranged from 0.8 to 2 ppm. At a distance of three inches away from the panel joint, sample results ranged from 0.4 to 1.9 ppm. These results suggest that PCB residues associated with the caulking may have penetrated the concrete panel at least 0.25 inches away from the caulking joint and potentially up to 3 inches away at concentrations above 1.0 ppm, the EPA's clean-up acceptance criterion for unrestricted use of porous surfaces in contact with PCB remediation waste.

5.5 ASPHALT SAMPLING

Two asphalt samples from the dumpster location were above one ppm; one sample was found to contain 140 ppm and one sample was found to be at 1.4 ppm. A third sample collected in the area was found to be below one ppm. Based on the definition of remediation wastes associated with the release of bulk product PCBs, the contaminated asphalt area needs to be removed, and adjoining sections need to be below 1 ppm. EH&E would recommend additional sampling to delineate how much asphalt needs to

be removed as part of the abatement plan and to determine if PCBs leached into the soil underneath the asphalt of concern. If there is leaching into the soil, EH&E would have to develop a response consistent with MCP requirements.

6.0 CONCLUSION

EH&E identified regulated PCB-containing (> 50 ppm) caulking associated with Tower A and the low-rise. These two buildings will require the implementation of an EPA approved abatement and remediation plan to remove PCB containing caulking and associated materials in contact with the caulking.

Original exterior caulking found on Towers B and C do not contain PCB caulking above the 50 ppm regulatory threshold. EH&E has submitted a letter to the EPA documenting the sample results from Towers B and C, notifying the EPA and UMass Amherst that the original exterior work may proceed for Towers B and C only, provided some practical measures are followed to reduce the potential release of caulking or caulking residues to the environment.

Air sample results from the library show a marked decrease in PCB air concentrations following increased ventilation rates. EH&E and UMass Amherst will continue to conduct periodic air sampling of the library to insure that air concentrations remain low while awaiting approval to implement a remediation plan for the building.

Based on the sampling results, EH&E recommends the following actions:

- Conduct periodic air monitoring of the library area to ensure that air concentrations remain as low as possible until an approved abatement plan is implemented. as part of the additional sampling, EH&E recommends the development and implementation of a risk communication strategy for the library staff.

- UMass Amherst may proceed with EPA approved interim measures (installation of temporary backer roads) for the low-rise building and to continue work with Towers B and C with the appropriate control measures, as specified in the letter in Appendix D.

- Confer with the project team to determine the extent of proposed restoration work and to evaluate abatement options for Tower A and the low-rise, including discussions concerning applicable acceptance clean-up standards.

- Develop an alternative abatement plan for Tower A and the low-rise to be submitted for review and approval by the EPA in accordance with TSCA requirements (40 CFR §761.79(h)). In conversations with the EPA, this would include development of a risk-based indoor air concentration for Tower A and the low-rise.

- Conduct detailed air and wipe sampling of the library for PCB homologs and dioxin-like congeners. These sample results will be incorporated into the risk assessment that will be developed for the risk-based indoor air concentration.

- Under separate cover, conduct soil sampling and reporting associated with MCP compliance requirements.

APPENDIX A

LIMITATIONS

LIMITATIONS

1. Environmental Health & Engineering, Inc.'s (EH&E) indoor air assessment described in the attached report number 14680, *Preliminary Report of Building-Related Polychlorinated Biphenyls Assessment, Lederle Graduate Research Complex, 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 presence of chemical residues, or to the presence of indirect evidence relating to chemical residues in 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

SAMPLE RESULTS

Table B.1 Air Sample Results from Lederle Graduate Research Center, University of Massachusetts, Amherst, Massachusetts, August 21, 2006

Sample ID	Location, Description	Air Volume (liters)	Concentration ($\mu g/m^3$)
79166-67	Rear, near dock	825	ND<0.07
79168-69	Rear, near dock	1,187	ND<0.05
79170-71	Tower C, Room 1535	1,431	0.05
79172-73	Tower B, Room 1530	792	ND<0.08
79174-75	Tower A, hall outside Room 1214	1,396	0.24
79176-77	Tower A, Room 801	1,364	0.23
79178-79	Tower A, Room 602	1,315	0.18
79182-83	Tower B 317A	216	ND<0.28
79184-85	Tower C, Room 430	1,344	0.05
79188-89	Low-rise, room A211B	1,379	0.69
79190-91	Library low-rise, first floor	1,396	1.1
79192-93	Second floor library office	952	1.2
79194-95	Low-Rise, Room A322	812	0.44
79196-97	Low-Rise, Room A322	585	0.47
79198-99	Conte, Room A610 desk	719	ND<0.08
79200-01	Conte, Room B422 lab table	704	ND<0.09
79202-03	Conte, Room A111	657	ND<0.09
79204-05	Tower A, Room1606	652	0.20
79206-07	Field blank	NA	ND<0.06 μg

$\mu g/m^3$ micrograms per cubic meter
ND non-detect
NA not applicable
μg micrograms

Pumps for samples 79180-81 and 79186-87 failed, so no concentration for either sample was available for calculation. Concentrations reported in total polychlorinated biphenyls (PCBs). Laboratory reported predominant pattern of Aroclor 1248. National Institute for Occupational Safety and Health (NIOSH) recommended exposure limit (REL) for total PCBs is 1 $\mu g/m^3$.

Samples analyzed by Galson Laboratories (East Syracuse, New York) following NIOSH method 5503.

Table B.2 Air Sample Results from Engineering Library at the Lederle Graduate Research Center, University of Massachusetts, Amherst, Massachusetts, September 6, 2006

Sample ID	Location, Description	Air Volume (liters)	Concentration ($\mu g/m^3$)
79726-27	Floor 1, southeast end	1,042	0.58
79728-29	Floor 1, southwest end	1,074	0.62
79730-31	Floor 1, southwest end	1,074	0.64
79732-33	Floor 2, Library office southeast end	1,109	0.57
79734-35	Floor 2, Reference desk	1,148	0.22
79736-37	Floor 2, southwest end	1,075	0.48
79738-39	Floor 3, outside Room A365	1,016	0.52
79740-41	Floor 3, southwest corner	1,146	0.46
79744-45	Field blank	NA	ND<0.06μg

$\mu g/m^3$ micrograms per cubic meter
ND non-detect
NA not applicable
μg micrograms

Pump for sample 79742-43 failed, so no concentration was available for calculation. Concentrations reported in total polychlorinated biphenyls (PCBs). Laboratory reported predominant pattern of Aroclor 1248. National Institute for Occupational Safety and Health (NIOSH) recommended exposure limit (REL) for total PCBs is 1 $\mu g/m^3$.

Samples analyzed by Galson Laboratories (East Syracuse, New York) following NIOSH method 5503.

Table B.3 Panel Caulking and Concrete Core Sample Results from Lederle Graduate Research Center, University of Massachusetts, Amherst, Massachusetts, August 21, 2006

Sample ID	Building	Side	Type	Description	Distance from Corner Caulking	Aroclor 1254[1,2] (ppm)	Notes
79246	Low-rise	East	Bulk	Panel caulking	NA	74,000	2C(73,000)
79247	Low-rise	East	Core	South side bumpout	3.0” away caulking	1.9	2C(1.6)
79248	Low-rise	East	Core	South side bumpout	1.5” away caulking	2	2C(1.7)
79249	Low-rise	East	Core	South side bumpout	0.25” away caulking	92	2C(85)
79250	Tower A	West	Bulk	Panel caulking	NA	57,000	2C(56,000)
79251	Tower A	West	Core	West end	3.0” away caulking	0.4	2C(0.3)
79252	Tower A	West	Core	West end	2.0” away caulking	0.4	2C(0.3)
79253	Tower A	West	Core	West end	1.0” away caulking	0.8	2C(0.6)
79254	Tower A	West	Core	West end	0.25” away caulking	40	2C(34)
79255	Tower A	West	Bulk	Panel caulking	NA	57,000	2C(53,000)
79256	Tower A	West	Core	South end	3.0” away caulking	0.9	2C(0.7)
79257	Tower A	West	Core	South end	1.5” away caulking	1.8	2C(1.3)
79405	Tower A	West	Core	South end	0.25” away caulking	12	2C(9.5)

ppm parts per million
NA not applicable
2C Confirmation concentration reported from second column quantification

[1] Polychlorinated biphenyl (PCB) concentration analysis performed by Groundwater Analytical, Inc., using U.S. Environmental Protection Agency (EPA) method 8082 (GC/ECD).
[2] Aroclor 1016, 1221, 1232, 1242, 1248, and 1260 also tested. All results below reporting levels, unless noted.

Table B.4 Bulk Sample Results from Dumpster Site at Lederle Graduate Research Center, University of Massachusetts, Amherst, Massachusetts, August 21, 2006

Sample ID	Location	Description	Aroclor 1254[1,2] (ppm)	Notes
79258	Dumpster	"Stained" asphalt sample 1	1.4	2C(1.2)
79259	Dumpster	"Stained" asphalt sample 2	140	2C(110)
79260	Dumpster	Downgrade of stain on asphalt	0.3	2C(0.3)

ppm parts per million
2C Confirmation concentration reported from second column quantification

[1] Polychlorinated biphenyl (PCB) concentration analysis performed by Groundwater Analytical, Inc., using U.S. Environmental Protection Agency (EPA) method 8082 (GC/ECD).
[2] Aroclor 1016, 1221, 1232, 1242, 1248, and 1260 also tested. All results below reporting levels, unless noted.

Table B.5 Panel Caulking Sample Results from Tower C of Lederle Graduate Research Center, University of Massachusetts, Amherst, Massachusetts, August 21, 2006

Sample ID	Building	Floor	Side	Description	Aroclor 1254[1,2] (ppm)	Notes
79406	Tower C	17	North	Caulking from horizontal panel joint (whitish)	1.0	1C(1.0)
79407	Tower C	15	North	Caulking from horizontal panel joint (whitish)	1.0	1C(0.9)
79408	Tower C	15	North	Duplicate of 79407	1.1	2C(1.1)
79409	Tower C	13	North	Caulking (whitish)	0.6	1C(0.6)
79410	Tower C	11	North	Horizontal and vertical panel caulking (whitish)	1.7	1C(1.7)
79411	Tower C	9	North	Horizontal panel caulking (whitish)	1.5	1C(1.5)
79412	Tower C	7	North	Caulking from panel joint (whitish)	2.8	1C(2.6)
79413	Tower C	5	North	Caulking from panel joint (whitish)	2.8	2C(2.4)
79414	Tower C	4	North, east bumpout	Panel joint caulking (whitish)	3.3	2C(3.0)
79415	Tower C	2	North, east bumpout	Panel joint caulking (whitish)	1.2	2C(1.1)
79416	Tower C	2	North, east bumpout	Thinner panel joint caulking from 79415	3.0	2C(2.9)

ppm parts per million
1C Confirmation concentration reported from first column quantification
2C Confirmation concentration reported from second column quantification

[1] Polychlorinated biphenyl (PCB) concentration analysis performed by Groundwater Analytical, Inc., using U.S. Environmental Protection Agency (EPA) method 8082 (GC/ECD).
[2] Aroclor 1016, 1221, 1232, 1242, 1248, and 1260 also tested. All results below reporting levels, unless noted.

Table B.6 Exterior Panel Caulking Bulk Sample Results from Tower B of Lederle Graduate Research Center, University of Massachusetts, Amherst, Massachusetts, August 22, 2006

Sample ID	Building	Floor	Side	Description	Aroclor 1254[1,2] (ppm)	Notes
78155	Tower B	16	West	Bottom, southwest corner	1.4	1C(1.3)
78156	Tower B	14	West	Top, line on the first panel	0.2	1C(0.2)
78157	Tower B	12	West	Top, middle right panel	0.3	1C(0.2)
78158	Tower B	10	West	Bottom, middle left panel	0.8	1C(0.7)
78159	Tower B	9	West	Top, corner bead for the western panel	2.8	2C(2.7)
78160	Tower B	7	West	Bottom, corner bead for the western panel	0.9	1C(0.7)
78161	Tower B	5	West	Bottom, middle left panel	0.5	1C(0.5)
78162	Tower B	3	West	Top, middle right panel	0.8	1C(0.7)
78163	Tower B	1	West	Southwest corner	1.6	1C(1.4)
78167	Tower B	1	North	Window/panel interface	2.5	1C(2.3)
78168	Tower B	1	North	Panel caulking	2.5	1C(2.4)

ppm parts per million
1C Confirmation concentration reported from first column quantification
2C Confirmation concentration reported from second column quantification

[1] Polychlorinated biphenyl (PCB) concentration analysis performed by Groundwater Analytical, Inc., using U.S. Environmental Protection Agency (EPA) method 8082 (GC/ECD).
[2] Aroclor 1016, 1221, 1232, 1242, 1248, and 1260 also tested. All results below reporting levels, unless noted.

Table B.7 Wipe Sample Results Collected from Tower A and Low-Rise Building, Lederle Graduate Research Center, University of Massachusetts, Amherst, Massachusetts, August 22, 2006

Sample ID	Location	Sample Description	Aroclor 1254* (μg/100 cm^2)	Notes	Wipe Area (ft^2)
79210	Tower A, Floor 16, Rm 1609	Desk next to window	0.2	2C(0.2)	1.0
79211	Tower A, Floor 15	Black window ledge elevator lobby	0.5	2C(0.5)	1.0
79212	Tower A, Floor 14, Rm 1404	Window ledge right	1.5	2C(1.4)	0.3
79213	Tower A, Floor 12	Black window ledge elevator lobby	0.9	2C(0.8)	1.0
79214	Tower A, Floor 11, Rm 1105	Window ledge interior side vent	0.4	2C(0.3)	0.7
79215	Tower A, Floor 10, Rm 1006	Desk top upper left corner	0.2	1C(0.2)	1.0
79216	Tower A, Floor 9	Window ledge in elevator	0.3	2C(0.3)	1.0
79217	Tower A, Floor 8, Rm 802	Microscope desk	0.3	2C(0.2)	1.0
79218	Tower A, Floor 7, Rm 707	Kitchen counter top	BRL <0.1	NA	1.0
79219	Tower A, Floor 6, Rm 608	Shelf above desk	0.5	1C(3.9)	1.0
79220	Tower A, Floor 5, Rm 503	Window ledge	1.1	2C(1.1)	0.8
79221	Tower A, Floor 4, Rm 404	Counter top next to computer	BRL <0.1	NA	1.0
79222	Tower A, Floor 3	Window ledge in elevator lobby	3.7	2C(3.3)	1.0
79223	Tower A, Floor 2, Rm 204	Teacher's desk	0.2	2C(0.2)	1.0
79224	Tower A, Floor 1, entrance	Window ledge in lobby	0.6	2C(0.5)	0.8
79225	Media blank	Media blank	BRL <1.0	NA	NA
79226	Field blank	Field blank	BRL <1.0	NA	NA
79227	Low-rise, A307	Desk next to door	0.2	1C(0.2)	1.0
79228	Low-rise, Floor 3	Window ledge in hall outside A311	5.2	2C(4.1)	0.5
79229	Low-rise, A323	Desk top in office	0.3	1C(0.3)	1.0
79230	Low-rise Floor 3, library	Window ledge southeast corner	3.1	2C(2.9)	1.0
79231	Low-rise, Floor 3, library	Table top southwest corner	0.3	2C(0.3)	1.0
79232	Low-rise, Floor 2, library	Top microfiche cabinet northeast corner	0.2	1C(0.1)	1.0
79233	Low-rise, Floor 2, library	Window frame top of wood face southwest	2.5	2C(2.3)	0.5
79234	Low-rise, Floor 2, A-20913	Window ledge	BRL <0.2	NA	0.5

Table B.7 Continued

Sample ID	Location	Sample Description	Aroclor 1254* (µg/100 cm^2)	Notes	Wipe Area (ft^2)
79235	Low-rise, Floor 2, 234	Center work station	0.3	2C(0.3)	1.0
79236	Low-rise, A265	Table surface in office	0.5	2C(0.4)	1.0
79237	Low-rise, Floor 1, email kiosk	Table at kiosk	0.4	1C(3.3)	1.0
79238	Low-rise A125C	Window ledge	0.6	2C(0.5)	0.7
79239	Low-rise A139	Window ledge	1.3	1C(1.3)	0.7
79240	Low-rise Floor 1, library	Center of south wall window ledge	34.4	2C(22.6)	1.0
79241	Low-rise Floor 1, library	Stairwell workstation	1.0	2C(0.9)	1.0
79242	Media blank	Media blank	BRL <1.0	NA	NA
79243	Field blank	Field blank	BRL <1.0	NA	NA

Rm room
BRL below reporting limit
NA not applicable
µg/100 cm^2 micrograms per 100 square centimeters
ft^2 square feet
1C Confirmation concentration reported from first column quantification
2C Confirmation concentration reported from second column quantification

* Aroclor 1016, 1221, 1232, 1242, 1248, and 1260 were also tested, but concentrations were below reporting limits.

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

Table B.8 Wipe Sample Results Collected from Engineering Library, Lederle Graduate Research Center, University of Massachusetts, Amherst, Massachusetts, September 6, 2006

Sample ID	Floor	Location	Sample Description	Aroclor 1254* (μg/100 cm^2)	Notes	Wipe Area (ft^2)
79746	1	Library south wall (row 53)	Ledge next to tables under windows	7.9	2C(7.0)	1.0
79747	1	Library south wall, southwest corner	Ledge next to tables under windows	22.6	2C(15.1)	1.0
79748	1	Bookshelf	Adjacent to back side of stairwell	0.1	2C(0.1)	1.7
79749	1	Table, southeast corner	Table top	0.5	2C(0.4)	1.0
79750	1	Bottom stair	Stair surface	0.5	2C(0.5)	1.0
79751	2	South wall, window ledge	Empty cube, office area	3.1	2C(2.6)	1.0
79752	2	South wall, southeast corner	Empty cube, desk surface	0.1	2C(0.1)	1.0
79753	2	North wall, computer workstation	Back of computer table	0.3	2C(0.3)	1.0
79754	2	South wall, southwest corner	Ledge next to tables under windows	2.7	2C(2.3)	1.0
79755	2	Floor, front door of library	Wipe of floor tile	0.1	2C(0.1)	1.0
79756	1+2	Stairwell between floors 1 and 2	Bottom stair	0.7	2C(0.6)	1.0
79757	1	Lobby entrance way	Surface wipe	0.4	2C(0.4)	1.0
79758	1	Concrete outside door	Surface wipe	5.6	2C(4.0)	1.0
79759	1	Library entrance	Surface wipe	0.3	2C(0.3)	1.0
79760	3	South wall, window ledge	Row 60	1.0	2C(0.9)	0.9
79761	3	North wall, window ledge	Surface wipe	2.0	2C(1.8)	1.0
79762	1	Outdoor air intake	Wipe of intake surface	0.2	2C(0.2)	1.0
79763		Mixing box at return supply junction	Wipe of surface for AC6	0.6	2C(0.5)	1.0
79764		Mixing box return	Wipe of surface for AC7	0.4	2C(0.4)	1.0
79765	3	East wall	Conference room, window ledge	17.2	16.1	1.0
79766	2	East wall	Bookshelf	ND<0.06	NA	1.7
79767	2	Return, west side	Return grill	0.3	2C(0.3)	1.8
79768	2	Supply, east side	Supply	ND<0.07	NA	1.5
79769		Field blank	Field blank	ND<1.0 μg	NA	NA

Table B.8 Continued

$\mu g/100\ cm^2$	micrograms per 100 square centimeters
ft^2	square feet
2C	Confirmation concentration reported from second column quantification
μg	microgram
ND	non-detect
NA	not applicable

* Aroclor 1016, 1221, 1232, 1242, 1248, and 1260 were also tested, but concentrations were below reporting limits.

Concentrations calculated based on wipe surface area.

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

Table B.9 Dust Thimble Results from Engineering Library, Lederle Graduate Research Center, University of Massachusetts, Amherst, Massachusetts, September 6, 2006

Sample ID	Building	Floor	Description	Aroclor 1254[1,2] (ppm)	Notes
79770	Low-rise library	1	South wall, table chair area 32" x 119" vacuumed surface area	10	2C(8.6)
79771	Low-rise library	2	Carpet at entrance 67.5" x 142" vacuumed surface area	10	2C(9.1)
79772	Low-rise library	3	Under table, conference room A365A 4' x 6' vacuumed surface area	37	2C(35)
79773	NA	NA	Field blank; dust thimble	BRL<0.7	NA

ppm parts per million
2C Confirmation concentration reported from second column quantification
BRL Below reporting limits
NA Not applicable

[1] Polychlorinated biphenyl (PCB) concentration analysis performed by Groundwater Analytical, Inc., using U.S. Environmental Protection Agency (EPA) method 8082 (GC/ECD).
[2] Aroclor 1016, 1221, 1232, 1242, 1248, and 1260 also tested. All results below reporting levels, unless noted.

APPENDIX C

WIPE SAMPLE PHOTOGRAPHS

WIPE SAMPLE PHOTOGRAPHS

Photograph C.1 Tower A, Sample 79210

Photograph C.2 Tower A, Sample 79211

Photograph C.3 Tower A, Sample 79212

Photograph C.4 Tower A, Sample 79313

Photograph C.5 Tower A, Sample 79214

Photograph C.6 Tower A, Sample 79215

Photograph C.7 Tower A, Sample 79216

Photograph C.8 Tower A, Sample 79217

Photograph C.9 Tower A, Sample 79218

Photograph C.10 Tower A, Sample 79219

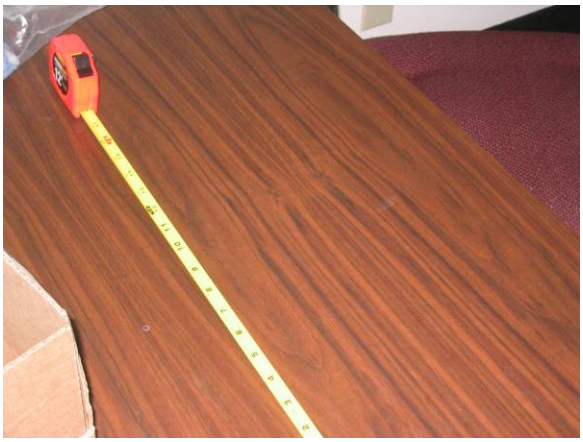
Photograph C.11 Tower A, Sample 79220

Photograph C.12 Tower A, Sample 79221

Photograph C.13 Tower A, Sample 79222

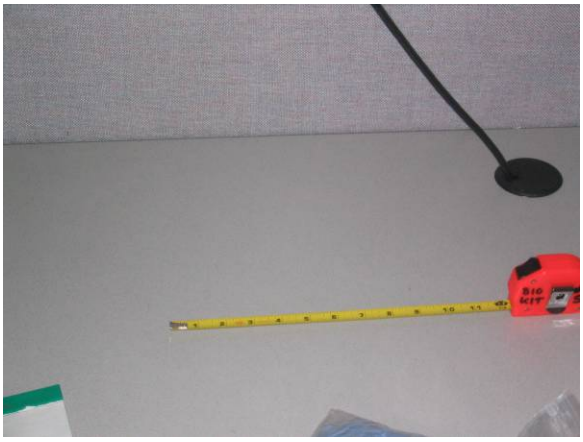
Photograph C.14 Tower A, Sample 79223

Photograph C.15 Tower A, Sample 79224



Photograph C.16 Tower A, Sample 79224

Photograph C.17 Low-rise, Sample 79228

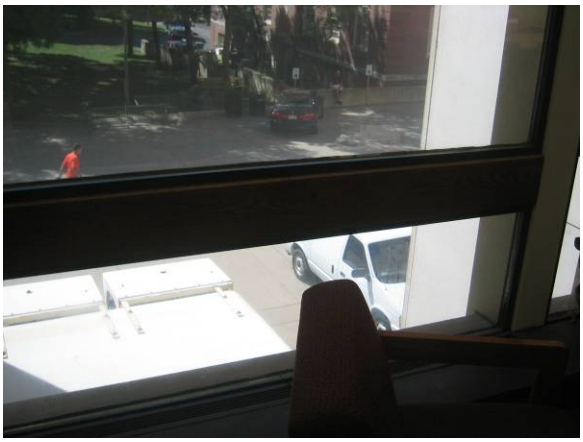


Photograph C.18 Low-rise, Sample 79229

Photograph C.19 Library, Sample 79230

Photograph C.20 Library, Sample 79231

Photograph C.21 Library, Sample 79232

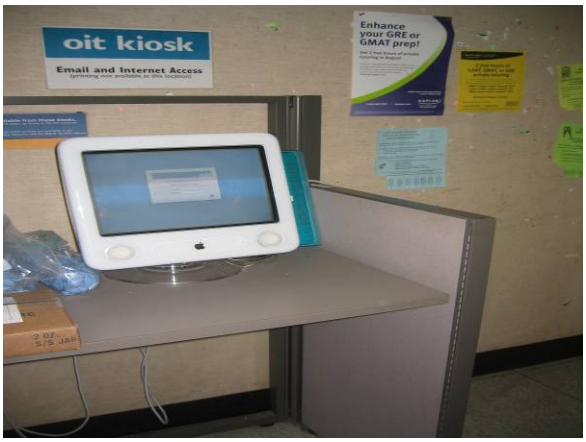


Photograph C.22 Library, Sample 79233

Photograph C.23 Low-rise, Sample 79234

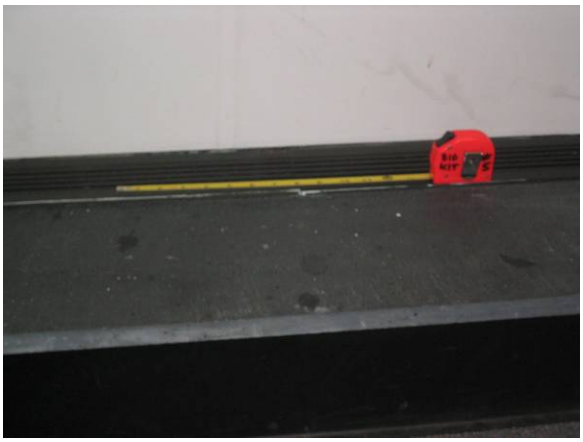
Photograph C.24 Low-rise, Sample 79235

Photograph C.25 Low-rise, Sample 79236

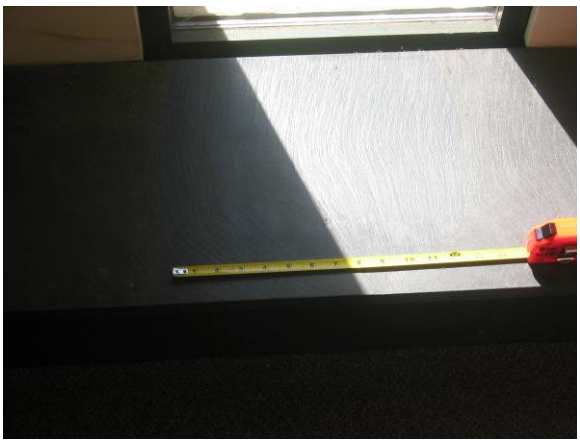


Photograph C.26 Low-rise, Sample 79237

Photograph C.27 Low-rise, Sample 79238



Photograph C.28 Low-rise, Sample 79239



Photograph C.29 Library, Sample 79240

APPENDIX D

EPA LETTER

Environmental Health & Engineering, Inc.
60 Wells Avenue
Newton, MA
02459-3210

Tel 800-825-5343
617-964-8550
FAX 617-964-8556

September 19, 2006

Ms. Kimberly N. Tisa
PCB Coordinator
United States Environmental Protection Agency
One Congress Street, Suite 1100 – CPT
Boston, MA 02114-2023

RE: Findings of Polychlorinated Biphenyls (PCBs) in Caulking from Towers B and C, Lederle Graduate Research Center, University of Massachusetts, Amherst, Massachusetts (EH&E 14680)

Dear Ms. Tisa:

On behalf of the University of Massachusetts, Amherst (the University), Environmental Health & Engineering, Inc. (EH&E) is submitting these sample results from exterior panel caulking found on Towers B and C of the Lederle Graduate Research Center (LRGC), Amherst, Massachusetts.

BACKGROUND

EH&E understands that the University discovered PCBs in exterior caulking at the Toxic Substance Control Act (TSCA) regulated and unregulated concentrations during the course of a planned waterproofing and concrete panel structural reinforcement project for LRGC. Samples for caulking contained TSCA regulated levels from Tower A and the low-rise ranged from 6,300 to 729,000 parts per million (ppm) as reported by analytical laboratories used by other consultants. Samples of caulking from Towers B and C contained unregulated levels of PCBs ranging from non detectable (ND) < 0.73 to 2.23 ppm as reported by other consultants.

LRGC is comprised of four buildings that were constructed in the early and mid seventies. Tower A and the low-rise building were completed in 1972; and Towers B and C were completed in 1974. Although PCBs were detected in caulking and soil samples taken from locations around LRGC, initial sample results were inconclusive regarding the location and

source of the PCB caulking and caulking residues. Based on the different construction time frames and the finding of both regulated and unregulated levels of PCBs in caulking, EH&E recommended that the University conduct additional confirmatory representative sampling of the caulking for the entire building complex.

EH&E SAMPLING

On August 21 and 22, 2006, EH&E collected bulk samples of exterior caulking from Towers A, B, and C, and the attached low-rise building. Approximately 27 samples of caulking were collected from the four buildings and placed into sterile glass jars for shipment. The samples were sent to Groundwater Analytical, Inc., in Buzzards Bay, Massachusetts, a National Environmental Laboratory Accreditation Conference (NELAC) accredited laboratory, by courier service under chain of custody on August 22.

The samples were extracted using a Soxhlet extraction procedure and analyzed by gas chromatography equipped with an electron capture device for quantification (GC-ECD) following the U.S. Environmental Protection Agency (EPA) Method 8082.

SAMPLE RESULTS

The following Table 1 summarizes the results of the PCB analysis for all exterior caulking samples collected by EH&E for Towers B and C. Exterior caulking samples from Towers A and the low rise building confirmed regulated levels of PCBs in the caulking from these two structures, and this data will be presented under a separate cover to the EPA pursuant to a 40 CFR 761.79(h) filing for an alternative decontamination plan approval.

As demonstrated by the data in Table 1, all the sample results from Towers B and C were well below the TSCA level for authorized use of non-liquid PCBs (<50 ppm). In fact, the levels were at or very close to the EPA level for unrestricted use of a contaminated surface or material (<1ppm). Based on these findings, which confirm earlier sample results, the University is requesting approval to proceed with the waterproofing on Towers B and C. Although the original exterior caulking is considered an excluded product under 40 CFR 761, the University will be appropriately removing and disposing of the caulking during this project. The University will employ reasonable protective measures to prevent the build up of caulking or caulking residues

associated with Towers B and C in the surrounding environment as described in the next section of this letter.

Table 1 Exterior Panel Caulking Bulk Sample Results from Tower B of Lederle Graduate Research Center, University of Massachusetts, Amherst, Massachusetts, August 21 and 22, 2006

Sample ID	Building	Floor	Side	Description	Aroclor 1254[1,2] (ppm)	Notes
78155	Tower B	16	West	Bottom, southwest corner	1.4	1C(1.3)
78156	Tower B	14	West	Top, line on the first panel	0.2	1C(0.2)
78157	Tower B	12	West	Top, middle right panel	0.3	1C(0.2)
78158	Tower B	10	West	Bottom, middle left panel	0.8	1C(0.7)
78159	Tower B	9	West	Top, corner bead for the western panel	2.8	2C(2.7)
78160	Tower B	7	West	Bottom, corner bead for the western panel	0.9	1C(0.7)
78161	Tower B	5	West	Bottom, middle left panel	0.5	1C(0.5)
78162	Tower B	3	West	Top, middle right panel	0.8	1C(0.7)
78163	Tower B	1	West	Southwest corner	1.6	1C(1.4)
78167	Tower B	1	North	Window/panel interface	2.5	1C(2.3)
78168	Tower B	1	North	Panel caulking	2.5	1C(2.4)
79406	Tower C	17	North	Caulking from horizontal panel joint (whitish)	1.0	1C(1.0)
79407	Tower C	15	North	Caulking from horizontal panel joint (whitish)	1.0	1C(0.9)
79408	Tower C	15	North	Duplicate of 79407	1.1	2C(1.1)
79409	Tower C	13	North	Caulking (whitish)	0.6	1C(0.6)
79410	Tower C	11	North	Horizontal and vertical panel caulking (whitish)	1.7	1C(1.7)
79411	Tower C	9	North	Horizontal panel caulking (whitish)	1.5	1C(1.5)
79412	Tower C	7	North	Caulking from panel joint (whitish)	2.8	1C(2.6)
79413	Tower C	5	North	Caulking from panel joint (whitish)	2.8	2C(2.4)
79414	Tower C	4	Northeast bumpout	Panel joint caulking (whitish)	3.3	2C(3.0)
79415	Tower C	2	Northeast bumpout	Panel joint caulking (whitish)	1.2	2C(1.1)
79416	Tower C	2	Northeast bumpout	Thinner panel joint caulking from 79415	3.0	2C(2.9)

ppm parts per million
1C Confirmation concentration reported from first column quantification
2C Confirmation concentration reported from second column quantification

[1] Polychlorinated biphenyl (PCB) concentration analysis performed by Groundwater Analytical, Inc., using U.S. Environmental Protection Agency (EPA) method 8082 (GC/ECD).
[2] Aroclor 1016, 1221, 1232, 1242, 1248, and 1260 also tested. All results below reporting levels, unless noted.

REASONABLE PROTECTIVE MEASURES FOR CAULKING REMOVAL

For Towers B and C only, the University will implement the following measures to contain the original caulking, caulking debris, and residues from accumulating in the environment surrounding the LGRC.

- Contain original caulking and caulking debris by securing drop cloths on the ground below all work that will disturb the existing caulking.
- Collect all original caulking and caulking debris in plastic bags, disposable drums, or equivalent method to prevent fugitive dust emissions during handling and disposal.
- Inspect daily and clean as necessary the ground under or near the work areas for any visible caulking or caulking debris.
- If the building is power washed with the original caulking in-place, the rinseate will be collected and tested for PCBs. Appropriate and reasonable measures will be implemented to contain the rinseate if the PCB levels exceed 0.5 micrograms of PCBs per liter of water (µg/l) or parts per billion (ppb).
- Alternatively, the work will be sequenced so that power washing will not be conducted until the original caulking is removed from the building to prevent the rinseate from contacting the original caulking. In this case, the rinseate will not be collected or tested.

The University is ready to re-start the activities on Towers B and C, and your quick response is greatly appreciated. Please do not hesitate to contact either one of us at 1-800-TALK EHE (1-800-825-5343) if you any questions or concerns.

Sincerely,

Maximillian P. Chang, M.S.
Staff Scientist/Project Manager

Kevin M. Coghlan, M.S., C.I.H.
Director
EH&S Compliance and Strategic Support

Attachments: Groundwater Analytical Laboratory Reports

cc: Donald Robinson, Ph.D., EH&S Director, University of Massachusetts
Brian Fitzpatrick, CHMM, EH&S/EMS Program Head, University of Massachusetts

Groundwater Analytical, Inc.
P.O.Box 1200
228 Main Street
Buzzards Bay, MA 02532

Telephone: (508) 759-4441
FAX: (508) 759-4475

GROUNDWATER ANALYTICAL

e-mail

To:	Max Chang	From:	e-mail reporting GWA
	Environmental Health &	Pages:	20
e-mail:	datacoordinator@eheinc.com	Date:	09/05/2006 15:16:00
Re:	98117	CC:	

☐ Urgent ☐ For Review ☐ Please Comment ☐ Please Reply

● Comments:

Project Report for 14680, Lab ID 98117, Received 08-23-06

Confidential

GROUNDWATER ANALYTICAL

Groundwater Analytical, Inc.
P.O. Box 1200
228 Main Street
Buzzards Bay, MA 02532

Telephone (508) 759-4441
FAX (508) 759-4475
www.groundwateranalytical.com

September 5, 2006

Mr. Max Chang
Environmental Health & Engineering, Inc.
60 Wells Avenue
Newton, MA 02159-3210

LABORATORY REPORT

Project: **14680**
Lab ID: **98117**
Received: **08-23-06**

Dear Max:

Enclosed are the analytical results for the above referenced project. The project was processed for Priority turnaround.

This letter authorizes the release of the analytical results, and should be considered a part of this report. This report contains a sample receipt report detailing the samples received, a project narrative indicating project changes and non-conformances, a quality control report, and a statement of our state certifications.

The analytical results contained in this report meet all applicable NELAC standards, except as may be specifically noted, or described in the project narrative. This report may only be used or reproduced in its entirety.

I attest under the pains and penalties of perjury that, based upon my inquiry of those individuals immediately responsible for obtaining the information, the material contained in this report is, to the best of my knowledge and belief, accurate and complete.

Should you have any questions concerning this report, please do not hesitate to contact me.

Sincerely,

Eric H. Jensen
Operations Manager

EHJ/jmp
Enclosures

GROUNDWATER ANALYTICAL

Sample Receipt Report

Project: **14680**
Client: **Environmental Health & Engineering, Inc.**
Lab ID: **98117**

Delivery: **GWA Courier**
Airbill: **n/a**
Lab Receipt: **08-23-06**

Temperature: **n/a**
Chain of Custody: **Present**
Custody Seal(s): **n/a**

Lab ID	Field ID		Matrix	Sampled	Method				Notes
98117-1	78155		Solid	8/22/06 0:00	EPA 8082 PCBs				
Con ID	**Container**	**Vendor**	**QC Lot**	**Preserv**	**QC Lot**	**Prep**	**Ship**		
C851489	Plastic Bag	n/a	n/a	None	n/a	n/a	n/a		

Lab ID	Field ID		Matrix	Sampled	Method				Notes
98117-2	78156		Solid	8/22/06 0:00	EPA 8082 PCBs				
Con ID	**Container**	**Vendor**	**QC Lot**	**Preserv**	**QC Lot**	**Prep**	**Ship**		
C851490	Plastic Bag	n/a	n/a	None	n/a	n/a	n/a		

Lab ID	Field ID		Matrix	Sampled	Method				Notes
98117-3	78157		Solid	8/22/06 0:00	EPA 8082 PCBs				
Con ID	**Container**	**Vendor**	**QC Lot**	**Preserv**	**QC Lot**	**Prep**	**Ship**		
C851491	Plastic Bag	n/a	n/a	None	n/a	n/a	n/a		

Lab ID	Field ID		Matrix	Sampled	Method				Notes
98117-4	78158		Solid	8/22/06 0:00	EPA 8082 PCBs				
Con ID	**Container**	**Vendor**	**QC Lot**	**Preserv**	**QC Lot**	**Prep**	**Ship**		
C851492	Plastic Bag	n/a	n/a	None	n/a	n/a	n/a		

Lab ID	Field ID		Matrix	Sampled	Method				Notes
98117-5	78159		Solid	8/22/06 0:00	EPA 8082 PCBs				
Con ID	**Container**	**Vendor**	**QC Lot**	**Preserv**	**QC Lot**	**Prep**	**Ship**		
C851493	Plastic Bag	n/a	n/a	None	n/a	n/a	n/a		

Lab ID	Field ID		Matrix	Sampled	Method				Notes
98117-6	78160		Solid	8/22/06 0:00	EPA 8082 PCBs				
Con ID	**Container**	**Vendor**	**QC Lot**	**Preserv**	**QC Lot**	**Prep**	**Ship**		
C851494	Plastic Bag	n/a	n/a	None	n/a	n/a	n/a		

Lab ID	Field ID		Matrix	Sampled	Method				Notes
98117-7	78161		Solid	8/22/06 0:00	EPA 8082 PCBs				
Con ID	**Container**	**Vendor**	**QC Lot**	**Preserv**	**QC Lot**	**Prep**	**Ship**		
C851495	Plastic Bag	n/a	n/a	None	n/a	n/a	n/a		

Lab ID	Field ID		Matrix	Sampled	Method				Notes
98117-8	78162		Solid	8/22/06 0:00	EPA 8082 PCBs				
Con ID	**Container**	**Vendor**	**QC Lot**	**Preserv**	**QC Lot**	**Prep**	**Ship**		
C851496	Plastic Bag	n/a	n/a	None	n/a	n/a	n/a		

Lab ID	Field ID		Matrix	Sampled	Method				Notes
98117-9	78163		Solid	8/22/06 0:00	EPA 8082 PCBs				
Con ID	**Container**	**Vendor**	**QC Lot**	**Preserv**	**QC Lot**	**Prep**	**Ship**		
C851497	Plastic Bag	n/a	n/a	None	n/a	n/a	n/a		

Lab ID	Field ID		Matrix	Sampled	Method				Notes
98117-10	78167		Solid	8/22/06 0:00	EPA 8082 PCBs				
Con ID	**Container**	**Vendor**	**QC Lot**	**Preserv**	**QC Lot**	**Prep**	**Ship**		
C851498	Plastic Bag	n/a	n/a	None	n/a	n/a	n/a		

Lab ID	Field ID		Matrix	Sampled	Method				Notes
98117-11	78168		Solid	8/22/06 0:00	EPA 8082 PCBs				
Con ID	**Container**	**Vendor**	**QC Lot**	**Preserv**	**QC Lot**	**Prep**	**Ship**		
C851499	Plastic Bag	n/a	n/a	None	n/a	n/a	n/a		

GROUNDWATER ANALYTICAL

EPA Method 8082
Polychlorinated Biphenyls (PCBs) by GC/ECD

Field ID:	**78155**	Matrix:	**Solid**
Project:	**14680**	Container:	**Plastic Bag**
Client:	**Environmental Health & Engineering, Inc.**	Preservation:	**Cool**
Laboratory ID:	**98117-01**	QC Batch ID:	**PB-2562-X**
Sampled:	**08-22-06 00:00**	Instrument ID:	**GC-13 Agilent 6890**
Received:	**08-23-06 17:30**	Sample Weight:	**18 g**
Extracted:	**08-27-06 14:00**	Final Volume:	**1 mL**
Cleaned Up:	**08-28-06 15:00**	Percent Solids:	**n/a**
Analyzed:	**09-01-06 18:41**	Dilution Factor:	**10**
Analyst:	**CRL**		

CAS Number	Analyte	Concentration	Notes	Units	Reporting Limit
12674-11-2	Aroclor 1016	BRL		ug/Kg	680
11104-28-2	Aroclor 1221	BRL		ug/Kg	680
11141-16-5	Aroclor 1232	BRL		ug/Kg	680
53469-21-9	Aroclor 1242	BRL		ug/Kg	680
12672-29-6	Aroclor 1248	BRL		ug/Kg	680
11097-69-1	Aroclor 1254	**1,400**	1C (1300)*	ug/Kg	680
11096-82-5	Aroclor 1260	BRL		ug/Kg	680
37324-23-5	Aroclor 1262 †	BRL		ug/Kg	680
11100-14-4	Aroclor 1268 †	BRL		ug/Kg	680

QC Surrogate Compound		Spiked	Measured	Recovery	QC Limits
First	Tetrachloro-*m*-xylene	11	6	**56** %	30 - 150 %
Column	Decachlorobiphenyl	11	7	**62** %	30 - 150 %
Second	Tetrachloro-*m*-xylene	11	7	**58** %	30 - 150 %
Column	Decachlorobiphenyl	11	7	**64** %	30 - 150 %

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996).
Sample extraction performed by EPA Method 3540C. Cleanup performed by EPA Method 3660B and EPA Method 3665A.

Report Notations:

BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.

† Non-target analyte. Result is based on a single mid-range calibration standard.

* Confirmatory column quantification.

1C Concentration reported from first column.

GROUNDWATER ANALYTICAL

EPA Method 8082
Polychlorinated Biphenyls (PCBs) by GC/ECD

Field ID:	**78156**	Matrix:	**Solid**
Project:	**14680**	Container:	**Plastic Bag**
Client:	**Environmental Health & Engineering, Inc.**	Preservation:	**Cool**
Laboratory ID:	**98117-02**	QC Batch ID:	**PB-2562-X**
Sampled:	**08-22-06 00:00**	Instrument ID:	**GC-13 Agilent 6890**
Received:	**08-23-06 17:30**	Sample Weight:	**22 g**
Extracted:	**08-27-06 14:00**	Final Volume:	**1 mL**
Cleaned Up:	**08-28-06 15:00**	Percent Solids:	**n/a**
Analyzed:	**09-01-06 19:56**	Dilution Factor:	**1**
Analyst:	**CRL**		

CAS Number	Analyte	Concentration	Notes	Units	Reporting Limit
12674-11-2	Aroclor 1016	BRL		ug/Kg	40
11104-28-2	Aroclor 1221	BRL		ug/Kg	40
11141-16-5	Aroclor 1232	BRL		ug/Kg	40
53469-21-9	Aroclor 1242	BRL		ug/Kg	40
12672-29-6	Aroclor 1248	BRL		ug/Kg	40
11097-69-1	Aroclor 1254	**230**	1C (220)*	ug/Kg	40
11096-82-5	Aroclor 1260	BRL		ug/Kg	40
37324-23-5	Aroclor 1262 †	BRL		ug/Kg	40
11100-14-4	Aroclor 1268 †	BRL		ug/Kg	40

QC Surrogate Compound		Spiked	Measured	Recovery		QC Limits
First Column	Tetrachloro-*m*-xylene	9	2	**22** %	m	30 - 150 %
	Decachlorobiphenyl	9	2	**24** %	m	30 - 150 %
Second Column	Tetrachloro-*m*-xylene	9	2	**24** %	m	30 - 150 %
	Decachlorobiphenyl	9	2	**21** %	m	30 - 150 %

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996).
Sample extraction performed by EPA Method 3540C. Cleanup performed by EPA Method 3660B and EPA Method 3665A.

Report Notations:

BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.

† Non-target analyte. Result is based on a single mid-range calibration standard.

* Confirmatory column quantification.

1C Concentration reported from first column.

m Surrogate recovery outside recommended limits due to sample matrix interference.

GROUNDWATER ANALYTICAL

EPA Method 8082
Polychlorinated Biphenyls (PCBs) by GC/ECD

Field ID:	**78157**	Matrix:	**Solid**
Project:	**14680**	Container:	**Plastic Bag**
Client:	**Environmental Health & Engineering, Inc.**	Preservation:	**Cool**
Laboratory ID:	**98117-03**	QC Batch ID:	**PB-2562-X**
Sampled:	**08-22-06 00:00**	Instrument ID:	**GC-13 Agilent 6890**
Received:	**08-23-06 17:30**	Sample Weight:	**33 g**
Extracted:	**08-27-06 14:00**	Final Volume:	**1 mL**
Cleaned Up:	**08-28-06 15:00**	Percent Solids:	**n/a**
Analyzed:	**09-01-06 19:32**	Dilution Factor:	**1**
Analyst:	**CRL**		

CAS Number	Analyte	Concentration	Notes	Units	Reporting Limit
12674-11-2	Aroclor 1016	BRL		ug/Kg	40
11104-28-2	Aroclor 1221	BRL		ug/Kg	40
11141-16-5	Aroclor 1232	BRL		ug/Kg	40
53469-21-9	Aroclor 1242	BRL		ug/Kg	40
12672-29-6	Aroclor 1248	BRL		ug/Kg	40
11097-69-1	Aroclor 1254	**260**	1C (220)*	ug/Kg	40
11096-82-5	Aroclor 1260	BRL		ug/Kg	40
37324-23-5	Aroclor 1262 †	BRL		ug/Kg	40
11100-14-4	Aroclor 1268 †	BRL		ug/Kg	40

QC Surrogate Compound		Spiked	Measured	Recovery		QC Limits
First	Tetrachloro-*m*-xylene	6	1	**19** %	m	30 - 150 %
Column	Decachlorobiphenyl	6	1	**20** %	m	30 - 150 %
Second	Tetrachloro-*m*-xylene	6	1	**21** %	m	30 - 150 %
Column	Decachlorobiphenyl	6	1	**16** %	m	30 - 150 %

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996).
Sample extraction performed by EPA Method 3540C. Cleanup performed by EPA Method 3660B and EPA Method 3665A.

Report Notations:

BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.

† Non-target analyte. Result is based on a single mid-range calibration standard.

* Confirmatory column quantification.

1C Concentration reported from first column.

m Surrogate recovery outside recommended limits due to sample matrix interference.

GROUNDWATER ANALYTICAL

EPA Method 8082
Polychlorinated Biphenyls (PCBs) by GC/ECD

Field ID:	**78158**	Matrix:	**Solid**
Project:	**14680**	Container:	**Plastic Bag**
Client:	**Environmental Health & Engineering, Inc.**	Preservation:	**Cool**
Laboratory ID:	**98117-04**	QC Batch ID:	**PB-2562-X**
Sampled:	**08-22-06 00:00**	Instrument ID:	**GC-13 Agilent 6890**
Received:	**08-23-06 17:30**	Sample Weight:	**23 g**
Extracted:	**08-27-06 14:00**	Final Volume:	**1 mL**
Cleaned Up:	**08-28-06 15:00**	Percent Solids:	**n/a**
Analyzed:	**09-01-06 16:37**	Dilution Factor:	**10**
Analyst:	**CRL**		

CAS Number	Analyte	Concentration	Notes	Units	Reporting Limit
12674-11-2	Aroclor 1016	BRL		ug/Kg	510
11104-28-2	Aroclor 1221	BRL		ug/Kg	510
11141-16-5	Aroclor 1232	BRL		ug/Kg	510
53469-21-9	Aroclor 1242	BRL		ug/Kg	510
12672-29-6	Aroclor 1248	BRL		ug/Kg	510
11097-69-1	Aroclor 1254	**790**	1C (660)*	ug/Kg	510
11096-82-5	Aroclor 1260	BRL		ug/Kg	510
37324-23-5	Aroclor 1262 †	BRL		ug/Kg	510
11100-14-4	Aroclor 1268 †	BRL		ug/Kg	510

QC Surrogate Compound		Spiked	Measured	Recovery	QC Limits
First	Tetrachloro-*m*-xylene	9	5	**56** %	30 - 150 %
Column	Decachlorobiphenyl	9	4	**47** %	30 - 150 %
Second	Tetrachloro-*m*-xylene	9	4	**45** %	30 - 150 %
Column	Decachlorobiphenyl	9	4	**46** %	30 - 150 %

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996).
Sample extraction performed by EPA Method 3540C. Cleanup performed by EPA Method 3660B and EPA Method 3665A.

Report Notations:

BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.

† Non-target analyte. Result is based on a single mid-range calibration standard.

* Confirmatory column quantification.

1C Concentration reported from first column.

GROUNDWATER ANALYTICAL

EPA Method 8082
Polychlorinated Biphenyls (PCBs) by GC/ECD

Field ID:	**78159**	Matrix:	**Solid**
Project:	**14680**	Container:	**Plastic Bag**
Client:	**Environmental Health & Engineering, Inc.**	Preservation:	**Cool**
Laboratory ID:	**98117-05**	QC Batch ID:	**PB-2562-X**
Sampled:	**08-22-06 00:00**	Instrument ID:	**GC-13 Agilent 6890**
Received:	**08-23-06 17:30**	Sample Weight:	**16 g**
Extracted:	**08-27-06 14:00**	Final Volume:	**1 mL**
Cleaned Up:	**08-28-06 15:00**	Percent Solids:	**n/a**
Analyzed:	**09-01-06 16:13**	Dilution Factor:	**10**
Analyst:	**CRL**		

CAS Number	Analyte	Concentration	Notes	Units	Reporting Limit
12674-11-2	Aroclor 1016	BRL		ug/Kg	760
11104-28-2	Aroclor 1221	BRL		ug/Kg	760
11141-16-5	Aroclor 1232	BRL		ug/Kg	760
53469-21-9	Aroclor 1242	BRL		ug/Kg	760
12672-29-6	Aroclor 1248	BRL		ug/Kg	760
11097-69-1	Aroclor 1254	**2,800**	2C (2700)*	ug/Kg	760
11096-82-5	Aroclor 1260	BRL		ug/Kg	760
37324-23-5	Aroclor 1262 †	BRL		ug/Kg	760
11100-14-4	Aroclor 1268 †	BRL		ug/Kg	760

QC Surrogate Compound		Spiked	Measured	Recovery	QC Limits
First	Tetrachloro-*m*-xylene	13	5	**40** %	30 - 150 %
Column	Decachlorobiphenyl	13	5	**41** %	30 - 150 %
Second	Tetrachloro-*m*-xylene	13	5	**39** %	30 - 150 %
Column	Decachlorobiphenyl	13	4	**35** %	30 - 150 %

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996).
Sample extraction performed by EPA Method 3540C. Cleanup performed by EPA Method 3660B and EPA Method 3665A.

Report Notations:

BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.

† Non-target analyte. Result is based on a single mid-range calibration standard.

* Confirmatory column quantification.

2C Concentration reported from second column.

GROUNDWATER ANALYTICAL

EPA Method 8082
Polychlorinated Biphenyls (PCBs) by GC/ECD

Field ID:	**78160**	Matrix:	**Solid**
Project:	**14680**	Container:	**Plastic Bag**
Client:	**Environmental Health & Engineering, Inc.**	Preservation:	**Cool**
Laboratory ID:	**98117-06**	QC Batch ID:	**PB-2562-X**
Sampled:	**08-22-06 00:00**	Instrument ID:	**GC-13 Agilent 6890**
Received:	**08-23-06 17:30**	Sample Weight:	**18 g**
Extracted:	**08-27-06 14:00**	Final Volume:	**1 mL**
Cleaned Up:	**08-28-06 15:00**	Percent Solids:	**n/a**
Analyzed:	**09-01-06 15:50**	Dilution Factor:	**10**
Analyst:	**CRL**		

CAS Number	Analyte	Concentration	Notes	Units	Reporting Limit
12674-11-2	Aroclor 1016	BRL		ug/Kg	650
11104-28-2	Aroclor 1221	BRL		ug/Kg	650
11141-16-5	Aroclor 1232	BRL		ug/Kg	650
53469-21-9	Aroclor 1242	BRL		ug/Kg	650
12672-29-6	Aroclor 1248	BRL		ug/Kg	650
11097-69-1	Aroclor 1254	**920**	1C (720)*	ug/Kg	650
11096-82-5	Aroclor 1260	BRL		ug/Kg	650
37324-23-5	Aroclor 1262 †	BRL		ug/Kg	650
11100-14-4	Aroclor 1268 †	BRL		ug/Kg	650

QC Surrogate Compound		Spiked	Measured	Recovery	QC Limits
First Column	Tetrachloro-*m*-xylene	11	5	**49** %	30 - 150 %
	Decachlorobiphenyl	11	6	**51** %	30 - 150 %
Second Column	Tetrachloro-*m*-xylene	11	5	**50** %	30 - 150 %
	Decachlorobiphenyl	11	5	**48** %	30 - 150 %

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996).
Sample extraction performed by EPA Method 3540C. Cleanup performed by EPA Method 3660B and EPA Method 3665A.

Report Notations:

BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.

† Non-target analyte. Result is based on a single mid-range calibration standard.

* Confirmatory column quantification.

1C Concentration reported from first column.

GROUNDWATER ANALYTICAL

EPA Method 8082
Polychlorinated Biphenyls (PCBs) by GC/ECD

Field ID:	**78161**	Matrix:	**Solid**
Project:	**14680**	Container:	**Plastic Bag**
Client:	**Environmental Health & Engineering, Inc.**	Preservation:	**Cool**
Laboratory ID:	**98117-07**	QC Batch ID:	**PB-2562-X**
Sampled:	**08-22-06 00:00**	Instrument ID:	**GC-13 Agilent 6890**
Received:	**08-23-06 17:30**	Sample Weight:	**19 g**
Extracted:	**08-27-06 14:00**	Final Volume:	**1 mL**
Cleaned Up:	**08-28-06 15:00**	Percent Solids:	**n/a**
Analyzed:	**09-01-06 19:09**	Dilution Factor:	**2**
Analyst:	**CRL**		

CAS Number	Analyte	Concentration	Notes	Units	Reporting Limit
12674-11-2	Aroclor 1016	BRL		ug/Kg	120
11104-28-2	Aroclor 1221	BRL		ug/Kg	120
11141-16-5	Aroclor 1232	BRL		ug/Kg	120
53469-21-9	Aroclor 1242	BRL		ug/Kg	120
12672-29-6	Aroclor 1248	BRL		ug/Kg	120
11097-69-1	Aroclor 1254	**540**	1C (480)*	ug/Kg	120
11096-82-5	Aroclor 1260	BRL		ug/Kg	120
37324-23-5	Aroclor 1262 †	BRL		ug/Kg	120
11100-14-4	Aroclor 1268 †	BRL		ug/Kg	120

QC Surrogate Compound		Spiked	Measured	Recovery	QC Limits
First	Tetrachloro-*m*-xylene	10	4	**41** %	30 - 150 %
Column	Decachlorobiphenyl	10	5	**48** %	30 - 150 %
Second	Tetrachloro-*m*-xylene	10	5	**45** %	30 - 150 %
Column	Decachlorobiphenyl	10	4	**38** %	30 - 150 %

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996).
Sample extraction performed by EPA Method 3540C. Cleanup performed by EPA Method 3660B and EPA Method 3665A.

Report Notations:

BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.

† Non-target analyte. Result is based on a single mid-range calibration standard.

* Confirmatory column quantification.

1C Concentration reported from first column.

GROUNDWATER ANALYTICAL

EPA Method 8082
Polychlorinated Biphenyls (PCBs) by GC/ECD

Field ID:	**78162**	Matrix:	**Solid**
Project:	**14680**	Container:	**Plastic Bag**
Client:	**Environmental Health & Engineering, Inc.**	Preservation:	**Cool**
Laboratory ID:	**98117-08**	QC Batch ID:	**PB-2562-X**
Sampled:	**08-22-06 00:00**	Instrument ID:	**GC-13 Agilent 6890**
Received:	**08-23-06 17:30**	Sample Weight:	**22 g**
Extracted:	**08-27-06 14:00**	Final Volume:	**1 mL**
Cleaned Up:	**08-28-06 15:00**	Percent Solids:	**n/a**
Analyzed:	**09-01-06 15:03**	Dilution Factor:	**10**
Analyst:	**CRL**		

CAS Number	Analyte	Concentration	Notes	Units	Reporting Limit
12674-11-2	Aroclor 1016	BRL		ug/Kg	540
11104-28-2	Aroclor 1221	BRL		ug/Kg	540
11141-16-5	Aroclor 1232	BRL		ug/Kg	540
53469-21-9	Aroclor 1242	BRL		ug/Kg	540
12672-29-6	Aroclor 1248	BRL		ug/Kg	540
11097-69-1	Aroclor 1254	**760**	1C (680)*	ug/Kg	540
11096-82-5	Aroclor 1260	BRL		ug/Kg	540
37324-23-5	Aroclor 1262 †	BRL		ug/Kg	540
11100-14-4	Aroclor 1268 †	BRL		ug/Kg	540

QC Surrogate Compound		Spiked	Measured	Recovery	QC Limits
First	Tetrachloro-*m*-xylene	9	4	**49** %	30 - 150 %
Column	Decachlorobiphenyl	9	5	**57** %	30 - 150 %
Second	Tetrachloro-*m*-xylene	9	5	**53** %	30 - 150 %
Column	Decachlorobiphenyl	9	5	**52** %	30 - 150 %

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996).
Sample extraction performed by EPA Method 3540C. Cleanup performed by EPA Method 3660B and EPA Method 3665A.

Report Notations:

BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.

† Non-target analyte. Result is based on a single mid-range calibration standard.

* Confirmatory column quantification.

1C Concentration reported from first column.

GROUNDWATER ANALYTICAL

EPA Method 8082
Polychlorinated Biphenyls (PCBs) by GC/ECD

Field ID:	**78163**	Matrix:	**Solid**
Project:	**14680**	Container:	**Plastic Bag**
Client:	**Environmental Health & Engineering, Inc.**	Preservation:	**Cool**
Laboratory ID:	**98117-09**	QC Batch ID:	**PB-2562-X**
Sampled:	**08-22-06 00:00**	Instrument ID:	**GC-13 Agilent 6890**
Received:	**08-23-06 17:30**	Sample Weight:	**26 g**
Extracted:	**08-27-06 14:00**	Final Volume:	**1 mL**
Cleaned Up:	**08-28-06 15:00**	Percent Solids:	**n/a**
Analyzed:	**09-01-06 14:39**	Dilution Factor:	**10**
Analyst:	**CRL**		

CAS Number	Analyte	Concentration	Notes	Units	Reporting Limit
12674-11-2	Aroclor 1016	BRL		ug/Kg	460
11104-28-2	Aroclor 1221	BRL		ug/Kg	460
11141-16-5	Aroclor 1232	BRL		ug/Kg	460
53469-21-9	Aroclor 1242	BRL		ug/Kg	460
12672-29-6	Aroclor 1248	BRL		ug/Kg	460
11097-69-1	Aroclor 1254	**1,600**	1C (1400)*	ug/Kg	460
11096-82-5	Aroclor 1260	BRL		ug/Kg	460
37324-23-5	Aroclor 1262 †	BRL		ug/Kg	460
11100-14-4	Aroclor 1268 †	BRL		ug/Kg	460

QC Surrogate Compound		Spiked	Measured	Recovery	QC Limits
First	Tetrachloro-*m*-xylene	8	4	**48** %	30 - 150 %
Column	Decachlorobiphenyl	8	4	**53** %	30 - 150 %
Second	Tetrachloro-*m*-xylene	8	4	**49** %	30 - 150 %
Column	Decachlorobiphenyl	8	4	**57** %	30 - 150 %

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996).
Sample extraction performed by EPA Method 3540C. Cleanup performed by EPA Method 3660B and EPA Method 3665A.

Report Notations:

BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.

† Non-target analyte. Result is based on a single mid-range calibration standard.

* Confirmatory column quantification.

1C Concentration reported from first column.

GROUNDWATER ANALYTICAL

EPA Method 8082
Polychlorinated Biphenyls (PCBs) by GC/ECD

Field ID:	**78167**	Matrix:	**Solid**
Project:	**14680**	Container:	**Plastic Bag**
Client:	**Environmental Health & Engineering, Inc.**	Preservation:	**Cool**
Laboratory ID:	**98117-10**	QC Batch ID:	**PB-2562-X**
Sampled:	**08-22-06 00:00**	Instrument ID:	**GC-13 Agilent 6890**
Received:	**08-23-06 17:30**	Sample Weight:	**8.2 g**
Extracted:	**08-27-06 14:00**	Final Volume:	**1 mL**
Cleaned Up:	**08-28-06 15:00**	Percent Solids:	**n/a**
Analyzed:	**09-01-06 14:16**	Dilution Factor:	**10**
Analyst:	**CRL**		

CAS Number	Analyte	Concentration	Notes	Units	Reporting Limit
12674-11-2	Aroclor 1016	BRL		ug/Kg	1,500
11104-28-2	Aroclor 1221	BRL		ug/Kg	1,500
11141-16-5	Aroclor 1232	BRL		ug/Kg	1,500
53469-21-9	Aroclor 1242	BRL		ug/Kg	1,500
12672-29-6	Aroclor 1248	BRL		ug/Kg	1,500
11097-69-1	Aroclor 1254	**2,500**	1C (2300)*	ug/Kg	1,500
11096-82-5	Aroclor 1260	BRL		ug/Kg	1,500
37324-23-5	Aroclor 1262 †	BRL		ug/Kg	1,500
11100-14-4	Aroclor 1268 †	BRL		ug/Kg	1,500

QC Surrogate Compound		Spiked	Measured	Recovery	QC Limits
First Column	Tetrachloro-*m*-xylene	24	15	**64** %	30 - 150 %
	Decachlorobiphenyl	24	18	**72** %	30 - 150 %
Second Column	Tetrachloro-*m*-xylene	24	15	**62** %	30 - 150 %
	Decachlorobiphenyl	24	19	**79** %	30 - 150 %

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996).
Sample extraction performed by EPA Method 3540C. Cleanup performed by EPA Method 3660B and EPA Method 3665A.

Report Notations:

BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.

† Non-target analyte. Result is based on a single mid-range calibration standard.

* Confirmatory column quantification.

1C Concentration reported from first column.

GROUNDWATER ANALYTICAL

EPA Method 8082
Polychlorinated Biphenyls (PCBs) by GC/ECD

Field ID:	**78168**	Matrix:	**Solid**
Project:	**14680**	Container:	**Plastic Bag**
Client:	**Environmental Health & Engineering, Inc.**	Preservation:	**Cool**
Laboratory ID:	**98117-11**	QC Batch ID:	**PB-2562-X**
Sampled:	**08-22-06 00:00**	Instrument ID:	**GC-13 Agilent 6890**
Received:	**08-23-06 17:30**	Sample Weight:	**7.5 g**
Extracted:	**08-27-06 14:00**	Final Volume:	**1 mL**
Cleaned Up:	**08-28-06 15:00**	Percent Solids:	**n/a**
Analyzed:	**09-01-06 13:52**	Dilution Factor:	**10**
Analyst:	**CRL**		

CAS Number	Analyte	Concentration	Notes	Units	Reporting Limit
12674-11-2	Aroclor 1016	BRL		ug/Kg	1,600
11104-28-2	Aroclor 1221	BRL		ug/Kg	1,600
11141-16-5	Aroclor 1232	BRL		ug/Kg	1,600
53469-21-9	Aroclor 1242	BRL		ug/Kg	1,600
12672-29-6	Aroclor 1248	BRL		ug/Kg	1,600
11097-69-1	Aroclor 1254	**2,500**	1C (2400)*	ug/Kg	1,600
11096-82-5	Aroclor 1260	BRL		ug/Kg	1,600
37324-23-5	Aroclor 1262 †	BRL		ug/Kg	1,600
11100-14-4	Aroclor 1268 †	BRL		ug/Kg	1,600

QC Surrogate Compound		Spiked	Measured	Recovery	QC Limits
First Column	Tetrachloro-*m*-xylene	27	12	**45** %	30 - 150 %
	Decachlorobiphenyl	27	14	**53** %	30 - 150 %
Second Column	Tetrachloro-*m*-xylene	27	13	**50** %	30 - 150 %
	Decachlorobiphenyl	27	13	**49** %	30 - 150 %

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996).
Sample extraction performed by EPA Method 3540C. Cleanup performed by EPA Method 3660B and EPA Method 3665A.

Report Notations:

BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.

† Non-target analyte. Result is based on a single mid-range calibration standard.

* Confirmatory column quantification.

1C Concentration reported from first column.

GROUNDWATER ANALYTICAL

Project Narrative

Project:	**14680**	Lab ID:	**98117**
Client:	**Environmental Health & Engineering, Inc.**	Received:	**08-23-06 17:30**

A. Documentation and Client Communication

The following documentation discrepancies, and client changes or amendments were noted for this project:

1 . No documentation discrepancies, changes, or amendments were noted.

B. Method Modifications, Non-Conformances and Observations

The sample(s) in this project were analyzed by the references analytical method(s), and no method modifications, non-conformances or analytical issues were noted, except as indicated below:

1 . EPA 8082 Note: Samples 98117-01, -04 through -11. Samples were diluted prior to analysis. Dilution was required to keep all target analytes within calibration.

2 . EPA 8082 Non-conformance: Samples 98117-02, -03. Samples had surrogate recoveries outside recommended limits dut to matrix interference. No additional sample was available for re-analysis.

Environmental Health & Engineering, Inc.

CHAIN OF CUSTODY FORM

DATE: 22 Aug 06

FROM: Environmental Health and Engineering, Inc.
60 Wells Avenue
Newton, MA 02459-3210

TO: GROUND WATER ANALYTICAL

Please send invoices to ATTN: Accounts Payable
Please send reports to ATTN: Data Coordinator

In all correspondence regarding this matter, please refer to EH&E Project # 14680

The cost of this analysis will be covered by EH&E Purchase Order # 997373

For EH & E Data Coordinator - URGENT DATA ☐

SAMPLE ID	SAMPLE TYPE	ANALYTICAL METHOD/NUMBER	OTHER:Time/Date/Vol.
78155	BULK	EPA 8082 – PCBS	
78156			
78157			
78158			
78159			
78160			
78161			
78162		ACE extraction	
78163			
78167			
78168			

Special instructions:

☐ Standard turn around time ☒ Rush by 5 DAY TAT date/time ☐ Other

☐ Fax results 617-964-8556

☐ **RETURN SAMPLES** ☒ Electronic transfer - datacoodinator@eheinc.com

☒ Additional report recipient MCHANG@EHEINC.COM ; ABISOL@EHEINC.COM

Each signatory please return one copy of this form to the above address

Relinquished by: _____ of Environmental Health & Engineering, Inc. Date: 8/23/06

Received by: _____ of (company name) GWA Date: 8/23/06

Relinquished by: _____ of (company name) GWA Date: 8/23/06 1735

Received by: _____ of (company name) GWA Date: 8/23/06

Relinquished by: _____ of (company name) _____ Date: _____

Received by: _____ of (company name) _____ Date: _____

Lab Data
Received by: _____ of Environmental Health & Engineering, Inc. Date: _____

Page 1 of 4

WHITE-EH&E FILE COPY YELLOW-LAB COPY PINK-PROJECT MANAGER COPY GOLD-DATA COORDINATOR COPY

Quality Assurance/Quality Control

A. Program Overview

Groundwater Analytical conducts an active Quality Assurance program to ensure the production of high quality, valid data. This program closely follows the guidance provided by *Interim Guidelines and Specifications for Preparing Quality Assurance Project Plans,* US EPA QAMS-005/80 (1980), and *Test Methods for Evaluating Solid Waste,* US EPA, SW-846, Update III (1996).

Quality Control protocols include written Standard Operating Procedures (SOPs) developed for each analytical method. SOPs are derived from US EPA methodologies and other established references. Standards are prepared from commercially obtained reference materials of certified purity, and documented for traceability.

Quality Assessment protocols for most organic analyses include a minimum of one laboratory control sample, one method blank, one matrix spike sample, and one sample duplicate for each sample preparation batch. All samples, standards, blanks, laboratory control samples, matrix spikes and sample duplicates are spiked with internal standards and surrogate compounds. All instrument sequences begin with an initial calibration verification standard and a blank; and excepting GC/MS sequences, all sequences close with a continuing calibration standard. GC/MS systems are tuned to appropriate ion abundance criteria daily, or for each 12 hour operating period, whichever is more frequent.

Quality Assessment protocols for most inorganic analyses include a minimum of one laboratory control sample, one method blank, one matrix spike sample, and one sample duplicate for each sample preparation batch. Standard curves are derived from one reagent blank and four concentration levels. Curve validity is verified by standard recoveries within plus or minus ten percent of the curve.

B. Definitions

Batches are used as the basic unit for Quality Assessment. A Batch is defined as twenty or fewer samples of the same matrix which are prepared together for the same analysis, using the same lots of reagents and the same techniques or manipulations, all within the same continuum of time, up to but not exceeding 24 hours.

Laboratory Control Samples are used to assess the accuracy of the analytical method. A Laboratory Control Sample consists of reagent water or sodium sulfate spiked with a group of target analytes representative of the method analytes. Accuracy is defined as the degree of agreement of the measured value with the true or expected value. Percent Recoveries for the Laboratory Control Samples are calculated to assess accuracy.

Method Blanks are used to assess the level of contamination present in the analytical system. Method Blanks consist of reagent water or an aliquot of sodium sulfate. Method Blanks are taken through all the appropriate steps of an analytical method. Sample data reported is not corrected for blank contamination.

Surrogate Compounds are used to assess the effectiveness of an analytical method in dealing with each sample matrix. Surrogate Compounds are organic compounds which are similar to the target analytes of interest in chemical behavior, but which are not normally found in environmental samples. Percent Recoveries are calculated for each Surrogate Compound.

GROUNDWATER ANALYTICAL

Quality Control Report
Laboratory Control Samples

		LCS		LCSD	
Category:	**EPA 8082**	Instrument ID:	**GC-13 Agilent 6890**	Instrument ID:	**GC-13 Agilent 6890**
QC Batch ID:	**PB-2562-X**	Extracted:	**08-27-06 14:00**	Extracted:	**08-27-06 14:00**
Matrix:	**Soil**	Cleaned Up:	**08-28-06 15:00**	Cleaned Up:	**08-28-06 15:00**
Units:	**ug/Kg**	Analyzed:	**09-01-06 09:42**	Analyzed:	**09-01-06 10:05**
		Analyst:	**CRL**	Analyst:	**CRL**

CAS Number	Analyte	LCS					LCS Duplicate							QC Limits	
		Spiked	Measured		Recovery		Spiked	Measured		Recovery		RPD			
			1st Col	2nd Col	1st Col	2nd Col		1st Col	2nd Col	1st Col	2nd Col	1st Col	2nd Col	Spike	RPD
12674-11-2	Aroclor 1016	170	150	160	**88%**	**98%**	170	140	140	**82%**	**86%**	**6 %**	**12 %**	40 - 140%	30 %
11096-82-5	Aroclor 1260	170	170	170	**103%**	**103%**	170	170	170	**105%**	**102%**	**2 %**	**1 %**	40 - 140%	30 %

QC Surrogate Compound	Surrogate Recovery										QC Limits
Tetrachloro-*m* -xylene	6.7	4.9	5.5	**74%**	**83%**	6.7	4.2	4.5	**63%**	**68%**	30 - 150 %
Decachlorobiphenyl	6.7	6.3	6.0	**94%**	**90%**	6.7	6.5	5.9	**98%**	**88%**	30 - 150 %

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996).
Sample extraction performed by EPA Method 3540C. Cleanup performed by EPA Method 3660B and EPA Method 3665A.

Report Notations: All calculations performed prior to rounding. Quality Control Limits are defined by the methodology, or alternatively based upon the historical average recovery plus or minus three standard deviation units.

GROUNDWATER ANALYTICAL

Quality Control Report
Method Blank

Category:	**EPA Method 8082**	Instrument ID:	**GC-13 Agilent 6890**
QC Batch ID:	**PB-2562-X**	Extracted:	**08-27-06 14:00**
Matrix:	**Soil**	Cleaned Up:	**08-28-06 15:00**
		Analyzed:	**09-01-06 09:18**
		Analyst:	**CRL**

CAS Number	Analyte	Concentration	Notes	Units	Reporting Limit
12674-11-2	Aroclor 1016	BRL		ug/Kg	80
11104-28-2	Aroclor 1221	BRL		ug/Kg	80
11141-16-5	Aroclor 1232	BRL		ug/Kg	80
53469-21-9	Aroclor 1242	BRL		ug/Kg	80
12672-29-6	Aroclor 1248	BRL		ug/Kg	80
11097-69-1	Aroclor 1254	BRL		ug/Kg	80
11096-82-5	Aroclor 1260	BRL		ug/Kg	80
37324-23-5	Aroclor 1262 †	BRL		ug/Kg	80
11100-14-4	Aroclor 1268 †	BRL		ug/Kg	80

QC Surrogate Compound		Spiked	Measured	Recovery	QC Limits
First Column	Tetrachloro-*m*-xylene	6.7	5.6	**84** %	30 - 150 %
	Decachlorobiphenyl	6.7	7.4	**111** %	30 - 150 %
Second Column	Tetrachloro-*m*-xylene	6.7	5.2	**79** %	30 - 150 %
	Decachlorobiphenyl	6.7	6.8	**103** %	30 - 150 %

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996).
Sample extraction performed by EPA Method 3540C. Cleanup performed by EPA Method 3660B and EPA Method 3665A.

Report Notations: BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.

† Non-target analyte. Result is based on a single mid-range calibration standard.

GROUNDWATER ANALYTICAL

Certifications and Approvals

Groundwater Analytical maintains environmental laboratory certification in a variety of states. Copies of our current certificates may be obtained from our website:

http://www.groundwateranalytical.com/qualifications.htm

CONNECTICUT, Department of Health Services, PH-0586

Categories: Potable Water, Wastewater, Solid Waste and Soil
http://www.dph.state.ct.us/BRS/Environmental_Lab/OutStateLabList.htm

FLORIDA, Department of Health, Bureau of Laboratories, E87643

Categories: SDWA, CWA, RCRA/CERCLA
http://www.floridadep.org/labs/qa/dohforms.htm

MAINE, Department of Human Services, MA103

Categories: Drinking Water and Wastewater
http://www.state.me.us/dhs/eng/water/Compliance.htm

MASSACHUSETTS, Department of Environmental Protection, M-MA-103

Categories: Potable Water and Non-Potable Water
http://www.state.ma.us/dep/bspt/wes/files/certlabs.pdf

NEW HAMPSHIRE, Department of Environmental Services, 202703

Categories: Drinking Water and Wastewater
http://www.des.state.nh.us/asp/NHELAP/labsview.asp

NEW YORK, Department of Health, 11754

Categories: Potable Water, Non-Potable Water and Solid Waste
http://www.wadsworth.org/labcert/elap/comm.html

PENNSYLVANIA, Department of Environmental Protection, 68-665

Environmental Laboratory Registration (Non-drinking water and Non-wastewater)
http://www.dep.state.pa.us/Labs/Registered/

RHODE ISLAND, Department of Health, 54

Categories: Surface Water, Air, Wastewater, Potable Water, Sewage
http://www.healthri.org/labs/labsCT_MA.htm

U.S. Department of Agriculture, Soil Permit, S-53921

Foreign soil import permit

VERMONT, Department of Environmental Conservation, Water Supply Division

Category: Drinking Water
http://www.vermontdrinkingwater.org/wsops/labtable.PDF

Groundwater Analytical, Inc.
P.O.Box 1200
228 Main Street
Buzzards Bay, MA 02532

Telephone: (508) 759-4441
FAX: (508) 759-4475

GROUNDWATER ANALYTICAL

e-mail

To:	Max Chang	From:	e-mail reporting GWA
	Environmental Health &	Pages:	20
e-mail:	mchang@eheinc.com	Date:	09/01/2006 10:24:27
Re:	98116	CC:	

☐ Urgent ☐ For Review ☐ Please Comment ☐ Please Reply

- Comments:

Project Report for 14680, Lab ID 98116, Received 08-23-06

Confidential

GROUNDWATER ANALYTICAL

Groundwater Analytical, Inc.
P.O. Box 1200
228 Main Street
Buzzards Bay, MA 02532

Telephone (508) 759-4441
FAX (508) 759-4475
www.groundwateranalytical.com

September 1, 2006

Mr. Max Chang
Environmental Health & Engineering, Inc.
60 Wells Avenue
Newton, MA 02159-3210

LABORATORY REPORT

Project: **14680**
Lab ID: **98116**
Received: **08-23-06**

Dear Max:

Enclosed are the analytical results for the above referenced project. The project was processed for Rush turnaround.

This letter authorizes the release of the analytical results, and should be considered a part of this report. This report contains a sample receipt report detailing the samples received, a project narrative indicating project changes and non-conformances, a quality control report, and a statement of our state certifications.

The analytical results contained in this report meet all applicable NELAC standards, except as may be specifically noted, or described in the project narrative. This report may only be used or reproduced in its entirety.

I attest under the pains and penalties of perjury that, based upon my inquiry of those individuals immediately responsible for obtaining the information, the material contained in this report is, to the best of my knowledge and belief, accurate and complete.

Should you have any questions concerning this report, please do not hesitate to contact me.

Sincerely,

Eric H. Jensen
Operations Manager

EHJ/jll
Enclosures

GROUNDWATER ANALYTICAL

Sample Receipt Report

Project: **14680**
Client: **Environmental Health & Engineering, Inc.**
Lab ID: **98116**

Delivery: **GWA Courier**
Airbill: **n/a**
Lab Receipt: **08-23-06**

Temperature: **n/a**
Chain of Custody: **Present**
Custody Seal(s): **n/a**

Lab ID	Field ID		Matrix	Sampled	Method				Notes
98116-1	79406		Solid	8/23/06 0:00	EPA 8082 PCBs				
Con ID	**Container**	**Vendor**	**QC Lot**	**Preserv**	**QC Lot**	**Prep**	**Ship**		
C851478	Plastic Bag	n/a	n/a	None	n/a	n/a	n/a		

Lab ID	Field ID		Matrix	Sampled	Method				Notes
98116-2	79407		Solid	8/23/06 0:00	EPA 8082 PCBs				
Con ID	**Container**	**Vendor**	**QC Lot**	**Preserv**	**QC Lot**	**Prep**	**Ship**		
C851479	Plastic Bag	n/a	n/a	None	n/a	n/a	n/a		

Lab ID	Field ID		Matrix	Sampled	Method				Notes
98116-3	79408		Solid	8/23/06 0:00	EPA 8082 PCBs				
Con ID	**Container**	**Vendor**	**QC Lot**	**Preserv**	**QC Lot**	**Prep**	**Ship**		
C851480	Plastic Bag	n/a	n/a	None	n/a	n/a	n/a		

Lab ID	Field ID		Matrix	Sampled	Method				Notes
98116-4	79409		Solid	8/23/06 0:00	EPA 8082 PCBs				
Con ID	**Container**	**Vendor**	**QC Lot**	**Preserv**	**QC Lot**	**Prep**	**Ship**		
C851481	Plastic Bag	n/a	n/a	None	n/a	n/a	n/a		

Lab ID	Field ID		Matrix	Sampled	Method				Notes
98116-5	79410		Solid	8/23/06 0:00	EPA 8082 PCBs				
Con ID	**Container**	**Vendor**	**QC Lot**	**Preserv**	**QC Lot**	**Prep**	**Ship**		
C851482	Plastic Bag	n/a	n/a	None	n/a	n/a	n/a		

Lab ID	Field ID		Matrix	Sampled	Method				Notes
98116-6	79411		Solid	8/23/06 0:00	EPA 8082 PCBs				
Con ID	**Container**	**Vendor**	**QC Lot**	**Preserv**	**QC Lot**	**Prep**	**Ship**		
C851483	Plastic Bag	n/a	n/a	None	n/a	n/a	n/a		

Lab ID	Field ID		Matrix	Sampled	Method				Notes
98116-7	79412		Solid	8/23/06 0:00	EPA 8082 PCBs				
Con ID	**Container**	**Vendor**	**QC Lot**	**Preserv**	**QC Lot**	**Prep**	**Ship**		
C851484	Plastic Bag	n/a	n/a	None	n/a	n/a	n/a		

Lab ID	Field ID		Matrix	Sampled	Method				Notes
98116-8	79413		Solid	8/23/06 0:00	EPA 8082 PCBs				
Con ID	**Container**	**Vendor**	**QC Lot**	**Preserv**	**QC Lot**	**Prep**	**Ship**		
C851485	Plastic Bag	n/a	n/a	None	n/a	n/a	n/a		

Lab ID	Field ID		Matrix	Sampled	Method				Notes
98116-9	79414		Solid	8/23/06 0:00	EPA 8082 PCBs				
Con ID	**Container**	**Vendor**	**QC Lot**	**Preserv**	**QC Lot**	**Prep**	**Ship**		
C851486	Plastic Bag	n/a	n/a	None	n/a	n/a	n/a		

Lab ID	Field ID		Matrix	Sampled	Method				Notes
98116-10	79415		Solid	8/23/06 0:00	EPA 8082 PCBs				
Con ID	**Container**	**Vendor**	**QC Lot**	**Preserv**	**QC Lot**	**Prep**	**Ship**		
C851487	Plastic Bag	n/a	n/a	None	n/a	n/a	n/a		

Lab ID	Field ID		Matrix	Sampled	Method				Notes
98116-11	79416		Solid	8/23/06 0:00	EPA 8082 PCBs				
Con ID	**Container**	**Vendor**	**QC Lot**	**Preserv**	**QC Lot**	**Prep**	**Ship**		
C851488	Plastic Bag	n/a	n/a	None	n/a	n/a	n/a		

GROUNDWATER ANALYTICAL

EPA Method 8082
Polychlorinated Biphenyls (PCBs) by GC/ECD

Field ID:	**79406**	Matrix:	**Solid**
Project:	**14680**	Container:	**Plastic Bag**
Client:	**Environmental Health & Engineering, Inc.**	Preservation:	**Cool**
Laboratory ID:	**98116-01**	QC Batch ID:	**PB-2561-X**
Sampled:	**08-23-06 00:00**	Instrument ID:	**GC-6 HP 5890**
Received:	**08-23-06 17:30**	Sample Weight:	**7.2 g**
Extracted:	**08-27-06 14:00**	Final Volume:	**1 mL**
Cleaned Up:	**08-28-06 15:00**	Percent Solids:	**n/a**
Analyzed:	**08-29-06 13:47**	Dilution Factor:	**1**
Analyst:	**CRL**		

CAS Number	Analyte	Concentration	Notes	Units	Reporting Limit
12674-11-2	Aroclor 1016	BRL		ug/Kg	170
11104-28-2	Aroclor 1221	BRL		ug/Kg	170
11141-16-5	Aroclor 1232	BRL		ug/Kg	170
53469-21-9	Aroclor 1242	BRL		ug/Kg	170
12672-29-6	Aroclor 1248	BRL		ug/Kg	170
11097-69-1	Aroclor 1254	**1,000**	1C (990)*	ug/Kg	170
11096-82-5	Aroclor 1260	BRL		ug/Kg	170
37324-23-5	Aroclor 1262 †	BRL		ug/Kg	170
11100-14-4	Aroclor 1268 †	BRL		ug/Kg	170

QC Surrogate Compound		Spiked	Measured	Recovery	QC Limits
First	Tetrachloro-*m*-xylene	28	16	**58** %	30 - 150 %
Column	Decachlorobiphenyl	28	22	**78** %	30 - 150 %
Second	Tetrachloro-*m*-xylene	28	16	**56** %	30 - 150 %
Column	Decachlorobiphenyl	28	24	**87** %	30 - 150 %

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996).
Sample extraction performed by EPA Method 3540C. Cleanup performed by EPA Method 3660B and EPA Method 3665A.

Report Notations:

BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.

† Non-target analyte. Result is based on a single mid-range calibration standard.

* Confirmatory column quantification.

1C Concentration reported from first column.

GROUNDWATER ANALYTICAL

EPA Method 8082
Polychlorinated Biphenyls (PCBs) by GC/ECD

Field ID:	**79407**	Matrix:	**Solid**
Project:	**14680**	Container:	**Plastic Bag**
Client:	**Environmental Health & Engineering, Inc.**	Preservation:	**Cool**
Laboratory ID:	**98116-02**	QC Batch ID:	**PB-2561-X**
Sampled:	**08-23-06 00:00**	Instrument ID:	**GC-6 HP 5890**
Received:	**08-23-06 17:30**	Sample Weight:	**4.6 g**
Extracted:	**08-27-06 14:00**	Final Volume:	**1 mL**
Cleaned Up:	**08-28-06 15:00**	Percent Solids:	**n/a**
Analyzed:	**08-29-06 14:22**	Dilution Factor:	**1**
Analyst:	**CRL**		

CAS Number	Analyte	Concentration	Notes	Units	Reporting Limit
12674-11-2	Aroclor 1016	BRL		ug/Kg	260
11104-28-2	Aroclor 1221	BRL		ug/Kg	260
11141-16-5	Aroclor 1232	BRL		ug/Kg	260
53469-21-9	Aroclor 1242	BRL		ug/Kg	260
12672-29-6	Aroclor 1248	BRL		ug/Kg	260
11097-69-1	Aroclor 1254	**1,000**	1C (920)*	ug/Kg	260
11096-82-5	Aroclor 1260	BRL		ug/Kg	260
37324-23-5	Aroclor 1262 †	BRL		ug/Kg	260
11100-14-4	Aroclor 1268 †	BRL		ug/Kg	260

QC Surrogate Compound		Spiked	Measured	Recovery	QC Limits
First	Tetrachloro-*m*-xylene	44	25	**57** %	30 - 150 %
Column	Decachlorobiphenyl	44	27	**62** %	30 - 150 %
Second	Tetrachloro-*m*-xylene	44	24	**56** %	30 - 150 %
Column	Decachlorobiphenyl	44	33	**77** %	30 - 150 %

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996).
Sample extraction performed by EPA Method 3540C. Cleanup performed by EPA Method 3660B and EPA Method 3665A.

Report Notations:

BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.

† Non-target analyte. Result is based on a single mid-range calibration standard.

* Confirmatory column quantification.

1C Concentration reported from first column.

GROUNDWATER ANALYTICAL

EPA Method 8082
Polychlorinated Biphenyls (PCBs) by GC/ECD

Field ID:	**79408**	Matrix:	**Solid**
Project:	**14680**	Container:	**Plastic Bag**
Client:	**Environmental Health & Engineering, Inc.**	Preservation:	**Cool**
Laboratory ID:	**98116-03**	QC Batch ID:	**PB-2561-X**
Sampled:	**08-23-06 00:00**	Instrument ID:	**GC-6 HP 5890**
Received:	**08-23-06 17:30**	Sample Weight:	**7.4 g**
Extracted:	**08-27-06 14:00**	Final Volume:	**1 mL**
Cleaned Up:	**08-28-06 15:00**	Percent Solids:	**n/a**
Analyzed:	**08-30-06 03:13**	Dilution Factor:	**1**
Analyst:	**CRL**		

CAS Number	Analyte	Concentration	Notes	Units	Reporting Limit
12674-11-2	Aroclor 1016	BRL		ug/Kg	160
11104-28-2	Aroclor 1221	BRL		ug/Kg	160
11141-16-5	Aroclor 1232	BRL		ug/Kg	160
53469-21-9	Aroclor 1242	BRL		ug/Kg	160
12672-29-6	Aroclor 1248	BRL		ug/Kg	160
11097-69-1	Aroclor 1254	**1,100**	2C (1100)*	ug/Kg	160
11096-82-5	Aroclor 1260	BRL		ug/Kg	160
37324-23-5	Aroclor 1262 †	BRL		ug/Kg	160
11100-14-4	Aroclor 1268 †	BRL		ug/Kg	160

QC Surrogate Compound		Spiked	Measured	Recovery	QC Limits
First	Tetrachloro-*m*-xylene	27	13	**48** %	30 - 150 %
Column	Decachlorobiphenyl	27	21	**78** %	30 - 150 %
Second	Tetrachloro-*m*-xylene	27	13	**48** %	30 - 150 %
Column	Decachlorobiphenyl	27	16	**61** %	30 - 150 %

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996).
Sample extraction performed by EPA Method 3540C. Cleanup performed by EPA Method 3660B and EPA Method 3665A.

Report Notations:

BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.

† Non-target analyte. Result is based on a single mid-range calibration standard.

* Confirmatory column quantification.

2C Concentration reported from second column.

GROUNDWATER ANALYTICAL

EPA Method 8082
Polychlorinated Biphenyls (PCBs) by GC/ECD

Field ID:	**79409**	Matrix:	**Solid**
Project:	**14680**	Container:	**Plastic Bag**
Client:	**Environmental Health & Engineering, Inc.**	Preservation:	**Cool**
Laboratory ID:	**98116-04**	QC Batch ID:	**PB-2561-X**
Sampled:	**08-23-06 00:00**	Instrument ID:	**GC-6 HP 5890**
Received:	**08-23-06 17:30**	Sample Weight:	**12 g**
Extracted:	**08-27-06 14:00**	Final Volume:	**1 mL**
Cleaned Up:	**08-28-06 15:00**	Percent Solids:	**n/a**
Analyzed:	**08-29-06 15:32**	Dilution Factor:	**1**
Analyst:	**CRL**		

CAS Number	Analyte	Concentration	Notes	Units	Reporting Limit
12674-11-2	Aroclor 1016	BRL		ug/Kg	100
11104-28-2	Aroclor 1221	BRL		ug/Kg	100
11141-16-5	Aroclor 1232	BRL		ug/Kg	100
53469-21-9	Aroclor 1242	BRL		ug/Kg	100
12672-29-6	Aroclor 1248	BRL		ug/Kg	100
11097-69-1	Aroclor 1254	**590**	1C (570)*	ug/Kg	100
11096-82-5	Aroclor 1260	BRL		ug/Kg	100
37324-23-5	Aroclor 1262 †	BRL		ug/Kg	100
11100-14-4	Aroclor 1268 †	BRL		ug/Kg	100

QC Surrogate Compound		Spiked	Measured	Recovery	QC Limits
First	Tetrachloro-*m*-xylene	17	7	**44** %	30 - 150 %
Column	Decachlorobiphenyl	17	13	**75** %	30 - 150 %
Second	Tetrachloro-*m*-xylene	17	7	**42** %	30 - 150 %
Column	Decachlorobiphenyl	17	15	**89** %	30 - 150 %

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996).
Sample extraction performed by EPA Method 3540C. Cleanup performed by EPA Method 3660B and EPA Method 3665A.

Report Notations:

BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.

† Non-target analyte. Result is based on a single mid-range calibration standard.

* Confirmatory column quantification.

1C Concentration reported from first column.

GROUNDWATER ANALYTICAL

EPA Method 8082
Polychlorinated Biphenyls (PCBs) by GC/ECD

Field ID:	**79410**	Matrix:	**Solid**
Project:	**14680**	Container:	**Plastic Bag**
Client:	**Environmental Health & Engineering, Inc.**	Preservation:	**Cool**
Laboratory ID:	**98116-05**	QC Batch ID:	**PB-2561-X**
Sampled:	**08-23-06 00:00**	Instrument ID:	**GC-6 HP 5890**
Received:	**08-23-06 17:30**	Sample Weight:	**17 g**
Extracted:	**08-27-06 14:00**	Final Volume:	**1 mL**
Cleaned Up:	**08-28-06 15:00**	Percent Solids:	**n/a**
Analyzed:	**08-30-06 09:38**	Dilution Factor:	**5**
Analyst:	**CRL**		

CAS Number	Analyte	Concentration	Notes	Units	Reporting Limit
12674-11-2	Aroclor 1016	BRL		ug/Kg	360
11104-28-2	Aroclor 1221	BRL		ug/Kg	360
11141-16-5	Aroclor 1232	BRL		ug/Kg	360
53469-21-9	Aroclor 1242	BRL		ug/Kg	360
12672-29-6	Aroclor 1248	BRL		ug/Kg	360
11097-69-1	Aroclor 1254	**1,700**	1C (1700)*	ug/Kg	360
11096-82-5	Aroclor 1260	BRL		ug/Kg	360
37324-23-5	Aroclor 1262 †	BRL		ug/Kg	360
11100-14-4	Aroclor 1268 †	BRL		ug/Kg	360

QC Surrogate Compound		Spiked	Measured	Recovery	QC Limits
First	Tetrachloro-*m*-xylene	12	7	**61** %	30 - 150 %
Column	Decachlorobiphenyl	12	14	**118** %	30 - 150 %
Second	Tetrachloro-*m*-xylene	12	7	**56** %	30 - 150 %
Column	Decachlorobiphenyl	12	10	**85** %	30 - 150 %

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996).
Sample extraction performed by EPA Method 3540C. Cleanup performed by EPA Method 3660B and EPA Method 3665A.

Report Notations:

BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.

† Non-target analyte. Result is based on a single mid-range calibration standard.

* Confirmatory column quantification.

1C Concentration reported from first column.

GROUNDWATER ANALYTICAL

EPA Method 8082
Polychlorinated Biphenyls (PCBs) by GC/ECD

Field ID:	**79411**	Matrix:	**Solid**
Project:	**14680**	Container:	**Plastic Bag**
Client:	**Environmental Health & Engineering, Inc.**	Preservation:	**Cool**
Laboratory ID:	**98116-06**	QC Batch ID:	**PB-2561-X**
Sampled:	**08-23-06 00:00**	Instrument ID:	**GC-6 HP 5890**
Received:	**08-23-06 17:30**	Sample Weight:	**18 g**
Extracted:	**08-27-06 14:00**	Final Volume:	**1 mL**
Cleaned Up:	**08-28-06 15:00**	Percent Solids:	**n/a**
Analyzed:	**08-30-06 02:38**	Dilution Factor:	**5**
Analyst:	**CRL**		

CAS Number	Analyte	Concentration	Notes	Units	Reporting Limit
12674-11-2	Aroclor 1016	BRL		ug/Kg	340
11104-28-2	Aroclor 1221	BRL		ug/Kg	340
11141-16-5	Aroclor 1232	BRL		ug/Kg	340
53469-21-9	Aroclor 1242	BRL		ug/Kg	340
12672-29-6	Aroclor 1248	BRL		ug/Kg	340
11097-69-1	Aroclor 1254	**1,500**	1C (1500)*	ug/Kg	340
11096-82-5	Aroclor 1260	BRL		ug/Kg	340
37324-23-5	Aroclor 1262 †	BRL		ug/Kg	340
11100-14-4	Aroclor 1268 †	BRL		ug/Kg	340

QC Surrogate Compound		Spiked	Measured	Recovery	QC Limits
First	Tetrachloro-*m*-xylene	11	6	**57** %	30 - 150 %
Column	Decachlorobiphenyl	11	7	**58** %	30 - 150 %
Second	Tetrachloro-*m*-xylene	11	5	**43** %	30 - 150 %
Column	Decachlorobiphenyl	11	12	**105** %	30 - 150 %

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996).
Sample extraction performed by EPA Method 3540C. Cleanup performed by EPA Method 3660B and EPA Method 3665A.

Report Notations:

BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.

† Non-target analyte. Result is based on a single mid-range calibration standard.

* Confirmatory column quantification.

1C Concentration reported from first column.

GROUNDWATER ANALYTICAL

EPA Method 8082
Polychlorinated Biphenyls (PCBs) by GC/ECD

Field ID:	**79412**	Matrix:	**Solid**
Project:	**14680**	Container:	**Plastic Bag**
Client:	**Environmental Health & Engineering, Inc.**	Preservation:	**Cool**
Laboratory ID:	**98116-07**	QC Batch ID:	**PB-2561-X**
Sampled:	**08-23-06 00:00**	Instrument ID:	**GC-6 HP 5890**
Received:	**08-23-06 17:30**	Sample Weight:	**28 g**
Extracted:	**08-27-06 14:00**	Final Volume:	**1 mL**
Cleaned Up:	**08-28-06 15:00**	Percent Solids:	**n/a**
Analyzed:	**08-30-06 03:48**	Dilution Factor:	**10**
Analyst:	**CRL**		

CAS Number	Analyte	Concentration	Notes	Units	Reporting Limit
12674-11-2	Aroclor 1016	BRL		ug/Kg	430
11104-28-2	Aroclor 1221	BRL		ug/Kg	430
11141-16-5	Aroclor 1232	BRL		ug/Kg	430
53469-21-9	Aroclor 1242	BRL		ug/Kg	430
12672-29-6	Aroclor 1248	BRL		ug/Kg	430
11097-69-1	Aroclor 1254	**2,800**	1C (2600)*	ug/Kg	430
11096-82-5	Aroclor 1260	BRL		ug/Kg	430
37324-23-5	Aroclor 1262 †	BRL		ug/Kg	430
11100-14-4	Aroclor 1268 †	BRL		ug/Kg	430

QC Surrogate Compound		Spiked	Measured	Recovery	QC Limits
First	Tetrachloro-*m*-xylene	7.2	4.8	**67** %	30 - 150 %
Column	Decachlorobiphenyl	7.2	6.3	**88** %	30 - 150 %
Second	Tetrachloro-*m*-xylene	7.2	3.8	**53** %	30 - 150 %
Column	Decachlorobiphenyl	7.2	11	**149** %	30 - 150 %

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996).
Sample extraction performed by EPA Method 3540C. Cleanup performed by EPA Method 3660B and EPA Method 3665A.

Report Notations:

BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.

† Non-target analyte. Result is based on a single mid-range calibration standard.

* Confirmatory column quantification.

1C Concentration reported from first column.

GROUNDWATER ANALYTICAL

EPA Method 8082
Polychlorinated Biphenyls (PCBs) by GC/ECD

Field ID:	**79413**	Matrix:	**Solid**
Project:	**14680**	Container:	**Plastic Bag**
Client:	**Environmental Health & Engineering, Inc.**	Preservation:	**Cool**
Laboratory ID:	**98116-08**	QC Batch ID:	**PB-2561-X**
Sampled:	**08-23-06 00:00**	Instrument ID:	**GC-6 HP 5890**
Received:	**08-23-06 17:30**	Sample Weight:	**16 g**
Extracted:	**08-27-06 14:00**	Final Volume:	**1 mL**
Cleaned Up:	**08-28-06 15:00**	Percent Solids:	**n/a**
Analyzed:	**08-30-06 04:23**	Dilution Factor:	**10**
Analyst:	**CRL**		

CAS Number	Analyte	Concentration	Notes	Units	Reporting Limit
12674-11-2	Aroclor 1016	BRL		ug/Kg	770
11104-28-2	Aroclor 1221	BRL		ug/Kg	770
11141-16-5	Aroclor 1232	BRL		ug/Kg	770
53469-21-9	Aroclor 1242	BRL		ug/Kg	770
12672-29-6	Aroclor 1248	BRL		ug/Kg	770
11097-69-1	Aroclor 1254	**2,800**	2C (2400)*	ug/Kg	770
11096-82-5	Aroclor 1260	BRL		ug/Kg	770
37324-23-5	Aroclor 1262 †	BRL		ug/Kg	770
11100-14-4	Aroclor 1268 †	BRL		ug/Kg	770

QC Surrogate Compound		Spiked	Measured	Recovery	QC Limits
First Column	Tetrachloro-*m*-xylene	13	7.8	**61** %	30 - 150 %
	Decachlorobiphenyl	13	13	**105** %	30 - 150 %
Second Column	Tetrachloro-*m*-xylene	13	6.7	**53** %	30 - 150 %
	Decachlorobiphenyl	13	5.8	**46** %	30 - 150 %

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996).
Sample extraction performed by EPA Method 3540C. Cleanup performed by EPA Method 3660B and EPA Method 3665A.

Report Notations:

BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.

† Non-target analyte. Result is based on a single mid-range calibration standard.

* Confirmatory column quantification.

2C Concentration reported from second column.

GROUNDWATER ANALYTICAL

EPA Method 8082
Polychlorinated Biphenyls (PCBs) by GC/ECD

Field ID:	**79414**	Matrix:	**Solid**
Project:	**14680**	Container:	**Plastic Bag**
Client:	**Environmental Health & Engineering, Inc.**	Preservation:	**Cool**
Laboratory ID:	**98116-09**	QC Batch ID:	**PB-2561-X**
Sampled:	**08-23-06 00:00**	Instrument ID:	**GC-6 HP 5890**
Received:	**08-23-06 17:30**	Sample Weight:	**7.7 g**
Extracted:	**08-27-06 14:00**	Final Volume:	**1 mL**
Cleaned Up:	**08-28-06 15:00**	Percent Solids:	**n/a**
Analyzed:	**08-30-06 04:58**	Dilution Factor:	**10**
Analyst:	**CRL**		

CAS Number	Analyte	Concentration	Notes	Units	Reporting Limit
12674-11-2	Aroclor 1016	BRL		ug/Kg	1,600
11104-28-2	Aroclor 1221	BRL		ug/Kg	1,600
11141-16-5	Aroclor 1232	BRL		ug/Kg	1,600
53469-21-9	Aroclor 1242	BRL		ug/Kg	1,600
12672-29-6	Aroclor 1248	BRL		ug/Kg	1,600
11097-69-1	Aroclor 1254	**3,300**	2C (3000)*	ug/Kg	1,600
11096-82-5	Aroclor 1260	BRL		ug/Kg	1,600
37324-23-5	Aroclor 1262 †	BRL		ug/Kg	1,600
11100-14-4	Aroclor 1268 †	BRL		ug/Kg	1,600

QC Surrogate Compound		Spiked	Measured	Recovery	QC Limits
First	Tetrachloro-*m*-xylene	26	14	**54** %	30 - 150 %
Column	Decachlorobiphenyl	26	16	**62** %	30 - 150 %
Second	Tetrachloro-*m*-xylene	26	13	**51** %	30 - 150 %
Column	Decachlorobiphenyl	26	15	**56** %	30 - 150 %

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996).
Sample extraction performed by EPA Method 3540C. Cleanup performed by EPA Method 3660B and EPA Method 3665A.

Report Notations:

BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.

† Non-target analyte. Result is based on a single mid-range calibration standard.

* Confirmatory column quantification.

2C Concentration reported from second column.

GROUNDWATER ANALYTICAL

EPA Method 8082
Polychlorinated Biphenyls (PCBs) by GC/ECD

Field ID:	**79415**	Matrix:	**Solid**
Project:	**14680**	Container:	**Plastic Bag**
Client:	**Environmental Health & Engineering, Inc.**	Preservation:	**Cool**
Laboratory ID:	**98116-10**	QC Batch ID:	**PB-2561-X**
Sampled:	**08-23-06 00:00**	Instrument ID:	**GC-6 HP 5890**
Received:	**08-23-06 17:30**	Sample Weight:	**16 g**
Extracted:	**08-27-06 14:00**	Final Volume:	**1 mL**
Cleaned Up:	**08-28-06 15:00**	Percent Solids:	**n/a**
Analyzed:	**08-30-06 05:33**	Dilution Factor:	**10**
Analyst:	**CRL**		

CAS Number	Analyte	Concentration	Notes	Units	Reporting Limit
12674-11-2	Aroclor 1016	BRL		ug/Kg	750
11104-28-2	Aroclor 1221	BRL		ug/Kg	750
11141-16-5	Aroclor 1232	BRL		ug/Kg	750
53469-21-9	Aroclor 1242	BRL		ug/Kg	750
12672-29-6	Aroclor 1248	BRL		ug/Kg	750
11097-69-1	Aroclor 1254	**1,200**	2C (1100)*	ug/Kg	750
11096-82-5	Aroclor 1260	BRL		ug/Kg	750
37324-23-5	Aroclor 1262 †	BRL		ug/Kg	750
11100-14-4	Aroclor 1268 †	BRL		ug/Kg	750

QC Surrogate Compound		Spiked	Measured	Recovery		QC Limits
First Column	Tetrachloro-*m*-xylene	13	3.1	**24** %	q	30 - 150 %
	Decachlorobiphenyl	13	4.4	**35** %		30 - 150 %
Second Column	Tetrachloro-*m*-xylene	13	2.5	**20** %	q	30 - 150 %
	Decachlorobiphenyl	13	3.0	**24** %	q	30 - 150 %

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996).
Sample extraction performed by EPA Method 3540C. Cleanup performed by EPA Method 3660B and EPA Method 3665A.

Report Notations:

BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.

† Non-target analyte. Result is based on a single mid-range calibration standard.

* Confirmatory column quantification.

2C Concentration reported from second column.

q Surrogate recovery outside recommended limits.

GROUNDWATER ANALYTICAL

EPA Method 8082
Polychlorinated Biphenyls (PCBs) by GC/ECD

Field ID:	**79416**	Matrix:	**Solid**
Project:	**14680**	Container:	**Plastic Bag**
Client:	**Environmental Health & Engineering, Inc.**	Preservation:	**Cool**
Laboratory ID:	**98116-11**	QC Batch ID:	**PB-2561-X**
Sampled:	**08-23-06 00:00**	Instrument ID:	**GC-6 HP 5890**
Received:	**08-23-06 17:30**	Sample Weight:	**8.2 g**
Extracted:	**08-27-06 14:00**	Final Volume:	**1 mL**
Cleaned Up:	**08-28-06 15:00**	Percent Solids:	**n/a**
Analyzed:	**08-30-06 06:08**	Dilution Factor:	**10**
Analyst:	**CRL**		

CAS Number	Analyte	Concentration	Notes	Units	Reporting Limit
12674-11-2	Aroclor 1016	BRL		ug/Kg	1,500
11104-28-2	Aroclor 1221	BRL		ug/Kg	1,500
11141-16-5	Aroclor 1232	BRL		ug/Kg	1,500
53469-21-9	Aroclor 1242	BRL		ug/Kg	1,500
12672-29-6	Aroclor 1248	BRL		ug/Kg	1,500
11097-69-1	Aroclor 1254	**3,000**	2C (2900)*	ug/Kg	1,500
11096-82-5	Aroclor 1260	BRL		ug/Kg	1,500
37324-23-5	Aroclor 1262 †	BRL		ug/Kg	1,500
11100-14-4	Aroclor 1268 †	BRL		ug/Kg	1,500

QC Surrogate Compound		Spiked	Measured	Recovery	QC Limits
First	Tetrachloro-*m*-xylene	24	11	**44** %	30 - 150 %
Column	Decachlorobiphenyl	24	13	**53** %	30 - 150 %
Second	Tetrachloro-*m*-xylene	24	10	**41** %	30 - 150 %
Column	Decachlorobiphenyl	24	8.4	**34** %	30 - 150 %

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996).
Sample extraction performed by EPA Method 3540C. Cleanup performed by EPA Method 3660B and EPA Method 3665A.

Report Notations:

BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.

† Non-target analyte. Result is based on a single mid-range calibration standard.

* Confirmatory column quantification.

2C Concentration reported from second column.

GROUNDWATER ANALYTICAL

Project Narrative

Project:	**14680**	Lab ID:	**98116**
Client:	**Environmental Health & Engineering, Inc.**	Received:	**08-23-06 17:30**

A. Documentation and Client Communication

The following documentation discrepancies, and client changes or amendments were noted for this project:

1 . No documentation discrepancies, changes, or amendments were noted.

B. Method Modifications, Non-Conformances and Observations

The sample(s) in this project were analyzed by the references analytical method(s), and no method modifications, non-conformances or analytical issues were noted, except as indicated below:

1 . EPA 8082 Note: Samples 98116-05, -06,-07,-08, -09, -10 and -11. Samples were diluted prior to analysis. Dilution was required to keep all target analytes within calibration.

2 . EPA 8082 Note: Sample 98116-10. Samples had surrogate recoveries outside recommended limits. No additional sample was available for re-analysis

Environmental Health & Engineering, Inc.

CHAIN OF CUSTODY FORM

DATE: 8-23-06

FROM: Environmental Health and Engineering, Inc.
60 Wells Avenue
Newton, MA 02459-3210

TO: Groundwater

Please send invoices to ATTN: Accounts Payable
Please send reports to ATTN: Data Coordinator

In all correspondence regarding this matter, please refer to EH&E Project # 14680

The cost of this analysis will be covered by EH&E Purchase Order # 997377

For EH & E Data Coordinator - URGENT DATA ☒

SAMPLE ID	SAMPLE TYPE	ANALYTICAL METHOD/NUMBER	OTHER:Time/Date/Vol.
79406	Bulk	EPA 8082 for PCB	
79407			
79408			
79409			
79410		ACE extraction	
79411			
79412			
79413		Caulking may contain moderate PCB concentrations	
79414			
79415			
79416			

Special Instructions:

☐ Standard turn around time ☒ Rush by 8/29/06 date/time ☐ Other

☐ Fax results 617-964-8556

☐ **RETURN SAMPLES**

☒ Electronic transfer - datacoodinator@eheinc.com

☒ Additional report recipient mchang@eheinc.com

Each signatory please return one copy of this form to the above address

Relinquished by: _____ of Environmental Health & Engineering, Inc. Date: 8-23-06

Received by: _____ of (company name) GWA Date: 8/23/06

Relinquished by: _____ of (company name) GWA Date: 8/23/06 1730

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Lab Data
Received by: _____ of Environmental Health & Engineering, Inc. Date: _____

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Quality Assurance/Quality Control

A. Program Overview

Groundwater Analytical conducts an active Quality Assurance program to ensure the production of high quality, valid data. This program closely follows the guidance provided by *Interim Guidelines and Specifications for Preparing Quality Assurance Project Plans,* US EPA QAMS-005/80 (1980), and *Test Methods for Evaluating Solid Waste,* US EPA, SW-846, Update III (1996).

Quality Control protocols include written Standard Operating Procedures (SOPs) developed for each analytical method. SOPs are derived from US EPA methodologies and other established references. Standards are prepared from commercially obtained reference materials of certified purity, and documented for traceability.

Quality Assessment protocols for most organic analyses include a minimum of one laboratory control sample, one method blank, one matrix spike sample, and one sample duplicate for each sample preparation batch. All samples, standards, blanks, laboratory control samples, matrix spikes and sample duplicates are spiked with internal standards and surrogate compounds. All instrument sequences begin with an initial calibration verification standard and a blank; and excepting GC/MS sequences, all sequences close with a continuing calibration standard. GC/MS systems are tuned to appropriate ion abundance criteria daily, or for each 12 hour operating period, whichever is more frequent.

Quality Assessment protocols for most inorganic analyses include a minimum of one laboratory control sample, one method blank, one matrix spike sample, and one sample duplicate for each sample preparation batch. Standard curves are derived from one reagent blank and four concentration levels. Curve validity is verified by standard recoveries within plus or minus ten percent of the curve.

B. Definitions

Batches are used as the basic unit for Quality Assessment. A Batch is defined as twenty or fewer samples of the same matrix which are prepared together for the same analysis, using the same lots of reagents and the same techniques or manipulations, all within the same continuum of time, up to but not exceeding 24 hours.

Laboratory Control Samples are used to assess the accuracy of the analytical method. A Laboratory Control Sample consists of reagent water or sodium sulfate spiked with a group of target analytes representative of the method analytes. Accuracy is defined as the degree of agreement of the measured value with the true or expected value. Percent Recoveries for the Laboratory Control Samples are calculated to assess accuracy.

Method Blanks are used to assess the level of contamination present in the analytical system. Method Blanks consist of reagent water or an aliquot of sodium sulfate. Method Blanks are taken through all the appropriate steps of an analytical method. Sample data reported is not corrected for blank contamination.

Surrogate Compounds are used to assess the effectiveness of an analytical method in dealing with each sample matrix. Surrogate Compounds are organic compounds which are similar to the target analytes of interest in chemical behavior, but which are not normally found in environmental samples. Percent Recoveries are calculated for each Surrogate Compound.

GROUNDWATER ANALYTICAL

Quality Control Report
Laboratory Control Samples

		LCS		LCSD	
Category:	**EPA 8082**	Instrument ID:	**GC-6 HP 5890**	Instrument ID:	**GC-6 HP 5890**
QC Batch ID:	**PB-2561-X**	Extracted:	**08-27-06 14:00**	Extracted:	**08-27-06 14:00**
Matrix:	**Soil**	Cleaned Up:	**08-28-06 15:00**	Cleaned Up:	**08-28-06 15:00**
Units:	**ug/Kg**	Analyzed:	**08-30-06 11:00**	Analyzed:	**08-30-06 11:34**
		Analyst:	**CRL**	Analyst:	**CRL**

CAS Number	Analyte	LCS					LCS Duplicate							QC Limits	
		Spiked	Measured		Recovery		Spiked	Measured		Recovery		RPD			
			1st Col	2nd Col	1st Col	2nd Col		1st Col	2nd Col	1st Col	2nd Col	1st Col	2nd Col	Spike	RPD
12674-11-2	Aroclor 1016	170	140	130	**84%**	**81%**	170	160	150	**98%**	**89%**	**16 %**	**10 %**	40 - 140%	30 %
11096-82-5	Aroclor 1260	170	150	160	**92%**	**95%**	170	160	170	**96%**	**101%**	**5 %**	**6 %**	40 - 140%	30 %

QC Surrogate Compound	Surrogate Recovery											QC Limits
Tetrachloro-*m* -xylene	6.7	6	19	**90%**	**282%**	6.7	7.1	54	**106%**	**806%**		30 - 150 %
Decachlorobiphenyl	6.7	6.1	6	**92%**	**90%**	6.7	6.4	6.3	**97%**	**95%**		30 - 150 %

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996).
Sample extraction performed by EPA Method 3540C. Cleanup performed by EPA Method 3660B and EPA Method 3665A.

Report Notations: All calculations performed prior to rounding. Quality Control Limits are defined by the methodology, or alternatively based upon the historical average recovery plus or minus three standard deviation units.

GROUNDWATER ANALYTICAL

Quality Control Report
Method Blank

Category:	**EPA Method 8082**	Instrument ID:	**GC-6 HP 5890**
QC Batch ID:	**PB-2561-X**	Extracted:	**08-27-06 14:00**
Matrix:	**Soil**	Cleaned Up:	**08-28-06 15:00**
		Analyzed:	**08-30-06 10:25**
		Analyst:	**CRL**

CAS Number	Analyte	Concentration	Notes	Units	Reporting Limit
12674-11-2	Aroclor 1016	BRL		ug/Kg	80
11104-28-2	Aroclor 1221	BRL		ug/Kg	80
11141-16-5	Aroclor 1232	BRL		ug/Kg	80
53469-21-9	Aroclor 1242	BRL		ug/Kg	80
12672-29-6	Aroclor 1248	BRL		ug/Kg	80
11097-69-1	Aroclor 1254	BRL		ug/Kg	80
11096-82-5	Aroclor 1260	BRL		ug/Kg	80
37324-23-5	Aroclor 1262 †	BRL		ug/Kg	80
11100-14-4	Aroclor 1268 †	BRL		ug/Kg	80

QC Surrogate Compound		Spiked	Measured	Recovery	QC Limits
First	Tetrachloro-*m*-xylene	6.7	4.3	**64** %	30 - 150 %
Column	Decachlorobiphenyl	6.7	6.1	**91** %	30 - 150 %
Second	Tetrachloro-*m*-xylene	6.7	8.5	**128** %	30 - 150 %
Column	Decachlorobiphenyl	6.7	5.8	**88** %	30 - 150 %

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996).
Sample extraction performed by EPA Method 3540C. Cleanup performed by EPA Method 3660B and EPA Method 3665A.

Report Notations: BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.

† Non-target analyte. Result is based on a single mid-range calibration standard.

GROUNDWATER ANALYTICAL

Certifications and Approvals

Groundwater Analytical maintains environmental laboratory certification in a variety of states. Copies of our current certificates may be obtained from our website:

http://www.groundwateranalytical.com/qualifications.htm

CONNECTICUT, Department of Health Services, PH-0586

Categories: Potable Water, Wastewater, Solid Waste and Soil
http://www.dph.state.ct.us/BRS/Environmental_Lab/OutStateLabList.htm

FLORIDA, Department of Health, Bureau of Laboratories, E87643

Categories: SDWA, CWA, RCRA/CERCLA
http://www.floridadep.org/labs/qa/dohforms.htm

MAINE, Department of Human Services, MA103

Categories: Drinking Water and Wastewater
http://www.state.me.us/dhs/eng/water/Compliance.htm

MASSACHUSETTS, Department of Environmental Protection, M-MA-103

Categories: Potable Water and Non-Potable Water
http://www.state.ma.us/dep/bspt/wes/files/certlabs.pdf

NEW HAMPSHIRE, Department of Environmental Services, 202703

Categories: Drinking Water and Wastewater
http://www.des.state.nh.us/asp/NHELAP/labsview.asp

NEW YORK, Department of Health, 11754

Categories: Potable Water, Non-Potable Water and Solid Waste
http://www.wadsworth.org/labcert/elap/comm.html

PENNSYLVANIA, Department of Environmental Protection, 68-665

Environmental Laboratory Registration (Non-drinking water and Non-wastewater)
http://www.dep.state.pa.us/Labs/Registered/

RHODE ISLAND, Department of Health, 54

Categories: Surface Water, Air, Wastewater, Potable Water, Sewage
http://www.healthri.org/labs/labsCT_MA.htm

U.S. Department of Agriculture, Soil Permit, S-53921

Foreign soil import permit

VERMONT, Department of Environmental Conservation, Water Supply Division

Category: Drinking Water
http://www.vermontdrinkingwater.org/wsops/labtable.PDF