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WOODARD &CURRAN

September 29, 2015

Ms. Kimberly Tisa
PCB Coordinator
U.S. Environmental Protection Agency Region 1
5 Post Office Square – Suite 100
Boston, Massachusetts 02109-3912

Re: 2015 Long Term Monitoring Report – LGRC Tower A and Low-Rise Buildings
University of Massachusetts - Amherst
Amherst, Massachusetts

Dear Ms. Tisa:

On behalf of the University of Massachusetts (UMass), please find attached a copy of the 2015 Long Term Monitoring Report for Tower A and the Low-Rise buildings within the Lederle Graduate Research Center (LGRC) on UMass' campus in Amherst, Massachusetts.

This report provides the results of the monitoring activities conducted in accordance with the December 2014 Revised Monitoring and Maintenance Plan (MMIP) for the encapsulated polychlorinated biphenyl (PCB) containing glazing sealants at the Tower A and Low-Rise buildings and the encapsulated residual PCBs in certain exterior masonry materials at the Low-Rise building.

In addition, this report has been prepared to meet the reporting requirements of the Consent Agreement and Final Order (CAFO) dated June 20, 2012 between UMass and the U.S. Environmental Protection Agency (EPA) for the encapsulation of polychlorinated biphenyl (PCB) containing glazing sealants at the Tower A and Low-Rise buildings.

If you have any comments, questions, or require further information, please do not hesitate to contact me at the number listed above.

Sincerely,

WOODARD & CURRAN INC.

Jeffrey Hamel, LSP, LEP
Senior Principal

cc: T. Wolejko, University of Massachusetts

2015 Long Term Monitoring Report

Lederle Graduate Research Center

Tower A and Low-Rise Buildings
Amherst, Massachusetts

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UMass LGRC
September 2015

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1. INTRODUCTION

This monitoring report has been prepared by Woodard & Curran on behalf of the University of Massachusetts (UMass) in accordance with the requirements of the Consent Agreement and Final Order (CAFO) dated June 20, 2012 between UMass and the U.S. Environmental Protection Agency (EPA) for the Lederle Graduate Research Center (LGRC) Tower A and Low-Rise buildings located at 701 – 740 North Pleasant Street on the UMass campus in Amherst, Massachusetts.

This monitoring report provides the results of the monitoring activities conducted in accordance with the December 2014 Revised Monitoring and Maintenance Implementation Plan (MMIP) developed in accordance with the requirements of the CAFO for the encapsulated polychlorinated biphenyl (PCB) containing glazing sealants at the Tower A and Low-Rise buildings and the encapsulated residual PCBs in certain exterior masonry materials at the Low-Rise.

1.1 SITE BACKROUND

During a hazardous building materials assessment at the LGRC, a sample of interior window glazing sealant was collected and analyzed for PCBs. This sample detected total PCBs at a concentration of 12,000 parts per million (ppm). Given that this concentration exceeded the regulatory threshold per Federal regulation (40 CFR 761) for PCBs in a non-totally enclosed manner, an approach was developed for the encapsulation of the glazing sealants as an interim measure until the glazing sealant could be removed during window replacement projects. The approach was presented to EPA in the May 2012 Interim Measures Plan (IMP) and finalized as part of the CAFO.

However, prior to (and/or following) implementation of the Interim Measures, UMass elected to remove windows in the following three areas:

- As part of the National Institute of Health (NIH) renovations, 42 laboratory windows on the 3rd, 7th, and 8th floors of Tower A were removed as reported in the PCB Remediation Activities Completion Report dated December 17, 2012.
- All windows within the Low-Rise building (except for those within Room A106, see below) including the library areas, were removed as part of a large-scale window replacement project (refer to the September 17, 2013 notification submittal and the December 29, 2014 Completion Report).
- Seven laboratory windows in Tower A Rooms 501 through 504 were removed as part of a laboratory renovation project in 2014/2015 (refer to the October 9, 2014 notification submittal and Section 3 of this Report).

As described in the CAFO Notification submittal on September 17, 2013, the 2007/2008 exterior remediation activities were not completed at the 50 Type L windows on the Low-Rise and bridge connector due to the inaccessibility of exterior perimeter window caulking at these locations (the windows are located between two structural concrete features approximately 1.5 feet apart). Removal and off-site disposal of all other ≥ 50 ppm exterior perimeter window caulking and the remediation of exterior building materials impacted by the PCBs was conducted in accordance with the EPA's June 22, 2007 Alternative Decontamination Approval under 40 CFR 761.61(a), 62, and 79(h). The remediation activities included the removal and off-site disposal of the exterior caulking and the removal of a minimum of ½ inch of exterior concrete masonry around each of the windows to achieve the applicable high or low occupancy use clean up criteria (≤ 1 ppm for first floor locations and ≤ 25 ppm for second and third floor locations). Given that the Type L windows were made accessible during the 2013/2014 window replacement project (through the removal of the windows themselves), remediation activities associated with the exterior perimeter caulking at the Type L windows

was completed in 2014 and included caulking removal and the in-place management of residual PCB impacts > 25 ppm in exterior concrete.

1.2 SUMMARY OF INTERIM MEASURES – INTERIOR GLAZING SEALANTS

Beginning in July 2012, the interim measures were implemented/completed at the respective windows in Tower A and the Low-Rise building. A summary of the activities is provided below.

1.2.1 Summary of Remedial Activities

In accordance with the CAFO, Interim Measures were conducted to address the presence of PCBs > 50 ppm in glazing sealants as follows:

- A general cleaning of the window units and surrounding surfaces was conducted via the removal of dust and debris using a vacuum equipped with HEPA filtration followed by cleaning of surfaces with a standard industrial/commercial cleaner (Klean-Strip TSP Plus).

- Containment of the glazing sealants was achieved through the installation of a layer of aluminum foil tape and a bead of silicone caulking to reduce potential direct contact exposures.

- As previously reported, these interim measures were completed at the following locations:

- Tower A High-Rise
    - July - August 2012: Elevator lobby windows located on the 1st 3rd, 7th, and 8th floors, as part of the NIH Grant Lab Renovation project.
    - July - August 2013: All remaining Tower A subject windows, as well as an additional sealant encountered in the stairwells (refer to the August 23, 2013 new condition notification submittal).
- Low-Rise
    - December 2013: Windows within Room A106 (the computer room). NOTE: all other low rise and library windows were removed.

1.2.2 Visual Inspection and Verification/Baseline Sampling

Following completion of the interim measures, visual inspections were conducted to confirm completion of the activities. Post-cleaning verification wipe samples were collected from accessible non-porous surfaces surrounding the windows and post-encapsulation surface wipe samples were collected from the encapsulated surfaces and window frames following the procedures and frequencies described in the IMP. A summary of the results of the initial/baseline wipe samples is provided below.

Post-Cleaning Wipe Samples

Post-cleaning wipe samples were collected from window ledges as part of the interim measures implementation and prior to the removal of the Low-Rise windows. Following the cleaning of the surrounding areas, verification wipe samples were collected from the non-porous window ledges adjacent to the windows. In accordance with the IMP, post-cleaning wipe samples were collected at a frequency of one sample per floor in the high rise and at a frequency of one sample per 20 windows in the Low-Rise. Analytical results of the verification wipe samples indicated that PCBs were below the high occupancy use cleanup standard for non-porous surfaces (10 µg/100 cm^2) in all samples with results reported as follows:

- Total PCBs were reported as non-detect (< 0.20 µg/100 cm^2) in 31 samples; and

- Total PCBs were present in 23 samples at concentrations below 10 µg/100 cm^2, with concentrations ranging from 0.20 to 2.0 µg/100 cm^2 and an average concentration of 0.56 µg/100cm^2.

Post-Encapsulation Wipe Samples

To confirm that the aluminum foil tape and caulking were effective encapsulants of PCBs in the glazing sealants, wipe samples were collected from the surface of the newly installed caulking. A summary of the analytical results from the hexane wipe samples is as follows:

- Total PCBs were reported as either non-detect (ten samples at < 0.20 µg/100 cm^2) or < 1 µg/100 cm^2 (five samples with reported concentrations ranging from 0.21 to 0.95 µg/100 cm^2) in 15 of the 17 samples collected; and
- Total PCBs were reported at concentrations > 1 µg/100 cm^2 in two samples with reported concentrations of 1.5 and 3.1 µg/100 cm^2 (both samples were collected from areas encapsulated during the NIH renovation prior to modifications to the application methods).

To evaluate the suitability of an alternative wipe sampling procedure to assess "surface" concentrations on the newly applied porous caulking, additional wipe samples were collected using four different solvents/methods: hexane, isopropyl alcohol, saline, and dry wipe. Wipe samples were collected from the surfaces of the glazing sealants and from the encapsulated surfaces following installation of the aluminum tape and caulking barriers. Results from the wipe samples were described in detail in the PCB Interim Measures Completion Report dated June 2, 2014 and December 2014 Revised MMIP and indicated that while all four methods were able to detect PCBs on the surface of the source materials and the encapsulated surfaces, the more aggressive solvents reported higher results.

Based on these results, the December 2014 Revised MMIP included the potential collection of saline wipes to evaluate the potential presence of PCBs on the surface of the encapsulating barriers; however, saline wipes were not analyzed during the 2015 event due to the results of the hexane wipes as presented in this report.

1.3 SUMMARY OF REMEDIATION ACTIVITIES – EXTERIOR CONCRETE AT TYPE L WINDOWS

Remediation activities associated with residual PCBs in exterior concrete surfaces surrounding the 50 Type L windows in the Low-Rise and the bridge connector were conducted in conjunction with the 2013/2014 window removal project.

1.3.1 Summary of Remedial Approach

The remedial approach consisted of the following:

- Exterior perimeter window caulking containing ≥ 50 ppm PCBs was removed for disposal as PCB Bulk Product Waste using hand tools as part of the window removal project.
- Residual PCBs were encapsulated through the application the following:
    - Liquid Epoxy Coating – A two inch wide strip of epoxy (either Sikagard 62 liquid epoxy or DevCon 5-minute epoxy), centered on the former joint, was applied to concrete surfaces;
    - Elastomeric Coating – Two coats of Sikagard 550W elastomeric coating were applied to concrete materials away from the joints and extending along the inner face of the concrete façade to match the rest of the building façade; and
    - Replacement Frames – The replacement window frames and a replacement bead of caulking were installed over the former caulked joints.

Detailed descriptions of the implemented activities were presented in the Window Removal Completion Report submittal dated December 29, 2014.

1.3.2 Visual Inspection and Verification/Baseline Sampling

Following application/installation of each of the above barriers, visual inspections were conducted. For liquid coatings, the visual inspection was conducted to confirm the coatings were applied over the designated areas and had a smooth uniform appearance. For window frames and caulking, the inspection confirmed installation in accordance with the project specifications.

To confirm that the epoxy and elastomeric coatings were effective encapsulants of residual PCBs in the concrete, wipe samples were collected from the surfaces of the newly applied coatings at a frequency of one sample for every five window locations (twelve wipe samples were collected from each due to the phased sequencing of work at the Type L windows). A summary of the analytical results from the wipe samples is as follows:

- Liquid Epoxy Coatings – Analytical results from eleven of the twelve samples indicated that PCBs were non-detect (9 samples at < 0.20 µg/100cm^2) or less than the encapsulation goal of 1 µg/100cm^2 (2 samples with reported concentrations of 0.22 and 0.28 µg/100cm^2). PCBs in the remaining sample were reported at concentration of 1.4 µg/100cm^2.
- Elastomeric Coatings – Analytical results indicated that PCBs were either non-detect (8 samples at < 0.20 µg/100cm^2) or less than the encapsulation goal of 1 µg/100cm^2 (4 samples with a maximum concentration of 0.56 µg/100cm^2).

1.4 MONITORING AND MAINTENANCE IMPLEMENTATION PLAN

In accordance with the requirements of the CAFO, annual monitoring is to be completed as part of the Interim Measures to monitor, over time, the effectiveness of the remedy for PCB-containing glazing sealants encapsulated through the application of aluminum foil tape and silicone caulking. In addition, and as described in the December 2014 Revised MMIP, monitoring is also to be conducted for the residual PCB impacted exterior concrete encapsulated through the application of liquid coatings and replacement frames at the Type L windows.

As discussed in the MMIP, the evaluation of the effectiveness of the measures will be accomplished through:

- Visual inspection – to evaluate the physical condition of the new caulking and/or window frames; to look for signs of separation between the silicone sealant/aluminum foil tape and the glazing sealant, window frame or glass; to look for signs of disturbance to the new sealants or exterior elastomeric coatings (Type L windows); and a general inspection of the surrounding areas.

- Accessible Non-Porous Surface Wipe Samples – A total of 9 wipe samples are to be collected (1 from the Low-Rise computer room and 8 from the Tower A high rise) from adjacent window ledges /sills to assess the effectiveness of the Interim Measure in reducing / eliminating PCB-containing dust or particulate levels on these adjacent surfaces.

- Encapsulated Surfaces Wipe Samples – A total of 9 wipe samples are to be collected (1 from the Low-Rise computer room and 8 from the Tower A high rise) from the new caulking/adjacent frame to assess the concentrations of PCBs on the surface of the encapsulating barrier; and

- Indoor Air Samples – Long Term Monitoring – Six samples are to be collected to assess the effectiveness of the encapsulation (window glazing sealant) in reducing indoor air levels.

In addition to indoor air samples collected as part of routine long term monitoring, post-removal indoor air samples were to be collected as a one-time event in 2015 from interior locations within the Low-Rise library and north wing to evaluate the concentration of PCBs following the removal of windows (and glazing sealant source material) from these areas.

2. 2015 MONITORING ACTIVITIES

2.1 VISUAL INSPECTIONS

Visual inspections of the encapsulated surfaces were conducted at the Tower A high rise, the Low-Rise computer room, and at the Type L windows of the Low-Rise building. The inspections consisted of an assessment of the following:

- Physical condition of the new caulk (cracking, peeling, discoloration, etc.) and/or window frames;
- Signs of separation between the silicone sealant/aluminum foil tape and the glazing sealant, window frame, or glass;
- Signs of disturbance of the new sealant;
- Signs of disturbance of the exterior elastomeric coating (Type L windows); and
- A general inspection of the surrounding areas.

For encapsulated glazing sealants, the specific windows that were visually inspected included the window unit randomly selected for wipe sampling (see discussion below) plus the window units on both sides of the selected window (total of three windows per sample location). For the Type L windows, 20% of the windows were inspected (10 windows).

Woodard & Curran did not observe any signs of disturbance or deterioration during the visual inspections.

2.2 ACCESSIBLE NON-POROUS SURFACES

Surface wipe samples were collected from nine representative locations on the accessible non-porous surfaces below the Tower A and Low-Rise computer room windows as described in the MMIP. The locations of the wipe samples are depicted on Figures 2-1 through 2-5.

At each location, the wipe sample was collected in accordance with the standard wipe test method as described in 40 CFR 761.123. At each sample location, a 2-inch square gauze pad, saturated with hexane, was wiped across a 100 square centimeter template area. All samples were transported to the laboratory under standard Chain of Custody procedures, extracted using USEPA Method 3540C (Soxhlet extraction), and analyzed for PCBs using USEPA Method 8082. In addition to the primary samples indicated above, one duplicate sample was collected and submitted to the laboratory as part of the QA/QC procedures associated with the sample collection procedures.

The complete analytical laboratory report is provided in Appendix A. A summary of the analytical results is presented on Table 2-1 and as follows:

- Total PCBs were reported as non-detect (< 0.20 µg/100cm^2) in 6 of the 9 samples; and
- Total PCBs were reported in 3 samples at concentrations of 0.24, 0.25, and 0.69 µg/100cm^2.

These results were below the project specific action level of 10 µg/100cm^2 for accessible non-porous surfaces.

2.3 ENCAPSULATED SURFACES

Surface wipe samples were collected from nine representative locations on the encapsulated surfaces and the windows frames as described in the MMIP. The locations of the wipe samples were co-located with those collected from accessible non-porous surfaces and are depicted on Figures 2-1 through 2-5. As presented on Table 2-2, some of the locations were also co-located with locations sampled during previous sampling events for comparisons over time.

Wipe samples were collected in accordance with the standard wipe test method as described in 40 CFR 761.123 modified due to the narrow width of the sample area (total width of caulking and frame is approximately ¾-inch). At

each sample location, a 2-inch square gauze pad, saturated with hexane, was wiped across a 22-inch long section of the caulking/window frame (to achieve a 100 cm^2 area). Samples were submitted for laboratory analysis as described above. In addition to the primary samples indicated above, one duplicate sample was collected and submitted to the laboratory as part of the QA/QC procedures associated with the sample collection procedures.

The complete analytical laboratory report is provided in Appendix A. A summary of the analytical results is presented on Table 2-2 and as follows:

- Total PCBs were reported as non-detect (< 0.020 µg/100cm^2) in 5 of the 9 samples;
- Total PCBs were reported at concentrations < 1 µg/100cm^2 in 3 of the samples with reported concentrations of 0.30, 0.38, and 0.82 µg/100cm^2; and
- Total PCBs were reported at a concentration of 3.3 µg/100cm^2 in the sample collected from the 7th floor elevator lobby window (consistent with previous wipe sampling from glazing encapsulated as part of the NIH renovation project in 2012).

These results were below the project specific action level of 1 µg/100cm^2 for encapsulated surfaces with the exception of the one location. This location is in the same area where results from hexane wipes collected as part of the 2014 baseline sampling exceeded the 1 µg/100cm^2 target (1.5 and 3.1 µg/100cm^2) in samples collected from the 3rd and 8th floors, respectively; which corresponds to the NIH related elevator lobby work on the 1st, 3rd, 7th, and 8th floors. (NOTE: previous results from wipe samples collected on the 1st and 7th floor lobbies were below the target). As described in the PCB Interim Measures Completion Report submitted on June 2, 2014, saline wipes collected from the same locations on the 3rd and 8th floors during the baseline monitoring event indicated that PCBs were non-detect (< 0.20 µg/100cm^2). Due to the transitory nature of the elevator lobbies, the consistent results between the two monitoring events, and the results of the 2014 saline wipe samples, no additional activities aside from continued monitoring are proposed.

2.4 INDOOR AIR – LONG TERM MONITORING

As part of the long term monitoring program, five indoor air samples and one ambient outdoor sample were collected from representative locations throughout the LGRC Tower A. In addition, one indoor air sample was collected from the Low-Rise Computer Room. Indoor air samples were distributed in a manner consistent with the 2009 baseline sampling event; modified based on the removal of select Tower A windows and the majority of the Low-Rise windows. The individual spaces were selected based on the use of the space (e.g., offices, laboratories, common areas) throughout the building.

Air samples were collected in accordance with USEPA Compendium Method TO-10A *"Determination of Pesticides and Polychlorinated Biphenyls In Ambient Air Using Low Volume Polyurethane Foam (PUF) Sampling Followed by Gas Chromatographic/Multi-Detector Detection (GC/MD)"* and submitted for laboratory analysis of PCBs homologs. At each of the sample locations, a low volume PUF cartridge was connected to a personal air pump with flexible tubing and the cartridge was positioned between three and five feet above the floor using a telescoping tubing stand.

Samples were collected at an approximate flow rate of 2.5 L/min for four hours. The flow rates were set by the equipment rental supply company prior to delivery and verified and adjusted as needed in the field using a BIOS digital flow rate calibrator or equivalent. Atmospheric information (ambient temperatures and barometric pressures) was obtained from a portable commercially available weather monitoring station. Pumps and flow rates were monitored periodically throughout the sample collection period. One duplicate sample was collected as part of the overall project QA/QC measures. At the end of the required sample interval, the pump was shut off and the cartridge placed in aluminum foil, labeled, and placed on ice for delivery to the analytical laboratory.

Analytical results indicated that PCBs were reported at concentrations ranging from 18.7 ng/m^3 to 53.5 ng/m^3 in the six samples collected with an average reported concentration of 40.1 ng/m^3. No PCBs were detected in the outdoor ambient air sample.

These indoor air results are lower than the results from the 2008 and 2009 air sampling events where PCBs were reported in Tower A locations at average concentrations of 151 ng/m^3 and 59.4 ng/m^3, respectively. These results are also below the project action level of 500 ng/m^3 (EPA's exposure levels for evaluating PCBs in indoor school air for students ages 19 plus and adults, as amended on July 2015).

The complete analytical laboratory reports are provided in Appendix A and a summary of the analytical results is provided on Table 2-3.

2.5 INDOOR AIR – POST WINDOW REMOVAL

To document the post-removal indoor air levels in the Low-Rise, a one-time indoor air sampling event was conducted following the sampling methods and procedures described in Section 2.4. Indoor air samples were collected from the north wing of the Low-Rise (one sample per floor) and the library (one sample per floor) for a total of six samples.

Analytical results indicated that PCBs were reported at concentrations ranging from 24.3 ng/m^3 to 92.6 ng/m^3 in the six samples collected with an average reported concentration of 52.1 ng/m^3. No PCBs were detected in the outdoor ambient air sample.

These indoor air results are lower than the results from the 2008 and 2009 air sampling events where PCBs were reported in Low-Rise locations at average concentrations of 239 ng/m^3 and 81.5 ng/m^3, respectively. These results are also below the project action level of 500 ng/m^3 (EPA's exposure levels for evaluating PCBs in indoor school air for students ages 19 plus and adults, as amended on July 2015).

The complete analytical laboratory reports are provided in Appendix A and a summary of the analytical results is provided on Table 2-4.

3. SUMMARY OF NON-ROUTINE MAINTENANCE ACTIVITIES

As described in the October 9, 2014 PCB Remediation Activity 30 Day Notification letter submitted to the EPA, seven laboratory windows in Rooms 501, 502, 503, and 504 of Tower A were removed and replaced as part of renovation activities.

The seven windows were removed as single units, wrapped in polyethylene sheeting at the point of generation and transported to a full asbestos containment area for resizing to meet the selected disposal facility requirements. Following resizing the materials were placed into a cubic yard box and transported for off-site disposal as PCB Bulk Product Waste to U.S. Ecology's Wayne Disposal landfill in Belleville, Michigan on July 8, 2015. Copies of the hazardous waste manifest and certificate of disposal are provided in Appendix B.

No other non-routine maintenance activities that disturbed the encapsulated materials were conducted in 2015.

4. SUMMARY AND CONCLUSIONS

Results of the 2015 long term monitoring event were as follows:

- Visual inspections indicated that the encapsulating barriers were in good physical condition with no observed damage or deterioration.
- Analytical results from wipe samples collected from accessible non-porous surfaces indicated that PCBs were either non-detect or present at concentrations below the project action level of 10 µg/100cm^2.
- Analytical results from wipe samples collected from encapsulated surfaces indicated that PCBs were < 1 µg/100cm^2 in all samples except for the sample collected from the 7th floor windows encapsulated during the NIH renovation project in 2012; these results were consistent with previous monitoring events from these elevator lobby windows.
- Analytical results from indoor air samples collected as part of long term monitoring and as a one-time post abatement sampling event indicted that PCBs were present at concentrations below the action level of 500 ng/m^3 and lower than the results from the 2008 and 2009 sampling events.

4.1 CORRECTIVE ACTIONS

No corrective actions are warranted based on the results of the 2015 monitoring event.

4.2 MODIFICATIONS TO THE LONG TERM MONITORING AND MAINTENANCE PLAN

Based on the results of the inspections and sampling activities conducted in 2015, no modifications to the existing Long Term Monitoring and Maintenance Plan are required. Going forward, sample location selection will be modified based on the removal of seven windows from Rooms 501, 502, 503, and 504.

4.3 NEXT MONITORING EVENT

Pursuant to the CAFO, the next monitoring event will be conducted in June 2016 and consist of the following activities to be conducted in accordance with the December 2014 Revised MMIP:

- Visual Inspections of encapsulated glazing sealants and exterior masonry surrounding the Type L windows;
- Wipe sampling of accessible non-porous surfaces from randomly selected locations;
- Wipe sampling of encapsulated surfaces from randomly selected locations; and
- The collection of indoor air samples for long term monitoring

In addition, specific focus on the encapsulating barriers on the elevator windows at the 1st, 3rd, 7th, and 8th floors (i.e., those installed during the 2012 NIH renovation project) will be conducted to confirm results remain consistent over time.

Table 2-1
Summary of Long Term Monitoring Wipe Sampling Results - Accessible Non-Porous Surfaces
UMass Amherst

June 2015 Wipe Samples: Non-Porous Surfaces				
Floor	**Room Number**	**Sample ID**	**Sample Date**	**Total PCBs (µg/100cm^2)**
1	Elevator Lobby	LGRC-VWP-102	6/18/2015	0.25
3	Southern Stairway	LGRC-VWP-104	6/18/2015	0.69
5	510	LGRC-VWP-106	6/18/2015	< 0.20
7	Elevator Lobby	LGRC-VWP-108	6/18/2015	< 0.20
9	903	LGRC-VWP-110	6/18/2015	0.24
11	1105	LGRC-VWP-112	6/18/2015	< 0.20
13	1303	LGRC-VWP-114	6/18/2015	< 0.20
15	1509	LGRC-VWP-118	6/18/2015	< 0.20
Low Rise	A106	LGRC-VWP-100	6/18/2015	< 0.20

Notes:
Total PCBs reported as Aroclor 1254, with the exception of sample LGRC-VWP-102, which is reported as Aroclor 1260.
No other Aroclor reported at concentrations above the minimum laboratory reporting limits.
Wipe samples collected over 4" x 4" square centered on the window sill to achieve a 100cm^2 sample area.

Table 2-2
Summary of Long Term Monitoring Wipe Sampling Results - Encapsulated Surfaces
UMass Amherst

Floor	2014 Baseline Wipe Samples				June 2015 Wipe Samples			
	Room Number	Sample ID	Sample Date	Total PCBs ($\mu g/100cm^2$)	Room Number	Sample ID	Sample Date	Total PCBs ($\mu g/100cm^2$)
1	Elevator Lobby	LGRC-EN-VWK-124	2/24/2014	< 0.20	Elevator Lobby	LGRC-VWP-103	6/18/2015	< 0.20
2	Elevator Lobby	LGRC-EN-VWK-128	2/24/2014	< 0.20	--	--	--	--
3	Elevator Lobby	LGRC-EN-VWK-130	2/24/2014	3.1	Southern Stairway	LGRC-VWP-105	6/18/2015	< 0.20
4	408	LGRC-EN-VWK-100	2/24/2014	< 0.20	--	--	--	--
5	502	LGRC-EN-VWK-102	2/24/2014	< 0.20	510	LGRC-VWP-107	6/18/2015	0.30
6	605	LGRC-EN-VWK-104	2/24/2014	0.27	--	--	--	--
7	Elevator Lobby	LGRC-EN-VWK-126	2/24/2014	0.64	Elevator Lobby	LGRC-VWP-109	6/18/2015	3.3
8	Elevator Lobby	LGRC-EN-VWK-122	2/24/2014	1.5	--	--	--	--
9	903A	LGRC-EN-VWK-120	2/24/2014	< 0.20	903	LGRC-VWP-111	6/18/2015	0.38
10	1003	LGRC-EN-VWK-118	2/24/2014	0.21	--	--	--	--
11	1108	LGRC-EN-VWK-116	2/24/2014	< 0.20	1105	LGRC-VWP-113	6/18/2015	< 0.20
12	1209	LGRC-EN-VWK-114	2/24/2014	< 0.20	--	--	--	--
13	1306	LGRC-EN-VWK-112	2/24/2014	< 0.20	1303	LGRC-VWP-116	6/18/2015	< 0.20
14	Elevator Lobby	LGRC-EN-VWK-110	2/24/2014	0.21	--	--	--	--
15	1508	LGRC-EN-VWK-108	2/24/2014	< 0.20	1509	LGRC-VWP-119	6/18/2015	0.82
16	1607	LGRC-EN-VWK-106	2/24/2014	0.95	--	--	--	--
Low Rise	A106	LGRC-EN-VWK-132	2/24/2014	< 0.20	A106	LGRC-VWP-101	6/18/2015	< 0.20

Notes:
Total PCBs reported as Aroclor 1254. No other Aroclor reported at concentrations above the minimum laboratory reporting limits.
Wipe samples collected over 22 inch long section of caulking and window frame based on width of approximately 3/4" to achieve a $100cm^2$ sample area.

Table 2-3
Summary of Long Term Monitoring Indoor Air Sampling Results
UMass Amherst

Location	Air Sample	PCB Concentration (µg/cartridge)	Flow Rate (L/Minute)	Duration (minutes)	PCB Concentration (ng/m^3)
Project Action Level: 500 ng/m^3					
Tower A - 403B	LGRC-403B-IAS-LT-011	35	2.79	240	53.5
Tower A -599A	LGRC-599A-IAS-LT-012	33	2.70	240	52.2
Tower A -903	LGRC-903-IAS-LT-013	16	2.78	240	24.7
Tower A -1105	LGRC-1105-IAS-LT-014	11	2.67	240	18.7
Tower A - 1506	LGRC-1506-IAS-LT-015	29	2.68	240	49.1
Low Rise - A106	LGRC-A106-IAS-LT-010	27	2.71	240	42.5
Ambient Air	LGRC-OUT-IAS-LT-016	0	2.68	240	0.0

Notes:
Project Specific Risk-based Action Level based on the EPA's exposure levels for evaluating PCBs in indoor school air for students ages 19 plus and adults (July 2015).
Air samples collected in accordance with USEPA Compendium Method TO-10A "Determination of Pesticides and Polychlorinated Biphenyls In Ambient Air Using Low Volume Polyurethane Foam (PUF) Sampling Followed by Gas Chromatographic/Multi-Detector Detection (GC/MD)" and submitted for laboratory analysis of PCBs homologs.
ng/m^3 = nanograms per cubic meter

Table 2-4
Summary of Post Abatement Indoor Air Sampling Results
UMass Amherst

Location	Air Sample	PCB Concentration (µg/cartridge)	Flow Rate (L/Minute)	Duration (minutes)	PCB Concentration (ng/m^3)
Project Action Level: 500 ng/m^3					
Low Rise - 2nd floor library	LGRC-L2-IAS-PA-001	16	2.75	240	24.3 J/UJ
Low Rise - 3rd floor library	LGRC-L3-IAS-PA-003	60	2.76	240	92.6
Low Rise - 1st floor library	LGRC-L1-IAS-PA-004	40	2.60	240	65.6
Low Rise - A201	LGRC-A243-IAS-PA-007	44	2.80	240	67.2
Low Rise - A307	LGRC-A307-IAS-PA-008	20	2.66	240	32.1
Low Rise - A121	LGRC-A121-IAS-PA-009	20	2.75	240	31
Ambient Air	LGRC-OUT-IAS-LT-016	0	2.68	240	0.0

Notes:
Project Specific Risk-based Action Level based on the EPA's exposure levels for evaluating PCBs in indoor school air for students ages 19 plus and adults (July 2015).
Air samples collected in accordance with USEPA Compendium Method TO-10A "Determination of Pesticides and Polychlorinated Biphenyls In Ambient Air Using Low Volume Polyurethane Foam (PUF) Sampling Followed by Gas Chromatographic/Multi-Detector Detection (GC/MD)" and submitted for laboratory analysis of PCBs homologs.
ng/m^3 = nanograms per cubic meter
J/UJ = Analytical results qualified as estimated based on data validation. See Appendix A for additional information.

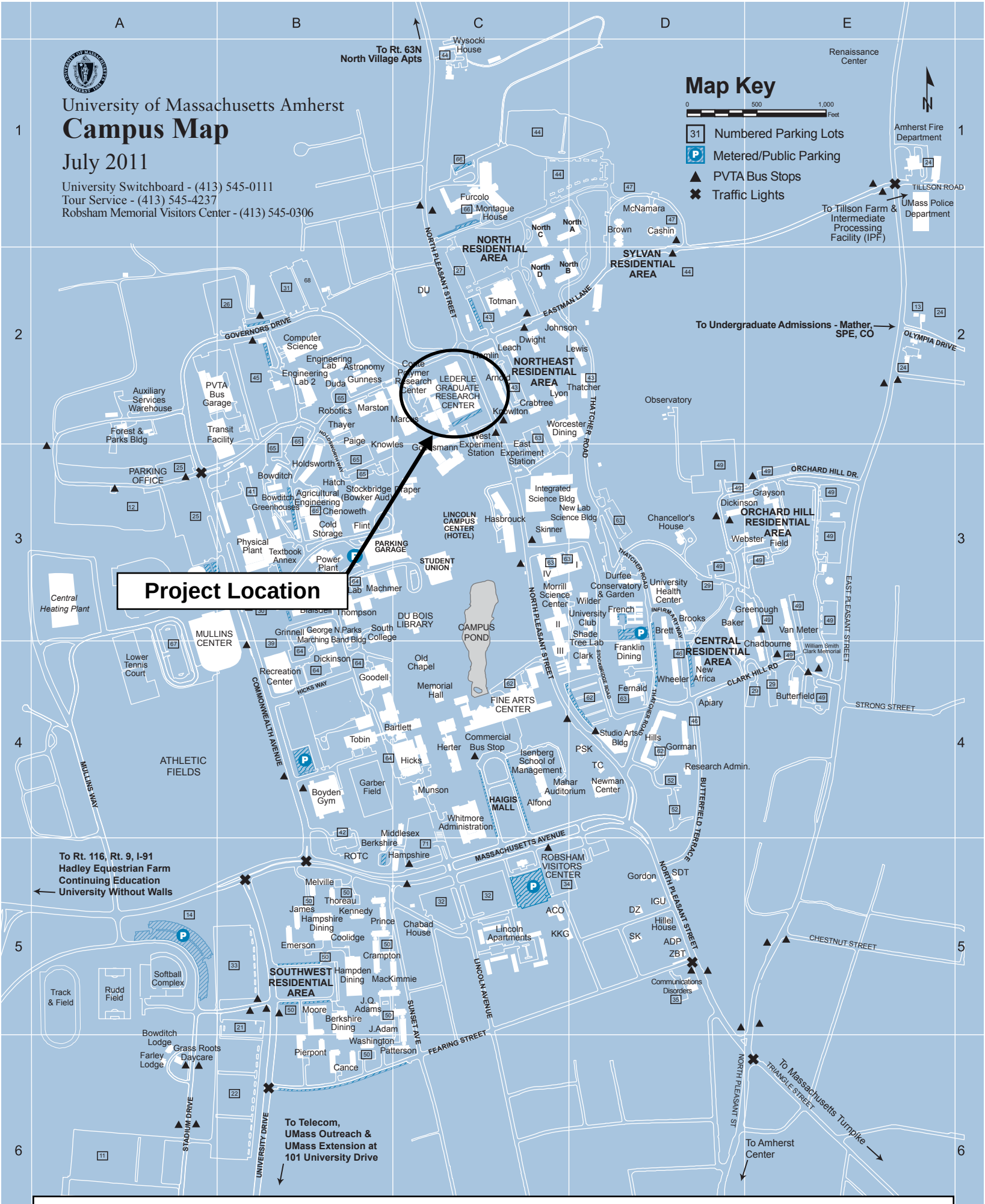
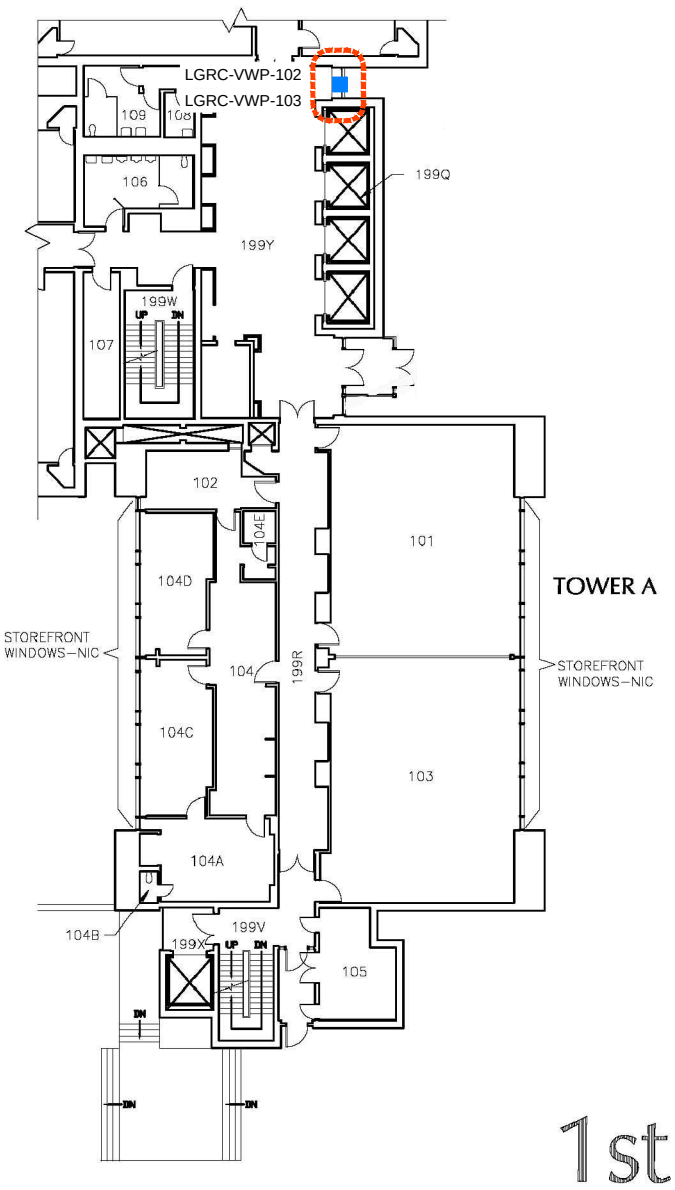


Figure 1-1 Site Location Map



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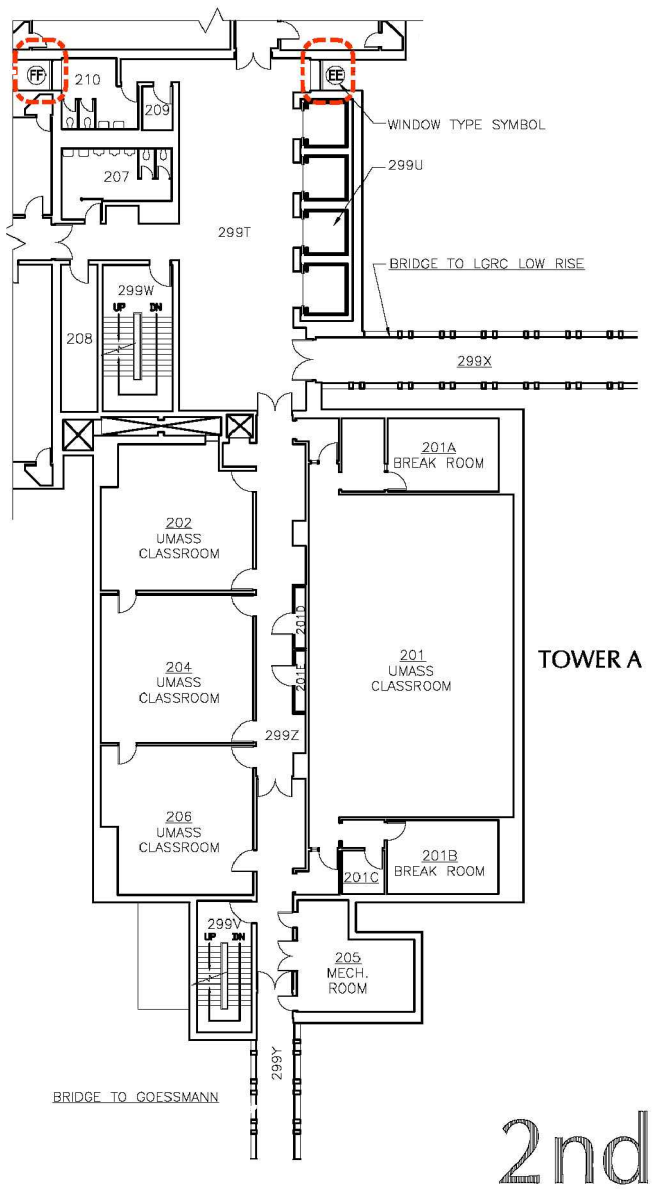


2nd

LEGEND

LOCATION OF WINDOWS/GLAZING SEALANTS INCLUDED IN THE INTERIM MEASURES AND SUBJECT TO LONG TERM MONITORING AND MAINTENANCE

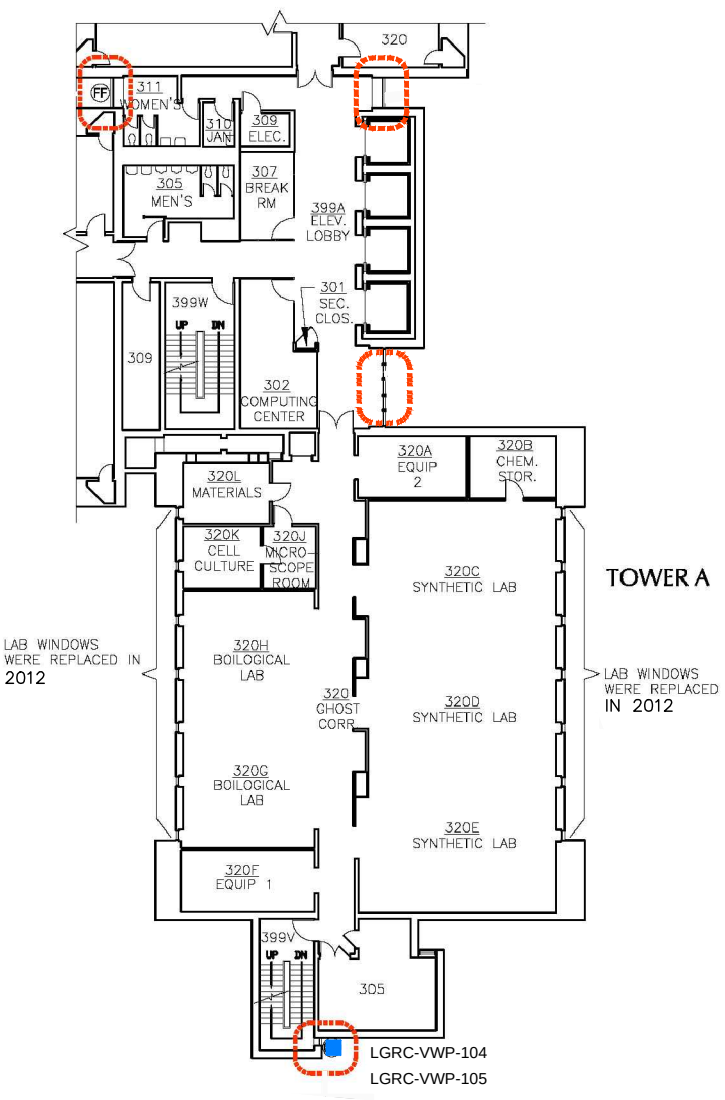
LOCATION OF WIPE SAMPLES

LOCATION OF POST–ABATEMENT AIR SAMPLES

LOCATION OF LONG TERM MONITORING AIR SAMPLE

NOTE:

1. ORIGINAL DESIGN DRAWINGS BY GOLDMAN REINDORF ARCHITECTS INC.



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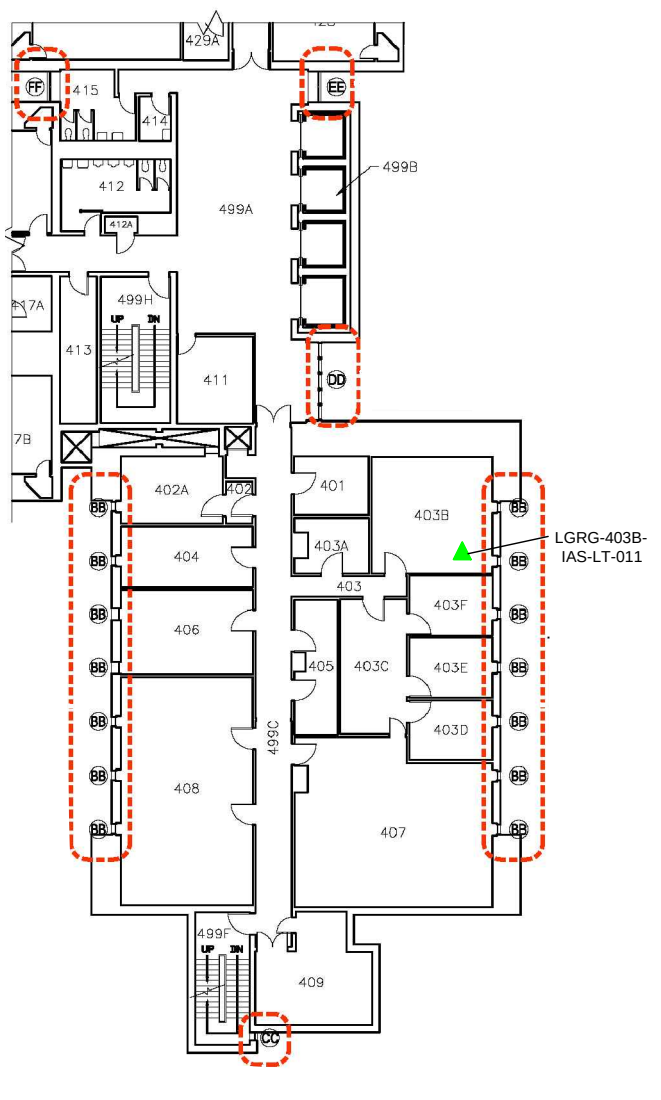

4th

FIGURE 2-1

JOB NO: 210918
DATE: JUNE 2015
SCALE: NOT TO SCALE

UMASS AMHERST
LEDERLE GRADUATE RESEARCH CENTER

MMIP

AREAS OF ENCAPSULATED MATERIALS
TOWER A 1st–4th FLOORS

DESIGNED BY:	CHECKED BY: JAH
DRAWN BY: PF	MMIP–FIGURE 2–1_A.DWG

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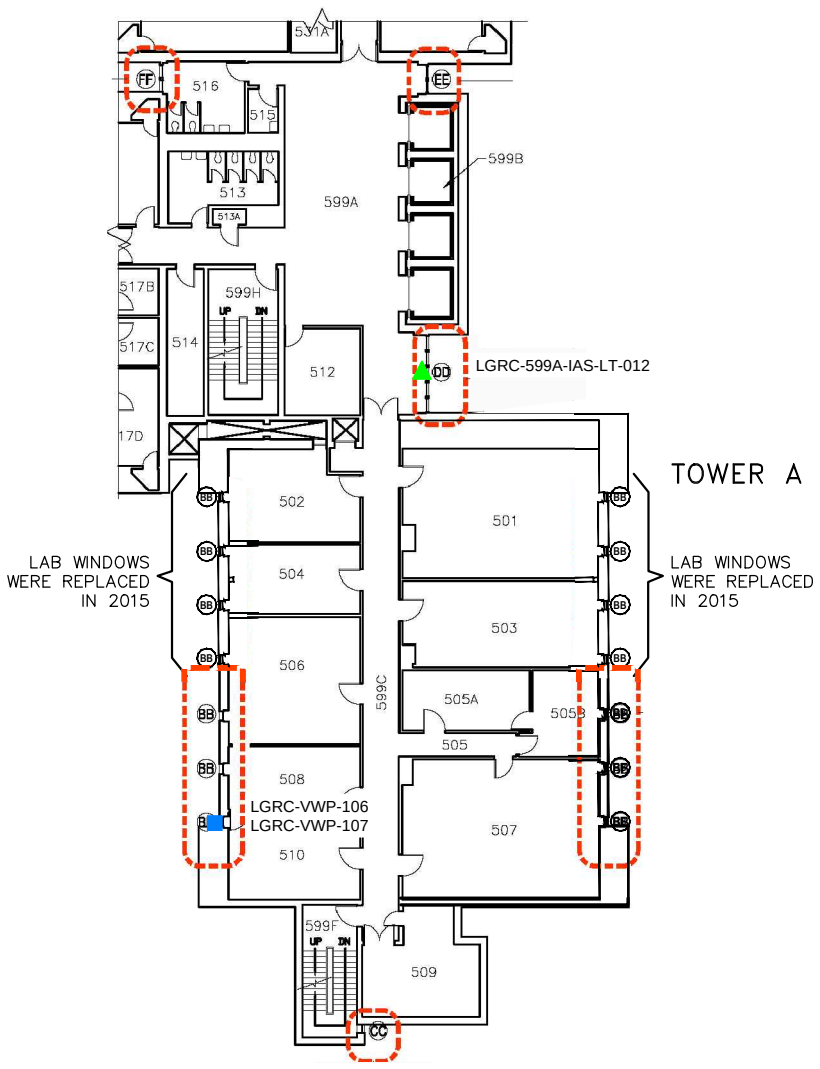
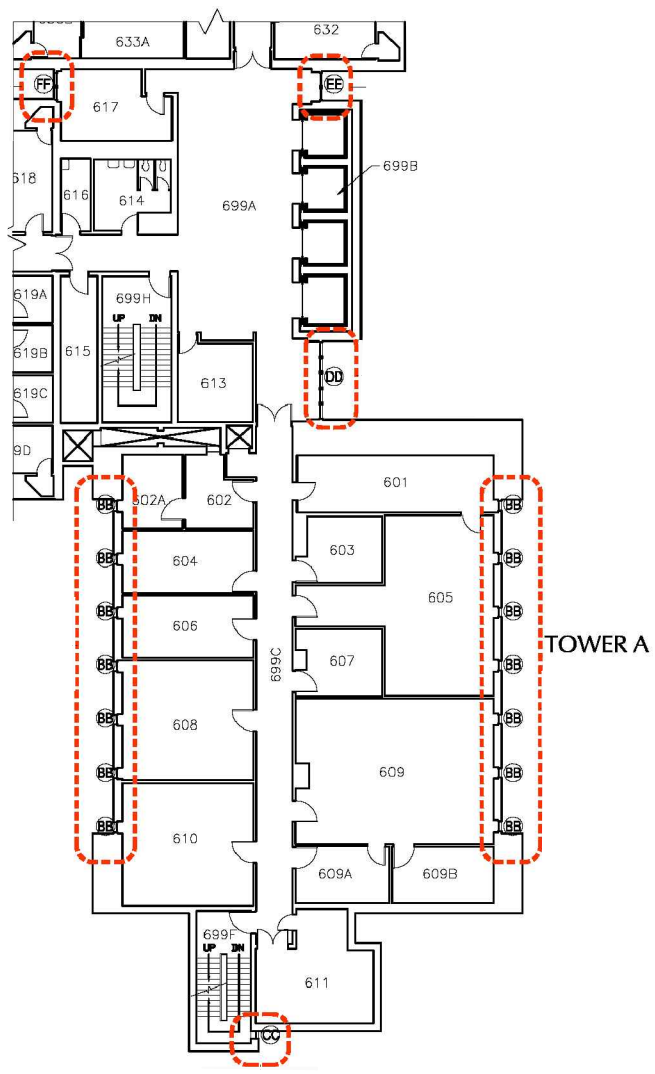
40 Shattuck Road | Suite 110
Andover, Massachusetts 01810
866.702.6371 | www.woodardcurran.com

COMMITMENT & INTEGRITY DRIVE RESULTS





LEGEND

LOCATION OF WINDOWS/GLAZING SEALANTS INCLUDED IN THE INTERIM MEASURES AND SUBJECT TO LONG TERM MONITORING AND MAINTENANCE

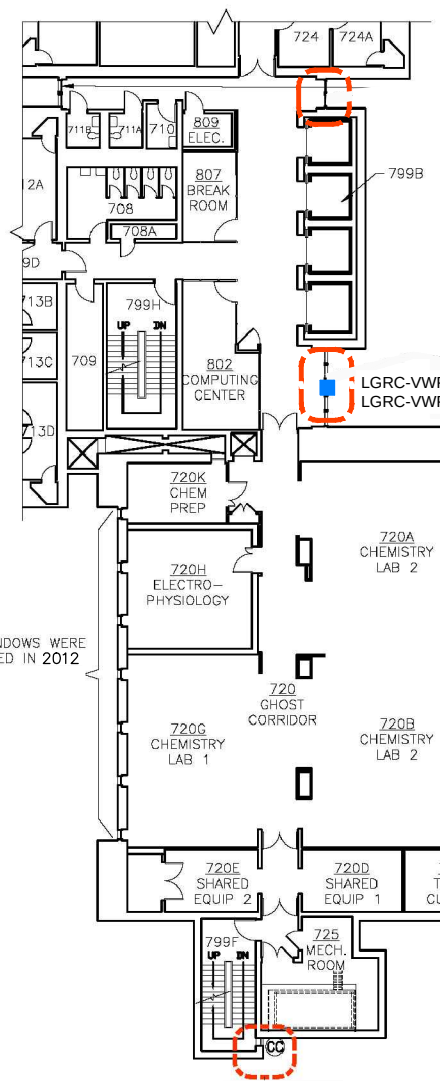
LOCATION OF WIPE SAMPLES

LOCATION OF POST–ABATEMENT AIR SAMPLES

LOCATION OF LONG TERM MONITORING AIR SAMPLE

NOTE:

1. ORIGINAL DESIGN DRAWINGS BY GOLDMAN REINDORF ARCHITECTS INC.



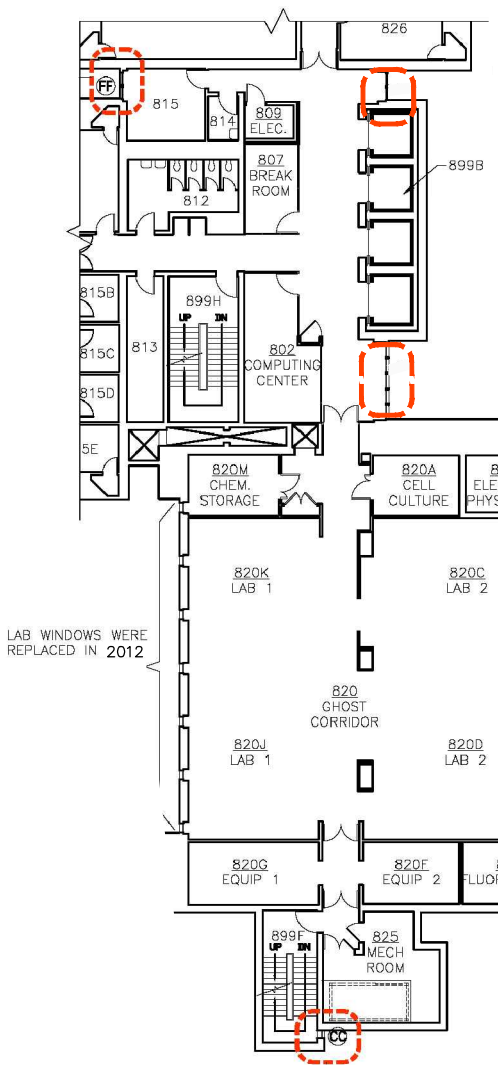


FIGURE 2-2	JOB NO: 210918 DATE: AUGUST 2015 SCALE: NOT TO SCALE	UMASS AMHERST LEDERLE GRADUATE RESEARCH CENTER MMIP	AREAS OF ENCAPSULATED MATERIALS TOWER A 5th–8th FLOORS DESIGNED BY: / CHECKED BY: JAH DRAWN BY: PFF / MMIP–FIGURE 2–2–A.DWG

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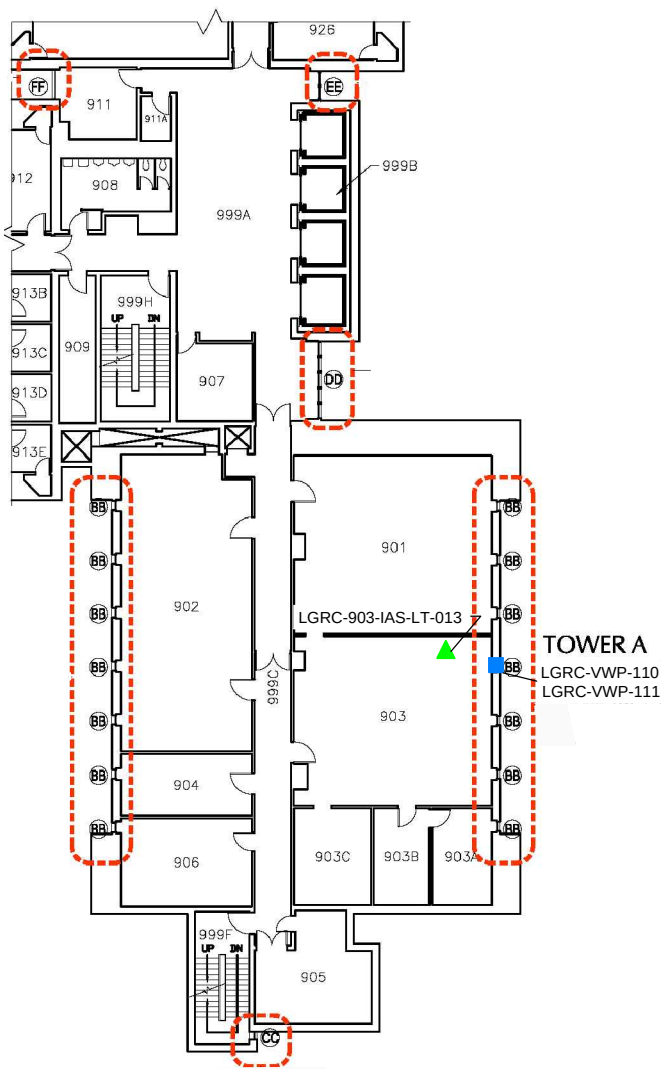
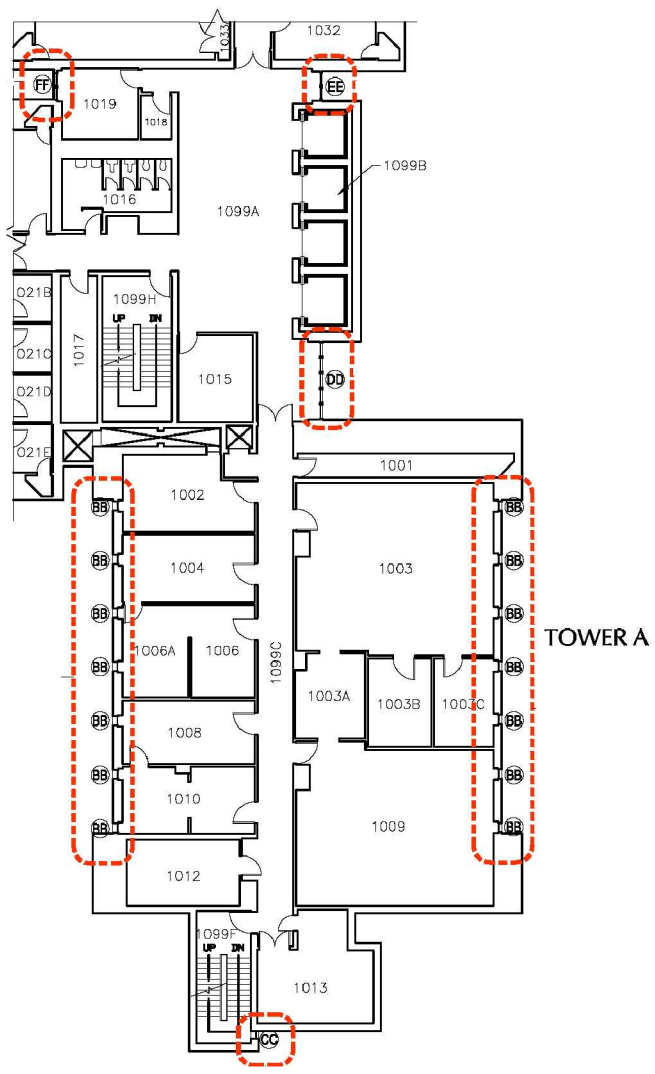


9th



10th

LEGEND

LOCATION OF WINDOWS/GLAZING SEALANTS INCLUDED IN THE INTERIM MEASURES AND SUBJECT TO LONG TERM MONITORING AND MAINTENANCE

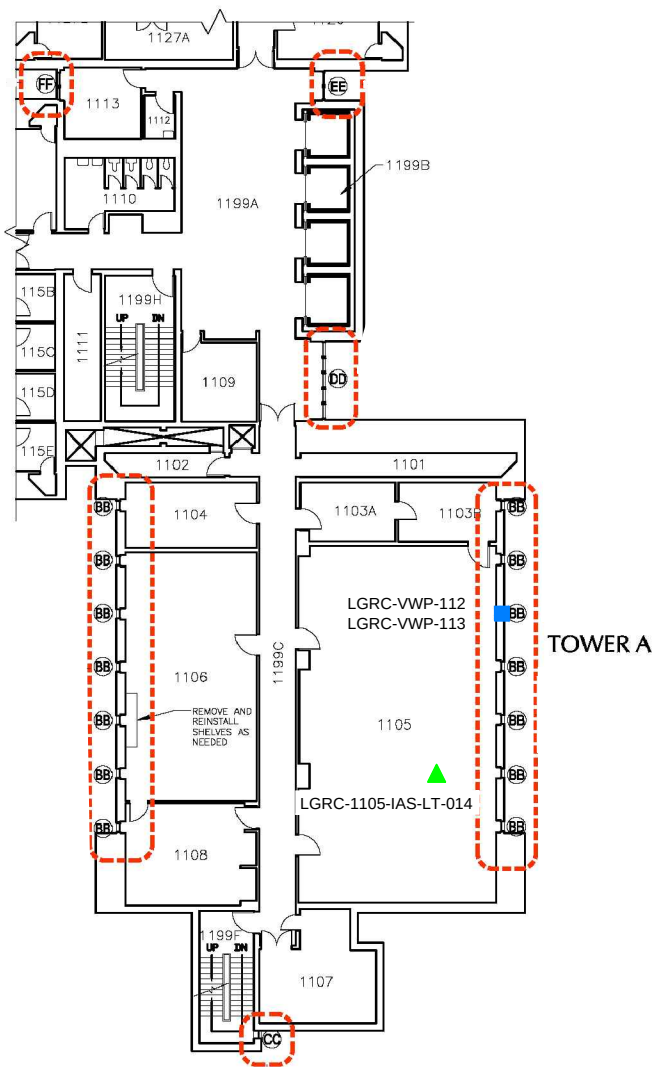
LOCATION OF WIPE SAMPLES

LOCATION OF POST–ABATEMENT AIR SAMPLES

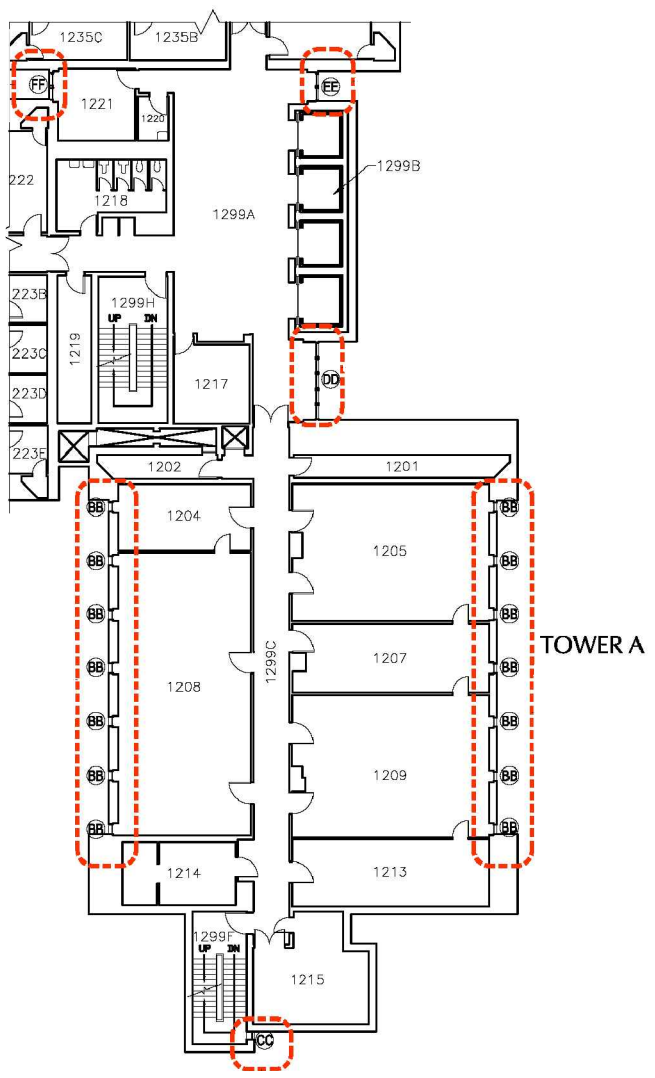
LOCATION OF LONG TERM MONITORING AIR SAMPLE

NOTE:

1. ORIGINAL DESIGN DRAWINGS BY GOLDMAN REINDORF ARCHITECTS INC.



11th



12th

FIGURE 2-3	JOB NO: 210918 DATE: JUNE 2015 SCALE: NOT TO SCALE	UMASS AMHERST LEDERLE GRADUATE RESEARCH CENTER MMIP	AREAS OF ENCAPSULATED MATERIALS TOWER A 9th–12th FLOORS DESIGNED BY: / CHECKED BY: JAH DRAWN BY: PF / MMIP–FIGURE 2–3–A.DWG

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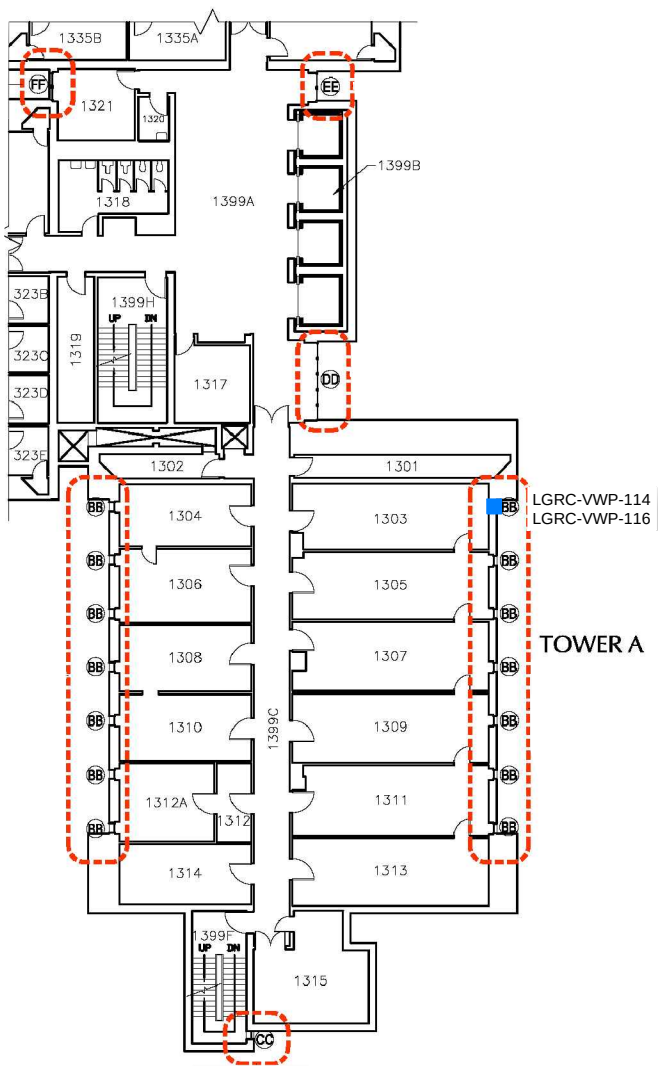
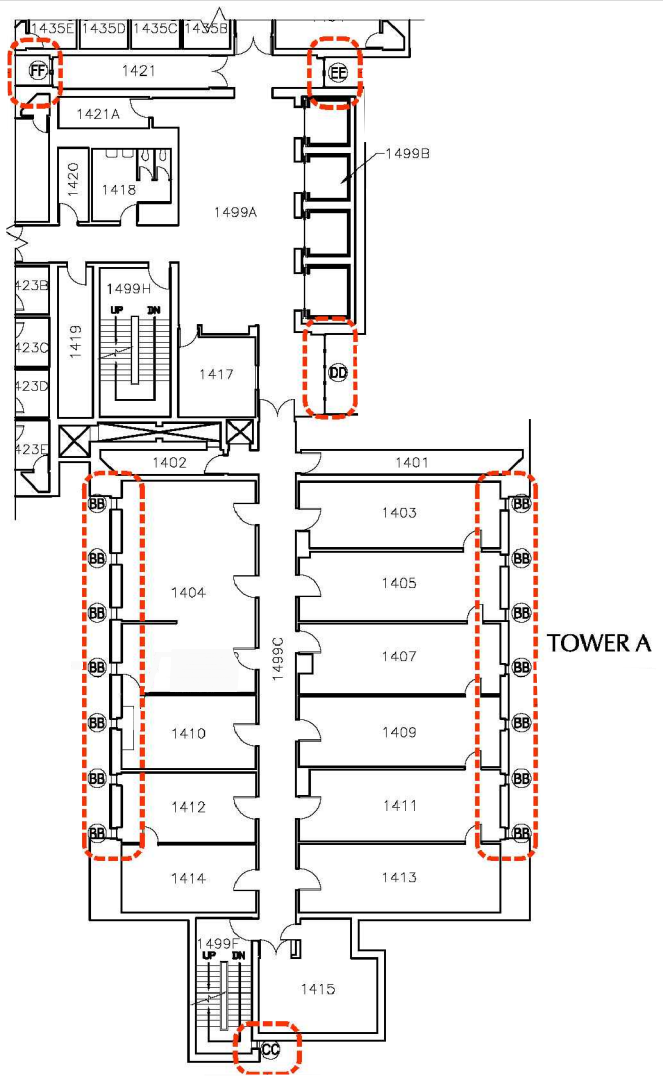


13th



14th

LEGEND

LOCATION OF WINDOWS/GLAZING SEALANTS INCLUDED IN THE INTERIM MEASURES AND SUBJECT TO LONG TERM MONITORING AND MAINTENANCE

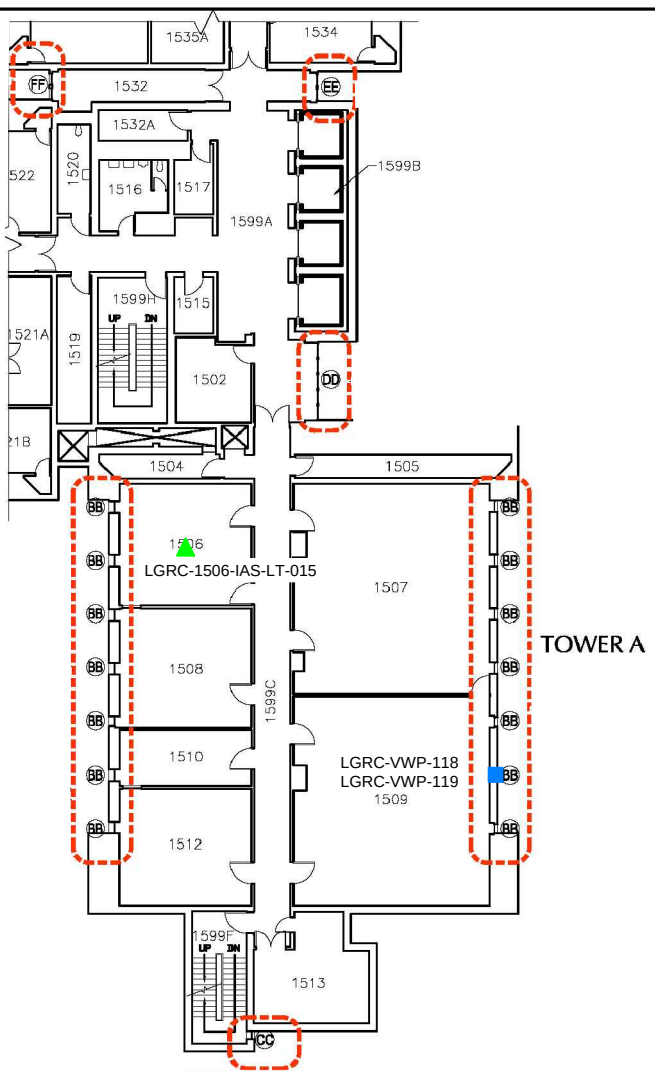
LOCATION OF WIPE SAMPLES

LOCATION OF POST–ABATEMENT AIR SAMPLES

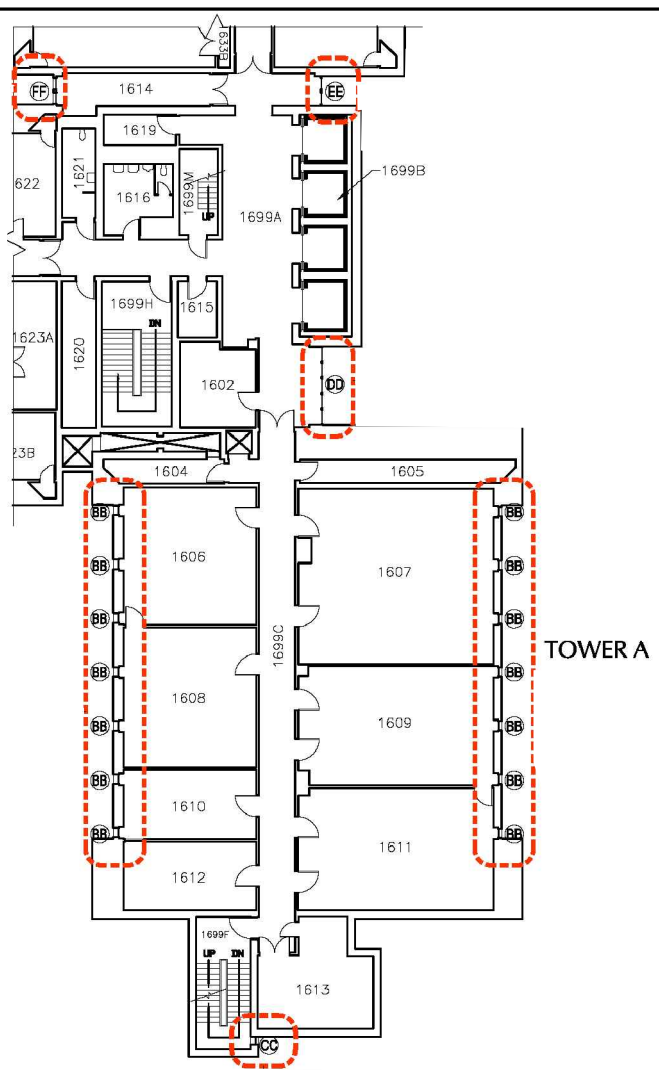
LOCATION OF LONG TERM MONITORING AIR SAMPLE

NOTE:

ORIGINAL DESIGN DRAWINGS BY GOLDMAN REINDORF ARCHITECTS INC.



15th



16th

FIGURE 2-4	UMASS AMHERST LEDERLE GRADUATE RESEARCH CENTER	AREAS OF ENCAPSULATED MATERIALS TOWER A 13th–16th FLOORS	WOODARD &CURRAN 40 Shattuck Road | Suite 110 Andover, Massachusetts 01810 866.702.6371 | www.woodardcurran.com COMMITMENT & INTEGRITY DRIVE RESULTS
JOB NO: 210918 DATE: JUNE 2015 SCALE:NOT TO SCALE	MMIP	DESIGNED BY: DRAWN BY: PF CHECKED BY: JAH MMIP–FIGURE 2–4_2–5–A.DWG	

LEGEND:

LOCATION OF WINDOWS/GLAZING SEALANTS OR EXTERIOR CONCRETE SURFACES INCLUDED IN THE INTERIM MEASURE AND SUBJECT TO LONG TERM MONITORING AND MAINTENANCE.

LOCATION OF WIPE SAMPLES

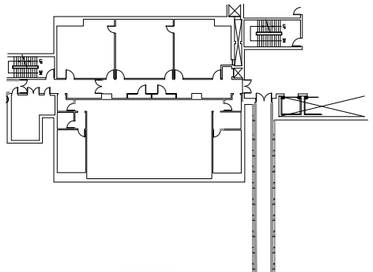
LOCATION OF POST-ABATEMENT AIR SAMPLES

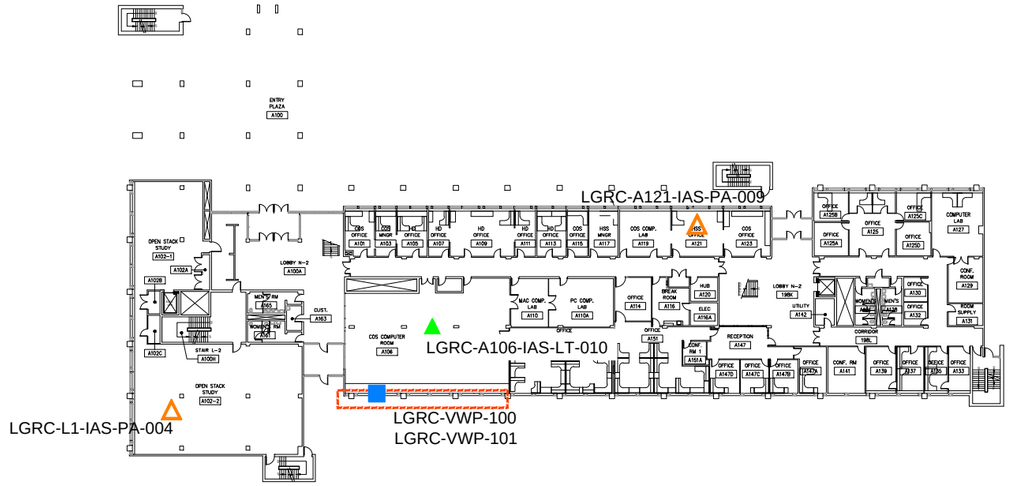
LOCATION OF LONG TERM MONITORING AIR SAMPLE

TYPE-L, VISUAL INSPECTION

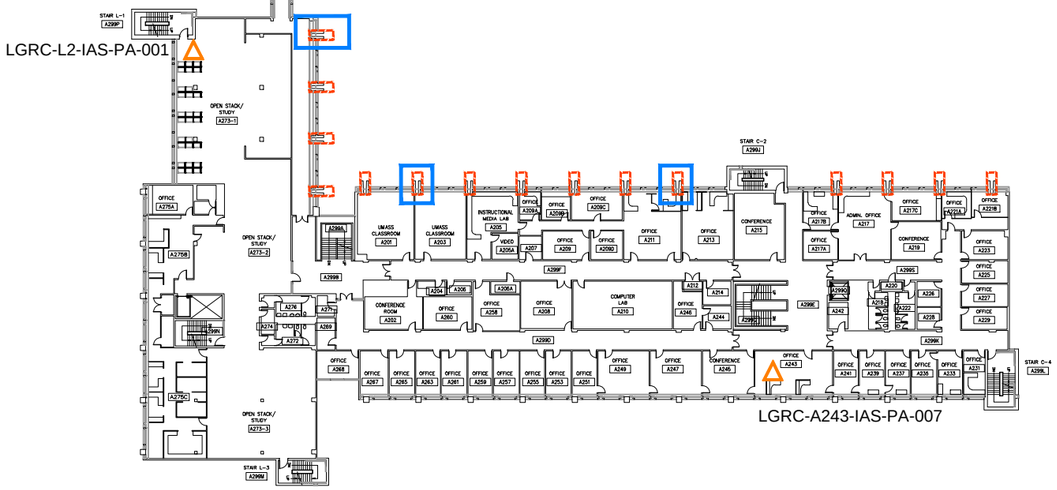
NOTE:

ORIGINAL DESIGN DRAWINGS BY GOLDMAN REINDORF ARCHITECTS INC.

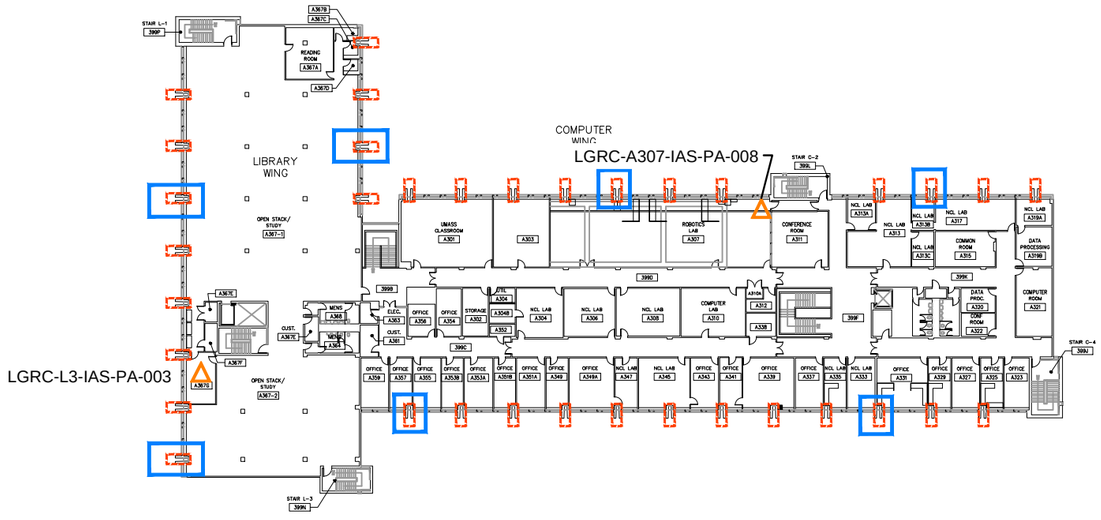




FIRST FLOOR PLAN



SECOND FLOOR PLAN



THIRD FLOOR PLAN

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WOODARD & CURRAN

AREAS OF ENCAPSULATED MATERIALS LOW-RISE BUILDING

DESIGNED BY: PF
DRAWN BY:
CHECKED BY: JAH
MMIP-FIGURE 2-5-A.DWG

UMASS AMHERST
LEDERLE GRADUATE RESEARCH CENTER

MMIP

JOB NO: 210918
DATE: JUNE 2015
SCALE: NOT TO SCALE

FIGURE 2-5

APPENDIX A: ANALYTICAL LABORATORY REPORTS AND DATA VALIDATION SUMMARIES

UMASS LGRC WIPE SAMPLES - PROJECT SUMMARY

Con-Test Analytical Laboratory Job Number: 15F0982

The criteria detailed below were used to qualify the data. Raw data were not used to verify the results reported by the laboratory.

The data validation was conducted in accordance with "USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review" June 2008; "EPA New England Environmental Data Review Supplement For Regional Data Review Elements and Superfund Specific Guidance/Procedures" April 2013; and the referenced method.

Samples were received at 2.8 degrees Celsius. No qualifications were applied.

PCBs:

All polychlorinated biphenyl compound (PCB) samples were extracted and analyzed within technical holding times. No qualifications were applied.

All PCB surrogates met acceptance criteria. No qualifications were applied.

The PCB method blanks were non-detect (ND) for all target analytes. No qualifications were applied.

No PCB field blank samples were submitted with this analytical package. No qualifications were applied.

No PCB matrix spike/matrix spike duplicate (MS/MSD) was performed on a sample from this analytical package. No qualifications were applied.

The PCB laboratory control samples/laboratory control sample duplicates (LCS/LCSD) met acceptance criteria. No qualifications were applied.

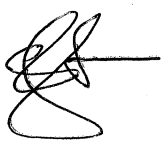
PCB field duplicate samples LGRC-VWPD-117 (15F0982-13)/LGRC-VWP-116 (15F0982-14) and LGRC-VWPD-115 (15F0982-15)/LGRC-VWP-114 (15F0982-16) met acceptance criteria. No qualifications were applied.

The relative percent difference (RPD) between the column results for all detected PCBs met acceptance criteria. No qualifications were applied.

One sample was analyzed at a 2-fold dilution due to the high concentration of PCB-1254 present in the sample. Elevated quantitation limits are reported in this sample as a result of the dilution performed.

Data Check, Inc.
P.O. Box 29
81 Meaderboro Road
New Durham, NH 03855

Gloria J. Switalski:
President



Date: 7/15/2015

UMASS LGRC INDOOR AIR - PROJECT SUMMARY

Con-Test Analytical Laboratory Job Number: 15F1024

The criteria detailed below were used to qualify the data. Raw data were not used to verify the results reported by the laboratory.

The data validation was conducted in accordance with "USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review" June 2008; "EPA New England Environmental Data Review Supplement For Regional Data Review Elements and Superfund Specific Guidance/Procedures" April 2013; and the referenced method.

Samples were received at 4.2 degrees Celsius. No qualifications were applied.

PCB Homologs:

All polychlorinated biphenyl compound (PCB) homolog samples were extracted and analyzed within technical holding times. No qualifications were applied.

The laboratory noted in the case narrative that for decachlorobiphenyl: "Continuing calibration did not meet method specifications and was biased on the high side. Data validation is not affected since sample result was "not detected" for this compound." No qualifications were applied.

All surrogates met laboratory acceptance criteria. No qualifications were applied.

The method blank was non-detect (ND) for all target analytes. No qualifications were applied.

No field blanks were submitted with this analytical package. No qualifications were applied.

No matrix spike/matrix spike duplicate (MS/MSD) was performed since the samples in this package are air samples. No qualifications were applied.

The laboratory control sample/laboratory control sample duplicate (LCS/LCSD) met laboratory acceptance criteria. No qualifications were applied.

The field duplicate samples LGRC-L2-IAS-PA-001 (15F1024-01)/LGRC-L2-IASD-PA-002 (15F1024-02) met acceptance criteria with the following exceptions. Tetrachlorobiphenyl was not detected in the sample but was detected at greater than two times the reporting limit in the field duplicate. In addition, the relative percent difference (RPD) values for pentachlorobiphenyl (71%), hexachlorobiphenyl (86%), and total polychlorinated biphenyls (100%) were above acceptance criteria (≤50%). Therefore, the detected and non-detected tetrachlorobiphenyl, pentachlorobiphenyl, hexachlorobiphenyl, and total polychlorinated biphenyls results in field duplicate pair LGRC-L2-IAS-PA-001 (15F1024-01)/LGRC-L2-IASD-PA-002 (15F1024-02) are qualified as estimated (J or UJ) with an unknown bias.

Data Check, Inc.
P.O. Box 29
81 Meaderboro Road
New Durham, NH 03855

Gloria J. Switalski:
President

Date: 7/15/2015

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

June 26, 2015

George Franklin
Woodard & Curran - Andover, MA
40 Shattuck Road., Suite 110
Andover, MA 01810

Project Location: UMASS Amherst- LGRC
Client Job Number:
Project Number: 210918
Laboratory Work Order Number: 15F0982

Enclosed are results of analyses for samples received by the laboratory on June 19, 2015. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Meghan E. Kelley
Project Manager

Table of Contents

Table of Contents (continued)

con-test® ANALYTICAL LABORATORY

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Woodard & Curran - Andover, MA
40 Shattuck Road., Suite 110
Andover, MA 01810
ATTN: George Franklin

REPORT DATE: 6/26/2015

PURCHASE ORDER NUMBER:

PROJECT NUMBER: 210918

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 15F0982

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: UMASS Amherst- LGRC

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
LRGC-VWP-100	15F0982-01	Wipe		SW-846 8082A	
LRGC-VWP-101	15F0982-02	Wipe		SW-846 8082A	
LRGC-VWP-102	15F0982-03	Wipe		SW-846 8082A	
LRGC-VWP-103	15F0982-04	Wipe		SW-846 8082A	
LRGC-VWP-108	15F0982-05	Wipe		SW-846 8082A	
LRGC-VWP-109	15F0982-06	Wipe		SW-846 8082A	
LRGC-VWP-107	15F0982-07	Wipe		SW-846 8082A	
LRGC-VWP-106	15F0982-08	Wipe		SW-846 8082A	
LRGC-VWP-110	15F0982-09	Wipe		SW-846 8082A	
LRGC-VWP-111	15F0982-10	Wipe		SW-846 8082A	
LRGC-VWP-112	15F0982-11	Wipe		SW-846 8082A	
LRGC-VWP-113	15F0982-12	Wipe		SW-846 8082A	
LRGC-VWPD-117	15F0982-13	Wipe		SW-846 8082A	
LRGC-VWP-116	15F0982-14	Wipe		SW-846 8082A	
LRGC-VWPD-115	15F0982-15	Wipe		SW-846 8082A	
LRGC-VWP-114	15F0982-16	Wipe		SW-846 8082A	
LRGC-VWP-105	15F0982-17	Wipe		SW-846 8082A	
LRGC-VWP-104	15F0982-18	Wipe		SW-846 8082A	
LRGC-VWP-118	15F0982-19	Wipe		SW-846 8082A	
LRGC-VWP-119	15F0982-20	Wipe		SW-846 8082A	

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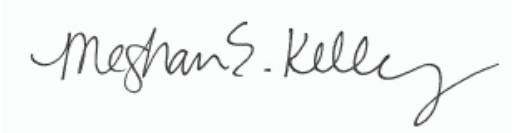
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

CASE NARRATIVE SUMMARY

All reported results are within defined laboratory quality control objectives unless listed below or otherwise qualified in this report.

REVISED REPORT - 6/26/2015 - 15F0982-13 ID revised per clients requset.

The results of analyses reported only relate to samples submitted to the Con-Test Analytical Laboratory for testing.
I certify that the analyses listed above, unless specifically listed as subcontracted, if any, were performed under my direction according to the approved methodologies listed in this document, and 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.



Meghan E. Kelley
Project Manager

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: UMASS Amherst- LGRC | Sample Description: | Work Order: 15F0982

Date Received: 6/19/2015

Field Sample #: LRGC-VWP-100 | Sampled: 6/18/2015 10:45

Sample ID: 15F0982-01

Sample Matrix: Wipe

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 0:06	PJG
Aroclor-1221 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 0:06	PJG
Aroclor-1232 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 0:06	PJG
Aroclor-1242 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 0:06	PJG
Aroclor-1248 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 0:06	PJG
Aroclor-1254 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 0:06	PJG
Aroclor-1260 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 0:06	PJG
Aroclor-1262 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 0:06	PJG
Aroclor-1268 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 0:06	PJG

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	120	30-150		6/25/15 0:06
Decachlorobiphenyl [2]	104	30-150		6/25/15 0:06
Tetrachloro-m-xylene [1]	99.9	30-150		6/25/15 0:06
Tetrachloro-m-xylene [2]	90.1	30-150		6/25/15 0:06

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Project Location: UMASS Amherst- LGRC | Sample Description: | Work Order: 15F0982

Date Received: 6/19/2015

Field Sample #: LRGC-VWP-101 | Sampled: 6/18/2015 10:48

Sample ID: 15F0982-02

Sample Matrix: Wipe

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 0:19	PJG
Aroclor-1221 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 0:19	PJG
Aroclor-1232 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 0:19	PJG
Aroclor-1242 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 0:19	PJG
Aroclor-1248 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 0:19	PJG
Aroclor-1254 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 0:19	PJG
Aroclor-1260 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 0:19	PJG
Aroclor-1262 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 0:19	PJG
Aroclor-1268 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 0:19	PJG

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	103	30-150		6/25/15 0:19
Decachlorobiphenyl [2]	91.4	30-150		6/25/15 0:19
Tetrachloro-m-xylene [1]	93.6	30-150		6/25/15 0:19
Tetrachloro-m-xylene [2]	86.2	30-150		6/25/15 0:19

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Project Location: UMASS Amherst- LGRC | Sample Description: | Work Order: 15F0982

Date Received: 6/19/2015

Field Sample #: LRGC-VWP-102 | Sampled: 6/18/2015 13:18

Sample ID: 15F0982-03

Sample Matrix: Wipe

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 0:32	PJG
Aroclor-1221 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 0:32	PJG
Aroclor-1232 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 0:32	PJG
Aroclor-1242 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 0:32	PJG
Aroclor-1248 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 0:32	PJG
Aroclor-1254 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 0:32	PJG
Aroclor-1260 [1]	0.25	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 0:32	PJG
Aroclor-1262 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 0:32	PJG
Aroclor-1268 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 0:32	PJG

Surrogates	% Recovery	Recovery Limits	Flag/Qual		
Decachlorobiphenyl [1]	111	30-150		6/25/15	0:32
Decachlorobiphenyl [2]	97.6	30-150		6/25/15	0:32
Tetrachloro-m-xylene [1]	97.4	30-150		6/25/15	0:32
Tetrachloro-m-xylene [2]	88.7	30-150		6/25/15	0:32

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Project Location: UMASS Amherst- LGRC | Sample Description: | Work Order: 15F0982

Date Received: 6/19/2015

Field Sample #: LRGC-VWP-103 | Sampled: 6/18/2015 13:19

Sample ID: 15F0982-04

Sample Matrix: Wipe

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 0:45	PJG
Aroclor-1221 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 0:45	PJG
Aroclor-1232 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 0:45	PJG
Aroclor-1242 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 0:45	PJG
Aroclor-1248 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 0:45	PJG
Aroclor-1254 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 0:45	PJG
Aroclor-1260 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 0:45	PJG
Aroclor-1262 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 0:45	PJG
Aroclor-1268 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 0:45	PJG

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	99.1	30-150		6/25/15 0:45
Decachlorobiphenyl [2]	88.2	30-150		6/25/15 0:45
Tetrachloro-m-xylene [1]	97.1	30-150		6/25/15 0:45
Tetrachloro-m-xylene [2]	89.9	30-150		6/25/15 0:45

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Project Location: UMASS Amherst- LGRC | Sample Description: | Work Order: 15F0982

Date Received: 6/19/2015

Field Sample #: LRGC-VWP-108 | Sampled: 6/18/2015 13:40

Sample ID: 15F0982-05

Sample Matrix: Wipe

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 0:58	PJG
Aroclor-1221 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 0:58	PJG
Aroclor-1232 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 0:58	PJG
Aroclor-1242 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 0:58	PJG
Aroclor-1248 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 0:58	PJG
Aroclor-1254 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 0:58	PJG
Aroclor-1260 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 0:58	PJG
Aroclor-1262 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 0:58	PJG
Aroclor-1268 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 0:58	PJG

Surrogates	% Recovery	Recovery Limits	Flag/Qual		
Decachlorobiphenyl [1]	102	30-150		6/25/15	0:58
Decachlorobiphenyl [2]	90.5	30-150		6/25/15	0:58
Tetrachloro-m-xylene [1]	93.1	30-150		6/25/15	0:58
Tetrachloro-m-xylene [2]	84.8	30-150		6/25/15	0:58

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Project Location: UMASS Amherst- LGRC | Sample Description: | Work Order: 15F0982

Date Received: 6/19/2015

Field Sample #: LRGC-VWP-109 | Sampled: 6/18/2015 13:41

Sample ID: 15F0982-06

Sample Matrix: Wipe

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [2]	ND	0.40	µg/Wipe	2		SW-846 8082A	6/23/15	6/25/15 11:58	PJG
Aroclor-1221 [2]	ND	0.40	µg/Wipe	2		SW-846 8082A	6/23/15	6/25/15 11:58	PJG
Aroclor-1232 [2]	ND	0.40	µg/Wipe	2		SW-846 8082A	6/23/15	6/25/15 11:58	PJG
Aroclor-1242 [2]	ND	0.40	µg/Wipe	2		SW-846 8082A	6/23/15	6/25/15 11:58	PJG
Aroclor-1248 [2]	ND	0.40	µg/Wipe	2		SW-846 8082A	6/23/15	6/25/15 11:58	PJG
Aroclor-1254 [1]	3.3	0.40	µg/Wipe	2		SW-846 8082A	6/23/15	6/25/15 11:58	PJG
Aroclor-1260 [1]	ND	0.40	µg/Wipe	2		SW-846 8082A	6/23/15	6/25/15 11:58	PJG
Aroclor-1262 [1]	ND	0.40	µg/Wipe	2		SW-846 8082A	6/23/15	6/25/15 11:58	PJG
Aroclor-1268 [1]	ND	0.40	µg/Wipe	2		SW-846 8082A	6/23/15	6/25/15 11:58	PJG

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	108	30-150		6/25/15 11:58
Decachlorobiphenyl [2]	96.9	30-150		6/25/15 11:58
Tetrachloro-m-xylene [1]	95.9	30-150		6/25/15 11:58
Tetrachloro-m-xylene [2]	87.1	30-150		6/25/15 11:58

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Project Location: UMASS Amherst- LGRC | Sample Description: | Work Order: 15F0982

Date Received: 6/19/2015

Field Sample #: LRGC-VWP-107 | Sampled: 6/18/2015 13:35

Sample ID: 15F0982-07

Sample Matrix: Wipe

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 1:24	PJG
Aroclor-1221 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 1:24	PJG
Aroclor-1232 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 1:24	PJG
Aroclor-1242 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 1:24	PJG
Aroclor-1248 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 1:24	PJG
Aroclor-1254 [1]	0.30	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 1:24	PJG
Aroclor-1260 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 1:24	PJG
Aroclor-1262 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 1:24	PJG
Aroclor-1268 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 1:24	PJG

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	104	30-150		6/25/15 1:24
Decachlorobiphenyl [2]	91.8	30-150		6/25/15 1:24
Tetrachloro-m-xylene [1]	94.4	30-150		6/25/15 1:24
Tetrachloro-m-xylene [2]	86.3	30-150		6/25/15 1:24

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Project Location: UMASS Amherst- LGRC | Sample Description: | Work Order: 15F0982

Date Received: 6/19/2015

Field Sample #: LRGC-VWP-106 | Sampled: 6/18/2015 13:33

Sample ID: 15F0982-08

Sample Matrix: Wipe

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 1:37	PJG
Aroclor-1221 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 1:37	PJG
Aroclor-1232 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 1:37	PJG
Aroclor-1242 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 1:37	PJG
Aroclor-1248 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 1:37	PJG
Aroclor-1254 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 1:37	PJG
Aroclor-1260 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 1:37	PJG
Aroclor-1262 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 1:37	PJG
Aroclor-1268 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 1:37	PJG

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	101	30-150		6/25/15 1:37
Decachlorobiphenyl [2]	89.1	30-150		6/25/15 1:37
Tetrachloro-m-xylene [1]	89.0	30-150		6/25/15 1:37
Tetrachloro-m-xylene [2]	80.9	30-150		6/25/15 1:37

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Project Location: UMASS Amherst- LGRC | Sample Description: | Work Order: 15F0982

Date Received: 6/19/2015

Field Sample #: LRGC-VWP-110 | Sampled: 6/18/2015 13:48

Sample ID: 15F0982-09

Sample Matrix: Wipe

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 2:29	PJG
Aroclor-1221 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 2:29	PJG
Aroclor-1232 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 2:29	PJG
Aroclor-1242 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 2:29	PJG
Aroclor-1248 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 2:29	PJG
Aroclor-1254 [2]	0.24	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 2:29	PJG
Aroclor-1260 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 2:29	PJG
Aroclor-1262 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 2:29	PJG
Aroclor-1268 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 2:29	PJG

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	111	30-150		6/25/15 2:29
Decachlorobiphenyl [2]	96.6	30-150		6/25/15 2:29
Tetrachloro-m-xylene [1]	97.6	30-150		6/25/15 2:29
Tetrachloro-m-xylene [2]	88.2	30-150		6/25/15 2:29

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Project Location: UMASS Amherst- LGRC | Sample Description: | Work Order: 15F0982

Date Received: 6/19/2015

Field Sample #: LRGC-VWP-111 | Sampled: 6/18/2015 13:47

Sample ID: 15F0982-10

Sample Matrix: Wipe

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 2:42	PJG
Aroclor-1221 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 2:42	PJG
Aroclor-1232 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 2:42	PJG
Aroclor-1242 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 2:42	PJG
Aroclor-1248 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 2:42	PJG
Aroclor-1254 [1]	0.38	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 2:42	PJG
Aroclor-1260 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 2:42	PJG
Aroclor-1262 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 2:42	PJG
Aroclor-1268 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 2:42	PJG

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	117	30-150		6/25/15 2:42
Decachlorobiphenyl [2]	101	30-150		6/25/15 2:42
Tetrachloro-m-xylene [1]	102	30-150		6/25/15 2:42
Tetrachloro-m-xylene [2]	91.4	30-150		6/25/15 2:42

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Project Location: UMASS Amherst- LGRC | Sample Description: | Work Order: 15F0982

Date Received: 6/19/2015

Field Sample #: LRGC-VWP-112 | Sampled: 6/18/2015 13:57

Sample ID: 15F0982-11

Sample Matrix: Wipe

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 2:55	PJG
Aroclor-1221 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 2:55	PJG
Aroclor-1232 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 2:55	PJG
Aroclor-1242 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 2:55	PJG
Aroclor-1248 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 2:55	PJG
Aroclor-1254 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 2:55	PJG
Aroclor-1260 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 2:55	PJG
Aroclor-1262 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 2:55	PJG
Aroclor-1268 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 2:55	PJG

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	115	30-150		6/25/15 2:55
Decachlorobiphenyl [2]	99.7	30-150		6/25/15 2:55
Tetrachloro-m-xylene [1]	99.9	30-150		6/25/15 2:55
Tetrachloro-m-xylene [2]	89.8	30-150		6/25/15 2:55

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Project Location: UMASS Amherst- LGRC | Sample Description: | Work Order: 15F0982

Date Received: 6/19/2015

Field Sample #: LRGC-VWP-113 | Sampled: 6/18/2015 13:56

Sample ID: 15F0982-12

Sample Matrix: Wipe

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 3:08	PJG
Aroclor-1221 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 3:08	PJG
Aroclor-1232 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 3:08	PJG
Aroclor-1242 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 3:08	PJG
Aroclor-1248 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 3:08	PJG
Aroclor-1254 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 3:08	PJG
Aroclor-1260 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 3:08	PJG
Aroclor-1262 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 3:08	PJG
Aroclor-1268 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 3:08	PJG

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	113	30-150		6/25/15 3:08
Decachlorobiphenyl [2]	98.4	30-150		6/25/15 3:08
Tetrachloro-m-xylene [1]	99.2	30-150		6/25/15 3:08
Tetrachloro-m-xylene [2]	90.6	30-150		6/25/15 3:08

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: UMASS Amherst- LGRC | Sample Description: | Work Order: 15F0982

Date Received: 6/19/2015

Field Sample #: LRGC-VWPD-117 | Sampled: 6/18/2015 14:07

Sample ID: 15F0982-13

Sample Matrix: Wipe

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 3:21	PJG
Aroclor-1221 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 3:21	PJG
Aroclor-1232 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 3:21	PJG
Aroclor-1242 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 3:21	PJG
Aroclor-1248 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 3:21	PJG
Aroclor-1254 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 3:21	PJG
Aroclor-1260 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 3:21	PJG
Aroclor-1262 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 3:21	PJG
Aroclor-1268 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 3:21	PJG

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	119	30-150		6/25/15 3:21
Decachlorobiphenyl [2]	103	30-150		6/25/15 3:21
Tetrachloro-m-xylene [1]	106	30-150		6/25/15 3:21
Tetrachloro-m-xylene [2]	95.2	30-150		6/25/15 3:21

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: UMASS Amherst- LGRC | Sample Description: | Work Order: 15F0982

Date Received: 6/19/2015

Field Sample #: LRGC-VWP-116 | Sampled: 6/18/2015 14:07

Sample ID: 15F0982-14

Sample Matrix: Wipe

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 3:34	PJG
Aroclor-1221 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 3:34	PJG
Aroclor-1232 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 3:34	PJG
Aroclor-1242 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 3:34	PJG
Aroclor-1248 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 3:34	PJG
Aroclor-1254 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 3:34	PJG
Aroclor-1260 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 3:34	PJG
Aroclor-1262 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 3:34	PJG
Aroclor-1268 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 3:34	PJG

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	118	30-150		6/25/15 3:34
Decachlorobiphenyl [2]	102	30-150		6/25/15 3:34
Tetrachloro-m-xylene [1]	104	30-150		6/25/15 3:34
Tetrachloro-m-xylene [2]	93.7	30-150		6/25/15 3:34

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: UMASS Amherst- LGRC | Sample Description: | Work Order: 15F0982

Date Received: 6/19/2015

Field Sample #: LRGC-VWPD-115 | Sampled: 6/18/2015 14:05

Sample ID: 15F0982-15

Sample Matrix: Wipe

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 3:47	PJG
Aroclor-1221 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 3:47	PJG
Aroclor-1232 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 3:47	PJG
Aroclor-1242 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 3:47	PJG
Aroclor-1248 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 3:47	PJG
Aroclor-1254 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 3:47	PJG
Aroclor-1260 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 3:47	PJG
Aroclor-1262 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 3:47	PJG
Aroclor-1268 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 3:47	PJG

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	116	30-150		6/25/15 3:47
Decachlorobiphenyl [2]	100	30-150		6/25/15 3:47
Tetrachloro-m-xylene [1]	102	30-150		6/25/15 3:47
Tetrachloro-m-xylene [2]	91.7	30-150		6/25/15 3:47

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: UMASS Amherst- LGRC | Sample Description: | Work Order: 15F0982

Date Received: 6/19/2015

Field Sample #: LRGC-VWP-114 | Sampled: 6/18/2015 14:05

Sample ID: 15F0982-16

Sample Matrix: Wipe

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 4:00	PJG
Aroclor-1221 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 4:00	PJG
Aroclor-1232 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 4:00	PJG
Aroclor-1242 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 4:00	PJG
Aroclor-1248 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 4:00	PJG
Aroclor-1254 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 4:00	PJG
Aroclor-1260 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 4:00	PJG
Aroclor-1262 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 4:00	PJG
Aroclor-1268 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 4:00	PJG

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	116	30-150		6/25/15 4:00
Decachlorobiphenyl [2]	101	30-150		6/25/15 4:00
Tetrachloro-m-xylene [1]	105	30-150		6/25/15 4:00
Tetrachloro-m-xylene [2]	94.3	30-150		6/25/15 4:00

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: UMASS Amherst- LGRC | Sample Description: | Work Order: 15F0982

Date Received: 6/19/2015

Field Sample #: LRGC-VWP-105 | Sampled: 6/18/2015 13:25

Sample ID: 15F0982-17

Sample Matrix: Wipe

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 4:13	PJG
Aroclor-1221 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 4:13	PJG
Aroclor-1232 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 4:13	PJG
Aroclor-1242 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 4:13	PJG
Aroclor-1248 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 4:13	PJG
Aroclor-1254 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 4:13	PJG
Aroclor-1260 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 4:13	PJG
Aroclor-1262 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 4:13	PJG
Aroclor-1268 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 4:13	PJG

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	116	30-150		6/25/15 4:13
Decachlorobiphenyl [2]	101	30-150		6/25/15 4:13
Tetrachloro-m-xylene [1]	103	30-150		6/25/15 4:13
Tetrachloro-m-xylene [2]	94.0	30-150		6/25/15 4:13

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: UMASS Amherst- LGRC | Sample Description: | Work Order: 15F0982

Date Received: 6/19/2015

Field Sample #: LRGC-VWP-104 | Sampled: 6/18/2015 13:26

Sample ID: 15F0982-18

Sample Matrix: Wipe

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 4:26	PJG
Aroclor-1221 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 4:26	PJG
Aroclor-1232 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 4:26	PJG
Aroclor-1242 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 4:26	PJG
Aroclor-1248 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 4:26	PJG
Aroclor-1254 [1]	0.69	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 4:26	PJG
Aroclor-1260 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 4:26	PJG
Aroclor-1262 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 4:26	PJG
Aroclor-1268 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 4:26	PJG

Surrogates	% Recovery	Recovery Limits	Flag/Qual		
Decachlorobiphenyl [1]	114	30-150		6/25/15 4:26	
Decachlorobiphenyl [2]	98.5	30-150		6/25/15 4:26	
Tetrachloro-m-xylene [1]	97.0	30-150		6/25/15 4:26	
Tetrachloro-m-xylene [2]	86.8	30-150		6/25/15 4:26	

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: UMASS Amherst- LGRC | Sample Description: | Work Order: 15F0982

Date Received: 6/19/2015

Field Sample #: LRGC-VWP-118 | Sampled: 6/18/2015 14:18

Sample ID: 15F0982-19

Sample Matrix: Wipe

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 4:39	PJG
Aroclor-1221 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 4:39	PJG
Aroclor-1232 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 4:39	PJG
Aroclor-1242 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 4:39	PJG
Aroclor-1248 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 4:39	PJG
Aroclor-1254 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 4:39	PJG
Aroclor-1260 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 4:39	PJG
Aroclor-1262 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 4:39	PJG
Aroclor-1268 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 4:39	PJG

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	112	30-150		6/25/15 4:39
Decachlorobiphenyl [2]	96.8	30-150		6/25/15 4:39
Tetrachloro-m-xylene [1]	101	30-150		6/25/15 4:39
Tetrachloro-m-xylene [2]	90.3	30-150		6/25/15 4:39

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: UMASS Amherst- LGRC | Sample Description: | Work Order: 15F0982

Date Received: 6/19/2015

Field Sample #: LRGC-VWP-119 | Sampled: 6/18/2015 14:19

Sample ID: 15F0982-20

Sample Matrix: Wipe

Polychlorinated Biphenyls with 3540 Soxhlet Extraction

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 4:52	PJG
Aroclor-1221 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 4:52	PJG
Aroclor-1232 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 4:52	PJG
Aroclor-1242 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 4:52	PJG
Aroclor-1248 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 4:52	PJG
Aroclor-1254 [1]	0.82	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 4:52	PJG
Aroclor-1260 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 4:52	PJG
Aroclor-1262 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 4:52	PJG
Aroclor-1268 [1]	ND	0.20	µg/Wipe	1		SW-846 8082A	6/23/15	6/25/15 4:52	PJG

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Decachlorobiphenyl [1]	119	30-150		6/25/15 4:52
Decachlorobiphenyl [2]	102	30-150		6/25/15 4:52
Tetrachloro-m-xylene [1]	110	30-150		6/25/15 4:52
Tetrachloro-m-xylene [2]	97.9	30-150		6/25/15 4:52

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Sample Extraction Data

Prep Method: SW-846 3540C-SW-846 8082A

Lab Number [Field ID]	Batch	Initial [Wipe]	Final [mL]	Date
15F0982-01 [LRGC-VWP-100]	B124726	1.00	10.0	06/23/15
15F0982-02 [LRGC-VWP-101]	B124726	1.00	10.0	06/23/15
15F0982-03 [LRGC-VWP-102]	B124726	1.00	10.0	06/23/15
15F0982-04 [LRGC-VWP-103]	B124726	1.00	10.0	06/23/15
15F0982-05 [LRGC-VWP-108]	B124726	1.00	10.0	06/23/15
15F0982-06 [LRGC-VWP-109]	B124726	1.00	10.0	06/23/15
15F0982-07 [LRGC-VWP-107]	B124726	1.00	10.0	06/23/15
15F0982-08 [LRGC-VWP-106]	B124726	1.00	10.0	06/23/15
15F0982-09 [LRGC-VWP-110]	B124726	1.00	10.0	06/23/15
15F0982-10 [LRGC-VWP-111]	B124726	1.00	10.0	06/23/15
15F0982-11 [LRGC-VWP-112]	B124726	1.00	10.0	06/23/15
15F0982-12 [LRGC-VWP-113]	B124726	1.00	10.0	06/23/15
15F0982-13 [LRGC-VWPD-117]	B124726	1.00	10.0	06/23/15
15F0982-14 [LRGC-VWP-116]	B124726	1.00	10.0	06/23/15
15F0982-15 [LRGC-VWPD-115]	B124726	1.00	10.0	06/23/15
15F0982-16 [LRGC-VWP-114]	B124726	1.00	10.0	06/23/15
15F0982-17 [LRGC-VWP-105]	B124726	1.00	10.0	06/23/15
15F0982-18 [LRGC-VWP-104]	B124726	1.00	10.0	06/23/15
15F0982-19 [LRGC-VWP-118]	B124726	1.00	10.0	06/23/15
15F0982-20 [LRGC-VWP-119]	B124726	1.00	10.0	06/23/15

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QUALITY CONTROL

Polychlorinated Biphenyls with 3540 Soxhlet Extraction - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B124726 - SW-846 3540C										
Blank (B124726-BLK1)				Prepared: 06/23/15 Analyzed: 06/24/15						
Aroclor-1016	ND	0.20	µg/Wipe							
Aroclor-1016 [2C]	ND	0.20	µg/Wipe							
Aroclor-1221	ND	0.20	µg/Wipe							
Aroclor-1221 [2C]	ND	0.20	µg/Wipe							
Aroclor-1232	ND	0.20	µg/Wipe							
Aroclor-1232 [2C]	ND	0.20	µg/Wipe							
Aroclor-1242	ND	0.20	µg/Wipe							
Aroclor-1242 [2C]	ND	0.20	µg/Wipe							
Aroclor-1248	ND	0.20	µg/Wipe							
Aroclor-1248 [2C]	ND	0.20	µg/Wipe							
Aroclor-1254	ND	0.20	µg/Wipe							
Aroclor-1254 [2C]	ND	0.20	µg/Wipe							
Aroclor-1260	ND	0.20	µg/Wipe							
Aroclor-1260 [2C]	ND	0.20	µg/Wipe							
Aroclor-1262	ND	0.20	µg/Wipe							
Aroclor-1262 [2C]	ND	0.20	µg/Wipe							
Aroclor-1268	ND	0.20	µg/Wipe							
Aroclor-1268 [2C]	ND	0.20	µg/Wipe							
Surrogate: Decachlorobiphenyl	*2.27*		µg/Wipe	2.00		113	30-150			
Surrogate: Decachlorobiphenyl [2C]	*1.92*		µg/Wipe	2.00		95.8	30-150			
Surrogate: Tetrachloro-m-xylene	*1.82*		µg/Wipe	2.00		90.9	30-150			
Surrogate: Tetrachloro-m-xylene [2C]	*1.64*		µg/Wipe	2.00		82.2	30-150			
LCS (B124726-BS1)				Prepared: 06/23/15 Analyzed: 06/24/15						
Aroclor-1016	0.56	0.20	µg/Wipe	0.500		112	40-140			
Aroclor-1016 [2C]	0.50	0.20	µg/Wipe	0.500		100	40-140			
Aroclor-1260	0.53	0.20	µg/Wipe	0.500		106	40-140			
Aroclor-1260 [2C]	0.49	0.20	µg/Wipe	0.500		97.4	40-140			
Surrogate: Decachlorobiphenyl	*2.17*		µg/Wipe	2.00		108	30-150			
Surrogate: Decachlorobiphenyl [2C]	*1.86*		µg/Wipe	2.00		92.8	30-150			
Surrogate: Tetrachloro-m-xylene	*1.88*		µg/Wipe	2.00		93.8	30-150			
Surrogate: Tetrachloro-m-xylene [2C]	*1.68*		µg/Wipe	2.00		84.0	30-150			
LCS Dup (B124726-BSD1)				Prepared: 06/23/15 Analyzed: 06/24/15						
Aroclor-1016	0.45	0.20	µg/Wipe	0.500		90.7	40-140	20.9	30	
Aroclor-1016 [2C]	0.41	0.20	µg/Wipe	0.500		82.0	40-140	19.8	30	
Aroclor-1260	0.42	0.20	µg/Wipe	0.500		84.9	40-140	21.7	30	
Aroclor-1260 [2C]	0.40	0.20	µg/Wipe	0.500		80.9	40-140	18.5	30	
Surrogate: Decachlorobiphenyl	*1.73*		µg/Wipe	2.00		86.7	30-150			
Surrogate: Decachlorobiphenyl [2C]	*1.51*		µg/Wipe	2.00		75.3	30-150			
Surrogate: Tetrachloro-m-xylene	*1.54*		µg/Wipe	2.00		76.9	30-150			
Surrogate: Tetrachloro-m-xylene [2C]	*1.40*		µg/Wipe	2.00		70.0	30-150			

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IDENTIFICATION SUMMARY FOR SINGLE COMPONENT ANALYTES

SW-846 8082A

LRGC-VWP-102

Lab Sample ID: 15F0982-03 Date(s) Analyzed: 06/25/2015 06/25/2015

Instrument ID (1): Instrument ID (2):

GC Column (1): ID: (mm) GC Column (2): ID: (mm)

ANALYTE	COL	RT	RT WINDOW		CONCENTRATION	%D
			FROM	TO		
Aroclor-1260	1	0.00	0.00	0.00	0.25	
	2	0.00	0.00	0.00	0.23	8.3

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IDENTIFICATION SUMMARY FOR SINGLE COMPONENT ANALYTES

SW-846 8082A

LRGC-VWP-109

Lab Sample ID: 15F0982-06 Date(s) Analyzed: 06/25/2015 06/25/2015

Instrument ID (1): Instrument ID (2):

GC Column (1): ID: (mm) GC Column (2): ID: (mm)

ANALYTE	COL	RT	RT WINDOW		CONCENTRATION	%D
			FROM	TO		
Aroclor-1254	1	0.00	0.00	0.00	3.3	
	2	0.00	0.00	0.00	2.8	16.7

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IDENTIFICATION SUMMARY FOR SINGLE COMPONENT ANALYTES

SW-846 8082A

LRGC-VWP-107

Lab Sample ID: 15F0982-07

Date(s) Analyzed: 06/25/2015 06/25/2015

Instrument ID (1):

Instrument ID (2):

GC Column (1): ID: (mm)

GC Column (2): ID: (mm)

ANALYTE	COL	RT	RT WINDOW		CONCENTRATION	%D
			FROM	TO		
Aroclor-1254	1	0.00	0.00	0.00	0.30	
	2	0.00	0.00	0.00	0.28	6.9

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IDENTIFICATION SUMMARY FOR SINGLE COMPONENT ANALYTES

SW-846 8082A

LRGC-VWP-110

Lab Sample ID: 15F0982-09 Date(s) Analyzed: 06/25/2015 06/25/2015

Instrument ID (1): Instrument ID (2):

GC Column (1): ID: (mm) GC Column (2): ID: (mm)

ANALYTE	COL	RT	RT WINDOW		CONCENTRATION	%D
			FROM	TO		
Aroclor-1254	1	0.00	0.00	0.00	0.24	
	2	0.00	0.00	0.00	0.24	1.3

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IDENTIFICATION SUMMARY FOR SINGLE COMPONENT ANALYTES

SW-846 8082A

LRGC-VWP-111

Lab Sample ID: 15F0982-10

Date(s) Analyzed: 06/25/2015 06/25/2015

Instrument ID (1):

Instrument ID (2):

GC Column (1): ID: (mm)

GC Column (2): ID: (mm)

ANALYTE	COL	RT	RT WINDOW		CONCENTRATION	%D
			FROM	TO		
Aroclor-1254	1	0.00	0.00	0.00	0.38	
	2	0.00	0.00	0.00	0.34	11.4

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IDENTIFICATION SUMMARY FOR SINGLE COMPONENT ANALYTES

SW-846 8082A

LRGC-VWP-104

Lab Sample ID: 15F0982-18 Date(s) Analyzed: 06/25/2015 06/25/2015

Instrument ID (1): Instrument ID (2):

GC Column (1): ID: (mm) GC Column (2): ID: (mm)

ANALYTE	COL	RT	RT WINDOW		CONCENTRATION	%D
			FROM	TO		
Aroclor-1254	1	0.00	0.00	0.00	0.69	
	2	0.00	0.00	0.00	0.66	3.9

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IDENTIFICATION SUMMARY FOR SINGLE COMPONENT ANALYTES

SW-846 8082A

LRGC-VWP-119

Lab Sample ID: 15F0982-20 Date(s) Analyzed: 06/25/2015 06/25/2015

Instrument ID (1): Instrument ID (2):

GC Column (1): ID: (mm) GC Column (2): ID: (mm)

ANALYTE	COL	RT	RT WINDOW		CONCENTRATION	%D
			FROM	TO		
Aroclor-1254	1	0.00	0.00	0.00	0.82	
	2	0.00	0.00	0.00	0.71	14.3

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IDENTIFICATION SUMMARY FOR SINGLE COMPONENT ANALYTES

SW-846 8082A

LCS

Lab Sample ID: B124726-BS1 Date(s) Analyzed: 06/24/2015 06/24/2015

Instrument ID (1): Instrument ID (2):

GC Column (1): ID: (mm) GC Column (2): ID: (mm)

ANALYTE	COL	RT	RT WINDOW		CONCENTRATION	%D
			FROM	TO		
Aroclor-1016	1	0.00	0.00	0.00	0.56	
	2	0.00	0.00	0.00	0.50	11
Aroclor-1260	1	0.00	0.00	0.00	0.53	
	2	0.00	0.00	0.00	0.49	7

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IDENTIFICATION SUMMARY FOR SINGLE COMPONENT ANALYTES

SW-846 8082A

LCS Dup

Lab Sample ID: B124726-BSD1 Date(s) Analyzed: 06/24/2015 06/24/2015

Instrument ID (1): Instrument ID (2):

GC Column (1): ID: (mm) GC Column (2): ID: (mm)

ANALYTE	COL	RT	RT WINDOW		CONCENTRATION	%D
			FROM	TO		
Aroclor-1016	1	0.00	0.00	0.00	0.45	
	2	0.00	0.00	0.00	0.41	10
Aroclor-1260	1	0.00	0.00	0.00	0.42	
	2	0.00	0.00	0.00	0.40	6

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FLAG/QUALIFIER SUMMARY

*	QC result is outside of established limits.
†	Wide recovery limits established for difficult compound.
‡	Wide RPD limits established for difficult compound.
#	Data exceeded client recommended or regulatory level

Percent recoveries and relative percent differences (RPDs) are determined by the software using values in the calculation which have not been rounded.

No results have been blank subtracted unless specified in the case narrative section.

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CERTIFICATIONS

Certified Analyses included in this Report

Analyte	Certifications

No certified Analyses included in this Report

The CON-TEST Environmental Laboratory operates under the following certifications and accreditations:

Code	Description	Number	Expires
AIHA	AIHA-LAP, LLC	100033	02/1/2016
MA	Massachusetts DEP	M-MA100	06/30/2016
CT	Connecticut Department of Publilc Health	PH-0567	09/30/2015
NY	New York State Department of Health	10899 NELAP	04/1/2016
NH-S	New Hampshire Environmental Lab	2516 NELAP	02/5/2016
RI	Rhode Island Department of Health	LAO00112	12/30/2015
NC	North Carolina Div. of Water Quality	652	12/31/2015
NJ	New Jersey DEP	MA007 NELAP	06/30/2015
FL	Florida Department of Health	E871027 NELAP	06/30/2016
VT	Vermont Department of Health Lead Laboratory	LL015036	07/30/2015
WA	State of Washington Department of Ecology	C2065	02/23/2016
ME	State of Maine	2011028	06/9/2017
VA	Commonwealth of Virginia	460217	12/14/2015
NH-P	New Hampshire Environmental Lab	2557 NELAP	09/6/2015

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www.contestlabs.com
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East longmeadow, MA 01028

CHAIN OF CUSTODY RECORD

15F0982
Rev 04.05.12

Company Name: Woodard + Curran
Address: 40 Shattuck Rd. Andover MA
Attention: G. Franklin
Project Location: UMass Amherst - LGRC
Sampled By: J. Perry + P. Quackenbush

Telephone: 978 557 8150
Project #: 210918
Client PO#:

Project Proposal Provided? (for billing purposes)
○ yes _____ proposal date

DATA DELIVERY (check all that apply)
○ FAX ○ EMAIL ○ WEBSITE
Fax #:
Email: ghamel@franklin jperry
Format: ○ PDF ○ EXCEL ○ GIS
○ OTHER
○ "Enhanced Data Package"

Con-Test Lab ID (laboratory use only)	Client Sample ID / Description	Collection Beginning Date/Time	Collection Ending Date/Time	Composite	Grab	*Matrix Code	Conc Code	# of Containers	** Preservation	***Container Code	PCBs (3540C/8082)
01	LGRC-VWP-100	6-18-15	1045		X	O	U				X
02	LGRC-VWP-101		1048								
03	LGRC-VWP-102		1318								
04	LGRC-VWP-103		1319								
05	LGRC-VWP-108		1340								
06	LGRC-VWP-109		1341								
07	LGRC-VWP-107		1335								
08	LGRC-VWP-106		1333								
09	LGRC-VWP-110		1348								
10	LGRC-VWP-111		1347								

ANALYSIS REQUESTED

Dissolved Metals
○ Field Filtered
○ Lab to Filter

***Cont. Code:
A=amber glass
G=glass
P=plastic
ST=sterile
V=vial
S=summa can
T=tedlar bag
O=Other

**Preservation
I = Iced
H = HCL
M = Methanol
N = Nitric Acid
S = Sulfuric Acid
B = Sodium bisulfate
X = Na hydroxide
T = Na thiosulfate
O = Other hexane

*Matrix Code:
GW= groundwater
WW= wastewater
DW= drinking water
A = air
S = soil/solid
SL = sludge
O = other wipe

Please use the following codes to let Con-Test know if a specific sample may be high in concentration in Matrix/Conc. Code Box:
H - High; M - Medium; L - Low; C - Clean; U - Unknown

Comments: PCBs (3540C/8082)

Relinquished by: (signature)	Date/Time:
[signature] 6/19/15	1145
Received by: (signature) Tom Mani 6/19/15	Date/Time: 1145
Relinquished by: (signature) Tom Mani 6/19/15	Date/Time: 1630
Received by: (signature) 2.8°C [signature] 6/19/15	Date/Time: 1630

Turnaround ††
☐ 7-Day
☐ 10-Day
☑ Other 5 day
RUSH †
☐ †24-Hr ☐ †48-Hr
☐ †72-Hr ☐ †4-Day
† Require lab approval

Detection Limit Requirements
Massachusetts:
Connecticut:
Other:

Is your project MCP or RCP ?
○ MCP Form Required
○ RCP Form Required
○ MA State DW Form Required PWSID # _____

NELAC & AIHA-LAP, LLC Accredited
WBE/DBE Certified

TURNAROUND TIME STARTS AT 9:00 A.M. THE DAY AFTER SAMPLE RECEIPT UNLESS THERE ARE QUESTIONS ON YOUR CHAIN. IF THIS FORM IS NOT FILLED OUT COMPLETELY OR INCORRECT, TURNAROUND TIME WILL NOT START UNTIL ALL QUESTIONS ARE ANSWERED BY OUR CLIENT.

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Fax: 413-525-6405
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www.contestlabs.com
39 Spruce Street
East longmeadow, MA 01028

CHAIN OF CUSTODY RECORD

15F0982
Rev 04.05.12

Company Name: Woodard & Curran
Address: 40 Shattuck Rd. Andover MA
Attention: G. Franklin
Project Location: UMass Amherst – LGRC
Sampled By: J. Perry + P. Quackenbush
Telephone: 978 557 8150
Project #: 210918
Client PO#:

Project Proposal Provided? (for billing purposes)
○ yes _____ proposal date

DATA DELIVERY (check all that apply)
○ FAX ○ EMAIL ○ WEBSITE
Fax #:
Email: jhamel gfranklin jperry
Format: ○ PDF ○ EXCEL ○ GIS
○ OTHER _____
○ "Enhanced Data Package"

Con-Test Lab ID (laboratory use only)	Client Sample ID / Description	Collection Beginning Date/Time	Collection Ending Date/Time	Composite	Grab	*Matrix Code	Conc Code	PCBs (3540C/8082)	# of Containers	** Preservation	***Container Code
11	LGRC-VWP-112	6-18-15	1357		X	O	U	X			
12	LGRC-VWP-113		1356								
13	LGRC-VWPD-117		1407								
14	LGRC-VWP-116		1407								
15	LGRC-VWPD-115		1405								
16	LGRC-VWP-114		1405								
17	LGRC-VWP-105		1325								
18	LGRC-VWP-104		1326								
19	LGRC-VWP-118		1418								
20	LGRC-VWP-119		1419								

ANALYSIS REQUESTED

Dissolved Metals
○ Field Filtered
○ Lab to Filter

***Cont. Code:
A=amber glass
G=glass
P=plastic
ST=sterile
V=vial
S=summa can
T=tedlar bag
O=Other

**Preservation
I = Iced
H = HCL
M = Methanol
N = Nitric Acid
S = Sulfuric Acid
B = Sodium bisulfate
X = Na hydroxide
T = Na thiosulfate
O = Other NaOH+Na

*Matrix Code:
GW= groundwater
WW= wastewater
DW= drinking water
A = air
S = soil/solid
SL = sludge
O = other wipe

Comments: PCBs (3540C/8082)

Please use the following codes to let Con-Test know if a specific sample may be high in concentration in Matrix/Conc. Code Box:
H - High; M - Medium; L - Low; C - Clean; U - Unknown

Relinquished by: (signature)	Date/Time:
Jen Perry	6/19/15 1145
Received by: (signature)	Date/Time:
Tom Mase	6/19/15 1745
Relinquished by: (signature)	Date/Time:
Tom Mase	6/19/15 1630
Received by: (signature)	Date/Time:
Rebecca Faust 28C	6/19/15 1630

Turnaround ††
☐ 7-Day
☐ 10-Day
☒ Other 5 day
RUSH †
☐ †24-Hr ☐ †48-Hr
☐ †72-Hr ☐ †4-Day
† Require lab approval

Detection Limit Requirements
Massachusetts:
Connecticut:
Other:

Is your project MCP or RCP ?
○ MCP Form Required
○ RCP Form Required
○ MA State DW Form Required PWSID # _____

NELAC & AIHA-LAP, LLC Accredited
WBE/DBE Certified

TURNAROUND TIME STARTS AT 9:00 A.M. THE DAY AFTER SAMPLE RECEIPT UNLESS THERE ARE QUESTIONS ON YOUR CHAIN. IF THIS FORM IS NOT FILLED OUT COMPLETELY OR INCORRECT, TURNAROUND TIME WILL NOT START UNTIL ALL QUESTIONS ARE ANSWERED BY OUR CLIENT.

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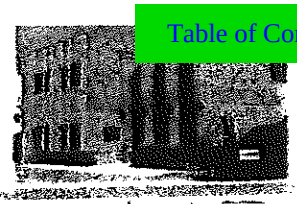

Sample Receipt Checklist

CLIENT NAME: Woodard & Curran **RECEIVED BY:** RLF **DATE:** 6/19/15

1) **Was the chain(s) of custody relinquished and signed?** (Yes) No No CoC Included

2) **Does the chain agree with the samples?** (Yes) No

If not, explain:

3) **Are all the samples in good condition?** (Yes) No

If not, explain:

4) **How were the samples received:**

On Ice ☑ Direct from Sampling ☐ Ambient ☐ In Cooler(s) ☑

Were the samples received in Temperature Compliance of (2-6°C)? (Yes) No N/A

Temperature °C by Temp blank _____ Temperature °C by Temp gun 2.8°C

5) **Are there Dissolved samples for the lab to filter?** Yes (No)

Who was notified _____ Date _____ Time _____

6) **Are there any RUSH or SHORT HOLDING TIME samples?** Yes (No)

Who was notified _____ Date _____ Time _____

7) **Location where samples are stored:** —

Permission to subcontract samples? Yes No

(Walk-in clients only) if not already approved

Client Signature: _____

8) **Do all samples have the proper Acid pH:** Yes No (N/A) _____

9) **Do all samples have the proper Base pH:** Yes No (N/A) _____

10) **Was the PC notified of any discrepancies with the CoC vs the samples:** Yes No (N/A)

Containers received at Con-Test

	# of containers		# of containers
1 Liter Amber		8 oz amber/clear jar	
500 mL Amber		4 oz amber/clear jar	20
250 mL Amber (8oz amber)		2 oz amber/clear jar	
1 Liter Plastic		Plastic Bag / Ziploc	
500 mL Plastic		SOC Kit	
250 mL plastic		Non-ConTest Container	
40 mL Vial - type listed below		Perchlorate Kit	
Colisure / bacteria bottle		Flashpoint bottle	
Dissolved Oxygen bottle		Other glass jar	
Encore		Other	

Laboratory Comments:

40 mL vials: # HCl _____ # Methanol _____

Bisulfate _____ # DI Water _____

Thiosulfate _____ Unpreserved _____

Time and Date Frozen:

Login Sample Receipt Checklist

(Rejection Criteria Listing - Using Sample Acceptance Policy)

Any False statement will be brought to the attention of Client

Question	Answer (True/False) T/F/NA	Comment
1) The cooler's custody seal, if present, is intact.	T	
2) The cooler or samples do not appear to have been compromised or tampered with.	T	
3) Samples were received on ice.	T	
4) Cooler Temperature is acceptable.	T	
5) Cooler Temperature is recorded.	T	
6) COC is filled out in ink and legible.	T	
7) COC is filled out with all pertinent information.	T	
8) Field Sampler's name present on COC.	T	
9) There are no discrepancies between the sample IDs on the container and the COC.	T	
10) Samples are received within Holding Time.	T	
11) Sample containers have legible labels.	T	
12) Containers are not broken or leaking.	T	
13) Air Cassettes are not broken/open.	NA	
14) Sample collection date/times are provided.	T	
15) Appropriate sample containers are used.	T	
16) Proper collection media used.	T	
17) No headspace sample bottles are completely filled.	T	
18) There is sufficient volume for all requsted analyses, including any requested MS/MSDs.	T	
19) Trip blanks provided if applicable.	NA	
20) VOA sample vials do not have head space or bubble is <6mm (1/4") in diameter.	NA	
21) Samples do not require splitting or compositing.	T	

Who notified of False statements? **Date/Time:**

Log-In Technician Initials: **Date/Time:** RLT 6/19/15 1630

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July 2, 2015

George Franklin
Woodard & Curran - Andover, MA
40 Shattuck Road., Suite 110
Andover, MA 01810

Project Location: UMass Amherst - LGRC
Client Job Number:
Project Number: 210918
Laboratory Work Order Number: 15F1024

Enclosed are results of analyses for samples received by the laboratory on June 19, 2015. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Meghan E. Kelley
Project Manager

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Woodard & Curran - Andover, MA
40 Shattuck Road., Suite 110
Andover, MA 01810
ATTN: George Franklin

REPORT DATE: 7/2/2015

PURCHASE ORDER NUMBER:

PROJECT NUMBER: 210918

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 15F1024

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: UMass Amherst - LGRC

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
LGRC-L2-IAS-PA-001	15F1024-01	Indoor air		TO-10A/EPA 680 Modified	
LGRC-L2-IASD-PA-002	15F1024-02	Indoor air		TO-10A/EPA 680 Modified	
LGRC-L3-IAS-PA-003	15F1024-03	Indoor air		TO-10A/EPA 680 Modified	
LGRC-L1-IAS-PA-004	15F1024-04	Indoor air		TO-10A/EPA 680 Modified	
LGRC-A243-IAS-PA-007	15F1024-05	Indoor air		TO-10A/EPA 680 Modified	
LGRC-A307-IAS-PA-008	15F1024-06	Indoor air		TO-10A/EPA 680 Modified	
LGRC-A121-IAS-PA-009	15F1024-07	Indoor air		TO-10A/EPA 680 Modified	
LGRC-A106-IAS-LT-010	15F1024-08	Indoor air		TO-10A/EPA 680 Modified	
LGRC-403B-IAS-LT-011	15F1024-09	Indoor air		TO-10A/EPA 680 Modified	
LGRC-599A-IAS-LT-012	15F1024-10	Indoor air		TO-10A/EPA 680 Modified	
LGRC-903-IAS-LT-013	15F1024-11	Indoor air		TO-10A/EPA 680 Modified	
LGRC-1105-IAS-LT-014	15F1024-12	Indoor air		TO-10A/EPA 680 Modified	
LGRC-1506-IAS-LT-015	15F1024-13	Indoor air		TO-10A/EPA 680 Modified	
LGRC-OUT-IAS-LT-016	15F1024-14	Ambient Air		TO-10A/EPA 680 Modified	

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CASE NARRATIVE SUMMARY

All reported results are within defined laboratory quality control objectives unless listed below or otherwise qualified in this report.

TO-10A/EPA 680 Modified

Qualifications:

V-06

Continuing calibration did not meet method specifications and was biased on the high side for this compound. Increased uncertainty is associated with the reported value which is likely to be biased on the high side.

Analyte & Samples(s) Qualified:

Decachlorobiphenyl

B124704-BS1, B124704-BSD1

V-20

Continuing calibration did not meet method specifications and was biased on the high side. Data validation is not affected since sample result was "not detected" for this compound.

Analyte & Samples(s) Qualified:

Decachlorobiphenyl

15F1024-01[LGRC-L2-IAS-PA-001], 15F1024-02[LGRC-L2-IASD-PA-002], 15F1024-03[LGRC-L3-IAS-PA-003], 15F1024-04[LGRC-L1-IAS-PA-004], 15F1024-05[LGRC-A243-IAS-PA-007], 15F1024-06[LGRC-A307-IAS-PA-008], 15F1024-07[LGRC-A121-IAS-PA-009], 15F1024-08[LGRC-A106-IAS-LT-010], 15F1024-09[LGRC-403B-IAS-LT-011], 15F1024-10[LGRC-599A-IAS-LT-012], 15F1024-11[LGRC-903-IAS-LT-013], 15F1024-12[LGRC-1105-IAS-LT-014], 15F1024-13[LGRC-1506-IAS-LT-015], 15F1024-14[LGRC-OUT-IAS-LT-016], B124704-BLK1

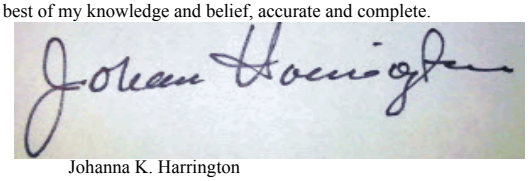
Monochlorobiphenyls

B124704-BLK1

Nonachlorobiphenyls

B124704-BLK1

The results of analyses reported only relate to samples submitted to the Con-Test Analytical Laboratory for testing.
I certify that the analyses listed above, unless specifically listed as subcontracted, if any, were performed under my direction according to the approved methodologies listed in this document, and 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.



Johanna K. Harrington
Manager, Laboratory Reporting

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ANALYTICAL RESULTS

Project Location: UMass Amherst - LGRC
Date Received: 6/19/2015
Field Sample #: LGRC-L2-IAS-PA-001
Sample ID: 15F1024-01
Sample Matrix: Indoor air
Sampled: 6/18/2015 13:07

Sample Description/Location:
Sub Description/Location:
Flow Controller ID:
Sample Type:
Air Volume L: 666.12

Work Order: 15F1024

TO-10A/EPA 680 Modified

Analyte	Total µg Results	RL	Flag/Qual	ug/m3 Results	RL	Dilution	Date/Time Analyzed	Analyst
Monochlorobiphenyls	ND	0.0010		ND	0.0015	1	6/24/15 15:22	CJM
Dichlorobiphenyls	ND	0.0010		ND	0.0015	1	6/24/15 15:22	CJM
Trichlorobiphenyls	ND	0.0010		ND	0.0015	1	6/24/15 15:22	CJM
Tetrachlorobiphenyls	ND	0.0020		ND	0.003	1	6/24/15 15:22	CJM
Pentachlorobiphenyls	0.011	0.0020		0.016	0.003	1	6/24/15 15:22	CJM
Hexachlorobiphenyls	0.0052	0.0020		0.0078	0.003	1	6/24/15 15:22	CJM
Heptachlorobiphenyls	ND	0.0030		ND	0.0045	1	6/24/15 15:22	CJM
Octachlorobiphenyls	ND	0.0030		ND	0.0045	1	6/24/15 15:22	CJM
Nonachlorobiphenyls	ND	0.0050		ND	0.0075	1	6/24/15 15:22	CJM
Decachlorobiphenyl	ND	0.0050	V-20	ND	0.0075	1	6/24/15 15:22	CJM
Total Polychlorinated biphenyls	0.016			0.024		1	6/24/15 15:22	CJM

Surrogates	% Recovery	% REC Limits	
Tetrachloro-m-xylene	79.5	50-125	6/24/15 15:22

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ANALYTICAL RESULTS

Project Location: UMass Amherst - LGRC
Date Received: 6/19/2015
Field Sample #: LGRC-L2-IASD-PA-002
Sample ID: 15F1024-02
Sample Matrix: Indoor air
Sampled: 6/18/2015 13:11

Sample Description/Location:
Sub Description/Location:
Flow Controller ID:
Sample Type:
Air Volume L: 690.52

Work Order: 15F1024

TO-10A/EPA 680 Modified

Analyte	Total µg Results	Total µg RL	Flag/Qual	ug/m3 Results	ug/m3 RL	Dilution	Date/Time Analyzed	Analyst
Monochlorobiphenyls	ND	0.0010		ND	0.0014	1	6/24/15 15:55	CJM
Dichlorobiphenyls	ND	0.0010		ND	0.0014	1	6/24/15 15:55	CJM
Trichlorobiphenyls	ND	0.0010		ND	0.0014	1	6/24/15 15:55	CJM
Tetrachlorobiphenyls	0.013	0.0020		0.018	0.0029	1	6/24/15 15:55	CJM
Pentachlorobiphenyls	0.023	0.0020		0.033	0.0029	1	6/24/15 15:55	CJM
Hexachlorobiphenyls	0.013	0.0020		0.018	0.0029	1	6/24/15 15:55	CJM
Heptachlorobiphenyls	ND	0.0030		ND	0.0043	1	6/24/15 15:55	CJM
Octachlorobiphenyls	ND	0.0030		ND	0.0043	1	6/24/15 15:55	CJM
Nonachlorobiphenyls	ND	0.0050		ND	0.0072	1	6/24/15 15:55	CJM
Decachlorobiphenyl	ND	0.0050	V-20	ND	0.0072	1	6/24/15 15:55	CJM
Total Polychlorinated biphenyls	0.048			0.070		1	6/24/15 15:55	CJM

Surrogates	% Recovery	% REC Limits	
Tetrachloro-m-xylene	83.0	50-125	6/24/15 15:55

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ANALYTICAL RESULTS

Project Location: UMass Amherst - LGRC
Date Received: 6/19/2015
Field Sample #: LGRC-L3-IAS-PA-003
Sample ID: 15F1024-03
Sample Matrix: Indoor air
Sampled: 6/18/2015 13:17

Sample Description/Location:
Sub Description/Location:
Flow Controller ID:
Sample Type:
Air Volume L: 663.12

Work Order: 15F1024

TO-10A/EPA 680 Modified

	Total µg			ug/m3			Date/Time	
Analyte	**Results**	**RL**	**Flag/Qual**	**Results**	**RL**	**Dilution**	**Analyzed**	**Analyst**
Monochlorobiphenyls	ND	0.0010		ND	0.0015	1	6/24/15 16:27	CJM
Dichlorobiphenyls	ND	0.0010		ND	0.0015	1	6/24/15 16:27	CJM
Trichlorobiphenyls	ND	0.0010		ND	0.0015	1	6/24/15 16:27	CJM
Tetrachlorobiphenyls	0.015	0.0020		0.023	0.003	1	6/24/15 16:27	CJM
Pentachlorobiphenyls	0.029	0.0020		0.044	0.003	1	6/24/15 16:27	CJM
Hexachlorobiphenyls	0.015	0.0020		0.023	0.003	1	6/24/15 16:27	CJM
Heptachlorobiphenyls	ND	0.0030		ND	0.0045	1	6/24/15 16:27	CJM
Octachlorobiphenyls	ND	0.0030		ND	0.0045	1	6/24/15 16:27	CJM
Nonachlorobiphenyls	ND	0.0050		ND	0.0075	1	6/24/15 16:27	CJM
Decachlorobiphenyl	ND	0.0050	V-20	ND	0.0075	1	6/24/15 16:27	CJM
Total Polychlorinated biphenyls	0.060			0.091		1	6/24/15 16:27	CJM

Surrogates	% Recovery	% REC Limits	
Tetrachloro-m-xylene	95.1	50-125	6/24/15 16:27

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ANALYTICAL RESULTS

Project Location: UMass Amherst - LGRC
Date Received: 6/19/2015
Field Sample #: LGRC-L1-IAS-PA-004
Sample ID: 15F1024-04
Sample Matrix: Indoor air
Sampled: 6/18/2015 13:26

Sample Description/Location:
Sub Description/Location:
Flow Controller ID:
Sample Type:
Air Volume L: 624.6

Work Order: 15F1024

TO-10A/EPA 680 Modified

Analyte	Total µg Results	Total µg RL	Flag/Qual	ug/m3 Results	ug/m3 RL	Dilution	Date/Time Analyzed	Analyst
Monochlorobiphenyls	ND	0.0010		ND	0.0016	1	6/24/15 17:00	CJM
Dichlorobiphenyls	ND	0.0010		ND	0.0016	1	6/24/15 17:00	CJM
Trichlorobiphenyls	ND	0.0010		ND	0.0016	1	6/24/15 17:00	CJM
Tetrachlorobiphenyls	0.012	0.0020		0.019	0.0032	1	6/24/15 17:00	CJM
Pentachlorobiphenyls	0.020	0.0020		0.031	0.0032	1	6/24/15 17:00	CJM
Hexachlorobiphenyls	0.0084	0.0020		0.013	0.0032	1	6/24/15 17:00	CJM
Heptachlorobiphenyls	ND	0.0030		ND	0.0048	1	6/24/15 17:00	CJM
Octachlorobiphenyls	ND	0.0030		ND	0.0048	1	6/24/15 17:00	CJM
Nonachlorobiphenyls	ND	0.0050		ND	0.008	1	6/24/15 17:00	CJM
Decachlorobiphenyl	ND	0.0050	V-20	ND	0.008	1	6/24/15 17:00	CJM
Total Polychlorinated biphenyls	0.040			0.064		1	6/24/15 17:00	CJM

Surrogates	% Recovery	% REC Limits	
Tetrachloro-m-xylene	89.0	50-125	6/24/15 17:00

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ANALYTICAL RESULTS

Project Location: UMass Amherst - LGRC
Date Received: 6/19/2015
Field Sample #: LGRC-A243-IAS-PA-007
Sample ID: 15F1024-05
Sample Matrix: Indoor air
Sampled: 6/18/2015 14:01

Sample Description/Location:
Sub Description/Location:
Flow Controller ID:
Sample Type:
Air Volume L: 671.88

Work Order: 15F1024

TO-10A/EPA 680 Modified

	Total µg			ug/m3			Date/Time	
Analyte	**Results**	**RL**	**Flag/Qual**	**Results**	**RL**	**Dilution**	**Analyzed**	**Analyst**
Monochlorobiphenyls	ND	0.0010		ND	0.0015	1	6/24/15 17:33	CJM
Dichlorobiphenyls	ND	0.0010		ND	0.0015	1	6/24/15 17:33	CJM
Trichlorobiphenyls	ND	0.0010		ND	0.0015	1	6/24/15 17:33	CJM
Tetrachlorobiphenyls	0.0096	0.0020		0.014	0.003	1	6/24/15 17:33	CJM
Pentachlorobiphenyls	0.024	0.0020		0.036	0.003	1	6/24/15 17:33	CJM
Hexachlorobiphenyls	0.010	0.0020		0.015	0.003	1	6/24/15 17:33	CJM
Heptachlorobiphenyls	ND	0.0030		ND	0.0045	1	6/24/15 17:33	CJM
Octachlorobiphenyls	ND	0.0030		ND	0.0045	1	6/24/15 17:33	CJM
Nonachlorobiphenyls	ND	0.0050		ND	0.0074	1	6/24/15 17:33	CJM
Decachlorobiphenyl	ND	0.0050	V-20	ND	0.0074	1	6/24/15 17:33	CJM
Total Polychlorinated biphenyls	0.044			0.065		1	6/24/15 17:33	CJM

Surrogates	% Recovery	% REC Limits	
Tetrachloro-m-xylene	75.2	50-125	6/24/15 17:33

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ANALYTICAL RESULTS

Project Location: UMass Amherst - LGRC
Date Received: 6/19/2015
Field Sample #: LGRC-A307-IAS-PA-008
Sample ID: 15F1024-06
Sample Matrix: Indoor air
Sampled: 6/18/2015 14:14

Sample Description/Location:
Sub Description/Location:
Flow Controller ID:
Sample Type:
Air Volume L: 637.92

Work Order: 15F1024

TO-10A/EPA 680 Modified

Analyte	Total µg Results	Total µg RL	Flag/Qual	ug/m3 Results	ug/m3 RL	Dilution	Date/Time Analyzed	Analyst
Monochlorobiphenyls	ND	0.0010		ND	0.0016	1	6/24/15 18:06	CJM
Dichlorobiphenyls	ND	0.0010		ND	0.0016	1	6/24/15 18:06	CJM
Trichlorobiphenyls	ND	0.0010		ND	0.0016	1	6/24/15 18:06	CJM
Tetrachlorobiphenyls	0.0041	0.0020		0.0065	0.0031	1	6/24/15 18:06	CJM
Pentachlorobiphenyls	0.011	0.0020		0.017	0.0031	1	6/24/15 18:06	CJM
Hexachlorobiphenyls	0.0053	0.0020		0.0083	0.0031	1	6/24/15 18:06	CJM
Heptachlorobiphenyls	ND	0.0030		ND	0.0047	1	6/24/15 18:06	CJM
Octachlorobiphenyls	ND	0.0030		ND	0.0047	1	6/24/15 18:06	CJM
Nonachlorobiphenyls	ND	0.0050		ND	0.0078	1	6/24/15 18:06	CJM
Decachlorobiphenyl	ND	0.0050	V-20	ND	0.0078	1	6/24/15 18:06	CJM
Total Polychlorinated biphenyls	0.020			0.032		1	6/24/15 18:06	CJM

Surrogates	% Recovery	% REC Limits	
Tetrachloro-m-xylene	65.8	50-125	6/24/15 18:06

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ANALYTICAL RESULTS

Project Location: UMass Amherst - LGRC
Date Received: 6/19/2015
Field Sample #: LGRC-A121-IAS-PA-009
Sample ID: 15F1024-07
Sample Matrix: Indoor air
Sampled: 6/18/2015 14:26

Sample Description/Location:
Sub Description/Location:
Flow Controller ID:
Sample Type:
Air Volume L: 660.96

Work Order: 15F1024

TO-10A/EPA 680 Modified

Analyte	Total µg Results	Total µg RL	Flag/Qual	ug/m3 Results	ug/m3 RL	Dilution	Date/Time Analyzed	Analyst
Monochlorobiphenyls	ND	0.0010		ND	0.0015	1	6/24/15 18:38	CJM
Dichlorobiphenyls	ND	0.0010		ND	0.0015	1	6/24/15 18:38	CJM
Trichlorobiphenyls	ND	0.0010		ND	0.0015	1	6/24/15 18:38	CJM
Tetrachlorobiphenyls	0.0067	0.0020		0.010	0.003	1	6/24/15 18:38	CJM
Pentachlorobiphenyls	0.0088	0.0020		0.013	0.003	1	6/24/15 18:38	CJM
Hexachlorobiphenyls	0.0048	0.0020		0.0073	0.003	1	6/24/15 18:38	CJM
Heptachlorobiphenyls	ND	0.0030		ND	0.0045	1	6/24/15 18:38	CJM
Octachlorobiphenyls	ND	0.0030		ND	0.0045	1	6/24/15 18:38	CJM
Nonachlorobiphenyls	ND	0.0050		ND	0.0076	1	6/24/15 18:38	CJM
Decachlorobiphenyl	ND	0.0050	V-20	ND	0.0076	1	6/24/15 18:38	CJM
Total Polychlorinated biphenyls	0.020			0.031		1	6/24/15 18:38	CJM

Surrogates	% Recovery	% REC Limits	
Tetrachloro-m-xylene	70.6	50-125	6/24/15 18:38

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ANALYTICAL RESULTS

Project Location: UMass Amherst - LGRC
Date Received: 6/19/2015
Field Sample #: LGRC-A106-IAS-LT-010
Sample ID: 15F1024-08
Sample Matrix: Indoor air
Sampled: 6/18/2015 14:40

Sample Description/Location:
Sub Description/Location:
Flow Controller ID:
Sample Type:
Air Volume L: 650.88

Work Order: 15F1024

TO-10A/EPA 680 Modified

Analyte	Total µg Results	Total µg RL	Flag/Qual	ug/m3 Results	ug/m3 RL	Dilution	Date/Time Analyzed	Analyst
Monochlorobiphenyls	ND	0.0010		ND	0.0015	1	6/24/15 19:10	CJM
Dichlorobiphenyls	ND	0.0010		ND	0.0015	1	6/24/15 19:10	CJM
Trichlorobiphenyls	ND	0.0010		ND	0.0015	1	6/24/15 19:10	CJM
Tetrachlorobiphenyls	0.0086	0.0020		0.013	0.0031	1	6/24/15 19:10	CJM
Pentachlorobiphenyls	0.012	0.0020		0.018	0.0031	1	6/24/15 19:10	CJM
Hexachlorobiphenyls	0.0069	0.0020		0.011	0.0031	1	6/24/15 19:10	CJM
Heptachlorobiphenyls	ND	0.0030		ND	0.0046	1	6/24/15 19:10	CJM
Octachlorobiphenyls	ND	0.0030		ND	0.0046	1	6/24/15 19:10	CJM
Nonachlorobiphenyls	ND	0.0050		ND	0.0077	1	6/24/15 19:10	CJM
Decachlorobiphenyl	ND	0.0050	V-20	ND	0.0077	1	6/24/15 19:10	CJM
Total Polychlorinated biphenyls	0.027			0.042		1	6/24/15 19:10	CJM

Surrogates	% Recovery	% REC Limits	
Tetrachloro-m-xylene	85.3	50-125	6/24/15 19:10

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ANALYTICAL RESULTS

Project Location: UMass Amherst - LGRC
Date Received: 6/19/2015
Field Sample #: LGRC-403B-IAS-LT-011
Sample ID: 15F1024-09
Sample Matrix: Indoor air
Sampled: 6/18/2015 15:30

Sample Description/Location:
Sub Description/Location:
Flow Controller ID:
Sample Type:
Air Volume L: 670.44

Work Order: 15F1024

TO-10A/EPA 680 Modified

	Total µg			ug/m3			Date/Time	
Analyte	**Results**	**RL**	**Flag/Qual**	**Results**	**RL**	**Dilution**	**Analyzed**	**Analyst**
Monochlorobiphenyls	ND	0.0010		ND	0.0015	1	6/24/15 19:42	CJM
Dichlorobiphenyls	ND	0.0010		ND	0.0015	1	6/24/15 19:42	CJM
Trichlorobiphenyls	ND	0.0010		ND	0.0015	1	6/24/15 19:42	CJM
Tetrachlorobiphenyls	0.010	0.0020		0.015	0.003	1	6/24/15 19:42	CJM
Pentachlorobiphenyls	0.017	0.0020		0.026	0.003	1	6/24/15 19:42	CJM
Hexachlorobiphenyls	0.0078	0.0020		0.012	0.003	1	6/24/15 19:42	CJM
Heptachlorobiphenyls	ND	0.0030		ND	0.0045	1	6/24/15 19:42	CJM
Octachlorobiphenyls	ND	0.0030		ND	0.0045	1	6/24/15 19:42	CJM
Nonachlorobiphenyls	ND	0.0050		ND	0.0075	1	6/24/15 19:42	CJM
Decachlorobiphenyl	ND	0.0050	V-20	ND	0.0075	1	6/24/15 19:42	CJM
Total Polychlorinated biphenyls	0.035			0.053		1	6/24/15 19:42	CJM

Surrogates	% Recovery	% REC Limits	
Tetrachloro-m-xylene	88.9	50-125	6/24/15 19:42

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ANALYTICAL RESULTS

Project Location: UMass Amherst - LGRC
Date Received: 6/19/2015
Field Sample #: LGRC-599A-IAS-LT-012
Sample ID: 15F1024-10
Sample Matrix: Indoor air
Sampled: 6/18/2015 15:46

Sample Description/Location:
Sub Description/Location:
Flow Controller ID:
Sample Type:
Air Volume L: 648

Work Order: 15F1024

TO-10A/EPA 680 Modified

Analyte	Total µg Results	Total µg RL	Flag/Qual	ug/m3 Results	ug/m3 RL	Dilution	Date/Time Analyzed	Analyst
Monochlorobiphenyls	ND	0.0010		ND	0.0015	1	6/24/15 20:14	CJM
Dichlorobiphenyls	ND	0.0010		ND	0.0015	1	6/24/15 20:14	CJM
Trichlorobiphenyls	ND	0.0010		ND	0.0015	1	6/24/15 20:14	CJM
Tetrachlorobiphenyls	0.0083	0.0020		0.013	0.0031	1	6/24/15 20:14	CJM
Pentachlorobiphenyls	0.021	0.0020		0.032	0.0031	1	6/24/15 20:14	CJM
Hexachlorobiphenyls	0.0038	0.0020		0.0058	0.0031	1	6/24/15 20:14	CJM
Heptachlorobiphenyls	ND	0.0030		ND	0.0046	1	6/24/15 20:14	CJM
Octachlorobiphenyls	ND	0.0030		ND	0.0046	1	6/24/15 20:14	CJM
Nonachlorobiphenyls	ND	0.0050		ND	0.0077	1	6/24/15 20:14	CJM
Decachlorobiphenyl	ND	0.0050	V-20	ND	0.0077	1	6/24/15 20:14	CJM
Total Polychlorinated biphenyls	0.033			0.051		1	6/24/15 20:14	CJM

Surrogates	% Recovery	% REC Limits	
Tetrachloro-m-xylene	83.1	50-125	6/24/15 20:14

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ANALYTICAL RESULTS

Project Location: UMass Amherst - LGRC
Date Received: 6/19/2015
Field Sample #: LGRC-903-IAS-LT-013
Sample ID: 15F1024-11
Sample Matrix: Indoor air
Sampled: 6/18/2015 15:54

Sample Description/Location:
Sub Description/Location:
Flow Controller ID:
Sample Type:
Air Volume L: 667.32

Work Order: 15F1024

TO-10A/EPA 680 Modified

	Total µg			ug/m3			Date/Time	
Analyte	**Results**	**RL**	**Flag/Qual**	**Results**	**RL**	**Dilution**	**Analyzed**	**Analyst**
Monochlorobiphenyls	ND	0.0010		ND	0.0015	1	6/24/15 20:46	CJM
Dichlorobiphenyls	ND	0.0010		ND	0.0015	1	6/24/15 20:46	CJM
Trichlorobiphenyls	ND	0.0010		ND	0.0015	1	6/24/15 20:46	CJM
Tetrachlorobiphenyls	0.0076	0.0020		0.011	0.003	1	6/24/15 20:46	CJM
Pentachlorobiphenyls	0.0081	0.0020		0.012	0.003	1	6/24/15 20:46	CJM
Hexachlorobiphenyls	ND	0.0020		ND	0.003	1	6/24/15 20:46	CJM
Heptachlorobiphenyls	ND	0.0030		ND	0.0045	1	6/24/15 20:46	CJM
Octachlorobiphenyls	ND	0.0030		ND	0.0045	1	6/24/15 20:46	CJM
Nonachlorobiphenyls	ND	0.0050		ND	0.0075	1	6/24/15 20:46	CJM
Decachlorobiphenyl	ND	0.0050	V-20	ND	0.0075	1	6/24/15 20:46	CJM
Total Polychlorinated biphenyls	0.016			0.024		1	6/24/15 20:46	CJM

Surrogates	% Recovery	% REC Limits	
Tetrachloro-m-xylene	82.3	50-125	6/24/15 20:46

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ANALYTICAL RESULTS

Project Location: UMass Amherst - LGRC
Date Received: 6/19/2015
Field Sample #: LGRC-1105-IAS-LT-014
Sample ID: 15F1024-12
Sample Matrix: Indoor air
Sampled: 6/18/2015 16:02

Sample Description/Location:
Sub Description/Location:
Flow Controller ID:
Sample Type:
Air Volume L: 640.68

Work Order: 15F1024

TO-10A/EPA 680 Modified

Analyte	Total µg Results	Total µg RL	Flag/Qual	ug/m3 Results	ug/m3 RL	Dilution	Date/Time Analyzed	Analyst
Monochlorobiphenyls	ND	0.0010		ND	0.0016	1	6/24/15 21:18	CJM
Dichlorobiphenyls	ND	0.0010		ND	0.0016	1	6/24/15 21:18	CJM
Trichlorobiphenyls	ND	0.0010		ND	0.0016	1	6/24/15 21:18	CJM
Tetrachlorobiphenyls	0.0046	0.0020		0.0071	0.0031	1	6/24/15 21:18	CJM
Pentachlorobiphenyls	0.0065	0.0020		0.010	0.0031	1	6/24/15 21:18	CJM
Hexachlorobiphenyls	ND	0.0020		ND	0.0031	1	6/24/15 21:18	CJM
Heptachlorobiphenyls	ND	0.0030		ND	0.0047	1	6/24/15 21:18	CJM
Octachlorobiphenyls	ND	0.0030		ND	0.0047	1	6/24/15 21:18	CJM
Nonachlorobiphenyls	ND	0.0050		ND	0.0078	1	6/24/15 21:18	CJM
Decachlorobiphenyl	ND	0.0050	V-20	ND	0.0078	1	6/24/15 21:18	CJM
Total Polychlorinated biphenyls	0.011			0.017		1	6/24/15 21:18	CJM

Surrogates	% Recovery	% REC Limits	
Tetrachloro-m-xylene	78.8	50-125	6/24/15 21:18

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ANALYTICAL RESULTS

Project Location: UMass Amherst - LGRC
Date Received: 6/19/2015
Field Sample #: LGRC-1506-IAS-LT-015
Sample ID: 15F1024-13
Sample Matrix: Indoor air
Sampled: 6/18/2015 16:10

Sample Description/Location:
Sub Description/Location:
Flow Controller ID:
Sample Type:
Air Volume L: 642.72

Work Order: 15F1024

TO-10A/EPA 680 Modified

Analyte	Total µg Results	Total µg RL	Flag/Qual	ug/m3 Results	ug/m3 RL	Dilution	Date/Time Analyzed	Analyst
Monochlorobiphenyls	ND	0.0010		ND	0.0016	1	6/24/15 21:50	CJM
Dichlorobiphenyls	ND	0.0010		ND	0.0016	1	6/24/15 21:50	CJM
Trichlorobiphenyls	ND	0.0010		ND	0.0016	1	6/24/15 21:50	CJM
Tetrachlorobiphenyls	0.0090	0.0020		0.014	0.0031	1	6/24/15 21:50	CJM
Pentachlorobiphenyls	0.020	0.0020		0.032	0.0031	1	6/24/15 21:50	CJM
Hexachlorobiphenyls	ND	0.0020		ND	0.0031	1	6/24/15 21:50	CJM
Heptachlorobiphenyls	ND	0.0030		ND	0.0047	1	6/24/15 21:50	CJM
Octachlorobiphenyls	ND	0.0030		ND	0.0047	1	6/24/15 21:50	CJM
Nonachlorobiphenyls	ND	0.0050		ND	0.0078	1	6/24/15 21:50	CJM
Decachlorobiphenyl	ND	0.0050	V-20	ND	0.0078	1	6/24/15 21:50	CJM
Total Polychlorinated biphenyls	0.029			0.046		1	6/24/15 21:50	CJM

Surrogates	% Recovery	% REC Limits	
Tetrachloro-m-xylene	83.3	50-125	6/24/15 21:50

con-test® ANALYTICAL LABORATORY
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ANALYTICAL RESULTS

Project Location: UMass Amherst - LGRC
Date Received: 6/19/2015
Field Sample #: LGRC-OUT-IAS-LT-016
Sample ID: 15F1024-14
Sample Matrix: Ambient Air
Sampled: 6/18/2015 16:23

Sample Description/Location:
Sub Description/Location:

Flow Controller ID:
Sample Type:
Air Volume L: 643.44

Work Order: 15F1024

TO-10A/EPA 680 Modified

Analyte	Total µg Results	Total µg RL	Flag/Qual	ug/m3 Results	ug/m3 RL	Dilution	Date/Time Analyzed	Analyst
Monochlorobiphenyls	ND	0.0010		ND	0.0016	1	6/24/15 22:22	CJM
Dichlorobiphenyls	ND	0.0010		ND	0.0016	1	6/24/15 22:22	CJM
Trichlorobiphenyls	ND	0.0010		ND	0.0016	1	6/24/15 22:22	CJM
Tetrachlorobiphenyls	ND	0.0020		ND	0.0031	1	6/24/15 22:22	CJM
Pentachlorobiphenyls	ND	0.0020		ND	0.0031	1	6/24/15 22:22	CJM
Hexachlorobiphenyls	ND	0.0020		ND	0.0031	1	6/24/15 22:22	CJM
Heptachlorobiphenyls	ND	0.0030		ND	0.0047	1	6/24/15 22:22	CJM
Octachlorobiphenyls	ND	0.0030		ND	0.0047	1	6/24/15 22:22	CJM
Nonachlorobiphenyls	ND	0.0050		ND	0.0078	1	6/24/15 22:22	CJM
Decachlorobiphenyl	ND	0.0050	V-20	ND	0.0078	1	6/24/15 22:22	CJM
Total Polychlorinated biphenyls	0.0			0		1	6/24/15 22:22	CJM

Surrogates	% Recovery	% REC Limits	
Tetrachloro-m-xylene	90.2	50-125	6/24/15 22:22

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Sample Extraction Data

Prep Method: SW-846 3540C-TO-10A/EPA 680 Modified

Lab Number [Field ID]	Batch	Initial [Cartridge	Final [mL]	Date
15F1024-01 [LGRC-L2-IAS-PA-001]	B124704	1.00	1.00	06/23/15
15F1024-02 [LGRC-L2-IASD-PA-002]	B124704	1.00	1.00	06/23/15
15F1024-03 [LGRC-L3-IAS-PA-003]	B124704	1.00	1.00	06/23/15
15F1024-04 [LGRC-L1-IAS-PA-004]	B124704	1.00	1.00	06/23/15
15F1024-05 [LGRC-A243-IAS-PA-007]	B124704	1.00	1.00	06/23/15
15F1024-06 [LGRC-A307-IAS-PA-008]	B124704	1.00	1.00	06/23/15
15F1024-07 [LGRC-A121-IAS-PA-009]	B124704	1.00	1.00	06/23/15
15F1024-08 [LGRC-A106-IAS-LT-010]	B124704	1.00	1.00	06/23/15
15F1024-09 [LGRC-403B-IAS-LT-011]	B124704	1.00	1.00	06/23/15
15F1024-10 [LGRC-599A-IAS-LT-012]	B124704	1.00	1.00	06/23/15
15F1024-11 [LGRC-903-IAS-LT-013]	B124704	1.00	1.00	06/23/15
15F1024-12 [LGRC-1105-IAS-LT-014]	B124704	1.00	1.00	06/23/15
15F1024-13 [LGRC-1506-IAS-LT-015]	B124704	1.00	1.00	06/23/15
15F1024-14 [LGRC-OUT-IAS-LT-016]	B124704	1.00	1.00	06/23/15

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QUALITY CONTROL

PCB Homologues by GC/MS with Soxhlet Extraction - Quality Control

Analyte	Total µg Results	Total µg RL	ug/m3 Results	ug/m3 RL	Spike Level Total µg	Source Result	%REC	%REC Limits	RPD	RPD Limit	Flag/Qual
Batch B124704 - SW-846 3540C											
Blank (B124704-BLK1)					Prepared: 06/23/15 Analyzed: 06/25/15						
Monochlorobiphenyls	ND	0.0010									V-20
Dichlorobiphenyls	ND	0.0010									
Trichlorobiphenyls	ND	0.0010									
Tetrachlorobiphenyls	ND	0.0020									
Pentachlorobiphenyls	ND	0.0020									
Hexachlorobiphenyls	ND	0.0020									
Heptachlorobiphenyls	ND	0.0030									
Octachlorobiphenyls	ND	0.0030									
Nonachlorobiphenyls	ND	0.0050									V-20
Decachlorobiphenyl	ND	0.0050									V-20
Total Polychlorinated biphenyls	0.0										
Surrogate: Tetrachloro-m-xylene	*0.118*				*0.200*		*59.1*	*50-125*			
LCS (B124704-BS1)					Prepared: 06/23/15 Analyzed: 06/24/15						
Monochlorobiphenyls	0.13	0.0010			0.200		65.5	40-140			
Dichlorobiphenyls	0.13	0.0010			0.200		63.5	40-140			
Trichlorobiphenyls	0.13	0.0010			0.200		62.6	40-140			
Tetrachlorobiphenyls	0.26	0.0020			0.400		65.3	40-140			
Pentachlorobiphenyls	0.31	0.0020			0.400		76.8	40-140			
Hexachlorobiphenyls	0.29	0.0020			0.400		71.8	40-140			
Heptachlorobiphenyls	0.47	0.0030			0.600		78.9	40-140			
Octachlorobiphenyls	0.50	0.0030			0.600		82.9	40-140			
Nonachlorobiphenyls	1.0	0.0050			1.00		104	40-140			
Decachlorobiphenyl	1.0	0.0050			1.00		100	40-140			V-06
Surrogate: Tetrachloro-m-xylene	*0.158*				*0.200*		*78.9*	*50-125*			
LCS Dup (B124704-BSD1)					Prepared: 06/23/15 Analyzed: 06/24/15						
Monochlorobiphenyls	0.15	0.0010			0.200		76.3	40-140	15.3	50	
Dichlorobiphenyls	0.14	0.0010			0.200		71.6	40-140	12.0	50	
Trichlorobiphenyls	0.14	0.0010			0.200		69.7	40-140	10.9	50	
Tetrachlorobiphenyls	0.29	0.0020			0.400		72.5	40-140	10.4	50	
Pentachlorobiphenyls	0.34	0.0020			0.400		83.8	40-140	8.70	50	
Hexachlorobiphenyls	0.32	0.0020			0.400		79.2	40-140	9.77	50	
Heptachlorobiphenyls	0.52	0.0030			0.600		86.3	40-140	8.96	50	
Octachlorobiphenyls	0.54	0.0030			0.600		90.7	40-140	8.90	50	
Nonachlorobiphenyls	1.1	0.0050			1.00		113	40-140	8.49	50	
Decachlorobiphenyl	1.1	0.0050			1.00		107	40-140	6.41	50	V-06
Surrogate: Tetrachloro-m-xylene	*0.162*				*0.200*		*80.9*	*50-125*			

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FLAG/QUALIFIER SUMMARY

*	QC result is outside of established limits.
†	Wide recovery limits established for difficult compound.
‡	Wide RPD limits established for difficult compound.
#	Data exceeded client recommended or regulatory level
	Percent recoveries and relative percent differences (RPDs) are determined by the software using values in the calculation which have not been rounded.
	No results have been blank subtracted unless specified in the case narrative section.
V-06	Continuing calibration did not meet method specifications and was biased on the high side for this compound. Increased uncertainty is associated with the reported value which is likely to be biased on the high side.
V-20	Continuing calibration did not meet method specifications and was biased on the high side. Data validation is not affected since sample result was "not detected" for this compound.

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CERTIFICATIONS

Certified Analyses included in this Report

Analyte	Certifications
TO-10A/EPA 680 Modified in Air	
Total Polychlorinated biphenyls	AIHA

The CON-TEST Environmental Laboratory operates under the following certifications and accreditations:

Code	Description	Number	Expires
AIHA	AIHA-LAP, LLC	100033	02/1/2016
MA	Massachusetts DEP	M-MA100	06/30/2016
CT	Connecticut Department of Publilc Health	PH-0567	09/30/2015
NY	New York State Department of Health	10899 NELAP	04/1/2016
NH-S	New Hampshire Environmental Lab	2516 NELAP	02/5/2016
RI	Rhode Island Department of Health	LAO00112	12/30/2015
NC	North Carolina Div. of Water Quality	652	12/31/2015
NJ	New Jersey DEP	MA007 NELAP	09/30/2015
FL	Florida Department of Health	E871027 NELAP	06/30/2016
VT	Vermont Department of Health Lead Laboratory	LL015036	07/30/2015
WA	State of Washington Department of Ecology	C2065	02/23/2016
ME	State of Maine	2011028	06/9/2017
VA	Commonwealth of Virginia	460217	12/14/2015
NH-P	New Hampshire Environmental Lab	2557 NELAP	09/6/2015

con-test® ANALYTICAL LABORATORY www.contestlabs.com

Phone: 413-525-2332
Fax: 413-525-6405
Email: info@contestlabs.com

39 SPRUCE ST
EAST LONGMEADOW, MA 01028

AIR SAMPLE CHAIN OF CUSTODY RECORD

15F1024

DOC#284
Rev. Feb 2014

Company Name: Woodard & Curran
Address: 40 Shattuck Rd, Andover MA
Attention: G. Franklin
Project Location: UMass Amherst - LGRC
Sampled By: J. Perry + P. Quackenbush
Proposal Provided? (For Billing purposes) ☐ yes ______ proposal date

Telephone: 978 557 8150
Project #: 210918
Client PO #:

DATA DELIVERY (check one): ☐FAX ☒EMAIL ☐WEBSITE CLIENT
Fax #:
Email: jhamel gfranklin jperry
Format: ☐EXCEL ☒PDF ☐GIS KEY ☐OTHER ___

Please fill out completely, sign, date and retain the yellow copy for your record.

Summa canisters and flow controllers must be returned within 14 days of receipt or rental fees will apply.

For summa canister and flow controller information please refer to Con-Test's Air Media Agreement.

ANALYSIS REQUESTED: PCB homologs

Field ID	Sample Description	Media	Lab #	Start Date/Time	Stop Date/Time	Total Minutes Sampled	Flow Rate M³/Min. or L/Min	Volume Liters or M³	Matrix Code*	PCB homologs	Initial pressure "Hg	Final pressure "Hg	Lab Receipt pressure	Summa Canister ID	Flow Controller ID
01	LGRC-L2-IAS-PA-001	P	061615-01	6/18/15 903	6/18/15 1307	244	2.753	~~666.72~~ 666.12	IA	X	29.87	29.79			
02	LGRC-L2-IASD-PA-002	P	061615-02	6/18/15 909	6/18/15 1311	242	2.83	690.52	IA	X	29.87	29.79			
03	LGRC-L3-IAS-PA-003	P	061615-03	6/18/15 917	6/18/15 1317	240	2.763	663.12	IA	X	29.89	29.79			
04	LGRC-L1-IAS-PA-004	P	061615-04	6/18/15 926	6/18/15 1326	240	2.6025	624.6	IA	X	29.89	29.79			
	~~LGRC-A201-IAS-PA-005~~	~~P~~	~~061615-05~~	~~6/18/15 939~~	~~6/18/15~~				~~IA~~	~~X~~					
05	LGRC-A243-IAS-PA-007	P	061615-07	6/18/15 1001	6/18/15 1401	240	2.7995	671.88	IA	X	29.82	29.82			
06	LGRC-A307-IAS-PA-008	P	061615-08	6/18/15 1014	6/18/15 1414	240	2.658	637.92	IA	X	29.87	29.81			
07	LGRC-A121-IAS-PA-009	P	061615-09	6/18/15 1026	6/18/15 1426	240	2.754	660.96	IA	X	29.84	29.79			

Laboratory Comments: TO-10A
PCB homologs via USEPA (680A) RL < 0.10 µg/m3

CLIENT COMMENTS:

Signature	Date/Time
Relinquished by: (signature) [signature]	6/18/15 0800
Received by: (signature) [signature]	6/19/15 0800
Relinquished by: (signature) [signature]	1145
Received by: (signature) Tom Masi 6/19/15	1145

Turnaround **
☐ 7-Day
☒ 10-Day
☐ Other ___
RUSH *
☐*24-Hr ☐*48-Hr
☐*72-Hr ☐*4-Day
*Approval Required

Special Requirements
Regulations: ____
Data Enhancement/RCP? ☐Y ☐N
Enhanced Data Package ☐Y ☐N
(Surchage Applies)
Required Detection Limits: ____
Other: ____

***Matrix Code:**
SG= SOIL GAS
IA= INDOOR AIR
AMB=AMBIENT
SS = SUB SLAB
D = DUP
BL = BLANK
O = other ____

****Media Codes:**
S=summa can
T=tedlar bag
P=PUF
T=tube
F= filter
C=cassette
O = Other ____

** TURNAROUND TIME STARTS AT 9:00 A.M. THE DAY AFTER SAMPLE RECEIPT UNLESS THERE ARE QUESTIONS ON YOUR CHAIN. IF THIS FORM IS NOT FILLED OUT COMPLETELY OR IS INCORRECT, TURNAROUND TIME WILL NOT START UNTIL ALL QUESTIONS ARE ANSWERED BY OUR CLIENT. NELAC & AIHA-LAP, LLC Accredited/WBE/DBE Certifi

Tom Masi 6/19/15 1630 Rcvd: [signature] 6/19/15 16:30 4.2°c

Table of Contents

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Email: info@contestlabs.com

AIR SAMPLE CHAIN OF CUSTODY RECORD

15F1024

39 SPRUCE ST
EAST LONGMEADOW, MA 01028

DOC#284
Rev. Feb 2014

Company Name: Woodard & Curran
Address: 40 Shattuck Rd, Andover MA
Attention: G. Franklin
Project Location: UMass Amherst - LGRC
Sampled By: J. Perry + P. Quackenbush
Proposal Provided? (For Billing purposes) ☐ yes ______ proposal date

Telephone: 978 557 8150
Project # 210918
Client PO #

DATA DELIVERY (check one): ☐FAX ☒EMAIL ☐WEBSITE CLIENT
Fax #:
Email: gfranklin, jperry
Format: ☐EXCEL ☒PDF ☐GIS KEY ☐OTHER ___

ANALYSIS REQUESTED: PCB homologs

Please fill out completely, sign, date and retain the yellow copy for your record.

Summa canisters and flow controllers must be returned within 14 days of receipt or rental fees will apply.

For summa canister and flow controller information please refer to Con-Test's Air Media Agreement.

Field ID	Sample Description	Media	Lab #	Start Date/Time	Stop Date/Time	Total Minutes Sampled	Flow Rate M³/Min. or L/Min.	Volume Liters or M³	Matrix Code*	PCB homologs	Initial Pressure "Hg	Final Pressure "Hg	Lab Receipt Pressure	Summa Canister ID	Flow Controller ID
08	LGRC-A106-IAS-LT-010	P	061615-10	6/18/15 1040	6/18/15 1440	240	2.712	650.88	IA	X	29.84	29.81			
09	LGRC-403B-IAS-LT-011	P	061615-11	6/18/15 1130	6/18/15 1530	240	2.7935	670.44	IA	X	29.84	29.81			
10	LGRC-S99A-IAS-LT-012	P	061615-12	6/18/15 1146	6/18/15 1546	240	2.7	648	IA	X	29.78	29.71			
11	LGRC-903-IAS-LT-013	P	061615-13	6/18/15 1154	6/18/15 1554	240	2.7805	667.32	IA	X	29.76	29.67			
12	LGRC-1105-IAS-LT-014	P	061615-14	6/18/15 1202	6/18/15 1602	240	2.6695	640.68	IA	X	26.67	29.67			
13	LGRC-1506-IAS-LT-015	P	061615-15	6/18/15 1210	6/18/15 1610	240	2.678	642.72	IA	X	26.67	29.64			
14	LGRC-OUT-IAS-LT-016	P	061615-02	6/18/15 1223	6/18/15	240	2.681	643.44	AMB	X	29.84	29.56			

Laboratory Comments: TO-10A PCB homologs via USEPA (680A) RL < 0.10 µg/m³

CLIENT COMMENTS:

Relinquished by: (signature)	Date/Time: 6/19/15 0800
Received by: (signature)	Date/Time: 6/19/15 0800
Relinquished by: (signature)	Date/Time:
Received by: (signature)	Date/Time: 6/19/15 1145

Turnaround **
☐ 7-Day
☒ 10-Day
☐ Other ___
RUSH *
☐ *24-Hr ☐ *48-Hr
☐ *72-Hr ☐ *4-Day
*Approval Required

Special Requirements
Regulations: ______
Data Enhancement/RCP? ☐Y ☐N
Enhanced Data Package ☐Y ☐N (Surchage Applies)
Required Detection Limits: ______
Other: ______

***Matrix Code:**
SG= SOIL GAS
IA= INDOOR AIR
AMB=AMBIENT
SS = SUB SLAB
D = DUP
BL = BLANK
O = other ______

****Media Codes:**
S=summa can
T=tedlar bag
P=PUF
T=tube
F= filter
C=cassette
O = Other ______

** TURNAROUND TIME STARTS AT 9:00 A.M. THE DAY AFTER SAMPLE RECEIPT UNLESS THERE ARE QUESTIONS ON YOUR CHAIN. IF THIS FORM IS NOT FILLED OUT COMPLETELY OR IS INCORRECT, TURNAROUND TIME WILL NOT START UNTIL ALL QUESTIONS ARE ANSWERED BY OUR CLIENT. NELAC & AIHA-LAP, LLC Accredited/WBE/DBE Certifi

Tom Maui 6/19/15 1630 Rcvd: 6/19/15 16:30 4.2°C

Sm Red Label

www.contestlabs.com

con-test ANALYTICAL LABORATORY

39 Spruce St.
East Longmeadow, MA.
01028
P: 413-525-2332
F: 413-525-6405

AIR Only Receipt Checklist

CLIENT NAME: Woodard + Curran RECEIVED BY: MJ DATE: 6/19/15

1) Was the chain(s) of custody relinquished and signed? (Yes) No

2) Does the chain agree with the samples? (Yes) No 4.2 °C
If not, explain:

3) Are all the samples in good condition? (Yes) No
If not, explain:

4) Are there any samples "On Hold"? Yes (No) Stored where:

5) Are there any RUSH or SHORT HOLDING TIME samples? Yes (No)
Who was notified _____ Date _____ Time _____

6) Location where samples are stored: Walk In

Permission to subcontract samples? Yes No
(Walk-in clients only) if not already approved
Client Signature: _____

7) Number of cans Individually Certified or Batch Certified? N/A

Containers received at Con-Test

		# of Containers	Types (Size, Duration)
Summa Cans (TO-14/TO-15/APH)			
Tedlar Bags			
TO-17 Tubes			
Regulators			
Restrictors			
Hg/Hopcalite Tube (NIOSH 6009)			
(TO-4A/ TO-10A/TO-13) PUFs		16	TO10
PCB Florisil Tubes (NIOSH 5503)			
Air cassette			
PM 2.5/PM 10			
TO-11A Cartridges			
Other			

Unused Summas/PUF Media:
061615-05
061615-06

Unused Regulators:

1) Was all media (used & unused) checked into the WASP?

2) Were all returned summa cans, Restrictors & Regulators and PUF's documented as returned in the Air Lab Inbound/Outbound Excel Spreadsheet?

Laboratory Comments:
061615-01 -> 04, 07 -> 15
061615-01/02 ? weird label

Login Sample Receipt Checklist

(Rejection Criteria Listing - Using Sample Acceptance Policy)

Any False statement will be brought to the attention of Client

Question	Answer (True/False) T/F/NA	Comment
1) The coolers'/boxes' custody seal, if present, is intact.	NA	
2) The cooler or samples do not appear to have been compromised or tampered with.	T	
3) Samples were received on ice.	T	
4) Cooler Temperature is acceptable.	T	
5) Cooler Temperature is recorded.	T	
6) COC is filled out in ink and legible.	T	
7) COC is filled out with all pertinent information.	T	
8) Field Sampler's name present on COC.	T	
9) Samples are received within Holding Time.	T	
10) Sample containers have legible labels.	T	
11) Containers/media are not broken or leaking and valves and caps are closed tightly.	T	
12) Sample collection date/times are provided.	T	
13) Appropriate sample/media containers are used.	T	
14) There is sufficient volume for all requsted analyses, including any requested MS/MSDs.	T	
15) Trip blanks provided if applicable.	NA	

Who notified of False statements? **Date/Time:**

Log-In Technician Initials: **Date/Time:**

Doc #278 Rev. 5 October 2014

MJ 6/19/15 16:30

APPENDIX B: WASTE DOCUMENTATION

CC: Generator State
T. Wolejko

Please print or type. (Form designed for use on elite (12-pitch) typewriter.)

Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator ID Number: MAD 000 844 670
2. Page 1 of: 1
3. Emergency Response Phone: (800) 535-5053
4. Manifest Tracking Number: 014480524 JJK

GENERATOR

5. Generator's Name and Mailing Address: UNIVERSITY OF MASSACHUSETTS
40 CAMPUS CENTER WAY
AMHERST, MA 01003
Generator's Phone: (413) 545-2682

Generator's Site Address (if different than mailing address): 710 NORTH PLEASANT STREET
AMHERST, MA 01003
5th Floor LGRT (mc)

6. Transporter 1 Company Name: EQ NORTHEAST, INC.
U.S. EPA ID Number: MAD 084 814 136

7. Transporter 2 Company Name: EQ Industrial Services
U.S. EPA ID Number: MIK435642742

8. Designated Facility Name and Site Address: WAYNE DISPOSAL, INC. SITE #2 LANDFILL
49350 N I-94 SERVICE DRIVE
BELLEVILLE, MI 48111
Facility's Phone: (800) 592-5489
U.S. EPA ID Number: MID 048 090 633

9a. HM	9b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	10. Containers No.	10. Containers Type	11. Total Quantity	12. Unit Wt./Vol.	13. Waste Codes		
X	1. RQ, UN3432, Polychlorinated biphenyls, solid, 9, PGIII, ERG #171	001	CF	660	K	MA02	PCB6	ASBE
	2.							
	3.							
	4.							

14. Special Handling Instructions and Additional Information
1. E159200WDI 7 (S) PCB REMEDIATION WASTE PCB CONTAMINATED WINDOWS / STORAGE START DATE 7/8/15 CONTAINER NUMBER
MDEQ Asbestos NESHAP Program, Cadillac Place, 3058 West Grand Boulevard, Suite 2-300, Detroit, MI 48207

15. **GENERATOR'S/OFFEROR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations. If export shipment and I am the Primary Exporter, I certify that the contents of this consignment conform to the terms of the attached EPA Acknowledgment of Consent.
I certify that the waste minimization statement identified in 40 CFR 262.27(a) (if I am a large quantity generator) or (b) (if I am a small quantity generator) is true.

Generator's/Offeror's Printed/Typed Name: Theresa M. Wolejko
Signature:
Month: 07 Day: 08 Year: 15

INT'L

16. International Shipments ☐ Import to U.S. ☐ Export from U.S. Port of entry/exit:
Transporter signature (for exports only): Date leaving U.S.:

TRANSPORTER

17. Transporter Acknowledgment of Receipt of Materials
Transporter 1 Printed/Typed Name: Roger W. Sloan
Signature:
Month: 07 Day: 28 Year: 15
Transporter 2 Printed/Typed Name: Tonya Stewart
Signature:
Month: 08 Day: 04 Year: 15

DESIGNATED FACILITY

18. Discrepancy
18a. Discrepancy Indication Space ☐ Quantity ☐ Type ☐ Residue ☐ Partial Rejection ☐ Full Rejection
18b. Alternate Facility (or Generator) Manifest Reference Number:
U.S. EPA ID Number
Facility's Phone:
18c. Signature of Alternate Facility (or Generator)
Month: Day: Year:

19. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)
1. PCB 2. 3. 4.

20. Designated Facility Owner or Operator: Certification of receipt of hazardous materials covered by the manifest except as noted in Item 18a
Printed/Typed Name: Tonya Stewart
Signature:
Month: 10 Day: 26 Year: 15

EPA Form 8700-22 (Rev. 3-05) Previous editions are obsolete.

DESIGNATED FACILITY TO GENERATOR

CERTIFICATE OF DISPOSAL

FOR MANIFESTED PCB WASTE

This certificate is to verify the wastes identified as pcb solid

and specified on Manifest # 014480624JJK, Line Item 1 has been landfilled on 7/20, 15 in accordance with all local, state and federal regulations by:

Wayne Disposal, Inc

(EPA I.D. # MID048090633)

49350 N. I-94 Service Drive, Belleville, Michigan 48111
Telephone: 1-800-KWALITY (592-5489)
Fax: 1-800-KWALFAX (592-5329)

Under civil and criminal penalties of law for the making or submission of false or fraudulent statements or representations (18 U.S.C. 1001 and 15 U.S.C. 2615), I certify that the information contained in or accompanying this document is true, accurate and complete. As to the identified section(s) of this document for which I cannot personally verify truth and accuracy. I certify as the company official having supervisory responsibility for the persons who are acting under my direct instructions made the verification that this information is true accurate and complete.

Authorized Signature: _____

woodardcurran.com

COMMITMENT & INTEGRITY DRIVE RESULTS