CORRECTIVE ACTION PLAN

Former Blue Motor Coach
614 East Madison Street
Louisville, Jefferson County, Kentucky

Prepared For:

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1.0 INTRODUCTION

The University of Louisville is proposing to convert the former Blue Motor Coach facility located at 614 East Madison Street in Louisville, Kentucky to a parking facility for the University of Louisville Hospital. The University of Louisville currently owns the subject property.

This Corrective Action Plan (CAP) was prepared for the University of Louisville (U of L), Department of Environmental, Health & Safety (DEHS) to meet the requirements of KRS 224.01-400 and provide guidance for management of impacted soil during demolition and subsequent construction of the proposed parking facility. The CAP establishes policies and procedures for managing soils containing concentrations of lead that may be encountered above established regulatory levels during demolition, excavation, and construction activities. The primary objectives are to protect human health, satisfy KDEP requirements, and prevent adverse human health effects by controlling exposure pathways. These exposure pathways include ingestion or inhalation of, and dermal contact with, soil containing elevated levels of lead.

Previous site investigations by the DEHS and previous owners of the property determined that lead was present at concentrations greater than the Kentucky Department for Environmental Protection (KDEP) regulatory level of 50 mg/kg. Remediation of two areas containing elevated lead concentrations was previously conducted at the site. However residual lead levels exceed the KDEP level at five areas of the site. Discussions with the KDEP indicate that soils with residual lead above the regulatory level can be successfully capped in place.

Construction activities associated with the future parking lot include the demolition of existing structures and excavation of construction materials, fill, and soil as required by the proposed facility design specifications. Following excavation, confirmation sampling will be conducted to establish residual soil levels. A closure report will be prepared and submitted to the KDEP detailing site activities and the need for a Risk Management Plan (RMP) based on the results of confirmation sampling. Areas with lead concentrations greater than 50 mg/kg will be addressed by the RMP. The RMP, if needed, will address future site use and exposure pathways based on confirmation sampling results for soil. The finished parking facility will feature a paved parking lot with raised landscape areas that will serve as an engineered barrier, or cap, to minimize exposure pathways to residual lead remaining in the soil.

2.0 SITE BACKGROUND

The site is located at 614 East Madison Street in Louisville, Kentucky (see Figure 1). The site is located on the northern half of the city block bound to the north by East Madison Street, to the west by South Hancock Street, to the south by East Chestnut Street, and to the east by Clay Street.

3.0 PREVIOUS INVESTIGATIONS

Previous site investigations by the DEHS and previous site owners of the property determined that lead was present at concentrations greater than regulatory levels. Remediation of two areas containing elevated lead concentrations was previously conducted, but residual lead levels are reported to be above the KDEP level of 50 mg/kg in five areas of the site. Four groundwater monitor wells installed during these previous investigations were properly abandoned by grouting the wells in place. American Drilling Services conducted the abandonment activities and completed the Kentucky Monitoring Well Records (Appendix 1).

A composite soil sample was analyzed for Toxicity Characteristic Leachate Procedure (TCLP) Semi-volatile Organic Compounds (SVOCs) and Resource Conservation and Recovery Act (RCRA) metals to determine if the soil was a hazardous waste. All constituents were below method detection limits; therefore, the soil is not classified as hazardous waste. Excavated soils and fill will be disposed at the Waste Management Outer Loop Landfill in Louisville, Kentucky, or another acceptable disposal facility. A copy of the analysis is provided in Appendix 2.

4.0 SITE DEVELOPMENT ACTIVITIES

As discussed in the introduction, the subject property is the future site of a parking facility. Approximately two-thirds of the site will be excavated to construct the proposed parking facility. The existing building slab will remain in place. Excavated areas will be covered by the parking facility and engineered landscape areas, which will minimize potential exposure pathways to lead remaining in the subsurface strata.

4.1 Utility Concerns

Kentucky Law (KRS 367.4901 through 4917) requires prior notification of excavation activities at least two business days before commencement. The one-call system for the area is Kentucky Underground Protection, Inc. (Before You Dig) and can be reached at 1-800-752-6007. The caller must provide pertinent information regarding the site when calling Kentucky Underground Protection. Kentucky Underground Protection will provide a list of the member utilities that will be notified for the requested work location, a confirmation number, and a legal date and time to proceed with excavation. Non-member utilities must be contacted separately to request the location of their lines. Please note that this service only locates utilities in the public right-of-way and will not locate on private property. AMEC will ensure that appropriate utility clearance is performed prior to initiating excavation activities.

4.2 Health and Safety Concerns

The primary entry routes for lead contaminated soil include inhalation of dust; skin contact with contaminated materials; and ingestion of airborne dust or materials from hand-to-mouth contact due to inadequate personal hygiene. To minimize these exposure pathways, dust suppression techniques will be employed by the onsite subcontractor as needed and continuous air monitoring for airborne particulates will be conducted along the site perimeter. This perimeter monitoring will ensure that dust emissions are properly managed and prevent off-site impacts. Other concerns including physical, energy, biological, and operational safety hazards are anticipated during this project. A site-specific Health and Safety Plan will be prepared that

details specific hazards and controls, appropriate Personal Protective Equipment (PPE), monitoring requirements, and emergency procedures. As requested by the KDEP, the plan will describe control measures for dust emissions and storm water runoff during construction of the parking lot.

4.3 Environmental Oversight of Construction Activities

AMEC will provide environmental oversight of construction activities to ensure proper management and disposal of lead contaminated soils. AMEC will also perform air quality monitoring to assess potential impacts to adjacent properties and the surrounding area and to monitor worker safety. Confirmation soil sampling will be conducted to determine whether remaining soil lead concentrations are above KDEP action level of 50 mg/kg, and if a RMP is required.

4.3.1 Excavation and Disposal

Planned construction activities include shallow excavation and compaction of approximately two-thirds of the site as required to match the floor elevation of the existing building slab, which will remain in place as part of the new parking facility. The shallow excavation will extend to a depth of approximately one foot below ground surface (bgs), nominal. The excavation may be deeper where required by the proposed facility plans. The proposed extent of the excavation is outlined on Figure 2.

Pavement, gravel, fill material, and soil will be excavated using trackhoes and backhoes for disposal as a non-hazardous waste. Excavated material will be loaded into trucks or roll off boxes for transportation to an acceptable disposal facility. If direct loading is not possible, the excavated material will be stockpiled on-site until transfer is feasible. Stockpiled soil will be placed on plastic sheeting to prevent possible lead contamination from leaching into potentially clean soil. In addition, plastic sheeting will be placed on top of the stockpile to prevent contact with storm water. The contractor shall observe best management practices to minimize soil erosion during excavation at the site. Silt barriers should be utilized to minimize suspended particulates in the storm water runoff leaving the site.

4.3.2 Dust Control and Particulate Monitoring

Air quality sampling will be conducted to ensure construction activities are not impacting adjacent properties or the surrounding area, and to monitor worker safety at the site. AMEC will install three high volume air samplers along the perimeter of the construction site to collect particulates both upwind and down wind. Air samplers will be installed and operated prior to initiation of site activities to establish baseline concentrations for lead.

The air filters will be analyzed for lead according to the method specified in 40 CFR Part 50 Appendix G - *Reference Method for the Determination of Lead in Suspended Particulate Matter Collected from Ambient Air.* The OSHA airborne action level for lead is 0.03 mg/m^3. This concentration is calculated by averaging the results over an eight-hour workday. A concentration below this action level will be verified at the perimeter of the site to ensure public safety. Air quality monitoring will be continuous during excavation of the surface soil (estimated at two days). AMEC will also record the prevailing wind direction each day that air particulate sampling is conducted. Engineering controls (i.e., dust suppression measures) will be initiated as necessary to control fugitive dust emissions.

5.0 CONFIRMATION SAMPLING

Upon excavation of the soil to the depth required for site development, confirmation soil sampling for lead (Method 6010) will be conducted across the disturbed portion of the site using a specified grid system. Based on the sampling grid, approximately 15 soil samples will be collected from the bottom of the excavation. Five aliquots will be collected from each grid and mixed thoroughly to obtain a composite. The confirmation sampling grid is presented on Figure 3. In addition, the rock and asphalt cap design is also depicted on Figure 3.

5.1 Soil Sample Collection

A clean pair of new disposable gloves shall be worn during all sampling activities and must be donned prior to sample collection. It is critical to properly collect and preserve samples to ensure valid analytical results. Samples will be transferred directly from the sampling device to the sample container. Required sample containers will be prepared and provided by the analytical laboratory.

Hand auger sampling will be conducted as follows:

- The hand auger will be advanced to a depth of six inches at five locations within the sample grid.
- Sampling personnel will wear clean, disposable surgeon's gloves while handling the soil. Gloves will be changed between each sample location and more frequently as necessary.
- The soil samples will be collected from the auger and composited in a stainless steel bowl. The composited sample will be hand packed into pre-labeled glass or plastic sample jars and tightly sealed.
- The hand auger and stainless steel bowl will be decontaminated between each grid as described in Section 5.3.
- These sampling procedures will be followed for each sample location.

5.2 Sampling Documentation

Sample containers provided by the laboratory will be virgin bottleware and will be free of foreign substances, particularly substances that will change sample quality or interfere with required analyses. Stick-on labels will be affixed to all containers.

5.2.1 Sample Identification

In the field, each sample container label will be marked in the field with the sample identification number, date, sampler's name, time of collection, place of collection, parameter(s) requested, sample type, and facility ID number. The labels will be completed in permanent ink.

5.2.2 Transport and Storage

All samples to be analyzed will be stored in a manner that protects the sample from breakage. Samples will be transported or shipped to the laboratory on the day of collection. Samples to be shipped to the laboratory will be packaged to prevent breakage. Samples transferred to the laboratory by overnight courier service will be packaged in coolers and sealed with custody tape to maintain the chain of custody. The Chain-of-Custody form will accompany the samples from the time of collection until they are received by the laboratory. Each party in possession of the samples will be required to sign the Chain-of-Custody form signifying receipt. A copy of the original completed form will be provided by the laboratory along with their report of results.

5.2.3 Coordination with Laboratory

AMEC will notify the laboratory of each sample shipment and the expected time of delivery. Upon receipt of samples, the laboratory will notify AMEC within 24-hours if conditions or problems are identified requiring immediate resolution. Such conditions include:

- container breakage
- missing or improper chain-of-custody
- holding times exceeded
- missing or improper sample labeling

AMEC will determine whether resampling is required and communicate instructions to the laboratory and/or field team. In general, the Project Manager will stay apprised of the sample shipment schedule and will designate an alternate representative to handle communications with the laboratory in case of his/her absence.

5.2.4 Sample Custody

The primary objective of the chain-of-custody procedure is to create an accurate written record in a form that can be used to trace the possession and handling of samples. Chain-of-custody will start with sample container shipment and continue through sample collection and shipment of samples back to the laboratory. Sample containers will be shipped in sealed coolers. Each cooler will have an accompanying chain-of-custody form supplied by the laboratory.

Sample custody, during the sampling phases of this project, will be maintained by sampling team members who are responsible for documenting each sample transfer by means of the chain-of-custody form. The form will record information pertinent to each sample, such as sampling date and time, matrix sampled, parameters to be analyzed, sampler's names, and type of sample (grab or composite).

Sampling team members will maintain custody of the samples until they are relinquished to laboratory personnel or sample courier. After samples are packed in coolers for shipping, custody tape will be placed around the coolers to provide assurance that the samples are not tampered with during transportation to the laboratory. The sample team member that prepared the package will sign the tape after packaging is complete. Chain-of-custody forms will be placed in a plastic bag and shipped with the samples inside the cooler. A copy of the original completed form will be provided by the laboratory along with the analytical results.

5.3 Decontamination of Equipment

All non-disposable sampling equipment will be thoroughly cleaned between each soil boring location to prevent cross-contamination. The primary pieces of equipment requiring decontamination are the hand auger sampling device and stainless steel bowl. Cleaning will take place at the sample location. The cleaning procedure will consist of the following steps:

1. Scrub and wash contaminated equipment sections with detergent,
2. Rinse with deionized water until visible signs of detergent are removed,
3. Spray rinse with isopropyl alcohol,
4. Triple rinse with distilled water.

5.4 Investigation Derived Waste

Investigation Derived Waste (IDW) will consist of decontamination solutions and excess soil samples. Any hand auger sample not containerized for analysis will be returned to the boring and any decontamination solutions will be discharged to the ground. Disposal sampling equipment such as disposable gloves will be placed in the solid waste dumpster.

6.0 SITE CONSTRUCTION

The proposed parking facility design plans include parking areas, sidewalks, green space with landscape plantings, and electric utilities for lighting and security.

The existing structures at the site will be demolished to the floor elevation of the main building. The entire site, except the main building floor, will be excavated to a nominal depth of one foot below the floor elevation.

Areas to be paved will include a minimum of eight inches of rock, two inches of bituminous binder, and one inch of asphalt, for a total thickness of eleven (11) inches, and will be lined with concrete curbing a minimum of six inches higher than the top of the pavement. The new pavement will be installed to match the elevation of the existing building pad.

Landscape or "green space" areas will be located between parking area curbs and facility boundaries according to the design plans, and will be filled with clean topsoil, including approximately an additional six inches of clean soil mounded above the curb elevation. The landscape areas will contain a minimum of 18 inches of clean soil above the excavated zone.

7.0 CLOSURE REPORT

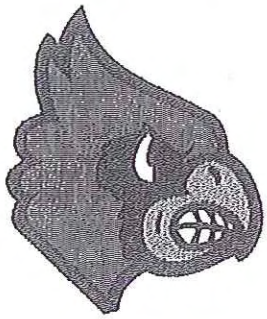
Upon completion of excavation and confirmation sampling activities, a Closure Report will be prepared and submitted to the KDEP on behalf of the University of Louisville DEHS. The report will document site activities and will include photographs of the excavation activities, soil disposal manifests and receipts, perimeter air quality monitoring results, confirmation soil sampling results, and a determination of the need for a RMP. Any adjustment to the proposed parking facility design will be addressed in the RMP, if determined to be necessary.

8.0 RISK MANAGEMENT

DEHS will submit an Operations and Maintenance (O&M) Plan describing procedures for inspection and maintenance of the asphalt cover and the raised landscape areas. All cover systems have the potential to erode and/or subside over time, and therefore require regular monitoring and maintenance. Subsidence is typically due to differential settling of the placement material. Evidence of subsidence can be observed after a significant rain event by walking the capped and looking for major puddles or ponding. Erosion can occur rapidly from a single large storm event, or more gradually from the impact of multiple storms. Repairs generally include filling in the depression or eroded area and reestablishing the vegetative cover. The O&M Plan will describe appropriate health and safety measures that must be observed during future disturbances of the asphalt cover such as pavement repairs or utility line installation.

As noted above, the majority of the remaining lead-impacted soil will be removed during the proposed excavation activities. If confirmation sampling indicates residual lead concentrations exceed the KDEP level of 50 mg/kg, a RMP will be prepared. The finished facility will feature a paved parking lot with raised landscape areas that will serve as an engineered barrier, or cap, as specified by the RMP, to block exposure pathways to residual lead contamination remaining in the soils at the parcel. As requested, the DEHS has attached a proposed deed restriction for the site (Appendix 3).

Prepared For:



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Risk Management Plan

for

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RISK MANAGEMENT PLAN
FORMER BLUE MOTOR COACH FACILITY
614 EAST MADISON STREET
LOUISVILLE, JEFFERSON COUNTY, KENTUCKY

1.0 INTRODUCTION

This Risk Management Plan (RMP) is designed to provide guidance for controlling risks associated with the former Blue Motor Coach facility located at 614 East Madison Street (Figure 1). The RMP establishes policies and procedures for managing remaining soils containing concentrations of lead above established regulatory levels (50 mg/kg). The primary objective is to prevent potential exposures by controlling contamination pathways. These exposure pathways include ingestion or inhalation of, and dermal contact with, soil containing elevated levels of lead. The University of Louisville (UofL) has successfully accomplished this objective by constructing a paved parking lot that will serve as an engineered barrier, or cap over these soils. This method was detailed in a Corrective Action Plan (CAP) (Appendix 5) prepared for UofL to meet the requirements of KRS 224.01-400 and approved by the Kentucky Department for Environmental Protection (KDEP), Superfund Branch. The site is depicted on the site layout map (Figure 2).

Prior to construction of the new parking lot, the subject site consisted of one structure (the former Blue Motor Coach facility building), a grassy lawn area, and a paved parking lot. The building was located just west of the center of the block and extends south from Madison Street to an alley. The paved parking lot was located west of the building and extended to Hancock Street, while the grassy lot was located east of the building and extended to Clay Street. Construction activities included the demolition of the building; the excavation, grading, and paving of the grassy lot; and, the removal and disposal of some contaminated soil to a local landfill. The floor of the building and the paved parking lot were preserved during the demolition so that they could be used in the construction of the new parking lot.

2.0 SITE BACKGROUND

The site is located at 614 East Madison Street in Louisville, Kentucky (see Figure 1). The site occupies approximately 3.7 acres near downtown Louisville and is bound by East Madison Street to the north, South Hancock Street to the west, East Chestnut Street to the south, and Clay Street to the east. The property has been developed into a parking facility for the University of Louisville Hospital. Blue Motor Coach operated on the subject site between 1961 to 1986. Prior to Blue Motor Coach, the property was reportedly residential.

Previous site investigations by the UofL Department of Environmental Health & Safety (DEHS) and previous owners of the property have determined that lead in the surficial soils of the grassy lot was present at concentrations greater than the KDEP regulatory level of 50 mg/kg. Discussions with the KDEP indicate that soils with residual lead above the regulatory level can be successfully capped in place.

2.1 Topography/Hydrogeology of Site

2.1.1 Topographic Setting

The USGS 7.5-Minute Topographic Map, Louisville East, KY. Quadrangle (Revised 1994) shows the subject site and surrounding properties are flat and lie at an approximate elevation of approximately 460 feet above mean sea level. The Ohio River is located approximately 5,000 feet north of the site. The South Fork Beargrass Creek is located approximately 2,000 feet east of the site.

Site surface water drainage is generally directed from north to south to the alley along the southern boundary of the property. This alley contains storm drains connected to the Louisville and Jefferson County Metropolitan Sewer District's (MSD) combined storm and sanitary sewer system, which serves a majority of the City of Louisville. Under normal rainfall conditions, the sewer system conveys liquid to a MSD treatment facility prior to discharge to the Ohio River. During heavy rainfall, a combined sewer overflow (CSO) located at Broadway and Beargrass Creek will allow for overflow of the combined sewer to the Creek (and ultimately to the Ohio River).

2.1.2 Geologic and Hydrogeologic Setting

A review of the USGS Geologic Map of the Louisville East Quadrangle, Jefferson County, Kentucky, 1974, indicated that the subject site is underlain by outwash from the Pleistocene Wisconsin glaciation. The outwash material is described as interbedded sand, gravel, silt, and clay that was deposited as alluvium by a river of low gradient following the release of glacial melt water. The outwash material can range up to 130 feet in thickness. Groundwater flow at the subject site is hydraulically connected to the Ohio River and Beargrass Creek and is anticipated to flow north to northeast. Based on the data search results of area wells and previous experience, depth to groundwater at the site is estimated at 35 - 40 feet below ground surface.

According to the *Soil Survey of Jefferson County, Kentucky* (1966), soil types of the Wheeling-Weinbach-Huntington association may occur on the subject property. A detailed soil survey of the downtown area of Louisville (including the subject site) has not been completed due to the area's history of extensive soil disturbance and urban development. Wheeling, Weinbach, and Huntington soils are all moderately deep to deep, well –drained soils consisting of silt loams to silty clays that developed in mixed alluvium washed from the upper part of the Ohio River drainage basin. All are underlain by stratified sand, silt, and clay, in places mixed with gravel at depths below 4 to 8 feet. These soils are moderately well to somewhat poorly drained and not generally subject to erosion. The soils are classified as moderately to highly productive for crops. As previously stated, all the soils on and in the immediate vicinity of the subject property have been developed or disturbed from historic urban residential or commercial use. Depth to rock in the Ohio River Alluvial is reported from 40 to 130 feet.

Bedrock on the subject property is reportedly comprised of the either the Jeffersonville or Louisville Limestone formations. The Jeffersonville Limestone formation is characterized as medium-to-thick-bedded medium-crystalline to coarsely crystalline limestone, siliceous and cherty in part. Louisville Limestone is thick-bedded fine-grained limestone, magnesian or siliceous in part. Wells drilled into the alluvium along the river yield 200 to 500 gallons per minute. Four wells installed near the site for groundwater quality monitoring had total depths of 45 feet below ground surface. Depth to groundwater in these wells was reported at 34 – 36 feet below ground surface at the time of installation in 1991. The four wells were properly abandoned on 17 July and 9 August 2002. Completed Kentucky Monitoring Well Record forms pertaining to the abandonment of each well are located in Appendix 1 of the CAP (Appendix 5). Groundwater flow direction in the area is generally to the north, towards the Ohio River.

2.1.3 Floodplain Information

AMEC has reviewed Flood Insurance Rate Maps for Jefferson County, Kentucky and Incorporated Areas - Panels 60 and 70 of 330 (Map Numbers 21111C0060 D and 21111C0070 D). These maps indicate the subject site (labeled in Zone X) is outside the 500-year floodplain. Based on this information, proposed activities will not impact the 100-year floodplain and the capped area will not be affected by flooding.

3.0 REGULATORY REVIEW AND COMPLIANCE

UofL has worked diligently with the KDEP Superfund Branch to ensure project activities were conducted with their review and approval. A CAP (Appendix 5) was submitted to the KDEP for their review and approval on 22 August 2002. The KDEP approved the CAP in a letter dated 17 September 2002. In addition, the KDEP Superfund Branch approved the preparation of an RMP and an Operations and Maintenance Plan to address remaining soil containing elevated levels of lead. Correspondence with the KDEP is included in Appendix 1. A copy of the CAP is included in Appendix 5. The CAP discussed how the following specific environmental issues would be addressed during construction activities.

3.1 Storm Water Management

Federal Law (40 CFR Part 122) prohibits point source discharges of storm water associated with industrial activity to a water body of the Commonwealth of Kentucky without a Kentucky Pollutant Discharge Elimination System (KPDES) permit. A KPDES permit is also required for all construction activities disturbing 5 or more acres. Since construction activities for this project did not disturb 5 or more acres, a KPDES permit was not required. However sediment and erosion management controls were implemented to minimize the loss of sediment from the site. To control storm water runoff from the site and manage sediment and erosion, the following were implemented: constructing silt fences around the perimeter of the site; covering soil stockpiles with plastic sheeting; and, installing straw barriers around storm water drainage inlets in the alley to control storm water runoff. Controls were checked on a routine basis to determine if repair or maintenance was required.

3.2 Dust Control and Emission Monitoring

Air sampling was conducted to ensure that major soil-moving activities did not impact adjacent properties or the surrounding area. AMEC installed three high volume air samplers along the perimeter of the construction site to collect particulates both upwind and downwind. Air samplers were installed and operated on 15 October 2002, two days prior to initiation of soil-disturbing activities, to establish baseline concentrations of lead. The air samplers were also operated on 17 and 18 October 2002 during soil excavation and removal activities at the site. Lead concentrations were below the OSHA Action level of 0.03 mg/m3 (averaged over 8 hours, adjusted if a longer workday) for both days that samples were taken. A summary of air sample results is included in Appendix A of the Corrective Action Completion Report (Appendix 6).

4.0 EXCAVATION ACTIVITIES

Construction of the parking lot required the excavation of approximately 12" – 16" of soil from across the entire grassy lot of the subject site. Excavation activities occurred on 17 October 2002, and excavated soil was stockpiled and covered on the east end of the lot. On 18 October 2002, the stockpile was loaded into hauling trucks which transported the soil to Waste Management of Kentucky, Outer Loop Landfill in Louisville, Kentucky, for disposal. Site grading began on 18 October 2002 and was originally considered "final" on 23 October 2002. However, a few areas of the site were later found to contain soil not suitable for construction and required overexcavation. These areas were excavated an additional 1.65 – 2 feet deep and filled with dense grade gravel. Overexcavation also occurred for the same reason on the west end of the property. Overexcavated soil from both areas of the site were also transported to and disposed at the Outer Loop Landfill. Figures 3a, 3b, and 3c showing these areas are included in Appendix 2. Photographs of site activities are included in Appendix 3. Soil disposal receipts and transporter receipts are included in Appendix B of the Corrective Action Completion Report (Appendix 6).

4.1 Closure Sampling

Confirmation sampling occurred on 22 and 23 October 2002, as the grading in an area was completed. Per the CAP, sampling was conducted based on a grid system which divided the subject property into 15 equal sections. Based on the total area of the property, a three-section by five-section grid system (with each section measuring approximately 58' by 53') was constructed.

Upon excavation of the soil to the depth required for site development (approximately 12" – 16"), a hand auger was advanced to a depth of six inches at five locations within each grid area. The five aliquots were mixed thoroughly in a stainless steel bowl to create one composite sample per grid area. The confirmation sampling grid layout is presented on Figure 1 of the Corrective Action Completion Report (Appendix 6). Sampling methodology (including equipment decon) followed the protocol indicated in the CAP. Soil samples were sent to Test America, Inc., 2960 Foster Creighton Drive, Nashville, Tennessee for analysis. Chain of Custody forms and laboratory results for confirmation soil samples are included in Appendix A of the Corrective Action Completion Report (Appendix 6).

As stated in Section 4.0, several areas of the property were overexcavated because the soil was not suitable for construction purposes. Overexcavation occurred after these areas had been sampled and

samples had been submitted to the lab for analysis. Therefore samples obtained from grids B-2 through B-7, B-10 through B-12, B-14, and B-15 may have contained soil which was later overexcavated and disposed. Since overexcavated areas were filled with gravel and the deeper soil is likely to contain lower levels of lead, these areas were not resampled.

5.0 RISK MANAGEMENT

As discussed previously, investigation results indicate lead is the constituent requiring risk management at the site. The KDEP has established 50 mg/kg as the action level for lead in soils. Lead concentration in soil above this level requires remediation or risk management if left onsite.

The Superfund Branch has agreed (in a letter dated 22 July 2002) that removing the site's surface soil and capping the residual contamination would be an acceptable strategy for lead remediation. Because of the persistent nature of lead in soils, a long-term maintenance plan for the parking lot cap is necessary to prevent potential exposures. Potential exposure pathways are inhalation and ingestion of, or dermal contact with, soil containing elevated levels of lead. The RMP discusses the measures that will be implemented to maintain the asphalt cap and prevent future exposures.

In addition, a letter dated 17 September 2002 from the KDEP Superfund Branch requires the RMP address lead contamination (discovered greater than 50 ppm during earlier site investigations associated with UST removals) under the foundation of the former building. The same letter indicates that KDEP considers the soil conditions beneath the asphalt on the west end of the property similar to the soil conditions under the building foundation, and therefore requires the RMP to also address this area.

Lead concentrations from 12 of the 15 samples collected from the east side of the subject property were above 50 mg/kg. Overexcavation after sampling (as described in Section 4.1) occurred in 9 of these 12 areas. Lead concentrations ranged from 11.7 mg/kg to 514 mg/kg, with a mean lead concentration of 161.61 mg/kg.

5.1 Administrative Controls and Organizational Structure and Responsibilities

This RMP document will be maintained with the UofL DEHS (1800 Arthur Street, Louisville, KY). The following key UofL and University Hospital entities and personnel will have environmental health and safety responsibilities that include adherence to the RMP, implementation of the Environmental Health and Safety Plan (Appendix 7), and oversight of activities and operations involving contact with the lead contaminated soil.

In addition, UofL has prepared a Declaration of Restrictions (i.e. Deed Restriction) describing specific restrictions ensuring the managed areas will not be compromised by future site activities (Appendix 4). Key UofL and University Hospital entities and personnel and their respective responsibilities include:

UofL's DEHS

- Responsible for written notification to the KDEP Superfund Branch concerning significant disturbance of the cap;
- Responsible for annual inspection of the cap;
- Responsible for annual report documenting the annual inspection and any excavation or construction on the site that exposes the soils underlying the completed cap;
- Responsible for maintaining records of disposition of excavated soils with regards to construction or excavation activities at the site;
- Assist University Hospital, Director of Engineering and UofL's Physical Plant with unexpected environmental conditions associated with excavations or construction activities at the site;
- Responsible for maintaining records regarding the activities related to remedial efforts such that representatives of city, county, state, and federal regulatory agencies may review the documents upon request;
- Responsible for Environmental Health and Safety Plan implementation by employees and trade contractors; and,
- Has authority to suspend work due to violations, health related incidents, and other increased risk situations.

UofL's Physical Plant Department

- Directly responsible for the management of the site in accordance with the RMP; and,
- Responsible for notifying UofL's DEHS and University Hospital, Director of Engineering prior to excavation or construction activities associated with the site.

University Hospital, Director of Engineering

- Directly responsible for implementation and adherence of the RMP by employees and trade contractors;
- Responsible for notifying UofL's DEHS prior to excavation or construction activities associated with the site; and,
- Reporting to UofL's DEHS on environmental health and safety conditions associated with excavations or construction activities at the site.

Site Workers

- Adherence to the RMP, the Environmental Health and Safety Plan, and/or the trade contractors health and safety plan;
- Immediate reporting of accidents, unsafe acts and environmental health and safety hazards to a supervisor and/or trade contractors job safety coordinators or supervisor;
- Performance of all work in a safe manner; and,
- Proper usage and maintenance of required personal protective equipment.

5.2 Engineered Barriers

Engineered barriers include physical structures (i.e. caps or permanent structures) and access controls (i.e. fencing) which cover, and/or control access to, the soil containing elevated levels of lead. The entire property has been constructed into an asphalt parking lot, therefore an engineered barrier has been utilized to cover and contain any soil on-site with elevated levels of lead. The construction of the parking lot provided approximately 11" (8" of rock base, 2" of binder, and 1" of asphalt) of cover for the soil. The aforementioned 17 September 2002 letter from the KDEP Superfund Branch indicates the Branch considers the building foundation and western asphalt lot to be sufficient for managing the suspected contamination beneath these areas. In order to complete the construction of the new parking lot, asphalt was placed over the building foundation and west parking lot. Raised landscape areas are also constructed on portions of the parking lot. These areas are elevated approximately 6" – 12" above the asphalt surface of the parking lot.

5.3 Operation and Maintenance (Post-Closure Monitoring)

All cover systems have the potential to subside and/or become damaged over time, and therefore require regular monitoring and maintenance. Subsidence is typically due to differential settling of the placement material. Damage (i.e., cracks, potholes) can occur from various sources including: freeze/thaw cycles, constant vehicle traffic (especially large vehicles or heavy equipment), and vegetation growth.

The UofL DEHS will conduct an annual inspection of the cap to identify potholes, subsidence depressions, areas of erosion, or other potential breaches in the cap that could expose underlying soils. Any noticed breaches in the cap shall be repaired. The following constitutes a breach in the environmental cap:

- **Asphalt areas** - potholes, which expose subgrade material, approximately 8" in depth in the parking lot or sidewalk.
- **Landscape areas** - excavation or erosion areas that expose soil cover approximately 4" in depth.

The UofL DEHS will prepare a report to the KDEP Superfund Branch documenting the annual inspection and excavation and construction activities that expose the soils underlying the protective cap. The report will be submitted to KDEP by July 31 of the following year.

The UofL DEHS shall maintain records regarding the activities related to remedial efforts such that representatives of city, county, state, and federal regulatory agencies may review the documents upon request.

6.0 CONCLUSIONS

The RMP documents construction and management activities conducted at the site and provides procedures for continued maintenance of the managed areas. According to the KDEP Superfund Branch, proper site management includes addressing the following issues:

6.1 Site Management Activities

1. Soil excavation and residual lead soil capping

As described in Section 4.0, approximately 12" – 16" of lead-contaminated soil was excavated from the east end of the site and properly disposed. The remaining soil from this area (as well as some soil beneath the former building's foundation) contained residual levels of lead which were left in place and capped as described in Section 5.2. According to KDEP, soil located beneath the asphalt on the west end of the property (which has not been analyzed for lead) may contain lead and therefore has been left in place and capped as described in Section 5.2.

2. Address long-term maintenance for the entire site.

The objective of the RMP is to establish policies and procedures for managing soils containing concentrations of lead above established regulatory levels. The University of Louisville is committed to ensuring public safety and protection of the environment and has proven this commitment by involving KDEP in all aspects of the risk management process for this site. UofL has successfully eliminated exposure pathways and has established procedures (Section 5.3) to ensure long-term maintenance of the managed areas as an asphalt parking lot.

6.2 Future Site Activities

The subject site has been constructed into an asphalt parking facility for the University of Louisville Hospital. UofL does not anticipate conducting future activities on this site, which will require the disturbance or exposure of the capped soil. However, the following general operations and activities may be required:

- Repair and maintenance of asphalt pavement (potholes) or concrete curbs or walkways;
- Repair and maintenance of existing underground utilities; and,
- Planting or replanting of trees, shrubs, and/or ground cover.

In the event that such an activity is planned which requires significant disturbance of the cap, a written notification detailing the activity will be sent to the KDEP Superfund Branch for their review and written approval. No such construction activity or disturbance is permitted without this prior written approval.