Soil Characterization Report

Sylvan Complex

University of Massachusetts

Amherst, MA

Project No. 227638

UMass Amherst

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1. INTRODUCTION

1.1 BACKGROUND

This soil characterization sampling report has been prepared by Woodard & Curran on behalf of the University of Massachusetts (UMass) document the soil sampling activities and analytical results associated with the assessment of shallow soils adjacent to three dormitories referred to as the Sylvan Residential Complex on the UMass Amherst campus.

The three dormitories are all of similar construction and built consecutively. These buildings are referred to as the Brown, McNamara, and Cashin Residences (see Figure 1-1). Between 2011 and 2013, UMass conducted building envelope repairs at each of these buildings, including the removal of exterior masonry joints identified as containing polychlorinated biphenyls (PCBs) at concentrations ≥ 50 parts per million (ppm). These activities were conducted consistent with Remediation Plans submitted to the United States Environmental Protection Agency (EPA) under 40 CFR 761. Consistent with the plans and once the repair projects were complete on the three buildings, ground surfaces surrounding each of the three buildings are being assessed and remediated, as necessary. Upon completion of the assessment a Remediation Plan will be prepared and submitted to the EPA for review and approval.

As part of this assessment, soil results were detected in excess of the Massachusetts Contingency Plan (MCP) reporting requirements and a Release Notification was submitted to the Massachusetts Department of Environmental Protection (MassDEP) on September 25, 2014. Following the notification, the MassDEP issues a Notice of Responsibility (NOR) on October 2, 2014, which included the submittal of a report summarizing the environmental assessment activities completed to date as they related to PCBs in soils.

1.2 CONCEPTUAL SITE MODEL

Certain joint caulking used as part of standard construction practices for masonry buildings and concrete structures erected between the 1950's and late 1970's is known to have been manufactured with PCBs. PCBs were added to caulking for durability, resistance to degradation, and as a softener/plasticizer for application. Production and approved usage of PCBs was halted in the United States in the late 1970s. The Sylvan Residential Area buildings were constructed during this time period.

In preparation for the building envelope repair projects, material surveys were conducted to check for the presence of PCBs in caulking. Results from analytical testing indicated that PCBs were present in horizontal and vertical control joints at concentrations up to 218,700 ppm. Note: some of the vertical controls joints terminated at the ground surface. PCBs in caulking may leach and/or weather, and/or may be disturbed during renovations or other building work. As such, PCB-containing caulking may come to be located in ground surfaces adjacent to the buildings, including shallow soils.

This report describes the soil assessment activities conducted to date; the regulatory requirements for managing the PCB impacted soils; and a summary description of next steps.

2. SOIL CHARACTERIZATION

Samples of soils surrounding each of the three buildings were collected to determine whether or not PCBs were present in soils surrounding the three buildings with follow up sampling conducted to delineate the concentrations and lateral and vertical extent of impact over 1 part per million (ppm).

2.1 CHARACTERIZATION SAMPLE COLLECTION

Characterization sampling of ground surfaces (soil, asphalt, and brick) surrounding the three buildings was conducted in a phased approach. During the initial phase, characterization samples were collected from soil profiles within transect locations distributed around each of the three buildings. Within each transect, characterization samples were collected from a combination of three distinct profiles selected to provide preliminary characterization data for specific building configurations which could have influenced the horizontal and vertical migration of PCBs away from the control joints over time. At each transect location, two of the three profiles originated at the base of vertical control joints to evaluate the presence/absence of PCBs at assumed worse-case locations and the vertical and lateral distribution of PCBs at the base of vertical joints. The third profile within each transect originated at the face of the building away from vertical joints to evaluate locations that were not directly adjacent to known source locations.

Results from the initial phase were used to develop the sampling approach for the remaining two phases. The second and third phases focused (in a step-wise manner) on collecting additional data for the purposes of the following:

- Determining the presence/absence of ≥ 50 ppm PCB impacts in soils;
- Evaluating whether or not there was a difference in the vertical profiles of PCBs impacts within the recessed areas with an increase in distance away from the vertical joints; and
- Delineating the lateral extent of PCB impacts > 1 ppm at locations away from the buildings.

2.1.1 Sample Collection Methods

Soil samples were collected over three inch sample intervals to depths of up to 24-27 inches below ground surface (in bgs) using standard environmental sampling techniques. For shallow samples (up to 12 in bgs) samples were collected primarily with hand tools including trowels and shovels. Deeper soil samples were collected by advancing a Geoprobe LB sampler using a slide hammer to the required depth.

Asphalt and brick samples were collected from a depth of 0-0.5 inches in accordance with USEPA Region 1 Standard Operating Procedure for Sampling Porous Surfaces for PCBs (May 2011) using a rotary impact hammer drill.

2.1.2 Laboratory Analysis

Samples were logged on standard chain of custody (COC) forms and stored on ice for delivery to the analytical laboratory. Samples were couriered to Con-Test Analytical Laboratory of East Longmeadow, Massachusetts. Samples were extracted using USEPA Method 3540C (Soxhlet Extraction) and analyzed for PCBs using USEPA Method 8082.

The complete laboratory analytical reports are provided in Appendix A.

2.2 CHARACTERIZATION SAMPLE RESULTS SUMMARY

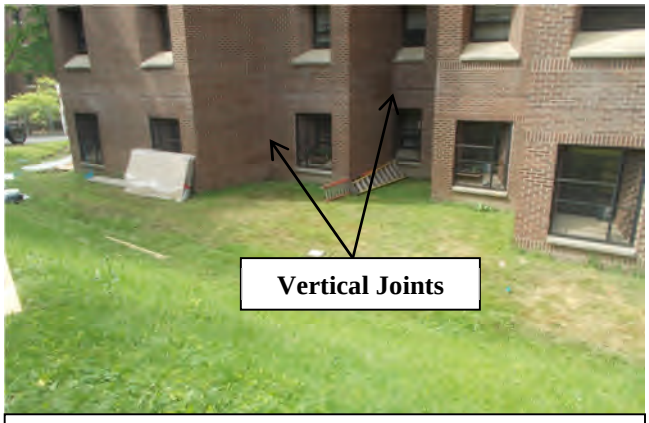
For the purposes of evaluating ground surface impacts, sample results were divided by media (soil, asphalt, and brick). Soil samples were further divided into two groups based on proximity to the former vertical joints as follows:

- Building Recess Areas (i.e., where the joints terminated at the ground surface); and
- Areas Away from the Recesses (where vertical joints terminating at the ground surface were not present).

A summary of the characterization sampling results for each of the groups is provided in the sections below. The locations of the samples are presented on Figure 2-1 and a summary of analytical results are presented on Tables 2-1 and 2-2, as well as on Figure 2-1.

2.2.1 Building Recess Areas

There are a total of 27 recessed areas within the Sylvan Complex (nine per building) that contain 84 vertical joints terminating at the ground surfaces (soils, brick, etc.). Of these 84 vertical joints, 69 joints in 24 recesses terminate on soil within the recessed areas. Samples were collected at the base of the vertical control joints and at increasing depths and distances from the joints to evaluate the distribution of PCB impacts in soils within the recessed areas. At least one characterization soil sample was collected from soils in each recess. The locations of the samples collected and the results from each sample are presented on Figure 2-1. A summary of analytical results is presented on Table 2-1 and the complete analytical laboratory reports are provided in Appendix A.



Typical Building Recess

Base of the Joint

- A total of 35 samples were collected from surficial soils (0-3 in bgs) at the base of the vertical joints (approximately 50% of the locations) to evaluate the presence/absence of PCBs ≥ 50 ppm at these worse-case locations. Analytical results indicated the following:
    - Total PCBs were reported at concentrations ≥ 50 ppm in 16 of the 35 samples collected with a median reported concentration of 100 ppm and a maximum reported concentration of 1,900 ppm;
    - Total PCBs were reported at concentrations > 10 and < 50 ppm in 14 of the samples; and
    - Total PCBs were reported at concentrations > 1 ppm and ≤ 10 ppm in 5 of the samples (minimum reported concentration of 6.6 ppm).
- A total of 12 samples were taken at the base of the joints at a depth of 12-15 in bgs. Analytical results indicated that PCBs were present at concentrations >1 ppm at 8 of these locations with an average concentration of 3.4 ppm and a maximum concentration of 7.4 ppm. Analytical results from the other 4 locations indicated that PCBs were non-detect (< 0.11 ppm) or present at concentrations of 0.18, 0.98, and 0.37 ppm.
- A total of 12 samples were taken at the base of the joints at a depth of 24-27 in bgs. Analytical results indicated that PCBs were present at concentrations > 1 ppm at one location (2.4 ppm). The remaining results indicated that PCBs were either non-detect (7 samples at < 0.11 or < 0.12 ppm) or present at concentrations ≤ 1 ppm with total PCBs reported at concentrations of 0.71, 0.35, 0.22, and 0.56 ppm.
- Seven soil samples were collected at a distance of five lateral feet from the base of the joint at a depth of 12-15 in bgs to determine if there was a difference in the vertical profile of PCB impacts with increasing distance away from the vertical joints. Analytical results from three of these locations indicated that PCBs were present at concentrations > 1 mg/kg with a maximum concentration of 2.7 ppm. The remaining four samples indicated that PCBs were present at concentrations ranging from 0.11 to 0.78 ppm.

Based on these results, PCBs ≥ 50 ppm are present in soils at the base of approximately 50% of the vertical joints. As such, additional characterization sampling may be conducted prior to excavation to determine the concentration of PCBs at the base of the remaining 34 vertical joints for waste segregation purposes (soils at the base of the joints are to be removed for disposal as either ≥ 50 ppm PCB remediation waste or < 50 ppm PCB remediation waste).

Vertically, PCB impacts at the base of the joints are assumed to extend to a distance of 18 in bgs based on the results from soil samples collected from 12-15 in bgs (8 of 12 samples containing PCBs > 1 ppm) and from 24-27 in bgs (PCBs non-detect or ≤ 1 ppm in 11 of 12 samples).

Results from the samples collected five lateral feet from the joints were consistent with the results from samples collected at the same depth interval at the base of the vertical joints (i.e., PCBs > 1 ppm in approximately 50% of the samples collected). As such, the data does not indicate that the vertical profile of PCB impacts changes from the base of the joints to a distance of five feet away.

Ten Feet from Joint

- Ten surficial soil samples (0-3 in bgs) were collected at a distance of ten feet from the joints within the recessed areas. Analytical results indicated that PCBs were present at concentrations ranging from 1.55 to 23.6 ppm with two samples reported to contain PCBs at concentrations > 10 ppm (12.3 and 23.6 ppm).
- Ten soil samples were collected at a depth of 12-15 in bgs. Analytical results indicated PCBs were either non-detect (2 samples at < 0.11 ppm) or present at concentrations ≤ 1 ppm (8 samples with an average concentration of approximately 0.59 ppm and a maximum concentration of 1.04 ppm).

Based on the maximum reported concentration of 23.6 ppm in surficial soils at a distance of ten feet from the joints, surficial soil impacts ≥ 50 ppm appear to be limited to within ten feet of the vertical joints. In addition, the vertical profile of PCB impacts changes at a distance of ten feet from the vertical joints with PCB impacts limited to the upper 12 inches of soils.

Twenty Feet from Joint

- Three surficial soil samples (0-3 in bgs) were collected at a distance of 20 feet from vertical joints within the recessed areas. Analytical results indicated PCBs were present at concentrations of 0.97, 1.03, and 1.4 ppm.

These results provide further support for the decreasing concentration of PCBs in surficial soils with distance from the vertical joints.

Data Summary

A summary of the analytical results from soils within the recessed areas, in reference to distance from the vertical joints and depth below ground surface, is presented on the table below. As shown on the table, highest PCB concentrations were detected in shallow soils adjacent to vertical joints and decrease with lateral and vertical distance from the joints. Additional characterization sampling will be conducted prior to remedy implementation to confirm the vertical extent of PCB impacts within the recessed areas and for waste segregation purposes (soils to be managed as either ≥ 50 ppm PCB Remediation Waste or < 50 ppm PCB Remediation Waste).

Depth of Sample (in bgs)	Lateral Distance from Vertical Joint and PCB Detection/Concentration Summary			
	0	5	10	20
0-3	35 samples collected (50% of joints); 16 samples ≥ 50 ppm (max. of 1,900 ppm); 14 samples > 10 and < 50 ppm; 5 samples > 1 and ≤ 10 ppm	No samples collected	10 samples collected; 2 samples > 10 ppm (12.3 and 23.6 ppm); 8 samples > 1 and ≤ 10 ppm (max. of 9.6 ppm and avg. of 4.8 ppm)	3 samples collected; 1 sample > 1 ppm (1.4 ppm); 2 samples ≤ 1 ppm (0.97 and 1.03 ppm)
12-15	12 samples collected; 6 > 1 ppm (max. of 7.4 ppm and avg. of 3.4 ppm); 6 samples ND or ≤ 1 ppm	7 samples collected; 3 samples > 1 ppm (max. of 2.7 ppm and avg. of 1.9 ppm); 4 samples ≤ 1 ppm (max. of 0.78 and avg. of 0.48 ppm)	10 samples collected; 8 samples ≤ 1 ppm (max. of 1.04 ppm and avg. of 0.59 ppm); 2 samples ND (< 0.11 ppm)	
24-27	12 samples collected; 1 sample > 1 ppm (2.4 ppm); 11 samples ND or < 1 ppm (max. of 0.71 ppm)			

2.2.2 Areas Away from the Building

Soils beyond the recessed areas were sampled to assess the extent of impacts in soils without a direct PCB source terminating at the ground surfaces (i.e., the former vertical joints). Samples were collected at lateral distances up to 25 feet away from the buildings and at depths of up to 24-27 in bgs (at the base of the building only). The locations of the samples collected and the results from each sample are presented on Figure 2-1. A summary of analytical results is presented on Table 2-2 and the complete analytical laboratory reports are provided in Appendix A.

Immediately adjacent to building

- Six samples of surficial soils (0-3 in bgs) were collected from locations at the base of the building but away from the vertical control joints to evaluate the extent of PCB impacts in areas without a direct transfer path to the soils. Analytical results indicated that PCBs ranged from 1.58 to 10.7 ppm.
- Six samples were collected at a depth of 12-15 in bgs. Analytical results from two of these samples indicated PCBs were present at concentrations > 1 ppm with reported concentrations of 1.4 and 1.6 ppm (both samples collected from Cashin). Analytical results from the remaining four samples indicated that PCBs were either non-detect (1 sample at < 0.10 ppm) or present at concentrations of 0.35, 0.55, and 0.71 ppm.
- Six samples were collected at a depth of 24-27 in bgs. Analytical results indicated that PCBs were either non-detect (5 samples at < 0.11 ppm) or present at a concentration of 0.11 ppm.

Based on the analytical results described above, PCB impacts to soils at the base of the building but away from the vertical joints are consistent with impacts to other shallow soils collected at distances from the vertical joints. As such, this data supports the conceptual site model that PCBs in soils appear to have originated primarily from the former vertical caulked joints.

Area Away from the Building

Characterization sampling of soils away from the building were collected during each of the three rounds of sampling to delineate the lateral and vertical extent of PCB impacts in soils away from the building. Samples were collected at distances of up to 25 feet away from the building and at depths of up to 12-15 in bgs. A summary of the results of the sampling for each building is presented below.

- Cashin – A total of 33 characterization samples were collected from soils away from the Cashin building. A summary of the analytical results for surficial and deeper soils is as follows:
    - Surficial Soils – Analytical results indicated that PCBs were present in surficial soils (0-3 in bgs) to distances of between ten and twenty feet from the building in most areas surrounding the Cashin building. The exception to this is along a portion of the north side of the building where analytical results indicate that impacts are limited to soils within five feet of the building. As shown on Figure 2-1, the extent of PCB impacts in some areas (primarily off of the west side and southeast corners of the building) have been inferred and will require additional characterization sampling to confirm the extent.
    - Deeper Soils – Analytical results from the nine samples collected from depths of 6-9 in bgs (1 sample due to obstruction at depth) and 12-15 in bgs indicated that PCBs were either non-detect (1 sample at < 0.11 ppm) or present at concentrations ≤ 1 ppm (total PCBs reported at concentrations up to 0.29 ppm).
- Brown – A total of 32 characterization samples were collected from soils away from the Brown building. A summary of the analytical results for surficial and deeper soils is as follows:
    - Surficial Soils – Analytical results indicated that PCBs were present in surficial soils (0-3 in bgs) to a distance of five feet along the north, west, and southwest corner of the building. Along the east side of the building, PCB impacts extend to a distance of ten feet from the building. As shown on Figure 2-1, the extent of PCB impacts away from the southeast corner of the Brown building have been inferred and will require additional characterization sampling to confirm the extent.
    - Deeper Soils – Analytical results from six of the seven samples collected from depths of 12-15 in bgs indicated that PCBs were either non-detect (3 sample at < 0.11 and < 0.12 ppm) or present at concentrations ≤ 1 ppm (3 samples at 0.11, 0.15, and 0.35 ppm). Analytical results from the seventh sample (collected on the east side of the building) indicated that PCBs were present at a concentration of 5.2 ppm.
- McNamara – A total of 32 characterization samples were collected from soils away from the Brown building. A summary of the analytical results for surficial and deeper soils is as follows:
    - Surficial Soils – As shown on Figure 2-1, analytical results indicated that PCBs were present in surficial soils (0-3 in bgs) to distances of up to 25 feet from the McNamara building with impacts typically present at distances of between ten and twenty feet. As depicted on Figure 2-1, the extent of impacts away from the building along the southwest and southeast corners as well as along the majority of the north elevation, have been inferred and will require additional characterization sampling to confirm the extent.
    - Deeper Soils – Analytical results from the eleven samples collected from depths of 12 to 15 in bgs indicated that PCBs were either non-detect (5 sample at < 0.11 ppm) or present at concentrations ≤ 1 ppm (total PCBs reported at concentrations up to 0.85 ppm and an average concentration of 0.42 ppm).

Based on the analytical results described above, PCB impacts are typically present in soils at distances of up to between ten and twenty feet from the buildings with some areas of lesser or greater lateral extent identified as presented above. Vertically, PCB impacts are limited to the upper 12 inches of soils in areas away from the buildings. Additional characterization sampling may be conducted prior to remedy implementation to confirm the vertical and lateral extent of PCB impacts in those areas where the extent has been inferred.

2.2.3 Asphalt

Asphalt samples were collected from each of the six walkways located on the ends of the buildings. During the first round of sampling, one sample per walkway was collected at the base of the building to evaluate potential worse-case conditions (i.e., directly below the vertical caulked joints located above the entrance doors). Analytical results indicated that PCBs were present at concentrations > 1 ppm in four of the six samples with concentrations up to 8.5 ppm. Analytical results from the other two samples indicated that PCBs were present at concentrations of 0.89 and 0.91 ppm.

Based on these results, one additional sample was collected at each building during the second round of sampling to delineate the horizontal extent of PCB impacts > 1 ppm. Results from the second round of sampling indicated that at a distance of ten feet from the building PCBs were present at concentrations > 1 ppm with reported concentrations of 1.6, 2.6, and 2.9 ppm. At each of the three locations, the concentrations of PCBs were observed to decrease from that reported at the base of the building.

Sample locations are depicted on Figure 2-1. A summary of the analytical results is presented on Table 2-3 and the complete analytical laboratory reports are provided in Appendix A.

2.2.4 Brick

Two brick pads are present on each of the three buildings. Based on the presence of a vertical caulked joint above each pad, one brick sample was collected at each building to evaluate potential worse-case conditions. Analytical results indicated that PCBs were non-detect in one sample (< 0.099 ppm) and present at concentrations of 0.45 and 2.7 ppm. Based on these results, PCB impacts may be present on the three brick pads that have not been sampled. Prior to finalization of the remediation plan, additional samples of the three pads will be collected. Brick materials will be managed based on the results of the characterization sampling and in accordance with the overall project requirements. Sample locations are depicted on Figure 2-1. A summary of the analytical results is presented on Table 2-3 and the complete analytical laboratory reports are provided in Appendix A.

2.3 DATA USABILITY ASSESSMENT

This data quality and data usability assessment has been conducted to review the samples collected in support of the remediation and verification activities. Data validation and review was conducted by Woodard & Curran and a third-party validator, Data Check, Inc. of New Durham, New Hampshire. This review included a check of field documentation including sample collection and preservation methods, a check of the laboratory data and documentation, a review of the internal laboratory QA/QC procedures and results including surrogate recoveries, blank results, matrix spike (MS) and matrix spike duplicate (MSD) results, laboratory control standard (LCS) and laboratory control standard duplicate (LCSD) results, an evaluation of sample holding times, and field duplicate results. Data Check's data validation summaries are provided in Appendix A.

A summary of the data usability assessment for the data is presented below:

- All samples were extracted by USEPA Method 3540C (Soxhlet Extraction) and analyzed for PCBs by USEPA Method 8082.
- Consistent procedures and laboratory analysis of the data were achieved. Sample containers were packed on ice and delivered to the laboratory under standard chain of custody procedures. All samples were extracted and analyzed within allowable holding times for the method with the exception of the six samples within sample delivery groups (SDG) 14F0363, 14F0365, and 14F0366 which were extracted beyond the 14 day technical holding limit due to being placed on hold pending the results of other samples collected at the same time (actual hold times for these samples were between 19 and 21 days from sample collection to extraction). Given that the holding time allowed by the analytical method (USEPA method 8082) is one year for non-aqueous samples and that the samples were preserved properly, the data was considered usable and the data was qualified as estimated (J, UJ).

- Samples were received at the laboratory within the acceptable temperature range (4º Celsius +/-2º). No qualifications have been applied.
- The data packages were reviewed to ensure that all sample and associated quality assurance results were available. Results of the completeness review indicated that all collected samples were analyzed and all quality control results were available to complete the data validation process.
- Some samples were analyzed at dilutions due to the high concentration of PCBs present in the samples and/or due to sample matrix. Elevated quantitation limits are reported in these samples as a result of the dilutions.
- A total of 13 field duplicate samples were collected during the sampling events to evaluate the precision of the sample results. Relative percent difference (RPD) between the primary and associated duplicate samples met the acceptance criteria with the exception of results between four primary and duplicate pairs. Analytical results from these samples were qualified as estimated (J).
- The RPD between sample column results for individual samples were evaluated to evaluate the precision of the results. The RPD between sample column results were evaluated and determined to be outside the acceptance criteria (≤ 25 %) in several samples. Analytical results for the affected samples were qualified as estimated (J).
- Accuracy of the analytical data was assessed by reviewing the recoveries for MS, MSD, LCS, and LCSD. The Aroclor 1260 MS/MSD results from some samples did not meet the acceptance criteria; however, no qualifications were applied due to Aroclor 1254 interferences. LCS/LCSD recoveries met the acceptance criteria. No qualifications were applied.
- Accuracy of the analytical data was assessed by reviewing the surrogate recoveries. All PCB surrogate recoveries met the acceptance criteria or were diluted out. No qualifications were applied.
- The PCB method blank and field blank samples were non-detect for all target analytes. No qualifications were applied.
- According to the case narratives, for Aroclor 1232, 1254, and/or 1260 results in several samples "Sample fingerprint does not match standard exactly. Aroclor with the closest matching pattern is reported." No qualifications were applied to the data based on the case narratives.
- According to the case narrative for Aroclor 1254 or 1260 in several samples, "Sample contains two incompletely resolved Aroclors. Aroclor with the closest matching pattern is reported." No qualifications were applied to the data based on the case narrative.

Based on this review, the data adequately represents the materials tested, and the samples are considered usable for the purposes of characterizing PCB-affected media.

3. REGULATORY REQUIREMENTS AND NEXT STEPS

Given the detection of PCBs > 1 ppm in soils, several actions have been completed and/or are in the planning process including:

Near Term Actions:

- Communication/Notification Process for UMass if soils are to be disturbed
- Regulatory Notifications

Subsequent Actions:

- Integration of soil remediation into upcoming planned projects
- Regulatory Requirements – MCP and 40 CFR 761

A summary of these actions are provided below. It should be noted that the primary foot traffic to the building is along the paved walkway paths and away from the recessed areas of the buildings (where the highest concentrations have been reported). In addition, the areas surrounding the three buildings do not include active use type areas (tables, benches, playing fields, volleyball courts, etc.).

3.1 COMMUNICATION/NOTIFICATION PROCESS

Based on the potential for facilities and other workers to come into contact with PCB impacted soils and other ground surfaces during maintenance activities (either planned or in emergency situations such as a utility line repair), a Notification and Materials Management Guidance Document was developed and distributed to the facilities and grounds department. This guidance document was prepared as an interim protocol, until the soils are remediated, and to facilitate the proper handling and off-site disposal of soils and other ground surface materials (e.g., asphalt, brick, etc.) that may be disturbed during performance of work at the Sylvan Residential Complex.

In summary, the guidance document requires that UMass Environmental Health and Safety be notified prior to any planned activities that requires Dig-Safe notification. The notification allows EH&S to review the planned scope of work and to determine if the materials to be disturbed are regulated by the MassDEP and/or the EPA due to PCB impacts and what, if any, additional worker training, controls, and disposal procedures would be required. Specifically, the guidance document requires that no materials be removed from the site prior to and pending approval from EH&S.

If PCB impacted soils are required to be excavated and removed from the site, the activities will be conducted as a Release Abatement Measure (RAM) in accordance with the requirements of the MCP.

3.2 STATE REQUIREMENTS – MASSACHUSETTS CONTINGENCY PLAN

Based on the presence of PCBs in soils at concentrations > 1 ppm, impacted soils are regulated by the MassDEP and subject to remediation in accordance with the MCP. A description of the steps within the MCP process conducted to date or anticipated to be conducted in the near term is provided in the following sections.

3.2.1 Notification

Based on the presence of PCBs in soils at concentrations above the MCP Reportable Concentration of 1 ppm (S1 soil standard), a Release Notification Form was submitted to MassDEP on September 25, 2014 to the meet the 120 day notification requirement. The potential for a two hour reportable condition was evaluated based on the presence of PCBs at concentrations > 10 ppm in soils within 12 inches of the ground surface. It was determined that a two hour reporting condition did not exist because children were not present within 500 feet of the Sylvan complex given the absence of schools, playgrounds, parks, or residential homes. UMass EH&S has, and will continue to coordinate

with the Residential Life department to understand/communicate the housing of advisors with children in Sylvan or the abutting residential areas without implementing different measures.

3.2.2 Subsequent MCP Submittals

If a permanent solution is not achieved within one year of the date of notification (e.g., soil removal and off-site disposal) a Tier Classification Phase I will be prepared/submitted on or before September 25, 2015 to meet the requirements of the MCP. It is anticipated that any soil removal activities will be conducted as a RAM. Additional MCP required submittals (Phase II/III) will also be prepared and submitted, as needed.

3.3 FEDERAL REQUIREMENTS – 40 CFR 761

As part of the remediation planning for the exterior rehabilitation project, PCB Remediation Plans were submitted to the EPA for the remediation of PCB containing building materials at each of the three buildings. As part of the plan submittals, UMass presented the plan to evaluate and remediate soils surrounding the three buildings as a single project following completion of the exterior projects.

Based on the analytical data collected to date and the former PCB source materials (exterior expansion joint caulking), soils surrounding the three Sylvan buildings that have been impacted by PCBs meet the definition of a PCB Remediation Waste under 40 CFR 761.3. As such, the remediation of these soils will be conducted in accordance with 40 CFR 761.61 and a remediation plan will be submitted to EPA for review and approval prior to remediation.

3.4 PROJECT PLANNING

Remediation of PCB impacted soils will be conducted as part of a larger utility and ground surface upgrade project within the Sylvan complex to be conducted over the next several years. The project will involve personnel from multiple departments within UMass and is currently in the initial planning stages. The remediation of PCB impacted ground surfaces will be integrated into the overall project with particular consideration given to utility work, grading, mapping of new hardscape surfaces, and tree protection/removal. At this time, the overall project schedule has not been established; however, it is anticipated that excavation may commence in 2016.

Table 2-1
Summary of Soil Characterization Sampling Results
Building Recess Areas

Sylvan Complex
UMass Amherst

Location	Depth (in bgs)	Building	Sample ID	Sample Date	Total PCBs (mg/kg)	
Base of Joint	0-3	Cashin	SR-CBS-111(0-3)	5/20/2014	8.9	
			SR-CBS-121(0-3)	5/20/2014	10.1	
			SR-CBS-211(0-3)	5/20/2014	30.9	J
			SR-CBS-221(0-3)	5/20/2014	10.2	
			CR-CBS-161(0-3)	9/2/2014	1900	
			CR-CBS-231	10/3/2014	92	
			CR-CBS-232	10/3/2014	42	
			CR-CBS-233	10/3/2014	48	
			CR-CBS-234	10/3/2014	110	
			CR-CBS-236	10/3/2014	23	
			CR-CBS-238	10/3/2014	59	
		Brown	SR-CBS-511(0-3)	5/21/2014	16.1	
			SR-CBS-521(0-3)	5/21/2014	14.1	J
			SR-CBS-611(0-3)	5/21/2014	12.9	
			SR-CBS-621(0-3)	5/21/2014	2.62	
			BR-CBS-120(0-3)	9/2/2014	1800	
			BR-CBS-114(0-3)	9/2/2014	34	
			BR-CBS-201	10/3/2014	76	
			BR-CBS-204	10/3/2014	100	
			BR-CBS-207	10/3/2014	220	
			BR-CBS-210	10/3/2014	190	
			BR-CBS-211	10/3/2014	26	
			BR-CBS-212	10/3/2014	57	
		McNamara	SR-CBS-311(0-3)	5/21/2014	21.2	
			SR-CBS-321(0-3)	5/21/2014	6.6	
			SR-CBS-411(0-3)	5/22/2014	18.1	J
			SR-CBS-421(0-3)	5/22/2014	6.9	J
			MR-CBS-171(0-3)	9/2/2014	7.7	
			MR-CBS-138(0-3)	9/2/2014	50	
			MR-CBS-213	10/3/2014	120	
			MR-CBS-214	10/3/2014	13	
			MR-CBS-219	10/3/2014	55	
			MR-CBS-220	10/3/2014	540	
			MR-CBS-223	10/3/2014	88	
			MR-CBS-224	10/3/2014	110	

Table 2-1
Summary of Soil Characterization Sampling Results
Building Recess Areas

Sylvan Complex
UMass Amherst

Location	Depth (in bgs)	Building	Sample ID	Sample Date	Total PCBs (mg/kg)	
Base of Joint	12-15	Cashin	SR-CBS-111(12-15)	5/20/2014	7.4	
			SR-CBS-121(12-15)	5/20/2014	1.4	
			SR-CBS-211(12-15)	5/20/2014	1.8	
			SR-CBS-221(12-15)	5/20/2014	0.18	
		Brown	SR-CBS-511(12-15)	5/21/2014	3.9	J
			SR-CBS-521(12-15)	5/21/2014	3.8	J
			SR-CBS-611(12-15)	5/21/2014	0.98	
			SR-CBS-621(12-15)	5/21/2014	< 0.11	
		McNamara	SR-CBS-311(12-15)	5/21/2014	1.03	
			SR-CBS-321(12-15)	5/21/2014	1.06	
			SR-CBS-411(12-15)	5/22/2014	2.07	
			SR-CBS-421(12-15)	5/22/2014	0.34	
	24-27	Cashin	SR-CBS-111(24-27)	5/20/2014	0.71	
			SR-CBS-121(24-27)	5/20/2014	< 0.11	
			SR-CBS-211(24-27)	5/20/2014	2.4	
			SR-CBS-221(24-27)	5/20/2014	0.35	
		Brown	SR-CBS-511(24-27)	5/20/2014	0.22	
			SR-CBS-521(24-27)	5/20/2014	< 0.11	
			SR-CBS-611(24-27)	5/20/2014	0.56	
			SR-CBS-621(24-27)	5/20/2014	< 0.11	
		McNamara	SR-CBS-311(24-27)	5/21/2014	< 0.11	
			SR-CBS-321(24-27)	5/21/2014	< 0.11	
			SR-CBS-411(24-27)	5/22/2014	< 0.12	
			SR-CBS-421(24-27)	5/22/2014	< 0.11	
5 Feet from Joint	12-15	Cashin	CR-CBS-162(12-15)	9/2/2014	2	
		Brown	BR-CBS-121(12-15)	9/2/2014	0.66	
			BR-CBS-115(12-15)	9/2/2014	0.78	
			BR-CBS-111(12-15)	9/2/2014	1.1	
		McNamara	MR-CBS-170(12-15)	9/2/2014	0.11	
			MR-CBS-131(12-15)	9/2/2014	2.7	
			MR-CBS-139(12-15)	9/2/2014	0.35	
10 Feet from Joint	0-3	Cashin	SR-CBS-112(0-3)	5/20/2014	4.9	
			SR-CBS-122(0-3)	5/20/2014	2.7	
			SR-CBS-212(0-3)	5/20/2014	9.6	
		Brown	SR-CBS-512(0-3)	5/21/2014	12.3	J
			SR-CBS-522(0-3)	5/21/2014	6	J
			SR-CBS-612(0-3)	5/21/2014	1.55	J
		McNamara	SR-CBS-312(0-3)	5/21/2014	6.4	
			SR-CBS-322(0-3)	5/21/2014	23.6	
			SR-CBS-412(0-3)	5/22/2014	5.4	
			SR-CBS-422(0-3)	5/22/2014	2.04	

Table 2-1
Summary of Soil Characterization Sampling Results
Building Recess Areas

Sylvan Complex
UMass Amherst

Location	Depth (in bgs)	Building	Sample ID	Sample Date	Total PCBs (mg/kg)	
10 Feet from Joint	12-15	Cashin	SR-CBS-112(12-15)	5/20/2014	0.96	
			SR-CBS-122(12-15)	5/20/2014	0.47	
			SR-CBS-212(12-15)	5/20/2014	1.04	J
		Brown	SR-CBS-512(12-15)	5/20/2014	0.5	
			SR-CBS-522(12-15)	5/20/2014	0.15	
			SR-CBS-612(12-15)	5/20/2014	0.37	
		McNamara	SR-CBS-312(12-15)	5/21/2014	0.39	
			SR-CBS-322(12-15)	5/21/2014	0.8	
			SR-CBS-412(12-15)	5/22/2014	< 0.11	
			SR-CBS-422(12-15)	5/22/2014	< 0.11	
20 Feet from Joint	0-3	Cashin	SR-CBS-113(0-3)	5/20/2014	1.03	J
		Brown	SR-CBS-513(0-3)	5/21/2014	0.97	
		McNamara	SR-CBS-313(0-3)	5/21/2014	1.4	

Notes:
Soil samples submitted for extraction via USEPA method 3540C and analyzed for PCBs via USEPA method 8082.
in. bgs. = inches below ground surface
J = Analytical resutls qualified as estimated based on data validation. See Appendix A for

Table 2-2
Summary of Soil Characterization Sampling Results
Areas Away from the Building

Sylvan Complex
UMass Amherst

Location	Depth (in. bgs.)	Sample ID	Sample Date	Total PCBs (mg/kg)	
Cashin Residence					
Base of Building	0-3	SR-CBS-131(0-3)	5/20/2014	3.3	
		SR-CBS-231(0-3)	5/20/2014	10.7	
	12-15	SR-CBS-131(12-15)	5/20/2014	1.6	
		SR-CBS-231(12-15)	5/20/2014	1.4	
	24-27	SR-CBS-131(24-27)	5/20/2014	< 0.11	
		SR-CBS-231(24-27)	5/20/2014	< 0.11	
5 ft From Building	0-3	CR-CBS-145(0-3)	9/2/2014	4	
		CR-CBS-148(0-3)	9/2/2014	0.74	
		CR-CBS-149(0-3)	9/2/2014	0.37	
		CR-CBS-152(0-3)	9/2/2014	0.37	
	12-15	CR-CBS-146(12-15)	9/2/2014	0.29	
		CR-CBS-150(12-15)	9/2/2014	< 0.11	
10 ft From Building	0-3	SR-CBS-222(0-3)	5/20/2014	0.82	
		SR-CBS-232(0-3)	5/20/2014	1.1	
		CR-CBS-165(0-3)	9/2/2014	0.77	
		CR-CBS-235	10/3/2014	4	
		CR-CBS-155(0-3)	9/2/2014	1.2	
		CR-CBS-160(0-3)	9/2/2014	0.33	
		CR-CBS-227	10/3/2014	0.45	
		CR-CBS-229	10/3/2014	5.3	J
	12-15	SR-CBS-222(12-15)	5/20/2014	0.16	J
		SR-CBS-232(12-15)	5/20/2014	0.18	
13 ft From Building	0-3	SR-CBS-123(0-3)	5/20/2014	1.4	J
		SR-CBS-132(0-3)	5/20/2014	0.6	
		CR-CBS-147(0-3)	9/2/2014	1.2	
		CR-CBS-230	10/3/2014	0.73	
		CR-CBS-157(0-3)	9/2/2014	1.1	J
	12-15	CR-CBS-159(12-15)	9/2/2014	0.26	
		SR-CBS-123(12-15)	5/20/2014	0.19	J
		SR-CBS-132(12-15)	5/20/2014	0.2	
15 ft From Building	0-3	SR-CBS-233(0-3)	5/20/2014	0.42	
		SR-CBS-213(0-3)	5/20/2014	0.45	J
		CR-CBS-163(0-3)	9/2/2014	0.32	
		CR-CBS-153(0-3)	9/2/2014	0.9	J
		CR-CBS-237	10/3/2014	0.84	
		CR-CBS-239	10/3/2014	0.76	
	6-9	CR-CBS-164(6-9)	9/2/2014	0.19	
	12-15	CR-CBS-154(12-15)	9/2/2014	0.17	
20 ft From Building	0-3	SR-CBS-223(0-3)	5/20/2014	0.35	

Table 2-2
Summary of Soil Characterization Sampling Results
Areas Away from the Building

Sylvan Complex
UMass Amherst

Location	Depth (in. bgs.)	Sample ID	Sample Date	Total PCBs (mg/kg)	
Brown Residence					
Base of Building	0-3	SR-CBS-531(0-3)	5/21/2014	1.58	
		SR-CBS-631(0-3)	5/21/2014	2.23	
	12-15	SR-CBS-531(12-15)	5/21/2014	0.35	
		SR-CBS-631(12-15)	5/21/2014	< 0.10	
	24-27	SR-CBS-531(24-27)	5/21/2014	< 0.10	
		SR-CBS-631(24-27)	5/21/2014	< 0.11	
5 ft From Building	0-3	BR-CBS-200	10/3/2014	2.4	
		BR-CBS-202	10/3/2014	3.2	
		BR-CBS-122(0-3)	9/2/2014	0.53	J
		BR-CBS-118(0-3)	9/2/2014	22	
		BR-CBS-116(0-3)	9/2/2014	1.6	
		BR-CBS-112(0-3)	9/2/2014	5.6	
		BR-CBS-209	10/3/2014	0.45	J
		BR-CBS-110(0-3)	9/2/2014	0.85	
		BR-CBS-107(0-3)	9/2/2014	0.16	
		BR-CBS-106(0-3)	9/2/2014	1.2	
		BR-CBS-105(0-3)	9/2/2014	0.62	
		BR-CBS-103(0-3)	9/2/2014	0.18	
		BR-CBS-102(0-3)	9/2/2014	0.96	
		SR-CBS-613(0-3)	5/21/2014	0.53	
		SR-CBS-622(0-3)	5/21/2014	< 0.12	
	12-15	BR-CBS-119(12-15)	9/2/2014	5.2	
		BR-CBS-113(12-15)	9/2/2014	0.35	
		BR-CBS-104(12-15)	9/2/2014	0.15	
		SR-CBS-622(12-15)	5/21/2014	< 0.12	
10 ft From Building	0-3	BR-CBS-205	10/3/2014	0.46	
		BR-CBS-208	10/3/2014	0.27	
		SR-CBS-523(0-3)	5/21/2014	0.3	J
		SR-CBS-532(0-3)	5/21/2014	0.74	J
		SR-CBS-632(0-3)	5/21/2014	0.18	
	12-15	SR-CBS-532(12-15)	5/21/2014	0.11	
		SR-CBS-632(12-15)	5/21/2014	< 0.12	
15 ft From Building	0-3	BR-CBS-109(0-3)	9/2/2014	0.83	
		BR-CBS-100	9/2/2014	0.18	
	12-15	CR-CBS-101	9/2/2014	< 0.11	
20 ft From Building	0-3	SR-CBS-533(0-3)	5/21/2014	0.45	
		SR-CBS-633(0-3)	5/21/2014	0.5	
		SR-CBS-623(0-3)	5/21/2014	0.37	J

Table 2-2
Summary of Soil Characterization Sampling Results
Areas Away from the Building

Sylvan Complex
UMass Amherst

Location	Depth (in. bgs.)	Sample ID	Sample Date	Total PCBs (mg/kg)	
McNamara Residence					
Base of Building	0-3	SR-CBS-331(0-3)	5/21/2014	6.6	
		SR-CBS-431(0-3)	5/22/2014	4.2	J
	12-15	SR-CBS-331(12-15)	5/21/2014	0.71	
		SR-CBS-431(12-15)	5/22/2014	0.55	
	24-27	SR-CBS-331(24-27)	5/21/2014	0.11	
		SR-CBS-431(24-27)	5/22/2014	< 0.11	
5 ft From Building	0-3	SR-CBS-432(0-3)	5/22/2014	0.58	J
	12-15	SR-CBS-432(12-15)	5/22/2014	< 0.11	
10 ft From Building	0-3	MR-CBS-166(0-3)	9/2/2014	1.8	
		MR-CBS-169(0-3)	9/2/2014	29	
		MR-CBS-221	10/3/2014	0.43	
		MR-CBS-222	10/3/2014	5.3	J
		MR-CBS-124(0-3)	9/2/2014	4.3	
		MR-CBS-125(0-3)	9/2/2014	< 0.10	
		MR-CBS-127(0-3)	9/2/2014	1.4	
		SR-CBS-323(0-3)	5/21/2014	2.7	
		SR-CBS-332(0-3)	5/22/2014	< 0.12	
		SR-CBS-413(0-3)	5/22/2014	3.7	
		MR-CBS-132(0-3)	9/2/2014	2.2	
		MR-CBS-136(0-3)	9/2/2014	3.1	
		MR-CBS-140(0-3)	9/2/2014	0.44	
		MR-CBS-143(0-3)	9/2/2014	0.71	
	12-15	SR-CBS-323(12-15)	5/21/2014	0.61	J
		SR-CBS-332(12-15)	5/22/2014	0.42	
		SR-CBS-413(12-15)	5/22/2014	< 0.11	UJ
		MR-CBS-126(12-15)	9/2/2014	< 0.11	
		MR-CBS-133(12-15)	9/2/2014	0.85	
		MR-CBS-142(12-15)	9/2/2014	< 0.11	
13 ft From Building	0-3	SR-CBS-423(0-3)	5/22/2014	1.8	
		MR-CBS-137(0-3)	9/12/2014	4.8	
	12-15	SR-CBS-423(12-15)	5/22/2014	0.27	J
		MR-CBS-217	10/3/2014	0.24	
15 ft From Building	0-3	MR-CBS-167(0-3)	9/2/2014	0.12	J
		MR-CBS-225	10/3/2014	< 0.12	
		MR-CBS-226	10/3/2014	0.66	
		CR-CBS-433(0-3)	5/22/2014	2.6	
		MR-CBS-130(0-3)	9/2/2014	0.51	
		MR-CBS-134(0-3)	9/2/2014	0.59	
		MR-CBS-218	10/3/2014	0.85	
	12-15	MR-CBS-168(12-15)	9/2/2014	0.1	
		CR-CBS-433(12-15)	5/22/2014	< 0.11	UJ
20 ft From Building	0-3	MR-CBS-128(0-3)	9/2/2014	0.81	
		SR-CBS-333(0-3)	5/22/2014	0.15	
		MR-CBS-215	10/3/2014	0.41	
		MR-CBS-129(0-3)	9/2/2014	3.9	
25 Feet from Building	0-3	MR-CBS-216	10/3/2014	2.4	

Notes:
Soil samples submitted for extraction via USEPA method 3540C and analyzed for PCBs via USEPA method 8082.
in. bgs. = inches below ground surface
J/UJ = Analytical results qualified as estimated based on data validation. See Appendix A for additional information.

Table 2-3
Summary of Asphalt and Brick Characterization Sampling Results

Sylvan Complex
UMass Amherst

Building	Sample ID	Sample Date	Total PCBs (mg/kg)	Sample ID	Sample Date	Total PCBs (mg/kg)
Location	Base of Building			Ten Feet from Building		
Asphalt Walkways						
Cashin	SR-CBA-001	5/20/2014	8.5	CR-CBA-175	9/2/2014	2.9
	SR-CBA-007	5/20/2014	2.57	- -	- -	- -
McNamara	SR-CBA-002	5/20/2014	3.62	MR-CBA-178	9/2/2014	2.6
	SR-CBA-003	5/20/2014	0.91 J	- -	- -	- -
Brown	SR-CBA-005	5/20/2014	6.1	BR-CBA-173	9/2/2014	1.6
	SR-CBA-006	5/20/2014	0.89	- -	- -	- -
Brick Pads						
Cashin	CR-CBB-177	9/2/2014	< 0.099	- -	- -	- -
McNamara	MR-CBB-172	9/2/2014	2.7	- -	- -	- -
Brown	MR-CBB-174	9/2/2014	0.45	- -	- -	- -

Notes:
Asphalt and brick samples collected in accordance with USEPA Region 1 Standard Operating Procedure for Sampling Porous Media for PCBs (May 2011).
Samples submitted for extraction via USEPA method 3540C and analyzed for PCBs via USEPA method 8082.
Total PCBs reported as Aroclor 1254 and/or Aroclor 1260. No other Aroclors reported above the minimum laboratory reporting limits.
J = Analytical results qualified as estimated based on data validation. See Appendix A for additional information.

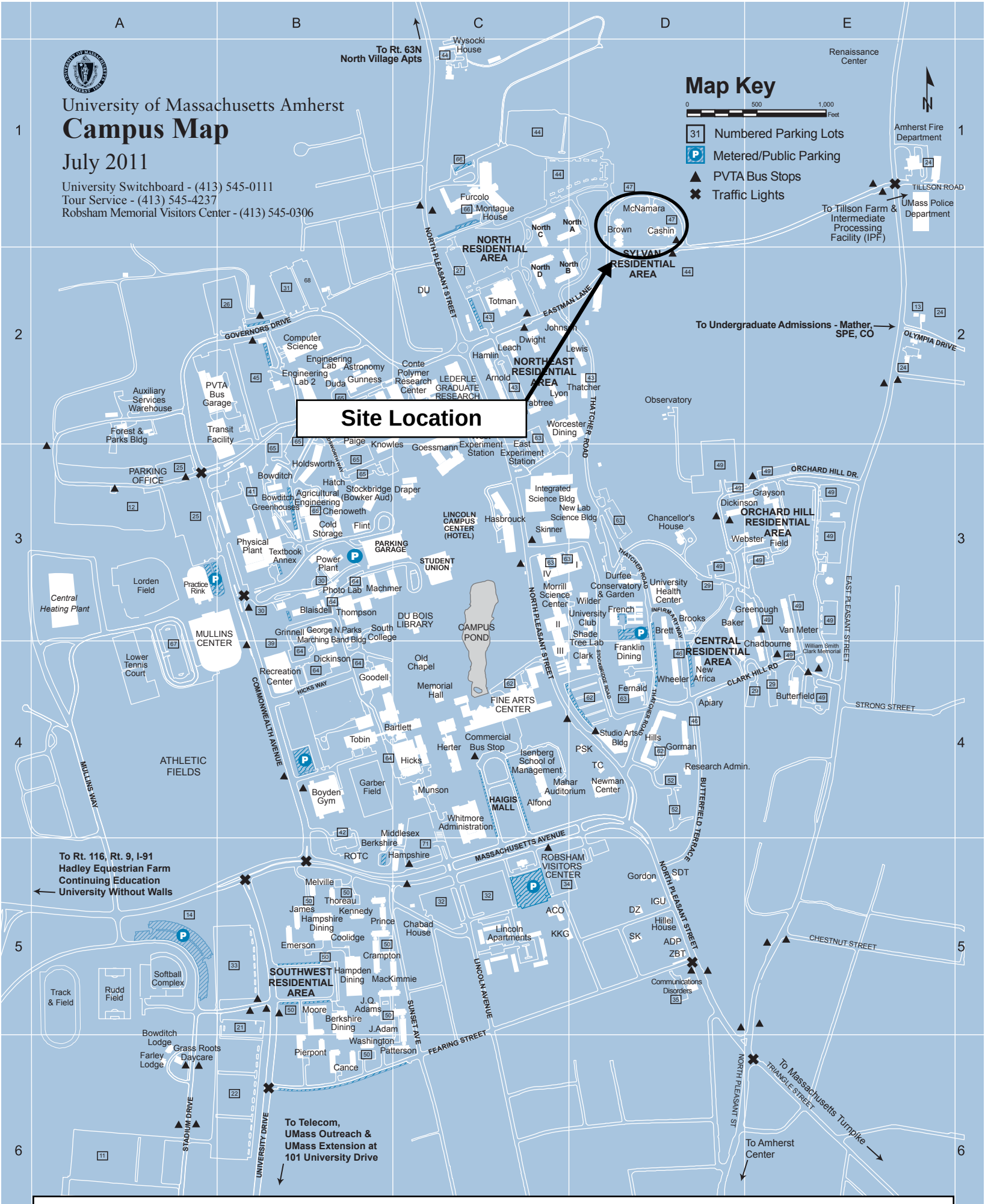


Figure 1-1 Site Location Map

N
W E
S

McNamera
Residence Hall

Loading Dock

Brown
Residence Hall

Loading Dock

Cashin
Residence Hall

Loading Dock

EASTMAN LANE

0 10 20 40
Feet

Legend

PCB Sample Results (Total PCBs presented in ppm next to sample location)

- Soil Sample Location
- Asphalt Sample Location
- Brick Sample Location
- Approximate extent of PCB impacts > 1ppm and < 50ppm to a depth of 18 inches bgs.
- Approximate extent of PCB impacts ≥50 ppm to a depth of 18 inches bgs.
- Approximate extent of PCB impacts to a depth of 18 inches bgs. PCB concentrations to be determined
- Approximate extent of PCB impacts >1ppm and <50ppm to a depth of 12 inches bgs (limits dashed where inferred).
- Brick Ground Surface
- Retaining Wall
- Road
- Asphalt Path
- Soils Previously Excavated for Installation of Emergency Generators
- Topography (2-ft)
- Approximate Tree Location
- Approximate Tree Canopy

Utilities

- Telecommunications
- Storm Drain
- Sewer
- Electric
- Water
- Steam
- Abandoned Steam Line

NOTES

1. Results greater than 1 ppm are highlighted in blue.

2. Posted results are from the following depth intervals

0-3 in. bgs: **9.60**
12-15 in. bgs: **1.04J**
24-27 in. bgs: --

-- = Not Analyzed
< = Not Detected
J = Laboratory Estimation
in. bgs = Inches Below Ground Surface

3. Location of site features and utilities based on site plan provided by UMASS Amherst.

4. Location of trees and size of canopies from Sylvan tree inventory provided by UMass Amherst and modified based on field observations and measurements by Woodard & Curran.

5. Topography based on site features map provided by UMass Amherst and modified along southwest corner of McNamera Residence and along northwest corner of Cashin Residence based on field observations and measurements by Woodard & Curran.

SYLVAN RESIDENTIAL HOUSING COMPLEX
UNIVERSITY OF MASSACHUSETTS AMHERST
Amherst, Massachusetts

Extent of PCB Impacted Soils

FIGURE 2-1

WOODARD &CURRAN

SCALE: 1" = 20'	DOC: SYLVANRESULTS.MXD
DATE: OCTOBER 2014	JOB NO: 227638
DRAWN BY: JMP	SOURCE: UMASS

APPENDIX A: ANALYTICAL LABORATORY REPORTS AND DATA VALIDATION SUMMARY

SYLVAN SOILS - PROJECT SUMMARY

ConTest Analytical Laboratory Job Numbers: 14E0705, 14E0706, 14E0780, 14E0781, 14E0782, 14E0783, 14E0829, 14F0363, 14F0365, 14F0366, 14I0092, 14I0117, 14I0118, 14I0119, 14I0120, & 14J0270

PCB field duplicate samples SR-CBS-132 (0-3) (14E0705-13)/SR-CBSD-132 (0-3) (14E0705-15), SR-CBS-213 (0-3) (14E0706-11)/SR-CBSD-213 (0-3) (14E0706-12), SR-CBA-003 (14E0780-03)/SR-CBAD-004 (14E0780-04), SR-CBS-612 (0-3) (14E0782-14)/SR-CBSD-612 (0-3) (14E0782-19), SR-CBS-522 (0-3) (14E0783-07)/SR-CBSD-522 (0-3) (14E0783-08), SR-CBS-331 (0-3) (14E0829-07)/SR-CBSD-331 (0-3) (14E0829-08), SR-CBS-431 (0-3) (14E0829-14)/SR-CBSD-431 (0-3) (14E0829-15), BR-CBS-116 (0-3) (14I0092-17)/BR-CBSD-117 (0-3) (14I0092-18), CR-CBA-175 (14I0117-05)/CR-CBAD-176 (14I0117-06), CR-CBS-157 (0-3) (14I0118-11)/CR-CBSD-158 (0-3) (14I0118-12), MR-CBS-140 (0-3) (14I0119-14)/MR-CBSD-141 (0-3) (14I0119-15), BR-CBS-205 (14J0270-05)/BR-CBSD-206 (14J0270-06), and BR-CBS-227 (14J0270-27)/BR-CBSD-228 (14J0270-28) met acceptance criteria with the following exceptions:

FIELD DUPLICATE ID	SAMPLE ID	PCB	RPD	QUALIFIER
14E0780-03/ 14E0780-04	SR-CBA-003/ SR-CBAD-004	1254 1260 Total	117 91 109	J J J
14E0782-14/ 14E0782-19	SR-CBS-612 (0-3)/ SR-CSBD-612 (0-3)	1254 1260 Total	144 105 133	J J J
14E0829-14/ 14E0829-15	SR-CBS-431 (0-3)/ SR-CSBD-431 (0-3)	1254 1260 Total	87 55 75	J J J
14I0118-11/ 14I0118-12	CR-CBS-157 (0-3)/ CR-CBSD-158 (0-3)	1254	58	J

The relative percent difference (RPD) between the column results for all detected Aroclors met acceptance criteria with the following exceptions:

LAB ID	SAMPLE ID	PCB	RPD	QUALIFIER
14E0705-01	SR-CBS-113 (0-3)	1260	33.1	J
14E0705-07	SR-CBS-123 (0-3)	1260	27.0	J
14E0706-07	SR-CBS-222 (12-15)	1254	30.4	J
14E0706-11	SR-CBS-213 (0-3)	1254	29.6	J
14E0706-14	SR-CBS-212 (12-15)	1260	31.4	J
14E0706-15	SR-CBS-211 (0-3)	1232	44.8	J
14E0782-07	SR-CBS-623 (0-3)	1260	30.3	J
14E0783-01	SR-CBS-532 (0-3)	1260	27.3	J
14E0783-06	SR-CBS-523 (0-3)	1260	26.3	J
14E0783-07	SR-CBS-522 (0-3)	1260	36.4	J
14E0783-08	SR-CBSD-522 (0-3)	1260	28.9	J
14E0783-10	SR-CBS-521 (0-3)	1260	37.4	J
14E0783-11	SR-CBS-521 (12-15)	1260	28.3	J
14E0783-14	SR-CBS-512 (0-3)	1260	29.2	J
14E0783-17	SR-CBS-511 (12-15)	1260	26.1	J
14E0829-12	SR-CBS-432 (0-3)	1254	33.4	J
14E0829-21	SR-CBS-421 (0-3)	1254	25.3	J
14E0829-27	SR-CBS-411 (0-3)	1260	45.0	J
14I0092-23	BR-CBS-122 (0-3)	1254	29.2	J

ConTest Analytical Laboratory Job Numbers: 14E0705, 14E0706, 14E0780, 14E0781, 14E0782, 14E0783, 14E0829, 14F0363, 14F0365, 14F0366, 14I0092, 14I0117, 14I0118, 14I0119, 14I0120, & 14J0270

LAB ID	SAMPLE ID	PCB	RPD	QUALIFIER
14I0118-07	CR-CBS-153 (0-3)	1254	31.5	J
		1260	33.7	J
14I0119-20	MR-CBS-167 (0-3)	1254	42.2	J
14J0270-09	BR-CBS-209	1254	26.4	J
14J0270-22	BR-CBS-222	1260	42.8	J
14J0270-39	BR-CBS-239	1260	32.3	J

According to the case narrative, for Aroclor-1232 in samples SR-CBS-211 (0-3) (14E0706-15), SR-CBS-211 (12-15) (14E0706-16), and SR-CBS-211 (24-27) (14E0706-17); "Sample fingerprint does not match standard exactly. Aroclor with the closet matching pattern is reported." No qualifications were applied.

According to the case narrative, for Aroclor-1254 in sample BR-CBSD-206 (14J0270-06); "Sample fingerprint does not match standard exactly. Aroclor with the closet matching pattern is reported." No qualifications were applied.

According to the case narrative, for Aroclor-1254 and Aroclor-1260 in samples SR-CBS-233 (0-3) (14E0705-19) and SR-CBS-232 (0-3) (14E0705-20); "Sample fingerprint does not match standard exactly. Aroclor with the closet matching pattern is reported." No qualifications were applied.

According to the case narrative, for Aroclor-1260 in sample SR-CBS-313 (0-3) (14E0781-01); "Sample fingerprint does not match standard exactly. Aroclor with the closet matching pattern is reported." No qualifications were applied.

According to the case narrative, for Aroclor-1254 in samples SR-CBS-132 (12-15) (14E0705-14), SR-CBS-232 (12-15) (14E0706-01), SR-CBS-233 (0-3) (14E0706-03), SR-CBS-222 (12-15) (14E0706-07), SR-CBS-221 (12-15) (14E0706-09), SR-CBS-632 (0-3) (14E0782-02), SR-CBS-612 (12-15) (14E0782-15), SR-CBS-533 (0-3) (14E0782-20), SR-CBS-532 (12-15) (14E0783-02), SR-CBS-522 (12-15) (14E0783-09), SR-CBS-511 (24-27) (14E0783-18), SR-CBS-333 (0-3) (14E0829-04), SR-CBS-433 (0-3) (14E0829-11), BR-CBS-100 (0-3) (14I0092-01), BR-CBS-103 (0-3) (14I0092-04), BR-CBS-104 (12-15) (14I0092-05), BR-CBS-119 (12-15) (14I0092-20), MR-CBB-172 (14I0117-02), BR-CBB-174 (14I0117-04), CR-CBS-146 (12-15) (14I0118-02), CR-CBS-162 (12-15) (14I0118-16), CR-CBS-163 (0-3) (14I0118-17), CR-CBS-164 (12-15) (14I0118-18), MR-CBS-167 (0-3) (14I0119-20), MR-CBS-221 (14J0270-21), MR-CBS-224 (14J0270-24), CR-CBS-229 (14J0270-29), CR-CBS-232 (14J0270-32), CR-CBS-234 (14J0270-34), CR-CBS-236 (14J0270-36), and CR-CBS-238 (14J0270-38); "Sample contains two incompletely resolved Aroclors. Aroclor with the closest matching pattern is reported." No qualifications were applied.

According to the case narrative, for Aroclor-1260 in samples SR-CBS-532 (12-15) (14E0783-02), SR-CBS-522 (12-15) (14E0783-09), SR-CBS-511 (24-27) (14E0783-18), SR-CBS-333 (0-3) (14E0829-04), SR-CBS-433 (0-3) (14E0829-11), BR-CBS-107 (0-3) (14I0092-08), CR-CBS-154 (12-15) (S14I0118-08), and MR-CBS-217 (14J0270-17); "Sample contains two incompletely resolved Aroclors. Aroclor with the closest matching pattern is reported." No qualifications were applied.

Many samples were analyzed at a dilution due to the high concentration of Aroclors present in the sample and/or due to the sample matrix. Elevated quantitation limits are reported in these samples as a result of the dilutions performed.

SYLVAN SOILS - PROJECT SUMMARY

ConTest Analytical Laboratory Job Numbers: 14E0705, 14E0706, 14E0780, 14E0781, 14E0782, 14E0783, 14E0829, 14F0363, 14F0365, 14F0366, 14I0092, 14I0117, 14I0118, 14I0119, 14I0120, & 14J0270

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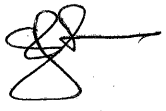

Date: 10/21/2014