ARCADIS Design & Consultancy for natural and built assets

Ms. Sheri Uhlenbruch, P.G.
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Subject:
Final Corrective Action Plan
Former Black Leaf Chemical Site, 1391 Dixie Highway,
Louisville, Jefferson County, KY
AI #52202, CERCLIS ID #KYD980559520

ENVIRONMENTAL

Date:
March 23, 2018

Contact:
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Our ref:
B0085908

Dear Ms. Uhlenbruch:

On behalf of ExxonMobil Oil Corporation, Occidental Chemical Corporation, and Greif, Inc. (collectively the Investigating Parties [IPs]), enclosed please find the Final Corrective Action Plan (CAP) for the Former Black Leaf Chemical Site located in Louisville, Jefferson County, Kentucky. This document has been prepared to address comments received by the Kentucky Division of Waste Management (KDWM) dated February 12, 2018. As requested, the Final CAP is a compilation of the CAP, CAP Addendums, and clarifications and response information related to the Site.

The February 12, 2018 letter from KDWM included a few conditions to the CAP approval. One of the conditions was submittal of language for an Environmental Covenant (EC) for approval by KDWM's legal counsel with eventual filing with Jefferson County. In March 2018, a Draft EC was submitted to KDWM's legal counsel. Once approved and finalized, the EC will be filed with Jefferson County. The current draft of the EC has been included in the Final CAP as Appendix A.

A second condition of CAP approval is to recalculate the onsite risk calculations once a backfill source is identified, tested, and approved by KDWM. It should be noted that based on the schedule for soil removal activities, the backfill source may not be identified until the fall of 2018; therefore, the risk calculations cannot be recalculated until later this year. Section 3.1 of the Final CAP includes the IPs commitment to preparing these calculations and discussing any alterations of the excavation areas based on the results prior to implementation of excavation and backfill activities.

The last condition to the CAP approval includes the requirement for KDWM to review and approve specific remediation plans or details regarding the corrective actions. These plans include the demolition plan, hydraulic cleaning plan, etc. Section 4.1.3 of the Final CAP includes the IPs commitment to submitting these plans once they are available to KDWM for review and approval prior to implementation of these activities.

If you have any questions, please feel free to contact me.

Sincerely,

Arcadis U.S., Inc.

Corrie Chwalek, PE

Principal Environmental Engineer

Copies:
Tim Hubbard, P.G., DWM
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David Mantor, ExxonMobil
Tom Dimond, Greif, Inc.
Frank Parigi, Occidental

Enclosures:

Final Corrective Action Plan, Former Black Leaf Chemical Site, Louisville, Jefferson County, Kentucky (March 2018)

ARCADIS Design & Consultancy for natural and built assets

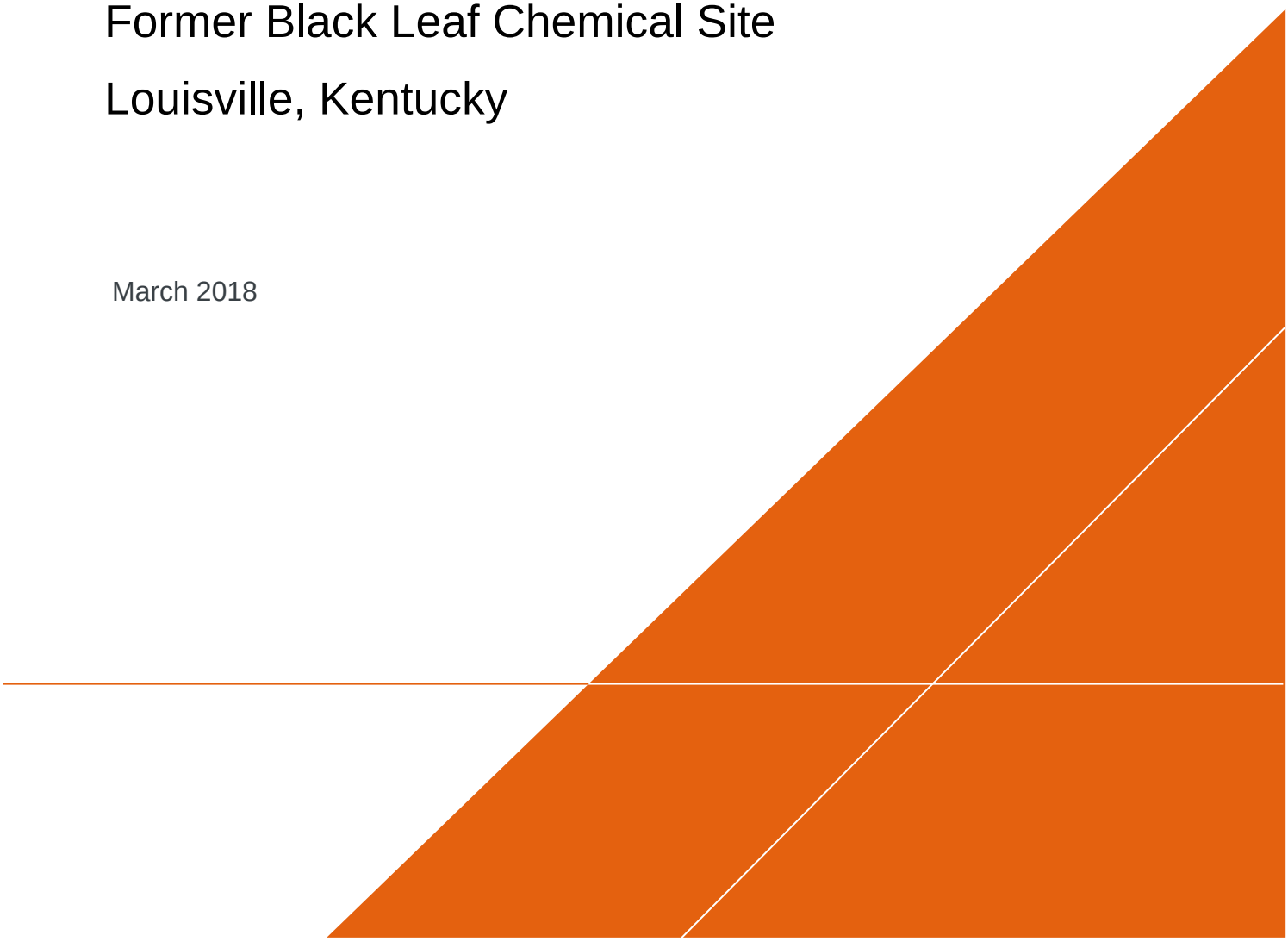
Black Leaf Cooperating Parties

FINAL CORRECTIVE ACTION PLAN

Former Black Leaf Chemical Site

Louisville, Kentucky

March 2018



FINAL CORRECTIVE ACTION PLAN

Former Black Leaf Chemical Site
Louisville, Jefferson County, Kentucky

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Our Ref.:

B0085908

Date:

March 2018

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ACRONYMS AND ABBREVIATIONS

Arcadis	Arcadis U.S., Inc.
CAP	Corrective Action Plan
COPC	Constituents of potential concern
DOT	Department of Transportation
E&SC	Erosion and Sediment Control
EC	Environmental covenant
HASP	Health and Safety Plan
IPs	Investigating Parties
JCAPCD	Jefferson County Air Pollution Control District
KAR	Kentucky Administrative Regulation
KDEP	Kentucky Department of Environmental Protection
MCL	maximum contaminant level
mg/kg	milligrams per kilogram
MSD	Metropolitan Sewer District
PAHs	polycyclic aromatic hydrocarbons
PMP	Property Management Plan
RAC	Removal Action Contractor
RAS	Risk Assessment Section
RCRA	Resource Conservation and Recovery Act
RSL	Regional Screening Level
SCR	Site Characterization Report
SQL	sample quantitation limit
UCL	Upper Confidence Limit
USEPA	United States Environmental Protection Agency

1 INTRODUCTION

This Final Corrective Action Plan (CAP) has been prepared by Arcadis U.S., Inc. (Arcadis) on behalf of the Black Leaf Cooperating Parties to describe the proposed corrective action to address impacted soil and sediment at the former Black Leaf Chemical Site located in Louisville, Jefferson County, Kentucky (Site). The Black Leaf Cooperating Parties include ExxonMobil Oil Corporation, Occidental Chemical Corporation, and Greif, Inc. who have been listed as the Investigating Parties (IPs). Figure 1-1 identifies the site location on the U.S. Geological Survey 7.5-minute quadrangle map for Louisville West, Kentucky-Indiana. As of October 2017, the property owner is FCBKy Holding, LLC.

The corrective action strategy outlined herein has been developed based on deed instruments that will be implemented to ensure the property will be restricted for industrial/commercial use. A Draft Environmental Covenant (EC), conforming to the requirements of KRS 224.80 and restricting the site to industrial/commercial use, has been submitted to Kentucky Department for Environmental Protection (KDEP) for review and approval prior to being filed with Jefferson County. The EC will be used in conjunction with the Property Management Plan (PMP) prepared for FCBKy Holding, LLC (Linebach Funkhouser, 2017) that was approved by KDEP to ensure compliance with the restrictions based on a management in place closure. The Draft EC and PMP are included in Appendices A and B, respectively.

As previously stated, the proposed corrective action strategy described herein has been developed based on deed instruments that will be implemented to ensure the property will be restricted to industrial/commercial use. Therefore, strategies to redevelop the property for residential use were not evaluated as part of this CAP.

1.1 Site Description and Background

The Site is located on a single 29-acre tax parcel (parcel number 039H 0026 0000) in Louisville, Jefferson County, Kentucky (Figure 1-2). The current street address that most closely matches the location of the Site is 1391 Dixie Highway. The geographical location of the center of the Site is at 38.23214° North Latitude and 85.78341° West Longitude (North American Datum of 1983).

Historical operations at the Site have included pesticide formulation, operations by cooperage/distillery, and lumber interests. Historical Sanborn mapping also indicated a former coal yard on a portion of the Site, as well as an off-site coal yard and foundry to the east. The Site has been vacant since 2006. A detailed summary of the current understanding of the site ownership history was provided in the Site Characterization Plan, Former Black Leaf Chemical Site, Louisville, Jefferson County, Kentucky (Arcadis, November 2013, revised via comment response letters in February 2014 and May 2014).

1.2 Current Site Use, Land Coverage, and Surrounding Area

Currently there are no active Site operations, though erosion and sediment control (E&SC) inspections are performed semi-annually in accordance with the Erosion and Sediment Control Plan, Former Black Leaf Chemical Site (Arcadis, 2014). Several buildings from former site operations remain on the central portion of the Site as shown in Figure 1-2. The condition of buildings onsite varies, but many are in poor condition and several of the building roofs have collapsed and are unsafe to enter. The buildings are scheduled to be demolished in 2018. The Site can be accessed through the gate from Dixie Highway to

the west, which is locked at all times. The Site is zoned EZ-1 Enterprise Zone, which allows C-2 commercial and M-3 industrial uses.

The far eastern and far western portions of the property are presently undeveloped and mostly unpaved with grass, brush/trees or gravel surface cover. Over the years, small bushes and trees have grown up along the fence-line surrounding the property. There are a few large diameter trees along the west property line at Saint Louis Ave, near the former Office building (Figure 1-2).

Use of land surrounding the Site includes residential properties to the north, a large rail yard to the south, and mixed-use industrial/commercial properties to the west and east.

1.3 CAP Organization

The introduction provided in this section is followed in Section 2 by a brief summary of the data generated during characterization activities which was previously submitted in the Site Characterization Report, Former Black Leaf Chemical Site, Louisville, Jefferson County, Kentucky ([SCR], Arcadis, February 2015, revised via comment response letters in May 2015 and August 2015), and approved by KDEP in a letter dated October 28, 2015. Section 3 presents the corrective action strategy. Section 4 presents the specific details of the corrective action at the Site. References cited in this document are included in Section 5.

2 SUMMARY OF SITE CHARACTERIZATION ACTIVITIES

2.1 Introduction

Soil, sediment, and groundwater samples have been collected by several parties to evaluate the presence and extent of constituents of potential concern (COPCs) at the Site. The United States Environmental Protection Agency (USEPA) and KDEP implemented preliminary field investigations in 2010 and 2011. Based on the data generated by USEPA and KDEP, site COPCs were identified as polycyclic aromatic hydrocarbons (PAHs), arsenic, lead, and organochlorine pesticides. Additional characterization activities were implemented by Arcadis on behalf of the IPs in August-September 2014 and June 2015. The following sections present a brief summary of the sampling activities and results from these investigations. A detailed summary of the site sampling and analytical results are provided in the SCR (Arcadis, 2015).

2.2 Soil Sampling and Results

During site characterization activities, 333 soil samples were collected from 115 soil borings advanced at the locations shown on Figures 2-1 and 2-2. Soil samples were generally collected from 0-1 foot, 1-2 feet, and then at 2-foot intervals to termination depth. With the exception of arsenic, the soil sample COPC concentrations were compared to the November 2017 USEPA Regional Screening Levels (RSLs) for industrial exposures (USEPA, 2017). Soil sample results are included in Appendix C.

Arsenic concentrations in soil were evaluated based on Kentucky's Bluegrass Regional Background guidance cited in the Risk Assessment Section (RAS) Memorandum dated April 7, 2008 (KDEP RAS, 2008) (Arsenic Background Guidance) which is based on the Kentucky Guidance for Ambient Background Assessment (NREPC, 2004). The Arsenic Background Guidance calculates cleanup levels for arsenic based on the Bluegrass Province database. The cleanup levels for arsenic presented in the Arsenic Background Guidance indicates that the mean site concentration must be below the 95% Upper Confidence Limit (UCL) of the mean concentration of background (13.12 milligrams per kilogram [mg/kg]); that half of the data points should be less than the midpoint (60th percentile, 10.6 mg/kg); and that no data point should be above the 95th percentile (22.7 mg/kg). The existing site data from the 0 to 1-foot interval has a mean arsenic concentration of 25.06 mg/kg, 32% of the data points were above 10.6 mg/kg, and 25% or 27 samples exceeded the arsenic concentration of 22.7 mg/kg which exceed the Arsenic Background Guidance levels. Arsenic calculations for existing site conditions are provided in Appendix D.

Soil boring locations with COPC concentrations above the Industrial RSLs or the Arsenic Background Guidance at one or more sample intervals in the top two feet of soil are presented on Figure 2-1. Soil boring locations with COPC concentrations above the Industrial RSLs or the Arsenic Background Guidance in soils greater than two feet below ground surface are presented on Figure 2-2. For presentation purposes, soil boring locations with arsenic concentrations above 22.7 mg/kg are shown on Figures 2-1 and 2-2 based on exceedances at the respective depths.

2.3 Sediment Sampling and Results

Site characterization activities included the collection of 15 sediment samples in 2011 and 2014 from the accumulated sediments in specific concrete basins throughout the Site. In the absence of established screening criteria for sediment in manholes and catch basins, data for the sediment samples were compared to the criteria for soil described in Section 2.2 for screening purposes (Appendix C). Figure 2-3 presents catch basin/manhole locations where sediment sample COPC concentrations exceed the Industrial RSLs or the Arsenic Background Guidance, and sections of sewer piping that were previously inspected/mapped.

2.4 Groundwater Sampling and Results

At the request of KDEP, the former production well onsite was purged and sampled in 2014. The analytical results from the groundwater sample were below USEPA Drinking Water Maximum Contaminant Level (MCL) concentrations for site COPCs. The well was therefore properly abandoned in 2014 in accordance KDEP requirements.

In addition, in accordance with Kentucky Guidance for Groundwater Screening, analytical data from the soil profile were also evaluated to demonstrate that groundwater is not impacted. No further action is necessary relative to groundwater at the Site.

3 CORRECTIVE ACTION STRATEGY AND TECHNICAL APPROACH

The corrective action strategy and technical approach presented in this section is consistent with 401 KAR 100:030 and with acceptable remedial approaches for a managed in place closure in accordance with KDEP rules and guidance. The proposed corrective action strategy outlined herein has been developed based on deed instruments that will be implemented to ensure the property will be restricted for industrial/commercial use. As noted in Section 1, a draft EC has been submitted to KDEP for review to restrict the site to industrial commercial use. The EC will be used in conjunction with the approved PMP included as Appendices A and B, respectively.

This CAP includes:

- Demolition of all on-site buildings and slabs;
- Removal of soils as described in this section and shown on Figure 3-1 with offsite disposal and replacement with clean fill;
- Hydraulic cleaning of specific portions of the on-site surface water drainage system (specific catch basins and downgradient sewer lines) to facilitate removal of impacted sediments, followed by implementation of E&SC measures at the Site. Additional details regarding the flushing of the drainage system and subsequent storm water management are provided in Section 4.1.8; and
- Use of institutional controls and the PMP to limit future use to those consistent with continued industrial and commercial operations and to require maintenance of E&SC measures to protect storm basins and piping and offsite areas.

The overall objective of the corrective action is to safely excavate identified soil locations and perform cleaning of site catch basin/sewer lines to remove impacted sediments to minimize the potential for future exposure to impacted soil/sediment by Site users while:

- Minimizing the disruption to the local community by completing construction activities in a timely manner;
- Protecting the structural integrity of permanent features (roadways, utilities, etc.); and
- Restoring the property to conditions that are as close as reasonably possible to pre-excavation conditions, or otherwise in a manner that is acceptable to the IPs and the property owner.

3.1 Soil Removal

The proposed corrective action for soil at the Site is consistent with 401 KAR 100:030 and with acceptable remedial approaches for a managed in place closure pursuant to KDEP rules and guidance. Following demolition of the onsite buildings, soils with pesticide and PAH concentrations at the point of exposure (top 1 foot) above the Industrial RSLs will be removed and, for arsenic, soils at the point of

exposure will be removed to achieve the background requirements specified in KDEP RAS 2008. The removed soils will be replaced with clean fill.

In addition, the residual risks below the point of exposure (i.e., below the top 1 foot of soil) were calculated to ensure that the mean residual concentrations of pesticides and PAHs, calculated as the 95% UCL of the mean using USEPA procedures, are below concentrations that result in a total residual target cancer risk level of 1×10^{-6} or a noncancer hazard quotient of 1 for an industrial use scenario. Meeting these criteria below the point of exposure is achieved by:

- Removal of all sample locations below the point of exposure containing pesticides at concentrations above the Industrial RSLs and replacement of excavated soils with clean fill; and

- Removal of some additional sample locations below the point of exposure containing PAHs at concentrations above the Industrial RSLs and replacement of excavated soils with clean fill.

Per the request of KDEP in a letter dated February 12, 2018, analytical results for the proposed backfill source will be submitted to KDEP for review and approval. Once approved, the analytical results from the backfill will be used to re-calculate the risk calculations discussed above for soils remaining below the point of exposure (i.e., below the top 1 foot of soil). If the risk calculations indicate alterations in excavation areas, the revised areas will be discussed with KDEP prior to implementation.

The excavation plan also includes removal of some sample locations below the point of exposure with arsenic concentrations above the Arsenic Background Guidance and replacement of excavated soils with clean fill.

Building demolition will take place prior to soil removal. All foundations will be removed as required to implement the EC for an industrial/commercial cleanup and property use restriction and to comply with regulatory requirements. At the request of, and following guidance provided by KDEP in an email dated April 13, 2017, soil remaining after building slabs and foundations have been removed will be characterized to a maximum depth of 2 feet below anticipated final grade as described in Section 4.1.6. This applies to buildings that do not have basements and where the soils beneath the slab were not previously characterized.

The proposed soil removal includes approximately 20,000 cubic yards over approximately 8.5 acres and building demolition over approximately 6 acres. In total, soil removal and building demolition activities will encompass approximately 14.5 acres. This area represents approximately 50% of the Site; therefore, at least half of the property will have clean backfill within the point of exposure.

The proposed soil excavation locations and depths are presented on Figure 3-1. Theissen polygons were developed to depict the approximate horizontal limits of soil associated with each soil boring. The horizontal limits of each polygon are based on the midpoint between soil borings. All excavated soil will be disposed off-site. Removal areas will be replaced with clean soil and seed or stone to match existing grade. Additional details are included in Section 4. Soil excavation areas and volumes are summarized in Table 3-1.

3.2 Arsenic Evaluation

Following the soil removal presented on Figure 3-1, the remaining soil concentrations will meet each of the criteria described in the Arsenic Background Guidance (KDEP RAS 2008). Specifically, the mean site concentration for arsenic in the top one foot will be 10.65 mg/kg (which is below the 95% UCL of the mean background concentration of 13.12 mg/kg); 50% of the data points will have arsenic concentrations less than the midpoint of 10.6 mg/kg; and no data point with arsenic concentrations above the 95th percentile of 22.7 mg/kg will remain in the top one foot. Calculations are presented in Appendix D.

3.3 Evaluation of Residual Risk below the Point of Exposure (Below the Top 1 foot)

The proposed soil removal strategy will meet KDEP criteria by removing all sample locations above the Industrial RSLs or the Arsenic Background Guidance at the point of exposure (in the top one foot of soil). Below the point of exposure (top one foot.), the post excavation residual risk was evaluated in the following manner.

All soil data below 1 foot that will not be excavated as part of the proposed corrective action plan were evaluated for use in the UCL calculations described below. For duplicate samples, the concentration for each constituent used in the UCL calculation was selected as follows: (1) if both samples reported positive detections, the higher measured analytical concentration was used in the calculation; (2) if only one result was a positive detection, that concentration was used in the calculation; (3) if both samples reported non-detections, the lower sample quantitation limit (SQL) was used as the proxy concentration. For the case of two non-detections, the lower SQL was used because higher SQLs are frequently the result of dilution of the sample and use of the higher SQL would introduce more uncertainty into the calculation. Additionally, it is not reasonable to use the higher SQL when the duplicate analysis for the sample indicated that the constituent was not present at the lower SQL. Soil data are included in Appendix C.

95% UCLs of the mean were calculated for COPCs detected at the Site consistent with the USEPA guidance (1989, 2002) as the 95% UCL of the mean assuming a one-tailed distribution. The UCL is a statistical number calculated to represent the mean concentration with a high level (e.g., 95% or higher) of confidence that the true arithmetic mean concentration for the Site will be less than the UCL. The high level of confidence is used to compensate for the uncertainty involved in representing site conditions with a finite number of samples. The UCLs were calculated using ProUCL 4.1 software (USEPA 2010). Calculations are presented in Appendix E. The UCLs recommended by the software were used in the evaluation.

The estimated post-excavation 95% UCLs were calculated by excluding the sample locations and depths shown on Table 3-1 from the data set (i.e., sample points that will be excavated). The post-excavation 95% UCLs are presented in Table 3-2 and are compared to the Industrial RSLs. As shown in Table 3-2, the calculated constituent 95% UCLs are below the Industrial RSLs for each COPC. The total post-excavation risk for the COPCs was calculated to be 8×10^{-8}, which is below the KDEP target risk level of 1×10^{-6}. Calculations are provided in Appendix E. Arsenic is not included in Table 3-2 because it is evaluated relative to background concentrations rather than based on risk.

As stated in Section 3.1, the risk calculations for soils remaining below the point of exposure (i.e., below the top 1 foot of soil) will be recalculated with the results of the actual backfill to be used onsite once approved by KDEP. If the risk calculations indicate alterations in excavation areas, the revised areas will be discussed with KDEP prior to implementation.

4 CORRECTIVE ACTION IMPLEMENTATION

The Corrective Action presented in this section has been prepared to outline the technical approach and methods for conducting a corrective action at the Site.

4.1 Technical Approach and Scope of Work

The soil corrective action consists of excavation of soils from the locations and depths depicted in Figure 3-1. Impacted soil will be disposed of off-site in accordance with all applicable regulations. Excavated soil areas will be backfilled with imported fill and restored as described in Section 4.1.10.

Storm basins and piping will be hydraulically cleaned to remove any impacted sediments that have accumulated, as described in Section 4.1.8. E&SC measures will be installed around the catch basins/manholes, and excavation areas as needed, to prevent introduction of additional sediments into the sewers or overland runoff during soil removal. Institutional controls requiring maintenance of the E&SC measures will be implemented as discussed in Section 4.1.4. The following sections describe activities in more detail.

4.1.1 Waste Disposal Facilities

Based on review of available data, removed soil and sediments from the corrective action will be disposed of as non-hazardous waste at the following Resource Conservation and Recovery Act (RCRA) Subtitle D landfill:

Waste Management – Outer Loop Landfill
2673 Outer Loop
Louisville, KY 40219
Landfill Permit No.: KY – 056.00028

Should any hazardous materials be encountered during the corrective action those materials will be disposed at the following RCRA Subtitle C landfill:

Chemical Waste Management
P.O. Box 55
Highway 17 North, Mile Marker 163
Emelle, AL 35459
205-652-8156
RCRA No.: ALD000622464

Based on the depth to groundwater at the site, no groundwater is expected to be encountered during soil removal activities. Any wastewater generated from hydraulic cleaning of catch basins/manholes or piping, or from cleaning of equipment onsite, will be characterized and properly disposed at one of the above facilities; or permitted for discharge to the local municipal sewer system.

4.1.2 Analytical Laboratory

ALS, located in Jacksonville, Florida has been selected to conduct any required sample analysis performed as part of this project.

4.1.3 Mobilization

This CAP provides a description of the overall strategy for implementation of the corrective action at the Site. Detailed plans for implementing this strategy, including the protection of workers during construction activities, will be prepared by the Removal Action Contractor (RAC). Plans prepared by the RAC will be submitted to Arcadis and the IPs for review and comment, and the final plans will be submitted to KDEP for approval prior to the start of work. These plans include a Site Operations Plan, Health and Safety Plan (HASP), Erosion and Sedimentation Control Plan, Hydraulic Cleaning Plan, and any required permit applications. Permits and assessments required to perform the work described in the CAP include a Jefferson County Air Pollution Control District (JCAPCD) permit for building demolition which will require an asbestos survey of suspect building materials with notification to JCAPCD and asbestos abatement as appropriate, based on results. A site disturbance and storm water permit through the Louisville/Jefferson County Metropolitan Sewer District (MSD) will be required as will written approval via MSD for any utility line disturbance/cleaning. The RAC will be responsible for obtaining any other permits that may be required.

4.1.4 Preparation of the Site for Soil Removal Activities

The following sections describe the activities that will be performed at the Site to prepare for the intrusive phases of the corrective action.

4.1.4.1 Installation of Erosion and Sediment Control Measures

E&SC measures (e.g., silt fence, hay bales) will be installed at the Site to prevent the migration of soil-bound contaminants to surface water drainage features during and after removal activities. The type and location of E&SC measures to be installed will be specified in the E&SC Plan. E&SC measures will be inspected regularly to monitor their continued effectiveness. Additional E&SC measures will be installed, as necessary, as the corrective action progresses and at the end of removal activities to prevent the migration of eroded soil from the Site.

Appropriate measures will be taken to minimize the volume of water accumulating in excavation areas that potentially contain soils with elevated COPC concentrations. Water that does not come into direct contact with disturbed soil will be directly discharged into the appropriate drainage feature. If water management is required, liquids will be pumped to a series of frac tanks for settling and filtering prior to discharge to the local publicly owned treatment works or a RCRA Subtitle D landfill for disposal. Solids accumulated in E&SC controls and/or frac tanks will be disposed at a RCRA Subtitle D landfill.

4.1.4.2 Subsurface Utility Mark Out

All necessary precautions will be taken to protect the various subsurface and aboveground utilities that exist at the Site from damage. A review of all available Site plans will be conducted to identify the general

location of subsurface utilities. Necessary permits and utility clearances will be obtained prior to any subsurface activities. The utility companies (and/or any private organization that is authorized by the utility companies to delineate the presence of all subsurface services) will be contacted at least 72 hours before onsite intrusive activities are started. A utility mark out will be conducted at the Site to locate all subsurface utilities (e.g., gas, sewer, water, electrical, telephone). In addition, a private utility locating contractor (or equivalent) will scan the area for the presence of subsurface utilities prior to excavation. The private utility contractor will be asked to identify the size and type of all subsurface utility lines identified within the work area. The field copy of the site plans will then be updated with the information obtained from the mark out. During the mark out, the location of aboveground utilities will also be identified. Section 4.1.6 describes the minimum requirements that will be taken to protect the utilities.

4.1.5 Clearing and Grubbing

Clearing and grubbing of the construction areas will be performed prior to or concurrent with soil excavation activities as needed. Although minimal clearing and grubbing is anticipated, the aboveground portions of any trees will either be disposed of off-site or chipped and reused on-site for the construction of haul roads and/or dust control. Portions of the vegetation in contact with the soil (e.g., stumps, roots) will be excavated with the soil and disposed of off-site.

4.1.6 Excavation of Impacted Soil

To the extent practicable, soil will be excavated and loaded directly into trucks and transported to the identified landfill. Waste characterization samples collected during prior investigation activities indicate that soils targeted for removal are non-hazardous for disposal purposes. The estimated areal dimensions, depths, and in-place volumes for each excavated area are presented in Table 3-1. Approximately 20,000 cubic yards of impacted soil across 8.5 acres will be removed. The actual horizontal limits of excavation may be modified in the field due to the presence of physical obstructions such as subsurface utilities.

Soil will generally be removed using standard construction equipment (e.g., backhoe, trackhoe) and manual shoveling. Large pieces of construction debris (e.g., chunks of concrete) found in the subsurface (greater than 1 foot below ground surface), that are larger than or equal to approximately 1 cy, will be left in place. Dry decontamination methods (e.g., brushing) will be used to remove impacted soil from the surfaces of this debris. Wet decontamination methods, such as pressure washing, may be used to remove residual soils if dry decontamination methods are not adequate. Smaller debris such as bricks will be excavated and handled with the excavated soil. Soil remaining below the subsurface debris that will be left in place is assumed to have the same concentrations as the adjacent soil and will be managed with cover thicknesses specified for former slab areas discussed at the end of this section, if long-term controls are required.

Excavation sidewalls adjacent to paved areas will be sloped to prevent undermining. At the elevation of the bottom of the pavement, excavation will be performed at least 6 inches laterally from the toe of the structure before deeper excavation continues. Additional excavation will be performed by sloping or benching the excavation adjacent to these areas at a slope no greater than a 1V:2H. No excavation will be performed within 25 feet of active railroad tracks.

Excavation within utility corridors will be conducted by hand or in accordance with utility owner specifications, whichever is more stringent. No mechanical excavation (e.g., by excavators) will take place within 2.5 feet of a marked subsurface utility. All excavation to be performed within 2.5 feet of a marked subsurface utility (except as specified above) will be performed manually. Utilities will be protected in the manner prescribed by the utility companies. The following describes the general actions that will be taken to protect the utilities:

1. Excavation of soil above and adjacent to a known utility will be performed manually in accordance with the methods, tolerances, and directions specified by the utility owner. At a minimum, all excavation above or within 2.5 feet of a marked utility will be performed manually. The use of an air spade or other similar equipment to remove soil around utilities will be discussed with utility owners on an individual basis.

2. Soil beneath any piped utilities or electric lines will be removed based on the ability to relocate the utility during excavation. Piped utilities include water lines and underground drain lines (if present). Piped utilities do not include phone lines and cable television lines. These lines are generally flexible and can be relocated within the excavation areas as work progresses.

3. If piped utilities are to be left in place during excavation, a soil shelf equal to the width of the pipe, plus a minimum of 6 inches on each side of the pipe will be left in place beneath the exposed piped utility for support. Soil beneath the piped utilities will then be sloped from the top edge of the shelf to the bottom of the excavation at a slope no greater than 1V:2H.

At the request of, and following guidance provided by KDEP in an email dated April 13, 2017, soil remaining after building slabs and foundations have been removed will be characterized to a maximum depth of 2 feet below final grade elevation. This applies to buildings that do not have basements and where the soils beneath the slab were not previously characterized. Two samples will be taken per building, except for the former pesticide manufacturing building where two samples will be taken per exterior wall and four interior footprint samples will be taken closer to the building centerline. As noted, buildings with basements will not be further characterized due to the thickness of material required to fill the void which will meet all cover requirements. Confirmation soil results will be compared to 10 times the Industrial RSLs and 3 times the Arsenic Background Guidance of 22.7 mg/kg. If soil results exceed the criteria, KDEP will be notified and either additional soil will be removed to a maximum depth of 2 feet below final grade surface and replaced with clean fill or up to 2 feet of clean soil fill will be placed on top of the area.

Measures will be taken to control dust produced by demolition, excavation, backfilling, loading, and other work-area activities. Dust will be controlled based on visual observations and the results of airborne particulate monitoring. A Dust Control Plan will be developed to address the safety of the workers and nearby residents. Appropriate dust-control measures include spraying equipment and building and excavation faces with a fine water mist. A supply of water and means of dispersion (e.g., a water tank and sprayer) will be maintained on-site for immediate dust control, if necessary. The Dust Control Plan will identify methods for dust control and provisions for work stoppage based on the appropriate action levels. Air monitoring will include perimeter monitoring to ensure adequate controls are in place. This plan will be submitted to KDEP for review and approval prior to beginning work activities.

4.1.7 Surveying

All excavation areas will be surveyed prior to and after backfilling for horizontal and vertical control and base of excavations will be surveyed to verify excavation depths. All survey data will be referenced to the North American Horizontal Datum of 1983 and the North American Vertical Datum of 1988.

4.1.8 Hydraulic Cleaning and Stormwater Management

4.1.8.1 Hydraulic Cleaning

Hydraulic cleaning of specific portions of the on-site surface water drainage system, catch basins, and sewer lines will be performed to facilitate removal of impacted sediments. Hydraulic cleaning will be performed in any basin or manhole where sediment samples had one or more COPC detected at concentrations above the Industrial RSLs or Arsenic Background Guidance. Hydraulic cleaning will typically include the basin/manhole and downgradient sewer lines to the next downgradient manhole, if possible. If physical obstructions in pipes prevent the advancement of cleaning equipment, cleaning will be conducted as far as possible down the given pipeline. Figure 2-3 shows the basins/manholes and pipe segments to be cleaned to the extent possible based on accessibility of pipe segments. Cleaning will be performed to the first downgradient manhole offsite and upgradient to the manholes with sediment impacts identified. Access will be coordinated with the City of Louisville Metropolitan Sewer District for offsite manholes where access and cleaning is to be performed.

The RAC shall be responsible for preparing a Hydraulic Cleaning Plan for review by Arcadis and the IPs prior to the start of the work that will define the methods of pipe cleaning. This plan will be provided to KDEP for review and approval prior to the start of work. The plan will include means and methods to complete the work including details such as coordination with Louisville MSD, measures to be taken to not damage existing infrastructure, and origin, capture method and location, treatment, and disposal of the water and sediments removed. Cleaning shall generally be performed as follows:

- Prior to the commencement of hydraulic cleaning, bypass pumping of dry weather flow will be established around the section of drainage system being cleaned. Alternatively, if capacity of the upstream sewer allows and flow is such that surcharge conditions will not cause issues, the upstream pipe will be plugged temporarily to facilitate cleaning of the line. Cleaning activities will not be conducted during rain events to minimize the amount of water requiring bypass. If bypass pumps are required, they (along with hoses) shall be watertight and free of leaks. Self-priming trash pumps or a submersible pump set in a sump established by sandbags are anticipated to be utilized. Pumps will either be self-powered (i.e., diesel or gasoline) or electric, with power supplied by a portable generator.

- Prior to commencement of hydraulic cleaning, the section of the drainage system to be cleaned will be isolated using appropriately sized sewer plugs and/or sand bags. These plugs will assure that flow from upstream is effectively eliminated from the section being cleaned and water used during flushing of the section is captured and removed from the drain and is not allowed to travel downstream. All water and debris generated during cleaning will be removed using a vacuum truck.

- Hydraulic cleaning of each storm drain section will be performed using a water jet / vacuum sewer cleaning truck. The truck shall be self-contained and utilize a low pressure / high volume water spray along with an integral vacuum. The unit operates by utilizing low pressure / high volume water produced by a pump located on the truck to propel a nozzle with rear thrust jets connected to a lightweight hose. The jets propel the hose up the pipe to be cleaned. When the hose is retracted, the jets flush solids within the pipe back to the manhole where the vacuum recovery system is employed to vacuum up the debris and rinse water and store it within the collector body of the truck for transport to the debris staging / water treatment area. No chemicals will be used for cleaning activities.

- Solids accumulated in the body of the truck will be transferred to a lined containment pad or into rolloff containers where the materials can be stabilized if required or mixed with drier solids for disposal at a RCRA Subtitle D landfill. Liquids will be pumped to a series of frac tanks for settling and filtering prior to discharge to the local publicly owned treatment works or a RCRA Subtitle D landfill for disposal.

- In addition to storm drain pipe sections, each manhole and catch basin associated with the storm drain pipe section being cleaned will also be pressure washed. This will be accomplished using the hand-held pressure washing wand, which is integral to the jetter / vacuum truck.

Following the completion of hydraulic cleaning activities, a post-cleaning video inspection will be performed to the extent possible to confirm accumulated sediments have been removed from the proposed cleaning locations.

4.1.8.2 Post-Removal Stormwater Controls

Following hydraulic cleaning, E&SC measures will be installed around catch basins and manholes, and along preferential drainage pathways onsite that have the potential to receive runoff. E&SC measures may include, but are not limited to seeding to ensure proper vegetative cover of soil areas; and installation of silt fence, gravel berms/check dams, hay bales/waddles, etc. An E&SC measures inspection and maintenance program will be developed as part of the post-remediation monitoring program to ensure proper care and maintenance of the measures. Institutional controls requiring maintenance of the E&SC measures will be implemented as discussed in Section 4.3.

4.1.9 Transport to Disposal Facility

All waste streams will be characterized before disposal, as required by applicable federal, state, and local laws, rules, and regulations, as well as any additional requirements imposed by the receiving landfill or disposal facility. Based on previous waste characterization, it is anticipated that soil, sediment, and demolition debris will be transported to a RCRA Subtitle D landfill for disposal. Wastewaters will either be transported to a RCRA Subtitle D landfill for disposal or permitted for discharge to the local municipal sewer. The RAC will be responsible for coordinating and scheduling the transport vehicles and loading the materials.

Excavated soil and dewatered sediments will be loaded into dump trucks for transport to the disposal facility. Wastewater to be transported offsite will be pumped into tanker trucks for transport to the disposal facility. Traffic patterns will be established in the Traffic Control Plan to minimize or prevent trucks that are hauling soil offsite from traversing bare soil in impacted areas. Trucks that traverse areas containing impacted soils will be decontaminated prior to exiting the impacted areas. Decontamination procedures will be described in the RAC's Site Operations Plan.

All containers used for the offsite transport of solid materials will be covered with tarps prior to offsite transport. The RAC will be responsible for verifying that all transportation containers are tarped, manifested, and placarded in accordance with appropriate RCRA and Department of Transportation (DOT) requirements before leaving the Site.

The weight of the transportation containers prior to departure from the Site will be within its allowable loaded capacity for subsequent transport and in compliance with all DOT regulations. A daily log of information that includes the date and time, container identification number, and measured weight of each loaded transportation container to have departed the Site will be compiled.

4.1.10 Site Restoration

Upon completion of the excavation activities, the Site will be restored to conditions that are as close as reasonably possible to pre-excavation conditions, or otherwise in a manner that is acceptable to the IPs and the property owner. Repairs will be made to any fences, hard features, etc. in the event of accidental contact/damage during the corrective action activities.

In general, excavation in vegetated areas will be backfilled and compacted within approximately 6 inches of existing grade. The remaining 6 inches will be backfilled with topsoil to support vegetation or ground cover and seeded with grass or covered with gravel. Excavation areas may also be backfilled with concrete or brick demolition debris if these materials are deemed to be suitable. The fill materials proposed by the RAC (soil or concrete/brick demolition debris) for site restoration will be analyzed for pH, grain size, total organic carbon, Target Analyte List metals, Target Compound List volatile organic compounds and semi-volatile organic compounds, pesticides, and polychlorinated biphenyls. Sample analytical results for proposed backfill material will be compared to residential and industrial RSLs or, for arsenic, applicable background concentrations, and submitted to KDEP for review and approval prior to use.

4.2 Reporting

4.2.1 Monthly Reports

Brief written progress reports that describe actions taken will be submitted to KDEP monthly. Each report will:

- Describe all significant developments of the preceding period, including actions performed and any problems encountered;

- Describe developments anticipated during the next reporting period, including anticipated problems (if necessary) and a schedule of work to be performed; and
- Discuss planned resolutions of past and/or anticipated future problems, if necessary.

4.2.2 Corrective Action Completion Report

A Corrective Action Completion Report summarizing the actions taken at the Site will be submitted to KDEP for review and approval within 90 days of completion of the soil and sediment remediation activities described herein and following receipt of the final survey. The report will conform, at a minimum, with the requirements of 401 Kentucky Administrative Regulation (KAR) 100:030, Section 9 ("Corrective Action Completion Report") and will include the following:

- Documentation of the completion of all activities specified in this CAP;
- Documentation of any modifications from this CAP;
- A listing of the quantities and types of materials removed from the Site;
- Discussion of the removal and disposal options considered for removed materials;
- A listing of the ultimate destinations of all removed materials;
- A presentation of the analytical results of all sampling and analyses performed; and
- Appendices containing all relevant documentation generated during the corrective action (e.g., manifests, permits).

The final report will also include a certification statement as required by 401 KAR 100:030 Section 9(2)(d).

4.3 Institutional Controls

Institutional controls will be implemented for the Site to limit future use to those consistent with continued industrial and commercial operations. An EC, conforming to the requirements of KRS 224.80 and restricting the Site to industrial/commercial use, will be circulated for execution, a public notice will be published, and the EC will be filed with the Jefferson County Clerk's Office. The EC will be used in conjunction with the PMP that was approved by KDEP to ensure compliance with the restrictions based on a management in place closure.

The Site will be enrolled in a long-term inspection and maintenance program that will be carried out by the property owner or authorized representative to confirm the Site remains zoned for non-residential use. As required for management in place closures, the Site will also comply with requirements for annual and five-year inspections and certifications while the institutional controls are required to meet established risk criteria.

4.4 Schedule

Below is an anticipated schedule of activities outlined in the CAP:

Prepare Demolition Bid Specifications/ Select RAC/ Prepare RAC Submittals	December 2017 – April 2018
Conduct Building Demolition	May – November 2018
Prepare Soil Removal Bid Specifications/ Select RAC/ Prepare RAC Submittals	August – December 2018
Conduct Soil Removal	January – May 2019
Prepare/Submit Final Corrective Action Completion Report	June – August 2019
Implement the EC/PMP	2019

5 REFERENCES

Arcadis. 2013. Site Characterization Plan, Former Black Leaf Chemical Site, Louisville, Kentucky. Revised February 2014 and May 2014.

Arcadis. 2014. Erosion and Sediment Control Plan, Former Black Leaf Chemical Site, 1391 Dixie Highway, Louisville, Kentucky – Jefferson County. AI#52202. December 2014.

Arcadis. 2015. Site Characterization Report, Former Black Leaf Chemical Site, Louisville, Kentucky. February 2015, revised May 2015. Addendum issued in August 2015.

KDEP RAS. 2008. Memorandum from Jerri Martin to Mark Strevels on Review of the Evaluation of Arsenic Background in Kentucky and Recommendation for Cleanup Levels for Residential Properties Adjacent to Kentucky Wood Preserving. Risk Assessment Section. April 7, 2008.

Linebach Funkhouser. 2017. Property Management Plan, Former Black Leaf Chemical Site, 1391 Dixie Highway, Louisville, Kentucky. Prepared for FCBKy Holding, LLC. February 10, 2017.

NREPC. 2004. Kentucky Guidance for Ambient Background Assessment. Natural Resources and Environmental Protection Cabinet. January 8, 2004.

USEPA. 1989. Risk Assessment Guidance for Superfund, Human Health Evaluation Manual, Volume 1, Part A. Interim Final. Office of Emergency and Remedial Response, Washington, DC. EPA/540/1-89/002. December.

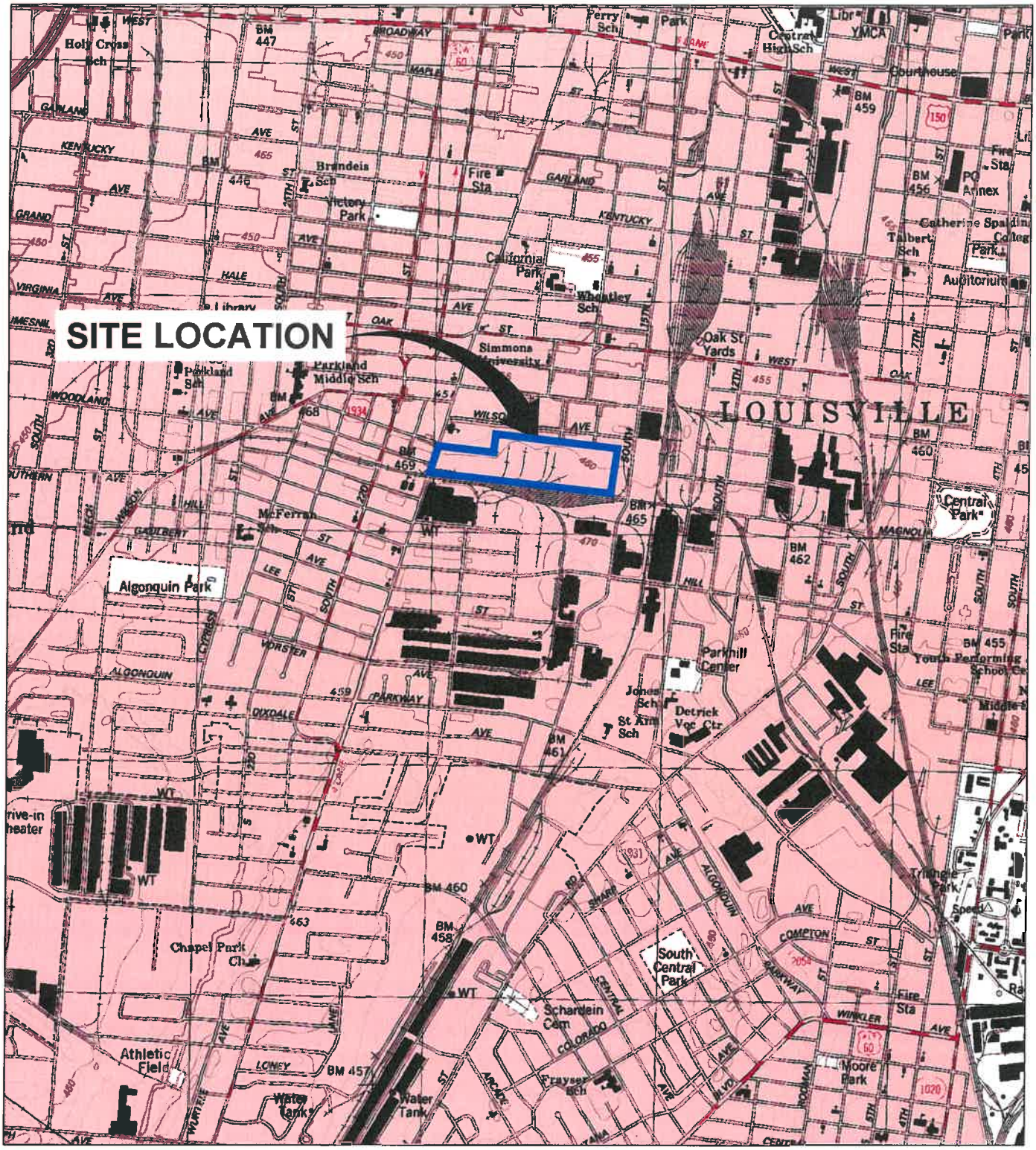
USEPA. 2002. Calculating Upper Confidence Limits for Exposure Point concentrations at Hazardous Waste Sites. OSWER 9285-6-10. December.

USEPA. 2010. ProUCL Statistical Support Software for Site Investigation and Evaluation, ProUCL Version 4.1.00. Office of Research and Development, EPA Site Characterization and Monitoring Technical Support Center. 19 September. Available at: http://www2.epa.gov/land-research/proucl-software

USEPA. 2017. Regional Screening Level Table. Available at: https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables-november-2017

TABLES

FIGURES



REFERENCE: BASE MAP USGS 7.5. MIN. TOPO. QUAD., LOUISVILLE WEST, KY-IN, 1998.

0 2000' 4000'

Approximate Scale: 1 in. = 2000 ft.

FORMER BLACK LEAF CHEMICAL SITE
LOUISVILLE, KENTUCKY
CORRECTIVE ACTION PLAN

SITE LOCATION MAP

ARCADIS Design & Consultancy for natural and built assets

FIGURE
1-1

CITY: SYRACUSE, NY DIV/GROUP: EBC-IM/DV DB/LD: L.POSENAUER PM/TM: M.PELTON LYR:(Opt)ON=*;OFF=*REF*
G:\ENV\CAD\SYRACUSE\ACTIVE\60086908\150100008\CAP\B5908N11.dwg LAYOUT: 1-1 SAVED: 11/20/2015 2:28 PM ACADVER: 19.1S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: PLTFULL.CTB PLOTTED: 12/16/2015 9:17 AM BY: POSENAUER, LISA
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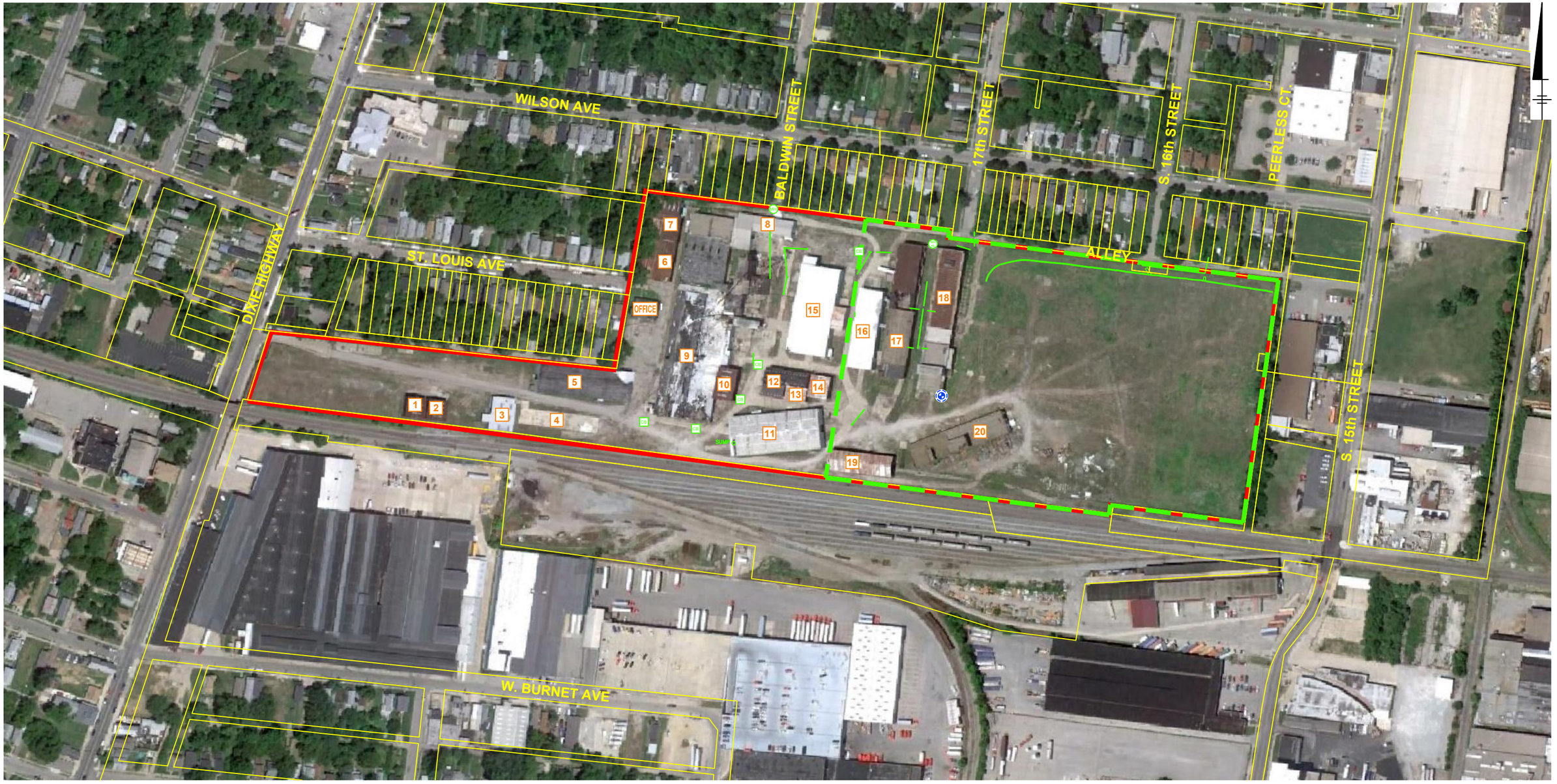

LEGEND:

- FORMER SCHENLEY DISTILLERS SITE/CURRENT LOUISVILLE INDUSTRIAL PARK, LLC PROPERTY
- APPROXIMATE BOUNDARY OF THE FORMER BLACK LEAF CHEMICAL SITE
- CURRENT TAX PARCEL BOUNDARY
- HISTORICAL RAILROAD SPUR
- FORMER WELL
- 1 BUILDING ID
- DL DRAIN LINES MAPPED BY VIDEO INSPECTION
- VISIBLE DRAIN LINE NOT MAPPED BY VIDEO DUE TO BLOCKAGE
- MH MANHOLES
- CB CATCH BASINS

NOTES:

1. AERIAL PHOTOGRAPH FROM GOOGLE EARTH (2010).
2. PARCEL BOUNDARIES PROVIDED BY THE LOUISVILLE/JEFFERSON COUNTY INFORMATION CONSORTIUM (LOJIC). THEY ARE CURRENT AS OF JANUARY 2012.
3. ALL LOCATIONS ARE APPROXIMATE.
4. SITE DRAINAGE FEATURES SURVEYED BY CARDINAL SURVEYORS IN AUGUST – OCTOBER 2014.

0 250’ 500’

GRAPHIC SCALE

FORMER BLACK LEAF CHEMICAL SITE
LOUISVILLE, KENTUCKY
CORRECTIVE ACTION PLAN

SITE PLAN AND CURRENT SITE FEATURES

ARCADIS Design & Consultancy for natural and built assets

FIGURE
1-2

CITY: SYRACUSE, NY DIV/GROUP: EBC-M/DV DB/LD: L.POSENAUER PM/TM: M.PELTON LYR:(Opt)ON=*;OFF=*REF*
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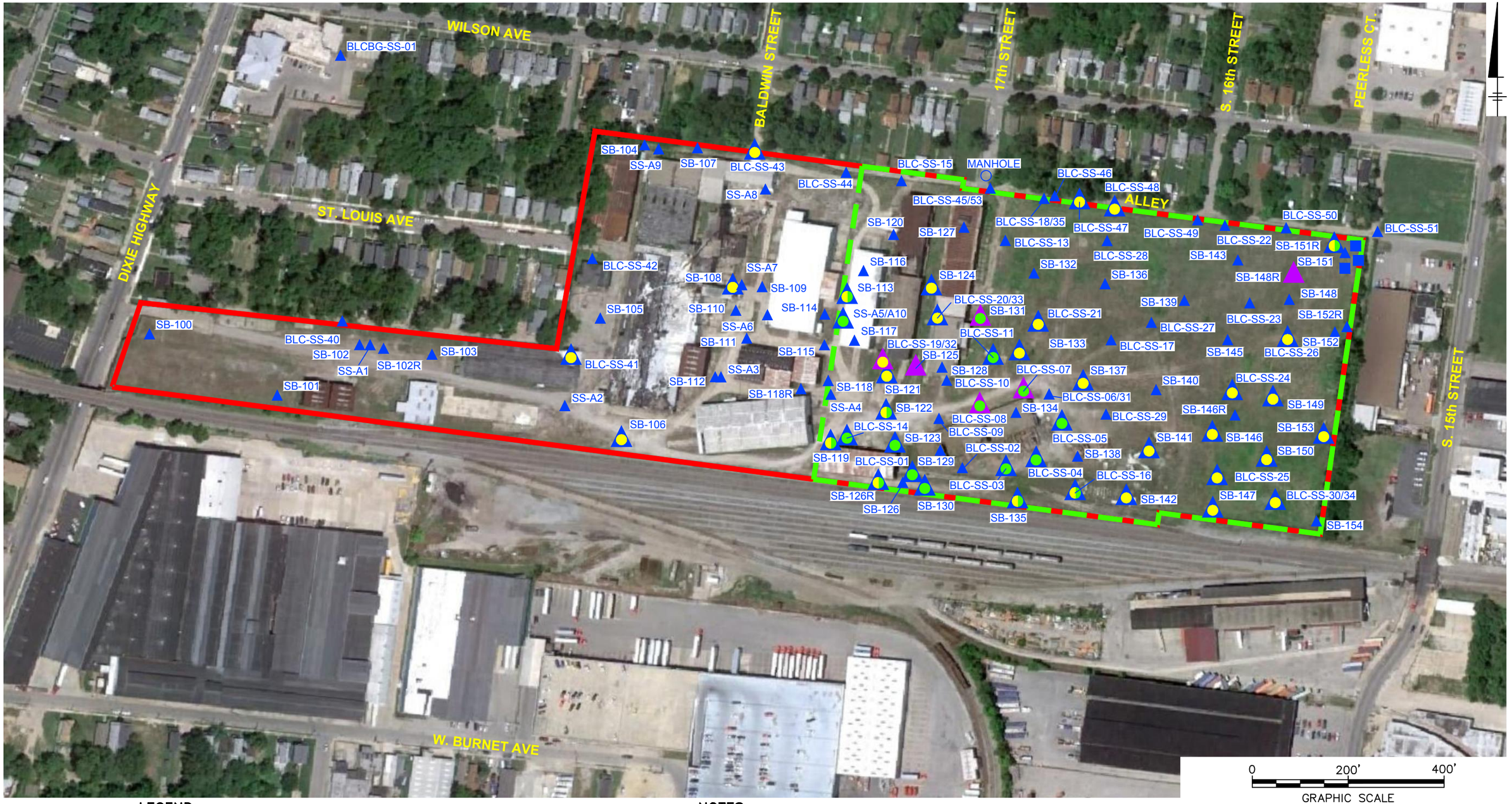
85908XBL



0 200' 400'

GRAPHIC SCALE

LEGEND:

- FORMER SCHENLEY DISTILLERS SITE/CURRENT LOUISVILLE INDUSTRIAL PARK, LLC PROPERTY
- APPROXIMATE BOUNDARY OF THE FORMER BLACK LEAF CHEMICAL PROPERTY
- SOIL SAMPLE LOCATION WITH NO COPCs ABOVE RSLs
- SOIL SAMPLE LOCATION ANALYZED FOR ONLY LEAD
- EXCEEDS THE KENTUCKY BLUEGRASS REGIONAL BACKGROUND SOIL CONCENTRATION FOR ARSENIC (>22.7 MG/KG)
- EXCEEDS POLYCYCLIC AROMATIC HYDROCARBON (PAH) RSL
- EXCEEDS PESTICIDE RSL

NOTES:

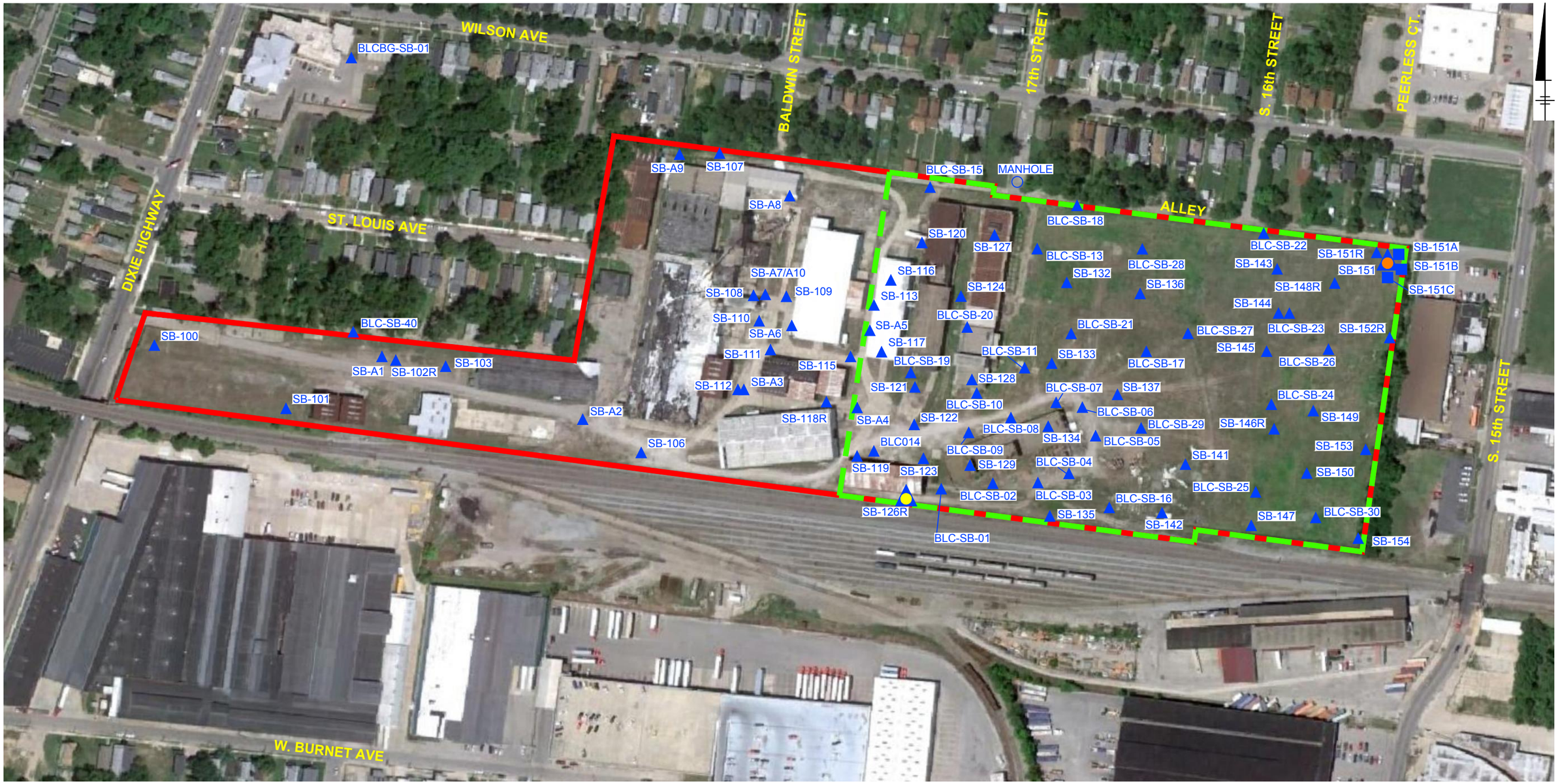
1. AERIAL PHOTOGRAPH FROM GOOGLE EARTH (2010).
2. SITE FEATURES AND SAMPLE LOCATIONS SURVEYED BY CARDINAL SURVEYORS IN AUGUST – OCTOBER 2014.
3. RSL – USEPA INDUSTRIAL REGIONAL SCREENING LEVEL (JUNE 2017).
4. MG/KG – MILLIGRAMS PER KILOGRAM
5. ARCADIS SOIL BORINGS COLLECTED IN SEPTEMBER 2014 BEGIN WITH BORING NUMBER SB–100. ARCADIS SOIL BORINGS ARE DISPLAYED ON DATA TABLES WITH PREFIX "BL–".

FORMER BLACK LEAF CHEMICAL SITE
LOUISVILLE, KENTUCKY
CORRECTIVE ACTION PLAN

LOCATIONS OF SOIL BORINGS WITH SAMPLES THAT EXCEED RSLs FOR INDUSTRIAL USE IN THE TOP 2 FEET

ARCADIS Design & Consultancy for natural and built assets

FIGURE
2-1



LEGEND:

- FORMER SCHENLEY DISTILLERS SITE/CURRENT LOUISVILLE INDUSTRIAL PARK, LLC PROPERTY
- APPROXIMATE BOUNDARY OF THE FORMER BLACK LEAF CHEMICAL PROPERTY
- SOIL SAMPLE LOCATION WITH NO COPCs ABOVE RSLs
- SOIL SAMPLE LOCATION ANALYZED FOR ONLY LEAD
- EXCEEDS THE KENTUCKY BLUEGRASS REGIONAL BACKGROUND SOIL CONCENTRATION FOR ARSENIC (>22.7 MG/KG)
- EXCEEDS PESTICIDE RSL
- EXCEEDS LEAD RSL*
- * REFER TO THE TEXT FOR A DISCUSSION OF SAMPLE LOCATION BL–SB–151

NOTES:

1. AERIAL PHOTOGRAPH FROM GOOGLE EARTH (2010).
2. SITE FEATURES AND SAMPLE LOCATIONS SURVEYED BY CARDINAL SURVEYORS IN AUGUST – OCTOBER 2014.
3. RSL – USEPA INDUSTRIAL REGIONAL SCREENING LEVEL (JUNE 2017).
4. MG/KG – MILLIGRAMS PER KILOGRAM
5. ARCADIS SOIL BORINGS COLLECTED IN SEPTEMBER 2014 BEGIN WITH BORING NUMBER SB–100. ARCADIS SOIL BORINGS ARE DISPLAYED ON DATA TABLES WITH PREFIX "BL–".
6. SUBSURFACE SAMPLES WERE ONLY ANALYZED FOR THE SPECIFIC CONSTITUENTS WHICH EXCEEDED RESIDENTIAL CRITERIA IN THE 0–2' INTERVAL.

0 200' 400'

GRAPHIC SCALE

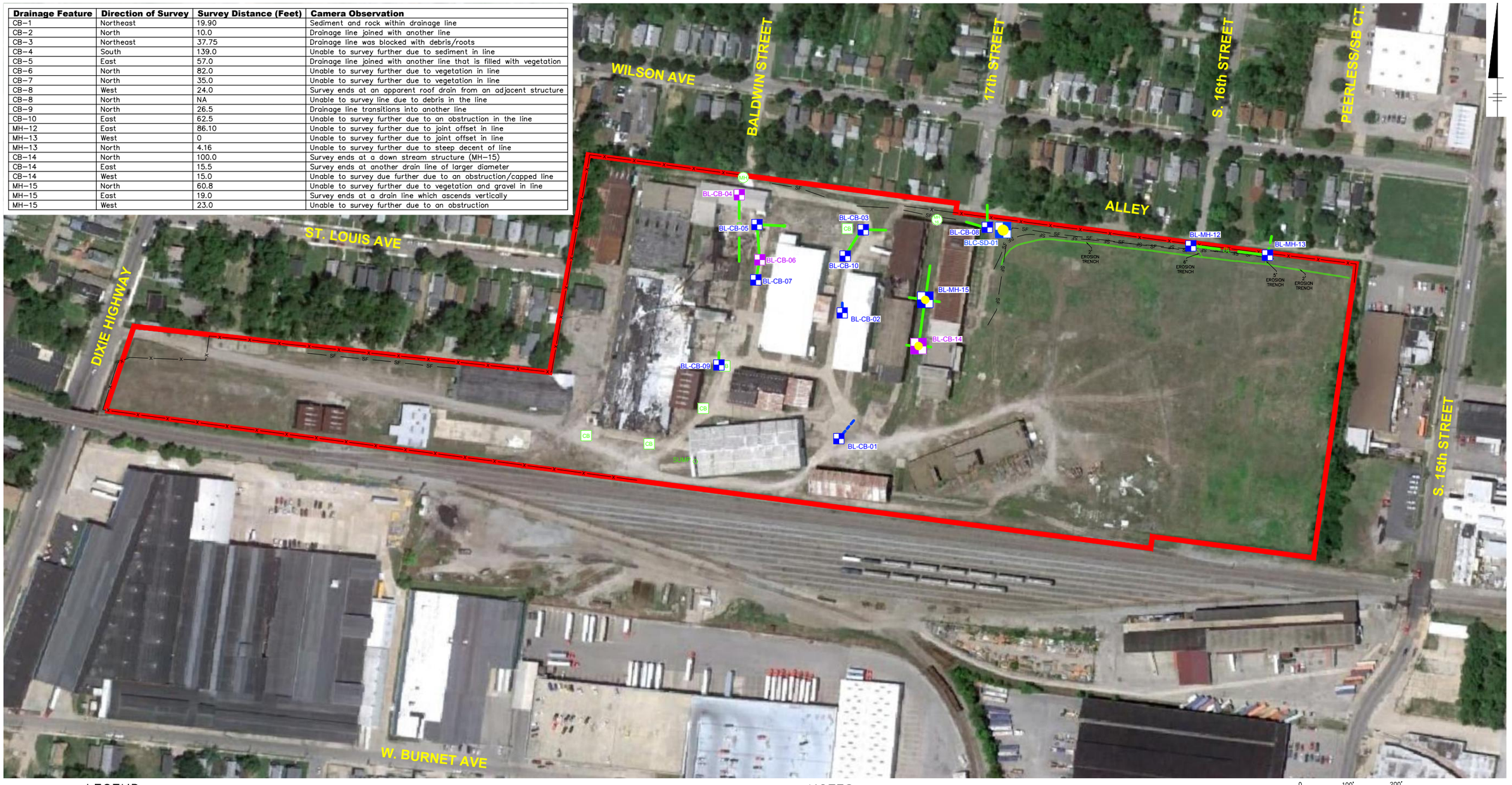
FORMER BLACK LEAF CHEMICAL SITE
LOUISVILLE, KENTUCKY
CORRECTIVE ACTION PLAN

LOCATIONS OF SOIL BORINGS WITH SAMPLES THAT EXCEED RSLs FOR INDUSTRIAL USE BELOW 2 FEET

ARCADIS Design & Consultancy for natural and built assets

FIGURE
2-2

Drainage Feature	Direction of Survey	Survey Distance (Feet)	Camera Observation
CB–1	Northeast	19.90	Sediment and rock within drainage line
CB–2	North	10.0	Drainage line joined with another line
CB–3	Northeast	37.75	Drainage line was blocked with debris/roots
CB–4	South	139.0	Unable to survey further due to sediment in line
CB–5	East	57.0	Drainage line joined with another line that is filled with vegetation
CB–6	North	82.0	Unable to survey further due to vegetation in line
CB–7	North	35.0	Unable to survey further due to vegetation in line
CB–8	West	24.0	Survey ends at an apparent roof drain from an adjacent structure
CB–8	North	NA	Unable to survey line due to debris in the line
CB–9	North	26.5	Drainage line transitions into another line
CB–10	East	62.5	Unable to survey further due to an obstruction in the line
MH–12	East	86.10	Unable to survey further due to joint offset in line
MH–13	West	0	Unable to survey further due to joint offset in line
MH–13	North	4.16	Unable to survey further due to steep decent of line
CB–14	North	100.0	Survey ends at a down stream structure (MH–15)
CB–14	East	15.5	Survey ends at another drain line of larger diameter
CB–14	West	15.0	Unable to survey due further due to an obstruction/capped line
MH–15	North	60.8	Unable to survey further due to vegetation and gravel in line
MH–15	East	19.0	Survey ends at a drain line which ascends vertically
MH–15	West	23.0	Unable to survey further due to an obstruction



LEGEND:

- FORMER SCHENLEY DISTILLERS SITE/CURRENT LOUISVILLE INDUSTRIAL PARK, LLC PROPERTY
- PROPERTY FENCE LINE
- MANHOLE/CATCH BASIN AND PIPE SEGMENT TO BE HYDRAULICALLY CLEANED
- DRAIN LINE MAPPED BY VIDEO INSPECTION
- SILT FENCE
- MANHOLE
- CATCHBASIN
- SEDIMENT SAMPLE LOCATION
- EXCEEDS THE KENTUCKY BLUEGRASS REGIONAL BACKGROUND SOIL CONCENTRATION FOR ARSENIC (>22.7 MG/KG)
- EXCEEDS POLYCYCLIC AROMATIC HYDROCARBON (PAH) RSL
- EXCEEDS PESTICIDE RSL
- EXCEEDS LEAD RSL

NOTES:

1. AERIAL PHOTOGRAPH FROM GOOGLE EARTH (2010).
2. SITE DRAINAGE FEATURES SURVEYED BY CARDINAL SURVEYORS IN AUGUST – OCTOBER 2014.
3. DRAINAGE FEATURES INSPECTED BY BLOOD HOUND INC. USING A PUSH–PULL OR ROBOTIC CAMERA SYSTEMS IN AUGUST/SEPTEMBER 2014.
4. RSL – USEPA INDUSTRIAL REGIONAL SCREENING LEVEL (NOVEMBER 2015).
5. MG/KG – MILLIGRAMS PER KILOGRAM

0 100' 200'
GRAPHIC SCALE

FORMER BLACK LEAF CHEMICAL SITE
LOUISVILLE, KENTUCKY
CORRECTIVE ACTION PLAN

SITE DRAINAGE FEATURES WITH SEDIMENT SAMPLES THAT EXCEED RSLs FOR INDUSTRIAL USE

ARCADIS Design & Consultancy for natural and built assets

FIGURE
2-3

CITY: SYRACUSE, NY DW/GROUP: EBC-IM/DV DB/LD: L.POSENAUER PM/TM: M.PELTON LYR:(Opt)ON=*;OFF=*REF*
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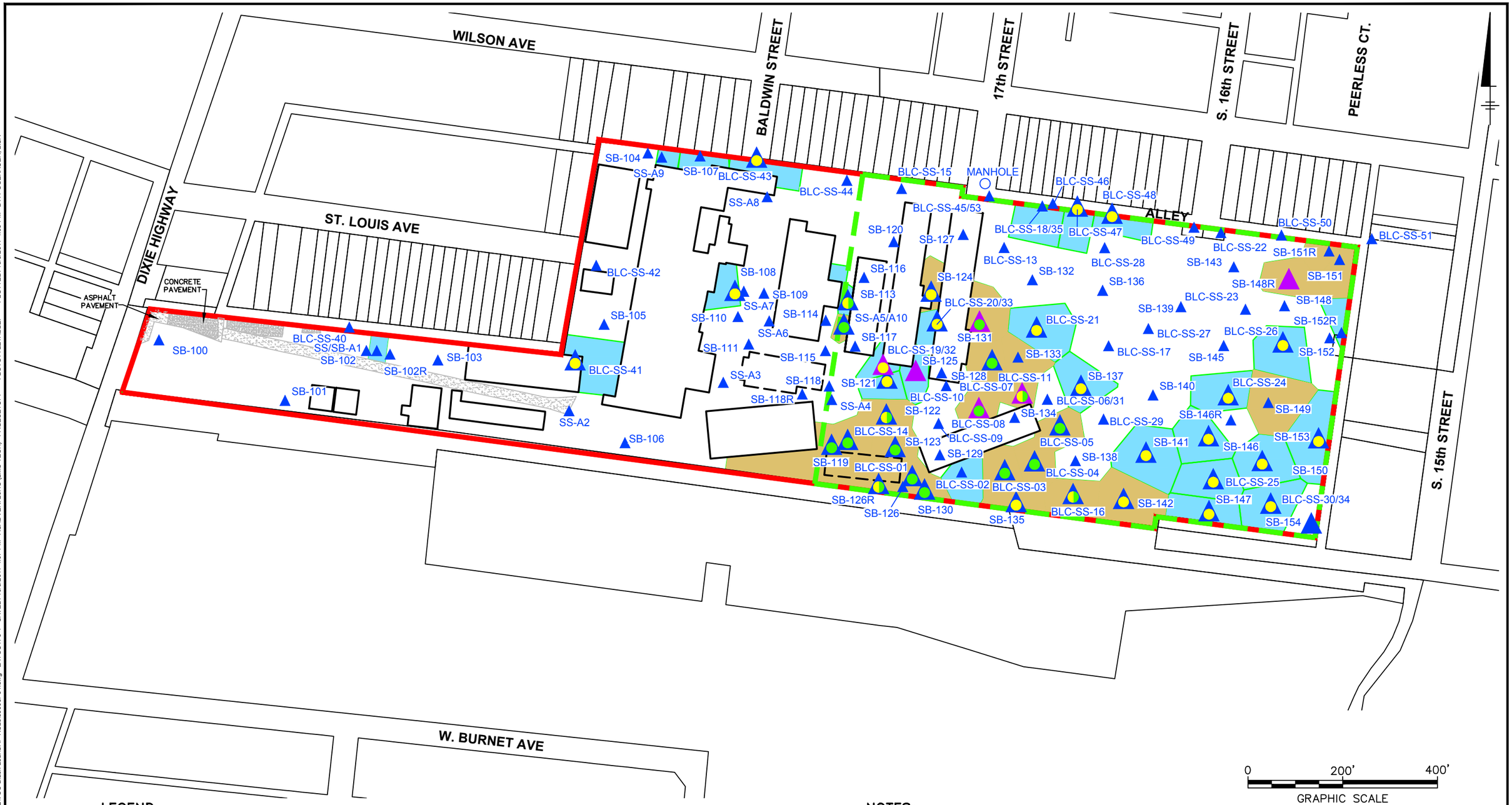

LEGEND:

- FORMER SCHENLEY DISTILLERS SITE/CURRENT LOUISVILLE INDUSTRIAL PARK, LLC PROPERTY
- APPROXIMATE BOUNDARY OF THE FORMER BLACK LEAF CHEMICAL PROPERTY
- BUILDING WITHOUT A SLAB
- SOIL SAMPLE LOCATION
- EXCEEDS THE KENTUCKY BLUEGRASS REGIONAL BACKGROUND SOIL CONCENTRATION FOR ARSENIC (>22.7 MG/KG) IN SOIL 0–1'
- EXCEEDS POLYCYCLIC AROMATIC HYDROCARBON (PAH) KDEP ACTION LEVEL IN SOIL 0–1'
- EXCEEDS PESTICIDE RSL IN SOIL 0–1'
- 1 FOOT EXCAVATION DEPTH
- 2 FOOT EXCAVATION DEPTH

NOTES:

1. SITE FEATURES AND SAMPLE LOCATIONS SURVEYED BY CARDINAL SURVEYORS IN AUGUST – OCTOBER 2014.
2. RSL – USEPA REGIONAL SCREENING LEVEL (JUNE 2017).
3. MG/KG – MILLIGRAMS PER KILOGRAM
4. ARCADIS SOIL BORINGS COLLECTED IN SEPTEMBER 2014 BEGIN WITH BORING NUMBER SB–100. ARCADIS SOIL BORINGS ARE DISPLAYED ON DATA TABLES WITH PREFIX "BL–".

0 200' 400'

GRAPHIC SCALE

FORMER BLACK LEAF CHEMICAL SITE
LOUISVILLE, KENTUCKY
CORRECTIVE ACTION PLAN

REVISED SOIL EXCAVATION AREAS

ARCADIS Design & Consultancy for natural and built assets

FIGURE
3-1

CITY: SYRACUSE, NY DIV/GROUP: EBC-IM/DV DB/LD: L.POSENAUER PM/TM: M.PELTON LYR:(Opt)ON=*;OFF=*REF*
C:\ENV\CAD\SYRACUSE\ACT\B0085908\171000002\VCC-Black Leaf\CAP-RSL\85908P31.dwg LAYOUT: 3-1 SAVED: 10/3/2017 4:07 PM ACADVER: 20.1S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: ---- PLOTTED: 10/3/2017 4:08 PM BY: POSENAUER, LISA
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IMAGES:
85908XBL

APPENDIX A

Draft Environmental Covenant

ENVIRONMENTAL COVENANT

FCBKy Holding, LLC (hereinafter "Grantor"), grants an Environmental Covenant (hereinafter "Covenant") this _____ day of _____, 2018 to the following Holders pursuant to KRS Chapter 224 Subchapter 80: **ExxonMobil Oil Corporation, Occidental Chemical Corporation, and Greif, Inc.** (hereinafter, collectively or individually as applicable, the "Grantees").

WHEREAS, Grantor is the owner of certain real property located at 1391 Dixie Highway, Louisville, Jefferson County, Kentucky (hereinafter the "Property") and as more particularly described in Deed Book 11007Page 445 of the Jefferson County Clerk's office as follows:

WHEREAS, this instrument is an Environmental Covenant developed and executed pursuant to KRS 224.80-100 to KRS 224.80-210;

WHEREAS, Arsenic, certain PAHs and pesticide compounds have been detected in soils on and beneath the Property, as more specifically detailed in the reports available from the Custodian of Records referenced below;

WHEREAS, Grantees have proposed a Corrective Action Plan (hereinafter the "CAP") to correct the effects of the release which includes controlling exposure to the hazardous substances, pollutants, or contaminants by restricting the use of the Property and the activities on the Property;

WHEREAS, Grantor has developed a Property Management Plan for the Property (the "PMP"), which was approved by the Division of Waste Management pursuant to KRS 224.01-415;

WHEREAS, concentrations of _____will remain in the soils on the Property after implementation of the CAP at concentrations that are compliant with industrial/commercial use as established by the Commonwealth of Kentucky; 401 KAR 100:30 ;

WHEREAS, the purpose of this Covenant is to ensure protection of human health and the environment by placing restrictions on the Property to reduce the risk to human health to below the target risk levels for those hazardous substances, pollutants, or contaminants that remain on the Property. In particular, prohibiting the use of groundwater on the Property for potable use, and prohibiting residential uses on the Property will eliminate exposure to those hazardous wastes, hazardous constituents, substances, pollutants or contaminants;

WHEREAS, further information concerning the release and the activities to correct the effects of the release may be obtained by contacting the Custodian of Records of the Kentucky Division of Waste Management at 300 Sower Boulevard, Frankfort, Kentucky 40601. Records concerning this Property may be found under AI #52202; and

NOW, **THEREFORE**, Grantor hereby grants this Environmental Covenant to the Grantees, and declares that the Property shall hereinafter be bound by, held, sold, used, improved, occupied, leased, hypothecated, encumbered, and/or conveyed subject to the following requirements set forth in Paragraphs 1 through 3 below:

1. DEFINITIONS

A. Owner. "Owner" means **FCBKy Holding, LLC**, its successors, assigns and heirs in interest.

B. Holders. "Holders" means Grantees .

C. Residential Use. "Residential Use" means any residential use as defined in 401 KAR 100:30 and includes but is not limited to single family or multi-family residences; child or adult care facilities; nursing home or assisted living facilities, any form of temporary housing, and any type of educational purpose for children/young adults in grades kindergarten through twelfth grade.

2. USE RESTRICTIONS

A. Prohibited Uses. The Property shall not be used for any of the following purposes:

i. No Residential Use of the Property shall be permitted.

B. Prohibited Activities.

i. Groundwater at the Property shall not be used for drinking or for any purpose other than in connection with remediation of the Property; and

ii. Except as necessary to protect human health, safety or the environment and to implement and maintain the CAP, no action shall be taken, allowed, suffered, or omitted on the Property if such action or omission is reasonably likely to:

a. Create a risk of migration of hazardous substances, pollutants or contaminants or a potential hazard to human health or the environment; or

b. Result in a disturbance of the structural integrity of any engineering controls designed or utilized at the Property to contain hazardous substances, pollutants or contaminants or limit human exposure to hazardous substances, pollutants or contaminants;

iii. Soil Disturbances. Soil at the Property shall not be disturbed in any manner inconsistent with the approved management plan

without the Owner obtaining prior approval of the Director, Kentucky Division of Waste Management. In no event shall Grantees be liable or responsible for any such soil disturbances or resulting necessary response activity that are inconsistent with the approved management plan.

iv. Construction. No building shall be constructed on the Property without the Owner providing notice to and obtaining the approval of the Director, Kentucky Division of Waste Management.

3. GENERAL PROVISIONS

A. Restrictions to Run with the Land. This Environmental Covenant runs with the land pursuant to KRS 224.80-140; is perpetual unless modified or terminated pursuant to the terms of this Covenant; is imposed upon the entire Property; and inures to the benefit of and passes with each and every portion of the Property; and binds the Owner, the Grantees, all persons using the land, all persons, their heirs, successors and assigns having any right, title or interest in the Property, or any part thereof who have subordinated those interests to this Environmental Covenant, and all persons, their heirs, successors and assigns who obtain any right, title or interest in the Property, or any part thereof after the recordation of this Environmental Covenant.

B. Conveyances of the Property. Owner shall notify the Director of the Kentucky Division of Waste Management at least thirty (30) days in advance of any grant, transfer, or conveyance of any interest in any or all of the Property. Notice shall include the name address and telephone number of the prospective transferee, a copy of the proposed deed or other documentation evidencing the conveyance, and a survey map that shows the boundaries of the Property being transferred.

C. Incorporation into Deeds and Leases. Each instrument hereafter conveying any interest in the Property or any portion of the Property shall contain a notice of the activity and use limitations set forth in this Environmental Covenant, and provide the recorded location of this Environmental Covenant. The notice shall be substantially in the following form:

> THE INTEREST CONVEYED HEREBY IS SUBJECT TO AN ENVIRONMENTAL COVENANT, DATED _____, _____, RECORDED IN THE OFFICIAL RECORDS OF THE JEFFERSON COUNTY CLERK'S OFFICE IN DEED BOOK _____, PAGE _____.

D. Zoning Changes. Owner shall notify the Director, Kentucky Division of Waste Management, simultaneously when any application is submitted to a local government for a building permit for the Property. Owner shall notify the Kentucky Division of Waste Management of any proposed change in the land use for the Property and comply with any requirements of 2(B) above.

E. Compliance Certification. Owner shall submit an annual report to the Director of the Kentucky Division of Waste Management, due on the anniversary of the date this Covenant was signed by the Grantor, detailing Owner's compliance, and any lack of compliance, with the terms of the Covenant.

F. Right of Access. Owner hereby grants the Kentucky Environmental and Public Protection Cabinet, its agents, contractors and employees the right of access to the Property for implementation or enforcement of this Environmental Covenant.

G. Representations and Warranties. Grantor or Grantees, respectively, represent and warrant as set forth below:

i. that the Grantor has the power and authority to enter into this Environmental Covenant, to grant the rights and interests herein provided and to carry out all obligations hereunder;

ii. that the Grantoris the sole owner of the Property and holds fee simple title;

iii. that the Grantees have complied with all public notice requirements in KRS 224.80-110;

iv. that this Environmental Covenant will not materially violate or contravene or constitute a material default under any other agreement, document or instrument to which Grantor is a party, or by which Grantor may be bound or affected;

v. that this Environmental Covenant will not materially violate or contravene any zoning law or other law regulating use of the Property; and

vi. that this Environmental Covenant does not authorize a use of the Property that is otherwise prohibited by a recorded instrument that has priority over the Environmental Covenant.

H. Compliance Enforcement. The terms of the Environmental Covenant may be enforced by the Kentucky Energy and Environment Cabinet, the Grantees, or any person identified in KRS 224.80-200 in accordance with applicable law. Failure to timely enforce compliance with this Environmental Covenant or the use limitations contained herein by any person shall not bar subsequent enforcement by such person and shall not be deemed a waiver of the person's right to take action to enforce any non-compliance. Nothing in this Environmental Covenant shall restrict the Kentucky Energy and Environment Cabinet from exercising any authority under applicable law.

I. Modifications/Termination. This Environmental Covenant runs with the land and is perpetual, unless modified or terminated in accordance with KRS 224.80-180 or KRS 224.80-190. The term "Amendment" as used in this Environmental Covenant, shall mean any changes to the Environmental Covenant, including the activity and use

limitations set forth herein, or the elimination of one or more activity and use limitations when there is at least one limitation remaining. The term "Termination" as used in this Environmental Covenant, shall mean the elimination of all activity and use limitations set forth herein and all other obligations under this Environmental Covenant.

J. Notices. Any document or communication required to be sent to Kentucky Energy and Environment Cabinet or the Director, Division of Waste Management under this Covenant shall be sent to:

Director, Division of Waste Management
Department for Environmental Protection
300 Sower Boulevard
Frankfort, Kentucky 40601

Any notice or communication to any Holder/Grantee shall be sent to the individual(s) and entit(ies) identified below in the respective signature blocks.

K. Severability. If any provision of this Environmental Covenant is found to be unenforceable in any respect, the validity, legality, and enforceability of the remaining provisions shall not in any way be affected or impaired.

L. Governing Law. This Environmental Covenant shall be governed by and interpreted in accordance with the laws of the Commonwealth of Kentucky.

M. Recordation. Within ten (10) business days after the date of the final required signature upon this Environmental Covenant, Grantor shall file this Environmental Covenant in the county clerk's office in each county that contains any portion of the real property subject to this environmental covenant.

N. Effective Date. The effective date of this Environmental Covenant shall be the date upon which the fully executed Environmental Covenant has been recorded as a deed record for the Property with the Jefferson County Clerk's Office.

O. Distribution of Environmental Covenant. The Grantor shall within thirty (30) days of filing this Environmental Covenant in the Jefferson County Clerk's Office, distribute a file and date stamped copy of the recorded Environmental Covenant to the following persons: Director, Kentucky Division of Waste Management, Mayor of the City of Louisville, every Holder of this Environmental Covenant, each person who is in possession of the Property, each person who holds a recorded interest in the Property, each person who signed this Environmental Covenant.

P. Cabinet and Division References. All references to the Kentucky Energy and Environment Cabinet and the Kentucky Division of Waste Management shall include successor agencies/departments/divisions or other successor entities.

Grantor has caused this Environmental Covenant to be executed pursuant to KRS Chapter 224.80-100 to KRS 224.80-210 on this ___ day of _____, 2018.

IN TESTIMONY WHEREOF, the parties have hereunto set their hands this the day and year first above written.

GRANTOR

:

FCBKy Holding, LLC

_____

By

_____

Its:

Date: _____, 20__

COMMONWEALTH OF KENTUCKY)
) SS
COUNTY OF JEFFERSON)

The foregoing Environmental Covenant was acknowledged before me by _____, as _____ of Grantor, this the ____ day of _____, 201__.

My Commission expires: _____.

_____

Notary Public

GRANTEES:

ExxonMobil Oil Corporation

_____

By:

Date: _____, 20__

STATE OF TEXAS)

) SS

COUNTY OF _____)

The foregoing Environmental Covenant was acknowledged before me by _____, as _____ of ExxonMobil Oil CorporationGrantees, this the ____ day of _____, 20__.

My Commission expires: _____.

_____

Notary Public

[NOTARY SEAL]

GRANTEES:

Occidental Chemical Corporation

_____

By:

Date: _____, 20__

STATE OF TEXAS)
) SS
COUNTY OF HARRIS)

The foregoing Environmental Covenant was acknowledged before me by _____, as _____ of Occidental Chemical Corporation, this the ____ day of _____, 20__.

My Commission expires: _____.

_____

Notary Public
[NOTARY SEAL]

GRANTEES:

Greif, Inc.

_____

By:

Date: _____, 20__

STATE OF _____)
) SS
COUNTY OF _____)

The foregoing Environmental Covenant was acknowledged before me by _____, as _____ of Greif, Inc., this the ____ day of _____, 20__.

My Commission expires: _____.

_____

Notary Public

[NOTARY SEAL]

KENTUCKY ENERGY AND ENVIRONMENT CABINET

This Environmental Covenant is hereby approved by the Kentucky Energy and Environment Cabinet this ____ day of _____, 20__.

By: _____

Title: Director, Division of Waste Management

Date: _____, 20__

COMMONWEALTH OF KENTUCKY)
)
COUNTY OF FRANKLIN)

The foregoing Environmental Covenant was acknowledged before me by _____ _____, as Director, on behalf of the Kentucky Division of Waste Management, this the ____ day of _____, 20__.

My Commission expires: _____.

_____
Notary Public

THIS INSTRUMENT PREPARED BY:

_____

COMMONWEALTH OF KENTUCKY)
)
COUNTY OF JEFFERSON)

I, _____, Clerk of the Jefferson County Court, do certify that the foregoing Environmental Covenant was lodged in my office for record, and that I have recorded it, and the certificate thereon, this _____ day of _____, 20__.

_____
Jefferson County Clerk

APPENDIX B

Property Management Plan

MATTHEW G. BEVIN
GOVERNOR

CHARLES G. SNAVELY
SECRETARY

AARON B. KEATLEY
COMMISSIONER

ENERGY AND ENVIRONMENT CABINET
Department for Environmental Protection

300 SOWER BOULEVARD
FRANKFORT, KENTUCKY 40601

October 19, 2017

Brian Karst
FCBKy Holding LLC
293 Hubbards Lane
Louisville, KY 40207

Re: **NOTIFICATION OF CONCURRENCE**
BROWNFIELD REDEVELOPMENT PROGRAM
Agency Interest Number (AI #): 52202
BLACK LEAF CHEMICALS
1391 DIXIE HIGHWAY
LOUISVILLE, KY
JEFFERSON COUNTY

Dear Mr. Karst:

The Division of Waste Management is in receipt of your Brownfield Redevelopment Program application and Property Management Plan received February 14, 2017 and Master Commissioner's Deed of Redemption received October 19, 2017 verifying that your client company taken legal title to the property. The Division of Waste Management finds that the application is administratively complete and that the conditions of KRS 224.01-415(2)(a) have been certified to be true. Based on the data and information provided to date, a review of the Property Management Plan, and warranty deed indicating ownership, the Division of Waste Management concurs that the intended future use and management of the property will not interfere with remediation of the release as required by the cabinet, increase impacts of the release on human health or the environment, or expose the public and environment to unacceptable harm, as required by KRS 224.01-415(2)(b).

Therefore, in accordance with KRS 224.01-415(2), you are not liable for performing characterization, correcting the effects of the release on the environment, or performing corrective action of any release or suspected release included in your certification.

The Property Management Plan is intended to ensure that property use is protective in light of the recognized environmental conditions of your company's property given the information available. There are two scenarios under which your company may propose or be required to amend your Property Management Plan:

1. Your company intends to change the usage of the property through expansion, reuse, or redevelopment, or

2. There is a discovery of new information that requires modification of the Property Management Plan to ensure that property use is protective in light of the recognized environmental conditions at your property.

Should these conditions be met, you must notify and work with the Division of Waste Management personnel to ensure that the Property Management Plan remains protective of human health and the environment or is amended based on the new information to ensure it is protective.

Failure to adhere to the approved Property Management Plan may result in the revocation of this Notice of Concurrence (NOC). If, by any means, the Division of Waste Management discovers that you have provided false information in your certification, the Notification of Concurrence will be withdrawn as required by KRS 224.01-415 (3).

Upon issuance of this NOC the property for which the NOC applies will be subject to annual auditing and site inspection to verify that the PMP remains in place and is being complied with. Nothing in this NOC alters in any way any other legal obligations the applicant would be subject to pursuant to any local, state, or federal law.

The Commonwealth of Kentucky is committed to the safe and productive reuse of properties on which releases have occurred or there is the perceived presence of releases. If we can provide any further service in helping to bring this property to productive reuse, or you have any questions regarding this letter, please contact us at 502-782-6679.

Sincerely,

Larry D. Hughes, P.G.
Registered Geologist Branch Manager
Superfund Branch

LDH/sg

e-copy: Adam Goebel
Roy Funkhouser, P.G.
Jim Kirby
Christoph Uhlenbruch, P.G.

PROPERTY MANAGEMENT PLAN

Former Black Leaf Chemical Site

1391 Dixie Highway
Louisville, Kentucky

Prepared For:

FCBKy Holding, LLC

February 10, 2017

Prepared By:

Linebach ▪ Funkhouser, Inc.
environmental compliance & consulting

Linebach ▪ Funkhouser, Inc.
environmental compliance & consulting

February 10, 2017

Mr. Larry D. Hughes, P.G.
Kentucky Division of Waste Management
Brownfields Redevelopment Program
200 Fair Oaks Lane
Frankfort, Kentucky 40601

Re: Property Management Plan
Former Black Leaf Chemical Site
1391 Dixie Highway - Louisville, Kentucky
AI No. 52202; CERCLIS ID No. KYD980559520
Linebach Funkhouser Project Number 059-15

Dear Mr. Hughes:

Linebach Funkhouser, Inc. (LFI), consultant for FCBKy Holding, LLC, (FCBKy) has completed the enclosed Property Management Plan (PMP) for the above-referenced property. FCBKy is acquiring the property from the current owner, Louisville Industrial Park, LLC. This PMP has been prepared in accordance with the requirements of KDEP's Brownfields Redevelopment Program (KRS 224.1-415).

Please contact us if you have any questions or comments regarding this PMP.

Sincerely,

Charles D. Linebach, CHMM
Principal

Roy V. Funkhouser, P.G.
Principal
KY Registered Geologist No. 113066

cc: Adam Goebel, Stoll Keenon Ogden PLLC

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CERTIFICATION

By my signature below I, Roy V. Funkhouser, am licensed in Kentucky to practice as a Professional Geologist and confirm that I have reviewed the Phase I Environmental Site Assessment Report dated January 10, 2016, this Property Management Plan, and any other relevant documents made available to me for the property at 1391 Dixie Highway in Louisville, Kentucky.

The intended future use of the property, including the proposed management of future use and proposed institutional or engineering controls, will not interfere with remediation of the release of hazardous substances, pollutants or contaminants, increase the impacts of the release on human health and the environment, or expose the public and environment to unacceptable harm.

Signature: _____ Date Signed: February 10, 2017

Kentucky License/Registration Number: 113066

1.0 INTRODUCTION

This Property Management Plan (PMP) for the former Black Leaf Chemical site in Louisville, Kentucky has been prepared in accordance with the provisions of the Kentucky Department for Environmental Protection's (KDEP's) Brownfield Redevelopment Program (KRS 224.1-415). The PMP is a follow-up (and compliment) to risk-based remediation work that has been conducted at the site by the United States Environmental Protection Agency (USEPA), KDEP, and Arcadis, U.S., Inc. (a consultant for companies with historical ownership ties to the property). Those companies with previous ownership ties are collectively referred to hereafter as the potential responsible parties group (PRP Group).

As of the date of submittal of this PMP, a risk-based Corrective Action Plan (CAP) for the site, developed by Arcadis for the PRP Group, is under review by KDEP and will be implemented following KDEP's approval. Key provisions of the CAP, as currently written and under review by KDEP, include:

- The removal of soil containing constituents in excess of screening levels for industrial/commercial property or background levels.
- Demolition of all onsite buildings and slabs.
- Application of an Environmental Covenant (EC) restricting site redevelopment to industrial/commercial use.

In accordance with KRS 224.1-415, the overall purpose of this PMP is to assure that future use of the property will not create additional harm to human health and the environment, nor interfere with required corrective action efforts to be implemented by others as part of the approved CAP implementation.

2.0 POTENTIAL FUTURE AMENDMENT OF THE PMP

This PMP will be amended, as necessary and appropriate, following the completion of the CAP implementation work by the PRP Group. The CAP implementation will result in the removal of structures, floor slabs, and soil present at the site as of the date of this PMP, along with the

hydraulic cleaning of on-site surface water drainage features. CAP implementation will also result in the establishment of a site cover over much of the site. An institutional control in the form of an Environmental Covenant will be employed as part of the CAP.

Implementation of CAP field activities is anticipated to be initiated in 2017. The PRP Group will maintain the responsibility for ongoing remediation and monitoring, which will continue until the PRP Group receives a managed site closure letter from KDEP.

3.0 SITE DESCRIPTION

The site has a street address of 1391 Dixie Highway in Louisville, and covers approximately 29 acres within an area of mixed residential and commercial/industrial development (**Figure 1**). As of the date of this PMP, several buildings from former site operations remain in the central portion of the site. The condition of those buildings is variable, with several in poor condition. (A CAP prepared by Arcadis for the PRP Group calls for the removal of the buildings and their underlying floor slabs is currently under review by KDEP).

Vehicle ingress to the site is by way of an asphalt drive through a gated entrance off of Dixie Highway on the western side of the property. The drive extends to the center area of the site where it transitions to gravel. The drive splits in several directions to access site buildings. The far eastern and western portions of the property are presently undeveloped and covered by grass, woody vegetation, and gravel surface cover. An aerial photograph showing the site and surrounding area is provided in **Figure 2**.

Historical operations at the site (prior to 1999) have included pesticide formulation and cooperage/distillery operations. Historical fire insurance maps indicate that a coal yard was once present on a section of the western portion of the property and a foundry on a section of the eastern. The property was purchased by the current owner, Louisville Industrial Park, LLC (LIP) in 1999. LIP operated a lumber warehouse and distribution facility on the property until approximately 2006. The site has been vacant since 2006 and has no active operations.

4.0 SITE ENVIRONMENTAL HISTORY

Since 2010, extensive environmental assessment work has been conducted at the site by USEPA (October 2010; September/October 2011), KDEP (December 2011), and Arcadis (consultant for the PRP Group. September 2014). Assessment work has included the collection of:

- 333 soil samples from 115 borings.
- 15 sediment samples from manholes and concrete drainage basins across the site.
- A groundwater sample from a production water well near the center of the site.

Results of that work is summarized in the following sections:

4.1 Soil Sampling – USEPA (2010/2011); KDEP (2011); Arcadis (2014)

A KDEP-approved soil sampling plan was implemented at the site with samples collected from various depths across the property:

- Shallow (0 to 2 feet below ground level) to evaluate the most significant potential exposure pathway.
- Deeper (various intervals below 2 feet in depth) to gauge the overall vertical extent of affected soil/fill.

Based on the site historical use, soil samples were analyzed in the laboratory for constituents determined to be of greatest likelihood to be present as well as those being representative of the greatest concern with regard to human health and the environment, i.e. constituents of concern (COCs). The constituents included:

- Arsenic
- Lead
- Organochlorine Pesticides
- Polynuclear Aromatic Hydrocarbons (PAHs)

All of the studies conducted to date (USEPA 2010/2011; KDEP 2011; Arcadis 2014) show that the most significant zone of affected soil at the site is the surficial soil zone (0 to 2 feet below ground level). In the Site Characterization Reports (SCRs), soil concentrations were compared to: (1) USEPA Regional Screening Levels (RSLs) for industrial/commercial redevelopment, (2)

RSLs for residential redevelopment and (3) background levels for arsenic. A brief summary of SCR findings by COC class are as follows:

Arsenic

Arsenic was detected in certain areas of the site at concentrations exceeding those established as "background" levels in KDEP's guidance for ambient background assessment. The maximum detected arsenic concentration was 337 mg/kg in a sample representative of the shallow interval from ground level to 1 foot deep. The arsenic exceedences were predominantly in the upper two feet of soil, and were detected in certain relatively isolated and disparate areas of the site. A table produced by Arcadis that lists the detected concentrations of arsenic in soil is included in **Appendix A** along with a figure illustrating the locations of elevated arsenic in soil.

Pesticides

Certain pesticides were detected in excess of KDEP's risk-based Industrial Screening Levels (ISLs) in surficial soil samples collected in the south-central portion of the site around building that had been used for pesticide manufacture and storage. Key pesticide detections were relatively inconsistent and infrequent, and were generally around the locations of on-site buildings. Where detected, 4,4 – DDT was at the highest overall concentrations, and those concentrations were from samples generally within the upper foot of soil. The other pesticides most often identified were:

- Dieldren
- 4,4 – DDD
- 4,4 – DDE

PAHs

Certain PAHs were detected in excess of KDEP ISLs. The most predominant depth of detection of PAHs was the upper 0 to 2 feet of soil; however, the PAH detections showed no obvious consistent correlation to those of arsenic and pesticide. The occurrence of PAHs in soil at the site and may be more related to the use of historical fill on the property rather than past production operations.

Arcadis' CAP for the property is driven by the elimination of the primary exposure pathway at the site, i.e., exposure to constituents in the uppermost foot of soil across the property. Therefore, concentrations of COCs in the top 1 foot of soil (i.e., exposure point concentrations (EPCs)) were compared to USEPA commercial/industrial regional screening levels (RSLs), or, for arsenic, to background concentrations as defined by KDEP (2008), and all exceedences were will be removed by the work to be conducted in the CAP.

Below one foot in depth, average concentrations of COCs that will be remaining after site excavation/remediation work (average defined as the 95% upper confidence level of the mean) were used in risk calculation to ensure that total risk is at or below $1x10^{-6}$ and a hazard index of 1 for commercial/industrial site use.

Based on the sampling results, an EPC for lead was not calculated because lead was not detected in excess of its respective industrial/commercial property standard in the top 2 feet of soil. Lead was detected in one deeper subsurface sample in excess of its industrial/commercial standard; however, upon further investigation, the lead detection was considered anomalous and not representative of site conditions.

4.2 Sediment Sampling – KDEP (2011); Arcadis (2014)

A total of 15 sediment samples were collected by KDEP (2011) and Arcadis (2014) from accumulated sediments in manholes and concrete basins throughout the site. Mapping of sewer piping was also conducted by Arcadis.

Sediment samples were analyzed for the same constituents as were soil. Arsenic and PAHs were detected above the RSLs in sediment samples collected from certain manhole/sewer line locations. A figure showing those locations is in **Appendix A.**

4.3 Groundwater Sampling – Arcadis (2014)

A former production well on the site was purged and sampled by Arcadis in 2014. No constituents were detected in the well water sample at concentrations exceeding USEPA drinking

water standards. The well was properly abandoned in 2014 in accordance with KDEP requirements.

4.4 Phase I Environmental Assessment – Linebach Funkhouser, Inc. (2017)

A Phase I Environmental Site Assessment (ESA) was conducted by Linebach Funkhouser, Inc. (LFI) for FCBKy Holding, LLC prior to its purchase of the site. Various recognized environmental conditions (RECs) associated with the historical use of the property were noted by LFI, as well as the ongoing environmental work being conducted by the PRP Group to satisfy KDEP requirements. LFI's Phase I ESA Report was dated January 11, 2017.

4.5 Corrective Action Plan. Arcadis. (2016 -2017)

A Corrective Action Plan (CAP) for managed closure of the site has been prepared by Arcadis on behalf of the PRPs, and as of the submittal date of this PMP, is currently being reviewed by KDEP. The CAP was submitted in 2016 and has undergone subsequent modification in response to KDEP's review comments. In the event that the approved CAP differs significantly from the CAP currently under review by KDEP, this PMP will be amended, as necessary, to serve as an appropriate compliment to the approved CAP.

According to the CAP prepared by Arcadis, site structures will be demolished and the ground surface graded for placement of unaffected fill and surface cover material. A total of approximately 23,000 cubic yards of soil will be excavated across 10 acres and disposed of at Waste Management Inc.'s Outer Loop Landfill in Louisville. The site will be left as essentially an open field, capable of redevelopment for commercial/industrial use.

5.0 CONCEPTUAL MODEL

LFI has developed a conceptual site model (CSM) of geologic conditions potentially affecting the occurrence and migration of constituents of concern at the property, and the conditions affecting potential future exposure of those constituents to human health and the environment.

5.1 Topography

The surface elevation of the subject property is approximately 450 feet above the National Geodetic Vertical Datum of 1929 (also known as mean sea level). The site is generally flat with a slight slope toward the north. A topographic map is provided in **Figure 1**.

5.2 Soils and Geology

Based on LFI's review of boring logs prepared by others as well as United States Geological Survey (USGS) literature, the subsurface geology at the site can be generalized as follows.

- 0 to 3 feet below ground level (bgl): FILL consisting of gravel, fragments of coal, wood, and bricks in a matrix of silty sand. The occurrence of surficial fill at the site is a reflection of historical site usage. A coal yard was formerly on the western portion of the site; a foundry was on the eastern part of the site.

- 3 to 8 feet bgl: Silty CLAY with a trace of gravel.

- 8 to 16 feet bgl: Silty CLAY, with silty sand.

Silty clay grades into predominantly sand and gravel outwash deposits with depth. Bedrock at the site likely occurs at a depth of approximately 100 – 110 feet bgl, and likely consists of the Louisville Limestone (Kepferle, 1974).

5.3 Hydrogeology

The aforementioned outwash sand and gravel deposits constitute an unconfined aquifer extending from the top of the saturated zone to bedrock. The depth to groundwater at the site is in the range of 35 to 40 feet bgl. The direction of groundwater flow is predominantly west-northwest across the site, in the direction of the Ohio River, which is approximately 3 miles west of the site.

5.4 Constituents of Concern/Extent of Affected Areas

Based on the results of previous site-specific assessment work, soil is the only medium of concern at the site. Information included in Arcadis' 2016 CAP identifies key constituents of concern as follows:

- Arsenic.
- Certain Polynuclear Aromatic Hydrocarbons (PAHs).
- Certain Organochlorine Pesticides, particularly Dieldren, DDT, DDD, and DDE.

Soil containing arsenic is predominantly in the upper one foot of soil, and was detected in the central and eastern areas of the site. Soil containing pesticides is predominantly limited to a series of relatively isolated areas in the south-central portion of the site, generally near buildings formerly associated with pesticide operations. A figure prepared by Arcadis illustrating the key areas of concern on site is provided in **Appendix A** (Figure 3-1). The predominant vertical extent of concern is from ground level to a depth of approximately 2 feet bgl.

Low concentrations of PAH constituents occur in surficial soil (0 – 1 foot bgl) across the site. These low concentrations are consistent with those typically found in fill historically used in older urban areas across the United States. The fill is commonly referred to as "urban fill," and the detections of PAHs in it are associated with the presence of coal fragments, charcoal/burned wood and cinders that constitute a portion of its make-up.

PAHs are ubiquitous at low levels in the environment since they are common constituents of soot formed during forest fires as well as the incomplete burning of coal, oil and gas, garbage, and other organic substances like tobacco and charbroiled meat (U.S. Agency for Toxic Substances & Disease Registry, 1996). Foundry sand, which was also commonly used in the past to fill low-lying areas of older urban sites across the country, is also known to contain low levels of PAHs.

6.0 INTENDED FUTURE USE

The intended future use of the site is yet to be determined; however, a Corrective Action Plan (CAP) for the site, prepared by Arcadis for the PRP Group, will render the property suitable for essentially any future commercial/industrial end-use that complies with the provisions of this PMP. Buildings and structures from historical operations will be razed in accordance with the approved CAP, and the site will be left essentially as an open field.

7.0 EXPOSURE PATHWAY EVALUATION

An exposure pathway is the course a constituent takes from a source to an exposed receptor. According to the USEPA (1989), for a risk to be present at all, an exposure pathway must be considered *complete*. A complete exposure pathway must include *all* of the following:

- Source and Mechanism for Release
- Transport Medium
- Receptor at an Exposure Point
- Route of Uptake (e.g. ingestion)

The following discussion of exposure pathways and receptors identifies possible means and locations where human or other biotic receptors may come in contact with constituent-containing media at the site either now or at some point in the future. The purpose of this exposure pathway/receptor evaluation is to:

- Assess potential environmental risks, if any, remaining at the site.
- Provide a basis for establishing site management actions to assure that exposure pathways remain incomplete in the future.

7.1 Human Health Evaluation

An evaluation of pathways and receptors associated with potential exposure to humans is as follows.

<u>Soil</u>

Based on the extensive assessment work conducted at the site by Arcadis and others, surficial soil (0 to 1 foot deep) is currently an exposure pathway of concern. Arsenic, PAHs, and

pesticides (in limited areas) are the constituents of concern in surficial soil, with some areas of the site containing concentrations of one or more of these constituents in excess of USEPA RSLs for industrial exposure (May 2016). Collectively, the Industrial RSLs and concentrations of arsenic provided in KDEP's Arsenic Background Guidance have been established as site-specific screening levels for the property (Arcadis, 2016).

The actions proposed in the CAP prepared by Arcadis for the PRP Group will remove arsenic concentrations above KDEP "background" levels in the top foot. Soil containing pesticides above the industrial RSLs will be removed. Soil containing PAHs at concentrations above the industrial RSL in the upper foot of soil will be removed and the majority of soils with PAHs below the top foot will also be removed to the point where the residual risks are less than regulatory standards for industrial/commercial use.

The possibility of a complete exposure pathway following the CAP implementation, if any, would be short-term and limited to possible future construction/excavation workers. Potential future exposure to construction workers will be managed by implementation of routine health and safety procedures, included in a generic Health and Safety Plan provided in **Appendix B.**

Groundwater

There currently is no complete exposure pathway to groundwater. Based on the depth of groundwater beneath the site (30 to 35 feet bgl), the likelihood of direct exposure to groundwater is nominal. The site is in an urban area of Louisville served by a municipal water supply; consequently, no exposure through potable use of groundwater on-site is likely.

A production water well was used on-site in the past as part of historical operations. The well was approximately 86 feet deep and was sampled by Arcadis in 2014 as part of site-wide assessment activities. The static water level in the well at that time was approximately 33 feet below ground level. No constituents were detected in excess of drinking water standards; consequently, the well was abandoned in accordance with KDEP requirements. No other water wells, including monitoring wells, remain on site.

Air

Air does not constitute a significant exposure pathway to human or ecological receptors. The predominant constituents of concern at the site in soil are not readily volatile. The primary potential exposure scenario via the air pathway would be wind dispersal of affected dust generated by excavation work into the urban fill below the site cover, should any occur in the future. That exposure pathway will be effectively controlled through the implementation of standard construction dust-suppression procedures, a description of which is included as part of this PMP in Section 9.0.

Surface Water/Sediment

The nearest significant surface water feature is the Ohio River, located approximately 3.5 miles north of the property. As no surface water features intersect the property or immediately surrounding area, the surface water exposure route is considered incomplete. Remnant sediment in surface water drainage features will be hydraulically removed as part of the CAP implementation, further eliminating on-site precipitation run-off as an exposure pathway of potential concern.

7.2 Ecological Evaluation

No threatened or endangered species are known to exist at the site. The site is located in a highly urbanized area south of downtown Louisville. The site is bordered predominantly by city streets and railroad tracks. The overall commercially developed nature of the site is not particularly conducive for a permanent habitat for environmental receptors other than rodents, birds, and other small species that typically occupy urbanized areas.

8.0 PROPERTY MANAGEMENT ACTIONS

Currently, the site is vacant and fenced with a locked gate. Warning signs are posted on the fence around the site and include “No Trespassing” and “Contaminated Area” statements. With that institutional control in place, no complete exposure pathways have been identified at the site other than possible short-term exposure to trespassers who may breech the fence and then dig into an area of affected surficial soil.

8.1 Planned Remediation Activities By Others

A CAP for the site, prepared by Arcadis on behalf of the PRP Group and currently pending final approval by KDEP, calls for the removal of approximately 23,000 cubic yards of soil over approximately 10 acres coupled with the demolition of buildings and concrete floor slabs over another 6 acres. Following soil removal and demolition work described in the CAP, all exceedances of the commercial/industrial standard (or in the case of arsenic, the background standard) will be removed from the top 1 foot of soil and more than 50% of the property will have been covered with at least 1 foot of unaffected backfill. The residual risk based on the site-wide average concentration (95% UCL of the mean) of constituents of concern (COCs) below the top 1 foot of soil will be less than the regulatory standard for industrial/commercial use.

Following the completion of the PRP Group's site remediation work, the site cover established at that time will be maintained as described in the following section. Future excavation through the site cover, if necessary, will be in accordance with the procedures outlined in Section 9.0.

8.2 Site Cover

Future exposure receptors, if any, would be limited to construction workers who may contact affected subsurface soil (urban fill) in the event of future excavation activities. This potential exposure would be short-term and the overall potential risk of an actual detrimental health impact associated with the exposure is nominal.

Future excavation through these areas, if necessary, will be in accordance with the procedures outlined in Section 9.0. In general, the minimum thickness of an unaffected, natural soil cover or a gravel cover will be one foot. Covering fill potentially added in the future will be underlain by plastic netting, which will serve as a demarcation liner for future reference.

8.3 Site Cover Monitoring and Maintenance

Routine monitoring and maintenance activities described as follows will provide continued protection of human health and the environment by minimizing the potential for complete exposure pathways.

Replacement and Repair of Site Cover

If future maintenance, upkeep, utility installation/repairs, or site alterations penetrate the existing site cover, the provisions described in Section 9.0 will be followed. Contractors conducting such activities will be provided a copy of the applicable segments of this PMP. Contractors will be expected to prepare their own task-specific Health and Safety Plans incorporating the information contained within this PMP, appropriate for the work being conducted.

Disturbance of Subsurface Soil The handling of soil potentially encountered in the event of any future excavation work shall be consistent with the provisions described in Section 9.0 of this PMP.

8.4 Environmental Covenant

An Environmental Covenant (EC), conforming to the requirements of KRS 224.80 and restricting the site to industrial/commercial use, will be filed by FCBKy Holding, LLC with the Jefferson County Clerk as part of the implementation of the approved CAP.

9.0 SOIL HANDLING AND DISPOSAL

Affected soil, if any, excavated as part of any future construction/excavation activities will either be re-buried beneath an appropriate cover such as buildings, pavement, gravel (minimum 1 foot), clean fill material (minimum 1 foot), or transported off-site for disposal at a State and/or federally approved regulatory landfill. The following procedures will be employed regarding the handling of affected soil.

- Reasonable fugitive dust suppression techniques will be employed during site activities that may generate fugitive affected dust. Those techniques may include applying water on major on-site construction access ways, wetting equipment and exposed soil, and spraying water on blades during scraping and grading.

- Soils identified for offsite disposal will be segregated and placed on either a paved surface or a minimum of 6 milliliter plastic sheeting. Segregated soils will be covered with an additional layer of 6 milliliter plastic sheeting until laboratory results are received. Soils may also be placed into a watertight container such as a covered roll-off box.

- Soils identified for offsite disposal will be sampled for constituents required by the disposal facility.

- Upon completion of the work, previously excavated site materials may be backfilled provided that the backfilled material maintains the necessary geotechnical characteristics to support the intended end-use. The backfill area shall be restored in a manner consistent with the original capping condition.

- A memorandum or report shall be prepared describing the work performed and the date of the work. The report will also identify the person(s) conducting the work and confirm that the provisions of the PMP were followed.

10.0 HEALTH AND SAFETY PLAN

Contractors and others potentially involved in future excavation activities will be informed of site conditions prior to initiating work on the site. Excavation work extending beyond the scope of standard utility line construction or landscaping will need to have proper OSHA training in accordance with the work activities being conducted. Contractors will be responsible for preparing and following their own Health and Safety Plan, which shall incorporate the information contained in this PMP and the attached Health and Safety Plan (**Appendix B**).

11.0 REPORTING

A maintenance form/checklist will be provided to KDEP by the Property Owner/Representative on an annual basis documenting that no significant changes have been made at the site that would affect the existing environmental conditions. A copy of that checklist is in **Appendix C.** In the event that soil handling or disposal actions are undertaken at the site, a memorandum or summary report of those actions with associated information pertaining to soil handling and disposal will be provided to KDEP's State Superfund Branch within 30 days of completion of the work.

12.0 CONDITIONS FOR CHANGE

Previously unknown conditions could be encountered during future excavation work. The potential for encountering localized areas of impacted soil, while not likely, is also present. In

the event that buried containers or obviously impaired soil is encountered during future excavation work, the procedures outlined in section 9.0 of this PMP will be followed. The EC for the site will require written approval from KDEP prior to disturbing the site cap and excavating soil.

13.0 REFERENCES

Arcadis, Inc. 2016. *Interim Corrective Action Plan, Revision No. 1: Former Black Leaf Chemical Site – Louisville, Kentucky.* Consulting Report Prepared for Exxon Mobil Corporation, Maxus Energy Corporation, Occidental Chemical Corporation, Greif, Inc. Chevron Environmental Management Company. October 2016.

Arcadis, Inc. 2015. *Site Characterization Report: Former Black Leaf Chemical Site – Louisville, Kentucky*. Consulting Report Prepared for Exxon Mobil Corporation, Maxus Energy Corporation, Occidental Chemical Corporation, Greif, Inc. October 2016.

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Linebach Funkhouser, Inc. 2017. *Phase I Environmental Site Assessment Report: Former Black Leaf Chemical Site – Louisville, Kentucky.* Consulting Report prepared for FCBKy Holding, LLC. January 2017.

United States Environmental Protection Agency. 2016. *Regional Screening Level Summary Table.* May 2016.

APPENDIX C

Soil Analytical Data

Table C-1
Summary of Soil Sample Analytical Results for all Depth Ranges
Corrective Action Plan Addendum
Former Black Leaf Chemical Site, Louisville, Kentucky

Location ID: / Sample Depth(Feet): / Date Collected: / Sample Name:	USEPA Residential Soil RSL Nov 2017	USEPA Industrial Soil RSL Nov 2017	Kentucky Arsenic Background Guidance	Units	BLC001 0 - 1 10/25/10 BLC-SS-01	BLC001 8 - 12 10/25/10 BLC-SB-01	BLC002 0 - 1 10/25/10 BLC-SS-02	BLC002 8 - 12 10/25/10 BLC-SB-02	BLC003 0 - 1 10/25/10 BLC-SS-03	BLC003 8 - 12 10/25/10 BLC-SB-03	BLC004 0 - 1 10/25/10 BLC-SS-04	BLC004 8 - 12 10/25/10 BLC-SB-04	BLC005 0 - 1 10/25/10 BLC-SS-05	BLC005 8 - 12 10/25/10 BLC-SB-05	BLC006 0 - 1 10/25/10 BLC-SS-06	BLC006 8 - 12 10/25/10 BLC-SB-06	BLC007 0 - 1 10/25/10 BLC-SS-07	BLC007 8 - 12 10/25/10 BLC-SB-07	BLC008 0 - 1 10/25/10 BLC-SS-08
Detected Semivolatile Organics																			
1,1'-Biphenyl	47	200	- -	mg/kg	4.5 U	0.19 U	0.52 U	0.18 U	0.2 U	0.19 U	0.07 J	0.19 U	0.047 J	0.18 U	0.18 U [0.19 U]	0.18 U	1.1 J	0.18 U	0.21 J
1,2,4,5-Tetrachlorobenzene	23	350	- -	mg/kg	8.9	0.19 U	0.52 U	0.18 U	0.042 J	0.19 U	0.022 J	0.19 U	0.18 U	0.18 U	0.18 U [0.19 U]	0.18 U	1.3 U	0.18 U	0.16 J
3&4-Methylphenol	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acetophenone	7,800	120,000	- -	mg/kg	4.5 U	0.19 U	0.52 U	0.18 U	0.039 J	0.19 U	0.18 U	0.19 U	0.18 U	0.18 U	0.18 U [0.19 U]	0.18 U	1.3 U	0.18 U	0.76 U
1-methyl-Naphthalene	18	73	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4,5-Trichlorophenol	6,300	82,000	- -	mg/kg	4.5 U	0.19 U	0.52 U	0.18 U	0.024 J	0.19 U	0.18 U	0.19 U	0.18 U	0.18 U	0.18 U [0.19 U]	0.18 U	1.3 U	0.18 U	0.76 U
2,4-Dimethylphenol	1,300	16,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzaldehyde	170	820	- -	mg/kg	4.5 U	0.19 U	0.52 U	0.18 U	0.2 U	0.19 U	0.18 U	0.19 U	0.18 U	0.18 U	0.18 U [0.19 U]	0.18 U	1.3 U	0.18 U	0.76 U
2-Methylnaphthalene	240	3,000	- -	mg/kg	0.17	0.0036 U	0.088	0.0035 U	0.26	0.0037 U	0.62	0.0026 J	0.66	0.0032 J	0.064 J [0.047 J]	0.0035 U	6.1	0.00035 J	2.5
4,6-Dinitro-2-methylphenol	5.1	66	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthene	3,600	45,000	- -	mg/kg	0.093	0.0036 U	0.14	0.0035 U	0.011	0.0037 U	0.011	0.0037 U	0.0049	0.0035 U	0.0025 J [0.0023 J]	0.0035 U	3	0.0035 U	0.26
Acenaphthylene	- -	- -	- -	mg/kg	0.014 J	0.0036 U	0.045	0.0035 U	0.0049	0.0037 U	0.0061	0.0037 U	0.01	0.0035 U	0.0072 [0.0033 J]	0.0035 U	0.3	0.0035 U	0.049
Anthracene	18,000	230,000	- -	mg/kg	0.33 J	0.0036 U	0.63	0.0006 J	0.046 J	0.0037 U	0.055 J	0.0037 U	0.024	0.0035 U	0.013 [0.0081]	0.0035 U	3.8	0.0035 U	0.49 J
Benzo(a)anthracene	1.1	21	- -	mg/kg	1.1 J	0.0036 U	**2.2**	0.0012 J	0.23	0.00087 J	0.17 J	0.00063 J	0.13 J	0.00044 J	0.079 J [0.082 J]	0.0035 U	**7.8**	0.0035 U	**5.2**
Benzo(a)pyrene	0.11	2.1	- -	mg/kg	**0.99 J**	0.0036 U	**2**	0.0038 U	**0.21**	0.0041 U	**0.13 J**	0.004 U	**0.12 J**	0.004 U	0.085 J [0.079 J]	0.0035 U	**6.4**	0.0035 U	**5**
Benzo(b)fluoranthene	1.1	21	- -	mg/kg	1.1 J	0.0036 U	**2.2**	0.00098 J	0.26	0.0011 J	0.15 J	0.00089 J	0.16 J	0.0009 J	0.13 J [0.14 J]	0.0035 U	**9.5**	0.00045 J	**6**
Benzo(g,h,i)perylene	- -	- -	- -	mg/kg	0.77 J	0.0036 U	1.9 J	0.0035 U	0.22 J	0.0037 U	0.097 J	0.0037 U	0.085 J	0.0035 U	0.1 J [0.047 J]	0.0035 UJ	3.7 J	0.0035 UJ	2.8 J
Benzo(k)fluoranthene	11	210	- -	mg/kg	1.1 J	0.0036 U	1.8	0.00091 J	0.2 J	0.0012 J	0.14 J	0.00092 J	0.12 J	0.00098 J	0.096 J [0.085 J]	0.0035 U	9.2	0.0035 U	5.1
Benzoic acid	250,000	3,300,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbazole	- -	- -	- -	mg/kg	4.5 U	0.19 U	0.19 J	0.18 U	0.03 J	0.19 U	0.18 U	0.19 U	0.02 J	0.18 U	0.18 U [0.19 U]	0.18 U	0.42 J	0.18 U	0.54 J
Chrysene	110	2,100	- -	mg/kg	1.2 J	0.0036 U	2.2	0.001 J	0.27	0.00097 J	0.2	0.00063 J	0.17 J	0.00054 J	0.11 J [0.12 J]	0.0035 U	13	0.0035 U	7.4
Dibenzo(a,h)anthracene	0.11	2.1	- -	mg/kg	**0.4 J**	0.0036 U	**0.48 J**	0.0035 U	0.075 J	0.0037 U	0.032 J	0.0037 U	0.027 J	0.0035 U	0.02 J [0.017]	0.0035 U	**2.2**	0.0035 U	**1.8**
Dibenzofuran	73	1,000	- -	mg/kg	4.5 U	0.19 U	0.12 J	0.18 U	0.07 J	0.19 U	0.18	0.19 U	0.15 J	0.18 U	0.18 U [0.19 U]	0.18 U	2.8	0.18 U	0.79
Di-n-butylphthalate	6,300	82,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	2,400	30,000	- -	mg/kg	2.9 J	0.0036 U	4.3	0.0032 J	0.44	0.0014 J	0.3	0.00079 J	0.19	0.00058 J	0.13 J [0.16 J]	0.0035 U	9.9	0.0035 U	8.1
Fluorene	2,400	30,000	- -	mg/kg	0.098	0.0036 U	0.17	0.0035 U	0.01	0.0037 U	0.01	0.0037 U	0.0048	0.0035 U	0.0027 J [0.002 J]	0.0035 U	2.9	0.0035 U	0.2
Indeno(1,2,3-cd)pyrene	1.1	21	- -	mg/kg	0.65 J	0.0036 U	**1.7**	0.0035 U	0.19 J	0.0037 U	0.092 J	0.0037 U	0.077 J	0.0035 U	0.075 J [0.052 J]	0.0035 U	**4.3**	0.0035 U	**3.3**
Naphthalene	3.8	17	- -	mg/kg	0.13	0.0036 U	0.055	0.0035 U	0.14 J	0.0037 U	0.31	0.0037 U	0.38	0.0035 U	0.026 [0.015]	0.0035 U	**6.9**	0.0035 U	1.7
Pentachlorophenol	1	4	- -	mg/kg	0.044 UJ	0.0074 UJ	0.071 UJ	0.0072 UJ	0.0081 UJ	0.0076 UJ	0.0071 UJ	0.0076 UJ	0.0072 UJ	0.0071 UJ	0.0069 UJ [0.37 U]	0.0071 UJ	0.19 UJ	0.0071 UJ	0.075 UJ
Phenanthrene	- -	- -	- -	mg/kg	1.8 J	0.0036 U	2.4	0.002 J	0.34	0.00086 J	0.5	0.0012 J	0.38	0.0015 J	0.086 J [0.093 J]	0.0035 U	12	0.00049 J	5.1
Phenol	19,000	250,000	- -	mg/kg	4.5 U	0.19 U	0.52 U	0.18 U	0.2 U	0.19 U	0.18 U	0.19 U	0.18 U	0.18 U	0.18 U [0.19 U]	0.18 U	1.3 U	0.18 U	0.76 U
Pyrene	1,800	23,000	- -	mg/kg	2.4 J	0.0036 U	4.1	0.0035 U	0.46	0.0037 U	0.33	0.0037 U	0.23	0.0035 U	0.13 J [0.19]	0.0035 U	10	0.0035 U	6.8
Detected Inorganics																			
Arsenic	**	**	22.7	mg/kg	7.4	8	11	8.2	5.6	12	9.5	7.8	8.7	9.3	6.3 [15]	8.2	**24**	8.1	22
Lead	400	800	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Detected Pesticides																			
2,4' DDD	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4'-DDE	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4'-DDT	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
trans-Nonachlor	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDD	1.9	9.6	- -	mg/kg	**120**	0.058	0.19	0.0035 U	**8.6**	0.0037 U	**34**	0.012	**2.7 J**	0.0042 U	**4.9 [0.29]**	0.0035 U	**15 J**	0.0036 U	**41**
4,4'-DDE	2.0	9.3	- -	mg/kg	**22 J**	0.0068	1.6	0.0092	**3.3**	0.0013 J	**4.4**	0.0015 J	**26**	0.028	0.88 [0.86]	0.0035 U	**13 J**	0.0049	**30**
4,4'-DDT	1.9	8.5	- -	mg/kg	**370**	0.49	0.76	0.013	**11**	0.0054 U	**41**	0.03	**26**	0.03	**5.6 [0.33]**	0.0035 U	**130**	0.032	**130**
Aldrin	0.039	0.18	- -	mg/kg	22 U	0.0019 U	0.018 U	0.0018 U	0.012 J	0.0019 U	0.18 U	0.0019 U	0.18 U	0.0018 U	0.036 U [0.0095 U]	0.0018 U	0.032 J	0.0018 U	**0.14 J**
alpha-BHC	0.086	0.36	- -	mg/kg	**1,400**	**0.36**	0.047	0.0076	**0.8**	0.0019 U	**6**	0.0019 U	0.18 U	0.015	0.036 U [0.0013 J]	0.0085	**1.3**	0.0018 U	**1.7**
alpha-Chlordane	1.7	7.7	- -	mg/kg	22 U	0.0019 U	0.0023 NJ	0.0018 U	0.051	0.0019 U	0.041 J	0.0019 U	0.25	0.0018 U	0.0036 J [0.0039 J]	0.0018 U	0.19 J	0.0018 U	0.62
beta-BHC	0.3	1.3	- -	mg/kg	**23**	0.073	0.022 NJ	0.0036	**1.2**	0.0019 U	**2.1**	0.0019 U	**0.57**	0.0055	0.036 U [0.0095 U]	0.014	**8 J**	0.0059	**8.9**
Chlordane (technical)	1.7	7.7	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
delta-BHC	- -	- -	- -	mg/kg	6.5 J	0.0094	0.018 U	0.0018 U	0.019 J	0.0019 U	0.19	0.0019 U	0.18 U	0.00033 J	0.036 U [0.0095 U]	0.0018	0.76	0.0018 U	0.28 J
Dieldrin	0.034	0.14	- -	mg/kg	**5.3 J**	0.0058	**0.035 J**	0.00048 J	**0.43**	0.0037 U	**0.24 J**	0.00053 J	**0.084 J**	0.00046 J	0.022 J [0.018 J]	0.0035 U	**4.4**	0.002 J	**18**
Endosulfan I	470	7000	- -	mg/kg	22 U	0.0019 U	0.018 U	0.0018 U	0.04 U	0.0019 U	0.18 U	0.0019 U	0.18 U	0.0018 U	0.036 U [0.0095 U]	0.0018 U	0.19 U	0.0018 U	0.38 U
Endosulfan II	470	7000	- -	mg/kg	43 U	0.0036 U	0.035 U	0.0035 U	0.078 U	0.0037 U	0.35 U	0.0037 U	0.35 U	0.0035 U	0.07 U [0.018 U]	0.0035 U	0.058 NJ	0.0035 U	0.74 U
Endosulfan sulfate	470	7000	- -	mg/kg	43 U	0.0036 U	0.035 U	0.0035 U	0.078 U	0.0037 U	0.35 U	0.0037 U	0.35 U	0.0035 U	0.07 U [0.018 U]	0.0035 U	0.37 U	0.0035 U	0.74 U
Endrin	19	250	- -	mg/kg	43 U	0.0036 U	0.035 U	0.0035 U	0.078 U	0.0037 U	0.35 U	0.0037 U	0.35 U	0.0035 U	0.07 U [0.018 U]	0.0035 U	0.37 U	0.0035 U	2.7
Endrin aldehyde	- -	- -	- -	mg/kg	43 U	0.0036 U	0.035 U	0.0035 U	0.078 U	0.0037 U	0.35 U	0.0037 U	0.35 U	0.0035 U	0.07 U [0.018 U]	0.0035 U	0.068 NJ	0.0035 U	0.12 J
Endrin ketone	- -	- -	- -	mg/kg	43 U	0.0036 U	0.004 J	0.0035 U	0.078 U	0.0037 U	0.35 U	0.0037 U	0.35 U	0.0035 U	0.07 U [0.018 U]	0.0035 U	0.13 J	0.0035 U	2
gamma-BHC (Lindane)	0.57	2.5	- -	mg/kg	**180**	0.041	0.0075 J	0.0012 J	0.14	0.0019 U	0.22	0.00021 J	0.036 J	0.0036	0.036 U [0.0095 U]	0.0077	0.51	0.0014 J	**0.68**
gamma-Chlordane	1.7	7.7	- -	mg/kg	22 U	0.0019 U	0.018 U	0.0018 U	0.056 U	0.0019 U	0.18 U	0.0019 U	0.27 U	0.0018 U	0.033 NJ [0.0095 U]	0.0018 U	0.19 U	0.0018 U	0.67 U
Heptachlor	0.13	0.63	- -	mg/kg	22 U	0.0019 U	0.018 U	0.0018 U	0.04 U	0.0019 U	0.18 U	0.0019 U	0.18 U	0.0018 U	0.036 U [0.0095 U]	0.0018 U	0.19 U	0.0018 U	0.38 U
Heptachlor epoxide	0.07	0.33	- -	mg/kg	22 U	0.0019 U	0.018 U	0.0018 U	0.04 U	0.0019 U	0.18 U	0.0019 U	0.18 U	0.0018 U	0.036 U [0.0095 U]	0.0018 U	0.19 U	0.0018 U	0.38 U
Hexachlorobenzene	0.21	0.96	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methoxychlor	320	4,100	- -	mg/kg	220 U	0.019 U	0.18 U	0.018 U	0.4 U	0.019 U	1.8 U	0.019 U	1.8 U	0.018 U	0.36 U [0.095 U]	0.018 U	1.9 U	0.018 U	3.8 U
Toxaphene	0.49	2.1	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table C-1
Summary of Soil Sample Analytical Results for all Depth Ranges
Corrective Action Plan Addendum
Former Black Leaf Chemical Site, Louisville, Kentucky

Location ID: / Sample Depth(Feet): / Date Collected: / Sample Name:	USEPA Residential Soil RSL Nov 2017	USEPA Industrial Soil RSL Nov 2017	Kentucky Arsenic Background Guidance	Units	BLC008 8 - 12 10/25/10 BLC-SB-08	BLC009 0 - 1 10/25/10 BLC-SS-09	BLC009 8 - 12 10/25/10 BLC-SB-09	BLC010 0 - 1 10/25/10 BLC-SS-10	BLC010 8 - 12 10/25/10 BLC-SB-10	BLC011 0 - 1 10/25/10 BLC-SS-11	BLC011 8 - 12 10/25/10 BLC-SB-11	BLC013 0 - 1 10/27/10 BLC-SS-13	BLC013 8 - 12 10/27/10 BLC-SB-13	BLC014 0 - 1 10/27/10 BLC-SS-14	BLC014 8 - 12 10/27/10 BLC-SB-14	BLC015 0 - 1 10/27/10 BLC-SS-15	BLC015 8 - 12 10/27/10 BLC-SB-15	BLC016 0 - 1 10/27/10 BLC-SS-16	BLC016 8 - 12 10/27/10 BLC-SB-16
Detected Semivolatile Organics																			
1,1'-Biphenyl	47	200	- -	mg/kg	0.18 U	0.17 U	0.18 U	0.18 U	0.19 U	0.18 U	0.18 U	0.19 U	0.18 U	0.023 J [0.18 U]	0.18 U	0.17 U	0.19 U	3.8 U	0.18 U
1,2,4,5-Tetrachlorobenzene	23	350	- -	mg/kg	0.18 U	0.17 U	0.18 U	0.18 U	0.19 U	0.18 U	0.18 U	0.19 U	0.18 U	0.18 U [0.18 U]	0.18 U	0.17 U	0.19 U	3.8 U	0.18 U
3&4-Methylphenol	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acetophenone	7,800	120,000	- -	mg/kg	0.18 U	0.17 U	0.18 U	0.18 U	0.19 U	0.18 U	0.18 U	0.19 U	0.18 U	0.18 U [0.18 U]	0.18 U	0.17 U	0.19 U	3.8 U	0.18 U
1-methyl-Naphthalene	18	73	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4,5-Trichlorophenol	6,300	82,000	- -	mg/kg	0.18 U	0.17 U	0.18 U	0.18 U	0.19 U	0.18 U	0.18 U	0.19 U	0.18 U	0.18 U [0.18 U]	0.18 U	0.17 U	0.19 U	3.8 U	0.18 U
2,4-Dimethylphenol	1,300	16,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzaldehyde	170	820	- -	mg/kg	0.18 U	0.17 U	0.18 U	0.18 U	0.19 U	0.18 U	0.18 U	0.19 U	0.18 U	0.18 U [0.18 U]	0.18 U	0.17 U	0.19 U	3.8 U	0.18 U
2-Methylnaphthalene	240	3,000	- -	mg/kg	0.00047 J	0.1 J	0.00074 J	0.063 J	0.0038 U	0.043 J	0.0036 U	0.0019 J	0.0035 U	0.16 J [0.083]	0.0036 U	0.0034 U	0.032	0.2	0.00042 J
4,6-Dinitro-2-methylphenol	5.1	66	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthene	3,600	45,000	- -	mg/kg	0.0035 U	0.0099	0.0035 U	0.0095	0.0038 U	0.018	0.0036 U	0.0037 U	0.0035 U	0.0074 [0.0085 U]	0.0036 U	0.0034 U	0.00057 J	0.03 J	0.0035 U
Acenaphthylene	- -	- -	- -	mg/kg	0.0035 U	0.0017 J	0.0035 U	0.0031 J	0.0038 U	0.013	0.0036 U	0.0037 U	0.0035 U	0.0044 [0.0017 J]	0.0036 U	0.0034 U	0.00081 J	0.18 U	0.0035 U
Anthracene	18,000	230,000	- -	mg/kg	0.0035 U	0.024	0.0015 J	0.018	0.0038 U	0.051 J	0.0036 U	0.00053 J	0.0035 U	0.026 [0.0047 J]	0.0036 U	0.0034 U	0.0037 J	0.095 J	0.0035 U
Benzo(a)anthracene	1.1	21	- -	mg/kg	0.0035 U	0.13 J	0.006	0.15 J	0.0038 U	0.35	0.0036 U	0.0053	0.0035 U	0.23 [0.033]	0.0036 U	0.0034 U	0.022	0.49	0.0035 U
Benzo(a)pyrene	0.11	2.1	- -	mg/kg	0.0035 U	**0.14 J**	0.01 U	**0.16 J**	0.0038 U	**0.37**	0.0043 U	0.0098 U	0.0035 U	**0.22 [0.038]**	0.0036 U	0.0034 U	0.025	**0.45**	0.0035 U
Benzo(b)fluoranthene	1.1	21	- -	mg/kg	0.00061 J	0.14 J	0.0088	0.25	0.0038 U	0.54 J	0.00045 J	0.0072	0.0035 U	0.32 J [0.066]	0.0036 U	0.0034 U	0.025	0.59	0.0035 U
Benzo(g,h,i)perylene	- -	- -	- -	mg/kg	0.0035 UJ	0.12 J	0.0048 J	0.15 J	0.0038 U	0.23	0.00045 J	0.0053 J	0.0035 U	0.13 J [0.043]	0.0036 U	0.0034 U	0.015	0.39	0.0035 U
Benzo(k)fluoranthene	11	210	- -	mg/kg	0.0035 U	0.15 J	0.0069	0.16 J	0.0038 U	0.47	0.00038 J	0.0062	0.0035 U	0.26 [0.051]	0.0036 U	0.0034 U	0.024	0.5	0.0035 U
Benzoic acid	250,000	3,300,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbazole	- -	- -	- -	mg/kg	0.18 U	0.028 J	0.18 U	0.024 J	0.19 U	0.054 J	0.18 U	0.19 U	0.18 U	0.031 J [0.18 U]	0.18 U	0.17 U	0.19 U	3.8 U	0.18 U
Chrysene	110	2,100	- -	mg/kg	0.00056 J	0.18	0.007	0.21	0.0038 U	0.55	0.0036 U	0.0061	0.0035 U	0.3 [0.044]	0.0036 U	0.0034 U	0.026	0.55	0.0035 U
Dibenzo(a,h)anthracene	0.11	2.1	- -	mg/kg	0.0035 U	0.02	0.0035 U	0.025 J	0.0038 U	0.091 J	0.0036 U	0.0015 J	0.0035 U	0.031 [0.015]	0.0036 U	0.0034 U	0.005	**0.13 J**	0.0035 U
Dibenzofuran	73	1,000	- -	mg/kg	0.18 U	0.021 J	0.18 U	0.022 J	0.19 U	0.024 J	0.18 U	0.19 U	0.18 U	0.056 J [0.019 J]	0.18 U	0.17 U	0.19 U	3.8 U	0.18 U
Di-n-butylphthalate	6,300	82,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	2,400	30,000	- -	mg/kg	0.0035 U	0.3	0.013	0.35	0.0038 U	0.94	0.0036 U	0.01	0.0035 U	0.53 [0.061]	0.0036 U	0.0034 U	0.033	0.99	0.0035 U
Fluorene	2,400	30,000	- -	mg/kg	0.0035 U	0.0085	0.00036 J	0.0077	0.0038 U	0.025	0.0036 U	0.0037 U	0.0035 U	0.0078 [0.0011 J]	0.0036 U	0.0034 U	0.00086 J	0.027 J	0.0035 U
Indeno(1,2,3-cd)pyrene	1.1	21	- -	mg/kg	0.0035 U	0.12 J	0.0054	0.14 J	0.0038 U	0.21	0.00043 J	0.0049	0.0035 U	0.12 J [0.04]	0.0036 U	0.0034 U	0.014	0.35	0.0035 U
Naphthalene	3.8	17	- -	mg/kg	0.0035 U	0.034	0.0035 U	0.025	0.0038 U	0.024	0.0036 U	0.0037 U	0.0035 U	0.082 J [0.052]	0.0036 U	0.0034 U	0.018	0.12 J	0.0035 U
Pentachlorophenol	1	4	- -	mg/kg	0.0071 UJ	0.0068 UJ	0.0071 UJ	0.0072 UJ	0.38 U	0.34 U	0.36 U	0.37 U	0.35 U	0.34 U [0.34 UJ]	0.36 U	0.34 U	0.37 U	7.3 U	0.35 U
Phenanthrene	- -	- -	- -	mg/kg	0.00063 J	0.23	0.0057	0.19	0.0038 U	0.59	0.0036 U	0.0044	0.0035 U	0.3 [0.054]	0.0036 U	0.0034 U	0.037	0.57	0.0035 U
Phenol	19,000	250,000	- -	mg/kg	0.18 U	0.17 U	0.18 U	0.18 U	0.19 U	0.18 U	0.18 U	0.19 U	0.18 U	0.18 U [0.18 U]	0.18 U	0.17 U	0.19 U	3.8 U	0.18 U
Pyrene	1,800	23,000	- -	mg/kg	0.0035 U	0.29	0.0093	0.31	0.0038 U	1.1	0.0036 U	0.01	0.0035 U	0.58 [0.063]	0.0036 U	0.0034 U	0.033	0.9	0.0035 U
Detected Inorganics																			
Arsenic	**	**	22.7	mg/kg	9.2	5.1	12	9	12	14	8.1	15	12	15 [14]	12	14	7.6	**24**	9.6
Lead	400	800	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Detected Pesticides																			
2,4' DDD	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4'-DDE	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4'-DDT	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
trans-Nonachlor	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDD	1.9	9.6	- -	mg/kg	0.0035 U	0.082	0.019	0.0099	0.0038 U	0.27	0.0035 U	0.0037 U	0.0035 U	1.5 [1.3]	0.0037 U	0.0035 U	0.0058	**61**	0.035
4,4'-DDE	2.0	9.3	- -	mg/kg	0.001 J	0.58	0.039	0.036	0.0038 U	1.7	0.0035 U	0.0035 J	0.0035 U	**2.4 [2.9]**	0.0037 U	0.0035 U	0.048	**6.9**	0.0046
4,4'-DDT	1.9	8.5	- -	mg/kg	0.0068	0.59	0.1	0.031 J	0.0038 U	**2.1**	0.0035 U	0.0037 U	0.0035 U	**23 [14]**	0.0037 U	0.0035 U	0.02	**280**	0.14
Aldrin	0.039	0.18	- -	mg/kg	0.0018 U	0.0087 U	0.0018 U	0.0018 U	0.002 U	0.018 U	0.0018 U	0.0019 U	0.0018 U	0.027 J [0.17 U]	0.0019 U	0.0018 U	0.0019 U	1.9 U	0.0018 U
alpha-BHC	0.086	0.36	- -	mg/kg	0.028	0.0087 U	0.013	0.0018 U	0.002 U	0.0091 J	0.0018 U	0.0019 U	0.00089 J	0.087 U [0.17 U]	0.0019 U	0.0018 U	0.0011 NJ	1.9 U	0.00045 NJ
alpha-Chlordane	1.7	7.7	- -	mg/kg	0.0018 U	0.0019 J	0.00043 J	0.00026 NJ	0.002 U	0.0071 NJ	0.0018 U	0.0019 U	0.0018 U	0.014 J [0.17 U]	0.0019 U	0.0018 U	0.00088 J	0.46 J	0.0005 J
beta-BHC	0.3	1.3	- -	mg/kg	0.097	0.012	0.018	0.0018 U	0.002 U	0.044	0.0018 U	0.0019 U	0.025	**0.17 [0.39]**	0.0019 U	0.0018 U	0.0019 U	1.9 U	0.022
Chlordane (technical)	1.7	7.7	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
delta-BHC	- -	- -	- -	mg/kg	0.024	0.0087 U	0.0012 J	0.0018 U	0.002 U	0.0029 J	0.0018 U	0.0019 U	0.00026 J	0.087 U [0.17 U]	0.0019 U	0.0018 U	0.0019 U	1.9 U	0.0012 J
Dieldrin	0.034	0.14	- -	mg/kg	0.0054	**0.064**	0.0092	0.0076 J	0.0038 U	**0.19**	0.0035 U	0.0037 U	0.0035 U	**3.5 [1.8]**	0.0037 U	0.0035 U	0.0056	**8.5**	0.013
Endosulfan I	470	7000	- -	mg/kg	0.0018 U	0.0087 U	0.0018 U	0.0018 U	0.002 U	0.018 U	0.0018 U	0.0019 U	0.0018 U	0.087 U [0.17 U]	0.0019 U	0.0018 U	0.00022 NJ	1.9 U	0.0018 U
Endosulfan II	470	7000	- -	mg/kg	0.0035 U	0.017 U	0.0035 U	0.0035 U	0.0038 U	0.034 U	0.0035 U	0.0037 U	0.0035 U	0.17 U [0.34 U]	0.0037 U	0.0035 U	0.0038 U	3.7 U	0.0036 U
Endosulfan sulfate	470	7000	- -	mg/kg	0.0035 U	0.017 U	0.0035 U	0.0035 U	0.0038 U	0.034 U	0.0035 U	0.0037 U	0.0035 U	0.17 U [0.34 U]	0.0037 U	0.0035 U	0.0038 U	3.7 U	0.0036 U
Endrin	19	250	- -	mg/kg	0.0035 U	0.017 U	0.00038 NJ	0.0035 U	0.0038 U	0.034 U	0.0035 U	0.0037 U	0.0035 U	0.038 J [0.34 U]	0.0037 U	0.0035 U	0.0038 U	3.7 U	0.0036 U
Endrin aldehyde	- -	- -	- -	mg/kg	0.0035 U	0.017 U	0.0035 U	0.0011 NJ	0.0038 U	0.017 NJ	0.0035 U	0.0037 U	0.0035 U	0.17 U [0.34 U]	0.0037 U	0.0035 U	0.0038 U	3.7 U	0.0036 U
Endrin ketone	- -	- -	- -	mg/kg	0.0021 J	0.0018 J	0.0035 U	0.0035 U	0.0038 U	0.015 NJ	0.0035 U	0.0037 U	0.0035 U	0.022 J [0.34 U]	0.0037 U	0.0035 U	0.0038 U	3.7 U	0.00049 J
gamma-BHC (Lindane)	0.57	2.5	- -	mg/kg	0.044	0.0087 U	0.005	0.0018 U	0.002 U	0.018	0.0018 U	0.0019 U	0.0018 U	0.087 U [0.17 U]	0.0019 U	0.0018 U	0.00034 J	1.9 U	0.00043 J
gamma-Chlordane	1.7	7.7	- -	mg/kg	0.0018 U	0.0087 U	0.0018 U	0.0018 U	0.002 U	0.018 U	0.0018 U	0.0019 U	0.0018 U	0.078 J [0.17 U]	0.0019 U	0.0018 U	0.0008 NJ	1.9 U	0.0008 J
Heptachlor	0.13	0.63	- -	mg/kg	0.0018 U	0.0087 U	0.0018 U	0.0018 U	0.002 U	0.018 U	0.0018 U	0.0019 U	0.0018 U	0.087 U [0.17 U]	0.0019 U	0.0018 U	0.0019 U	1.9 U	0.0018 U
Heptachlor epoxide	0.07	0.33	- -	mg/kg	0.0018 U	0.0087 U	0.0018 U	0.0018 U	0.002 U	0.018 U	0.0018 U	0.0019 U	0.0018 U	0.087 U [0.17 U]	0.0019 U	0.0018 U	0.0019 U	1.9 U	0.0018 U
Hexachlorobenzene	0.21	0.96	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methoxychlor	320	4,100	- -	mg/kg	0.018 U	0.087 U	0.018 U	0.018 U	0.02 U	0.18 U	0.018 U	0.019 U	0.018 U	0.87 U [1.7 U]	0.019 U	0.018 U	0.019 U	19 U	0.018 U
Toxaphene	0.49	2.1	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table C-1
Summary of Soil Sample Analytical Results for all Depth Ranges
Corrective Action Plan Addendum
Former Black Leaf Chemical Site, Louisville, Kentucky

Location ID: Sample Depth(Feet): Date Collected: Sample Name:	USEPA Residential Soil RSL Nov 2017	USEPA Industrial Soil RSL Nov 2017	Kentucky Arsenic Background Guidance	Units	BLC017 0 - 1 10/27/10 BLC-SS-17	BLC017 8 - 12 10/27/10 BLC-SB-17	BLC018 0 - 1 10/27/10 BLC-SS-18	BLC018 8 - 12 10/27/10 BLC-SB-18	BLC019 0 - 1 10/25/10 BLC-SS-19	BLC019 8 - 12 10/25/10 BLC-SB-19	BLC020 0 - 1 10/26/10 BLC-SS-20	BLC020 8 - 12 10/26/10 BLC-SB-20	BLC021 0 - 1 10/27/10 BLC-SS-21	BLC021 8 - 12 10/27/10 BLC-SB-21	BLC022 0 - 1 10/27/10 BLC-SS-22	BLC022 8 - 12 10/27/10 BLC-SB-22	BLC023 0 - 1 10/27/10 BLC-SS-23
Detected Semivolatile Organics																	
1,1'-Biphenyl	47	200	- -	mg/kg	0.19 U	0.18 U	0.039 J [0.19 U]	0.21 U	0.61 J [0.2 U]	0.18 U	0.33 U [0.21 U]	0.18 U	0.18 U	0.18 U	0.2 U	0.21 U	0.19 U
1,2,4,5-Tetrachlorobenzene	23	350	- -	mg/kg	0.19 U	0.18 U	0.18 U [0.19 U]	0.21 U	3.9 U [0.2 U]	0.18 U	0.33 U [0.21 U]	0.18 U	0.18 U	0.18 U	0.2 U	0.21 U	0.19 U
3&4-Methylphenol	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acetophenone	7,800	120,000	- -	mg/kg	0.19 U	0.18 U	0.061 J [0.19 U]	0.21 U	3.9 U [0.2 U]	0.18 U	0.33 U [0.21 U]	0.18 U	0.18 U	0.18 U	0.2 U	0.21 U	0.19 U
1-methyl-Naphthalene	18	73	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4,5-Trichlorophenol	6,300	82,000	- -	mg/kg	0.19 U	0.18 U	0.18 U [0.19 U]	0.21 U	3.9 U [0.2 U]	0.18 U	0.33 U [0.21 U]	0.18 U	0.18 U	0.18 U	0.2 U	0.21 U	0.19 U
2,4-Dimethylphenol	1,300	16,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzaldehyde	170	820	- -	mg/kg	0.19 U	0.18 U	0.18 U [0.19 U]	0.21 U	3.9 U [0.2 U]	0.18 U	0.33 U [0.21 U]	0.18 U	0.18 U	0.18 U	0.2 U	0.21 U	0.19 U
2-Methylnaphthalene	240	3,000	- -	mg/kg	0.0043	0.0035 U	0.24 [0.026]	0.0041 U	1.3 [0.11 J]	0.0036 U	0.086 [0.028]	0.0034 U	0.027	0.0035 U	0.13 J	0.0042 U	0.083 J
4,6-Dinitro-2-methylphenol	5.1	66	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthene	3,600	45,000	- -	mg/kg	0.0036 U	0.0035 U	0.1 [0.0056]	0.0041 U	3.6 J [0.061 J]	0.0036 U	0.18 [0.033]	0.0034 U	0.0027 J	0.0035 U	0.0091	0.0042 U	0.02
Acenaphthylene	- -	- -	- -	mg/kg	0.0036 U	0.0035 U	0.018 [0.0064]	0.0041 U	0.19 U [0.0032 J]	0.0036 U	0.011 J [0.0037 J]	0.0034 U	0.018 U	0.0035 U	0.005	0.0042 U	0.01
Anthracene	18,000	230,000	- -	mg/kg	0.0036 U	0.0035 U	0.37 [0.023]	0.0041 U	11 [0.23]	0.0036 U	0.43 [0.091 J]	0.0034 U	0.0084 J	0.0035 U	0.036	0.0042 U	0.074 J
Benzo(a)anthracene	1.1	21	- -	mg/kg	0.0008 J	0.0035 U	1 [0.17 J]	0.0041 U	**14 [0.53]**	0.0036 U	**1.4 [0.26]**	0.00037 J	0.048	0.0035 U	0.2 J	0.0042 U	0.29
Benzo(a)pyrene	0.11	2.1	- -	mg/kg	0.0042 U	0.0035 U	**0.77 [0.19]**	0.0041 U	**12 [0.43]**	0.0043 U	**1.5 [0.27]**	0.0034 U	0.038	0.0035 U	**0.19 J**	0.0042 U	**0.3**
Benzo(b)fluoranthene	1.1	21	- -	mg/kg	0.0021 J	0.0035 U	**1.2 [0.22]**	0.0041 U	**14 [0.57 J]**	0.00043 J	**1.7 J [0.36]**	0.00044 J	0.052	0.0035 U	0.23	0.0042 U	0.42
Benzo(g,h,i)perylene	- -	- -	- -	mg/kg	0.00087 J	0.0035 U	0.47 [0.19]	0.0041 U	7.8 [0.23]	0.00042 J	0.79 J [0.23]	0.0034 U	0.019	0.0035 U	0.11 J	0.0042 U	0.15 J
Benzo(k)fluoranthene	11	210	- -	mg/kg	0.0015 J	0.0035 U	0.8 [0.2]	0.0041 U	11 [0.45]	0.0036 U	1.7 [0.22]	0.00035 J	0.038	0.0035 U	0.23	0.0042 U	0.4
Benzoic acid	250,000	3,300,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbazole	- -	- -	- -	mg/kg	0.19 U	0.18 U	0.21 [0.019 J]	0.21 U	5.2 [0.12 J]	0.18 U	0.25 J [0.05 J]	0.18 U	0.18 U	0.18 U	0.023 J	0.21 U	0.037 J
Chrysene	110	2,100	- -	mg/kg	0.0012 J	0.0035 U	0.95 [0.2]	0.0041 U	15 [0.6]	0.0036 U	1.8 [0.32]	0.00042 J	0.061	0.0035 U	0.26	0.0042 U	0.4
Dibenzo(a,h)anthracene	0.11	2.1	- -	mg/kg	0.0036 U	0.0035 U	**0.12 J [0.033]**	0.0041 U	**2.2 J [0.048 J]**	0.0036 U	**0.3 J [0.044 J]**	0.0034 U	0.018 U	0.0035 U	0.039	0.0042 U	0.068 J
Dibenzofuran	73	1,000	- -	mg/kg	0.19 U	0.18 U	0.25 [0.19 U]	0.21 U	5 [0.083 J]	0.18 U	0.11 J [0.032 J]	0.18 U	0.18 U	0.18 U	0.035 J	0.21 U	0.041 J
Di-n-butylphthalate	6,300	82,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	2,400	30,000	- -	mg/kg	0.001 J	0.0035 U	1.4 [0.31]	0.00051 J	43 [1.4]	0.0036 U	3.2 [0.61]	0.00097 J	0.082	0.0035 U	0.39	0.0042 U	0.55
Fluorene	2,400	30,000	- -	mg/kg	0.0036 U	0.0035 U	0.097 [0.0049]	0.0041 U	5.4 [0.083 J]	0.0036 U	0.17 [0.034]	0.0034 U	0.0032 J	0.0035 U	0.013	0.0042 U	0.023
Indeno(1,2,3-cd)pyrene	1.1	21	- -	mg/kg	0.00086 J	0.0035 U	0.45 [0.17 J]	0.0041 U	**7.6 [0.21]**	0.0036 U	0.7 [0.18 J]	0.0034 U	0.019	0.0035 U	0.098 J	0.0042 U	0.15 J
Naphthalene	3.8	17	- -	mg/kg	0.0036 U	0.0035 U	0.27 [0.017]	0.0041 U	**4.5 [0.079 J]**	0.0036 U	0.036 J [0.011]	0.0034 U	0.018 U	0.0035 U	0.085 J	0.0042 U	0.05 J
Pentachlorophenol	1	4	- -	mg/kg	0.36 U	0.35 U	0.35 U [0.36 UJ]	0.41 U	7.5 U [0.38 U]	0.36 U	0.65 U [0.41 UJ]	0.34 U	0.36 U	0.35 U	0.38 U	0.42 U	0.36 U
Phenanthrene	- -	- -	- -	mg/kg	0.0036 U	0.0035 U	1.5 [0.18 J]	0.0041 U	46 [1.1]	0.0036 U	2.2 [0.45]	0.0034 U	0.067	0.0035 U	0.27	0.0042 U	0.38
Phenol	19,000	250,000	- -	mg/kg	0.19 U	0.18 U	0.18 U [0.19 U]	0.21 U	3.9 U [0.2 U]	0.18 U	0.33 U [0.21 U]	0.18 U	0.18 U	0.18 U	0.2 U	0.21 U	0.19 U
Pyrene	1,800	23,000	- -	mg/kg	0.0036 U	0.0035 U	1.9 [0.3]	0.0041 U	33 [1.4]	0.0036 U	3.2 [0.52]	0.0034 U	0.11	0.0035 U	0.44	0.0042 U	0.6
Detected Inorganics																	
Arsenic	**	**	22.7	mg/kg	15	7.5	18 [17]	16	**56 [46]**	8.2	**17 [40]**	8.3	**47**	8.5	18	15	13
Lead	400	800	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Detected Pesticides																	
2,4' DDD	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4'-DDE	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4'-DDT	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
trans-Nonachlor	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDD	1.9	9.6	- -	mg/kg	0.054 J	0.0034 U	0.09 [0.065]	0.0067	0.12 [0.14]	0.0035 U	0.0055 [0.0041 U]	0.0033 U	0.096	0.0035 U	0.0064	0.0042 U	0.21
4,4'-DDE	2.0	9.3	- -	mg/kg	0.64	0.0034 U	0.48 [0.26]	0.00095 J	1.3 [1.2]	0.0035 U	0.039 [0.011 N]	0.0033 U	1.1	0.0035 U	0.044	0.0042 U	0.25
4,4'-DDT	1.9	8.5	- -	mg/kg	0.085	0.0036 U	0.23 [0.19]	0.042	0.34 [0.32]	0.0035 U	0.023 [0.011]	0.0033 U	0.46	0.0035 U	0.029	0.0042 U	0.11
Aldrin	0.039	0.18	- -	mg/kg	0.0038 U	0.0017 U	0.0035 U [0.0019 U]	0.0021 U	0.0098 U [0.0099 U]	0.0018 U	0.002 U [0.0021 U]	0.0017 U	0.0094 U	0.0018 U	0.002 U	0.0022 U	0.0019 U
alpha-BHC	0.086	0.36	- -	mg/kg	0.0038 U	0.0017 U	0.0012 NJ [0.0013 J]	0.0021 U	0.0018 J [0.0018 J]	0.0018 U	0.002 U [0.0021 U]	0.0017 U	0.0094 U	0.0018 U	0.002 U	0.0022 U	0.00076 J
alpha-Chlordane	1.7	7.7	- -	mg/kg	0.00051 NJ	0.0017 U	0.0074 [0.0042]	0.0021 U	0.0019 NJ [0.0019 NJ]	0.0018 U	0.002 U [0.0021 U]	0.0017 U	0.0094 U	0.0018 U	0.002 U	0.0022 U	0.0019 U
beta-BHC	0.3	1.3	- -	mg/kg	0.0046	0.0017 U	0.0039 [0.0026]	0.0021 U	0.0098 U [0.0099 U]	0.0018 U	0.002 U [0.0041 U]	0.0017 U	0.0094 U	0.0018 U	0.002 U	0.0022 U	0.0019 U
Chlordane (technical)	1.7	7.7	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
delta-BHC	- -	- -	- -	mg/kg	0.0038 U	0.0017 U	0.0035 U [0.0019 U]	0.0021 U	0.0098 U [0.0099 U]	0.0018 U	0.002 U [0.0021 U]	0.0017 U	0.0094 U	0.0018 U	0.002 U	0.0022 U	0.0019 U
Dieldrin	0.034	0.14	- -	mg/kg	0.014	0.0034 U	0.03 [0.015]	0.0015 J	**0.03 [0.042]**	0.0035 U	0.0059 [0.0028 J]	0.0033 U	0.017 J	0.0035 U	0.0018 J	0.0042 U	0.003 J
Endosulfan I	470	7000	- -	mg/kg	0.0038 U	0.0017 U	0.0035 U [0.0019 U]	0.0021 U	0.0098 U [0.0099 U]	0.0018 U	0.002 U [0.0021 U]	0.0017 U	0.0037 J	0.0018 U	0.002 U	0.0022 U	0.001 NJ
Endosulfan II	470	7000	- -	mg/kg	0.0073 U	0.0034 U	0.0069 U [0.0037 U]	0.0041 U	0.019 U [0.019 U]	0.0035 U	0.0039 U [0.0041 U]	0.0033 U	0.018 U	0.0035 U	0.0039 U	0.0042 U	0.0036 U
Endosulfan sulfate	470	7000	- -	mg/kg	0.0073 U	0.0034 U	0.0069 U [0.0037 U]	0.0041 U	0.019 U [0.019 U]	0.0035 U	0.0039 U [0.0041 U]	0.0033 U	0.018 U	0.0035 U	0.00046 NJ	0.0042 U	0.00058 NJ
Endrin	19	250	- -	mg/kg	0.0073 U	0.0034 U	0.00071 NJ [0.00064 NJ]	0.0041 U	0.019 U [0.019 U]	0.0035 U	0.00064 J [0.0041 U]	0.0033 U	0.018 U	0.0035 U	0.0039 U	0.0042 U	0.0036 U
Endrin aldehyde	- -	- -	- -	mg/kg	0.0073 U	0.0034 U	0.0019 NJ [0.0037 U]	0.0041 U	0.019 U [0.019 U]	0.0035 U	0.0039 U [0.0041 U]	0.0033 U	0.018 U	0.0035 U	0.0039 U	0.0042 U	0.0017 NJ
Endrin ketone	- -	- -	- -	mg/kg	0.0073 U	0.0034 U	0.0069 U [0.0013 NJ]	0.0041 U	0.019 U [0.019 U]	0.0035 U	0.0039 U [0.001 NJ]	0.0033 U	0.0033 NJ	0.0035 U	0.0013 J	0.0042 U	0.0017 NJ
gamma-BHC (Lindane)	0.57	2.5	- -	mg/kg	0.0038 U	0.0017 U	0.00051 J [0.0003 J]	0.0021 U	0.0098 U [0.0099 U]	0.0018 U	0.002 U [0.0021 U]	0.0017 U	0.0094 U	0.0018 U	0.002 U	0.0022 U	0.00032 NJ
gamma-Chlordane	1.7	7.7	- -	mg/kg	0.0038 U	0.0017 U	0.0077 U [0.0042]	0.00025 J	0.0098 U [0.0099 U]	0.0018 U	0.00044 NJ [0.00023 NJ]	0.0017 U	0.0094 U	0.0018 U	0.00025 J	0.0022 U	0.0019 U
Heptachlor	0.13	0.63	- -	mg/kg	0.0038 U	0.0017 U	0.0035 U [0.0019 U]	0.0021 U	0.0098 U [0.0099 U]	0.0018 U	0.002 U [0.00058 NJ]	0.0017 U	0.0094 U	0.0018 U	0.002 U	0.0022 U	0.00062 J
Heptachlor epoxide	0.07	0.33	- -	mg/kg	0.0038 U	0.0017 U	0.0035 U [0.0019 U]	0.0021 U	0.0098 U [0.0099 U]	0.0018 U	0.002 U [0.0021 U]	0.0017 U	0.0094 U	0.0018 U	0.0011 J	0.0022 U	0.0053 U
Hexachlorobenzene	0.21	0.96	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methoxychlor	320	4,100	- -	mg/kg	0.038 U	0.017 U	0.035 U [0.019 U]	0.021 U	0.098 U [0.099 U]	0.018 U	0.02 U [0.021 U]	0.017 U	0.094 U	0.018 U	0.02 U	0.022 U	0.019 U
Toxaphene	0.49	2.1	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table C-1
Summary of Soil Sample Analytical Results for all Depth Ranges
Corrective Action Plan Addendum
Former Black Leaf Chemical Site, Louisville, Kentucky

Location ID: / Sample Depth(Feet): / Date Collected: / Sample Name:	USEPA Residential Soil RSL Nov 2017	USEPA Industrial Soil RSL Nov 2017	Kentucky Arsenic Background Guidance	Units	BLC023 8 - 12 10/27/10 BLC-SB-23	BLC024 0 - 1 10/27/10 BLC-SS-24	BLC024 8 - 12 10/27/10 BLC-SB-24	BLC025 0 - 1 10/27/10 BLC-SS-25	BLC025 8 - 12 10/27/10 BLC-SB-25	BLC026 0 - 1 10/27/10 BLC-SS-26	BLC026 8 - 12 10/27/10 BLC-SB-26	BLC027 0 - 1 10/27/10 BLC-SS-27	BLC027 8 - 12 10/27/10 BLC-SB-27	BLC028 0 - 1 10/27/10 BLC-SS-28	BLC028 8 - 12 10/27/10 BLC-SB-28	BLC029 0 - 1 10/27/10 BLC-SS-29	BLC029 8 - 12 10/27/10 BLC-SB-29	BLC030 0 - 1 10/27/10 BLC-SS-30	BLC030 8 - 12 10/27/10 BLC-SB-30
Detected Semivolatile Organics																			
1,1'-Biphenyl	47	200	- -	mg/kg	0.2 U	0.22 U	0.18 U	0.18 U	0.19 U	0.19 U	0.2 U	0.18 U	0.18 U	0.17 U	0.22 U	0.18 U	0.19 U	0.2 U [0.18 U]	0.18 U
1,2,4,5-Tetrachlorobenzene	23	350	- -	mg/kg	0.2 U	0.22 U	0.18 U	0.18 U	0.19 U	0.19 U	0.2 U	0.18 U	0.18 U	0.17 U	0.22 U	0.18 U	0.19 U	0.2 U [0.18 U]	0.18 U
3&4-Methylphenol	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acetophenone	7,800	120,000	- -	mg/kg	0.2 U	0.22 U	0.18 U	0.18 U	0.034 J	0.19 U	0.2 U	0.18 U	0.18 U	0.17 U	0.22 U	0.18 U	0.19 U	0.2 U [0.18 U]	0.18 U
1-methyl-Naphthalene	18	73	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4,5-Trichlorophenol	6,300	82,000	- -	mg/kg	0.2 U	0.22 U	0.18 U	0.18 U	0.19 U	0.19 U	0.2 U	0.18 U	0.18 U	0.17 U	0.22 U	0.18 U	0.19 U	0.2 U [0.18 U]	0.18 U
2,4-Dimethylphenol	1,300	16,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzaldehyde	170	820	- -	mg/kg	0.2 U	0.023 J	0.18 U	0.18 U	0.67	0.19 U	0.21	0.18 U	0.18 U	0.17 U	0.17 J	0.18 U	0.19 U	0.2 U [0.18 U]	0.18 U
2-Methylnaphthalene	240	3,000	- -	mg/kg	0.02	0.079 J	0.0036 U	0.061 J	0.0038 U	0.042	0.004 U	0.012	0.0035 U	0.0013 J	0.00064 J	0.019	0.0036 U	0.048 [0.094 J]	0.0036 U
4,6-Dinitro-2-methylphenol	5.1	66	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthene	3,600	45,000	- -	mg/kg	0.017	0.01	0.0036 U	0.0052	0.0038 U	0.015	0.004 U	0.007 U	0.0035 U	0.0033 U	0.0042 U	0.0069 U	0.0036 U	0.0064 J [0.0031 J]	0.0036 U
Acenaphthylene	- -	- -	- -	mg/kg	0.0022 J	0.015	0.0036 U	0.011	0.0038 U	0.021 J	0.004 U	0.0015 J	0.0035 U	0.0033 U	0.0042 U	0.0017 J	0.0036 U	0.0041 J [0.0065]	0.0036 U
Anthracene	18,000	230,000	- -	mg/kg	0.067 J	0.049 J	0.0036 U	0.02	0.0038 U	0.053	0.004 U	0.0024 J	0.0035 U	0.0033 U	0.00063 J	0.0029 J	0.0036 U	0.019 J [0.042 J]	0.0036 U
Benzo(a)anthracene	1.1	21	- -	mg/kg	0.23	0.33	0.0036 U	0.14 J	0.0038 U	0.36	0.004 U	0.021	0.0035 U	0.0023 J	0.0024 J	0.025	0.0036 U	0.085 [0.14 J]	0.0036 U
Benzo(a)pyrene	0.11	2.1	- -	mg/kg	**0.23**	**0.36**	0.0036 U	**0.16 J**	0.0038 U	**0.35**	0.004 U	0.03	0.0035 U	0.0055 U	0.0055 U	0.031	0.0036 U	**0.067 [0.15 J]**	0.0036 U
Benzo(b)fluoranthene	1.1	21	- -	mg/kg	0.2 J	0.7	0.0036 U	0.25 J	0.0038 U	0.31	0.004 U	0.048	0.0035 U	0.0058	0.0025 J	0.039	0.0036 U	0.093 [0.23]	0.0036 U
Benzo(g,h,i)perylene	- -	- -	- -	mg/kg	0.1 J	0.2 J	0.0036 U	0.083 J	0.0038 U	0.32	0.004 U	0.022	0.0035 U	0.0034	0.0019 J	0.026	0.0036 U	0.051 [0.15 J]	0.0036 U
Benzo(k)fluoranthene	11	210	- -	mg/kg	0.25	0.42	0.0036 U	0.2	0.0038 U	0.36	0.004 U	0.039	0.0035 U	0.0038	0.0021 J	0.03	0.0036 U	0.074 [0.15 J]	0.0036 U
Benzoic acid	250,000	3,300,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbazole	- -	- -	- -	mg/kg	0.2 U	0.031 J	0.18 U	0.18 U	0.19 U	0.027 J	0.2 U	0.18 U	0.18 U	0.17 U	0.22 U	0.18 U	0.19 U	0.2 U [0.18 U]	0.18 U
Chrysene	110	2,100	- -	mg/kg	0.24	0.46	0.0036 U	0.2	0.0038 U	0.4	0.004 U	0.033	0.0035 U	0.0035	0.0024 J	0.033	0.0036 U	0.1 [0.19]	0.0036 U
Dibenzo(a,h)anthracene	0.11	2.1	- -	mg/kg	0.029 J	0.057 J	0.0036 U	0.028	0.0038 U	0.077	0.004 U	0.0082	0.0035 U	0.00085 J	0.00057 J	0.0097	0.0036 U	0.019 J [0.025]	0.0036 U
Dibenzofuran	73	1,000	- -	mg/kg	0.2 U	0.038 J	0.18 U	0.027 J	0.19 U	0.025 J	0.2 U	0.18 U	0.18 U	0.17 U	0.22 U	0.18 U	0.19 U	0.2 U [0.036 J]	0.18 U
Di-n-butylphthalate	6,300	82,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	2,400	30,000	- -	mg/kg	0.43	0.63	0.0036 U	0.22	0.0038 U	0.74	0.004 U	0.026	0.0035 U	0.0041	0.0059	0.028	0.0036 U	0.17 [0.24]	0.0036 U
Fluorene	2,400	30,000	- -	mg/kg	0.016	0.0081	0.0036 U	0.0062	0.0038 U	0.016	0.004 U	0.007 U	0.0035 U	0.0033 U	0.0042 U	0.00091 J	0.0036 U	0.0068 J [0.0048]	0.0036 U
Indeno(1,2,3-cd)pyrene	1.1	21	- -	mg/kg	0.1 J	0.19 J	0.0036 U	0.087 J	0.0038 U	0.31	0.004 U	0.021	0.0035 U	0.0029 J	0.0017 J	0.025	0.0036 U	0.047 [0.14 J]	0.0036 U
Naphthalene	3.8	17	- -	mg/kg	0.012	0.035	0.0036 U	0.024	0.0038 U	0.024	0.004 U	0.007 U	0.0035 U	0.0033 U	0.0042 U	0.0069 U	0.0036 U	0.028 [0.043 J]	0.0036 U
Pentachlorophenol	1	4	- -	mg/kg	0.4 U	0.43 U	0.36 U	0.35 U	0.38 U	0.37 U	0.4 U	0.35 U	0.35 U	0.33 U	0.42 U	0.34 U	0.36 U	0.38 U [0.001 J]	0.36 UJ
Phenanthrene	- -	- -	- -	mg/kg	0.27	0.28	0.0036 U	0.12 J	0.0038 U	0.33	0.004 U	0.0088	0.0035 U	0.0033 U	0.003 J	0.021	0.0036 U	0.12 [0.14 J]	0.0036 U
Phenol	19,000	250,000	- -	mg/kg	0.2 U	0.22 U	0.18 U	0.18 U	0.022 J	0.19 U	0.2 U	0.18 U	0.18 U	0.17 U	0.22 U	0.18 U	0.19 U	0.2 U [0.18 U]	0.18 U
Pyrene	1,800	23,000	- -	mg/kg	0.47	0.67	0.0036 U	0.27	0.0038 U	0.69	0.004 U	0.032	0.0035 U	0.17 U	0.0045	0.051	0.0036 U	0.18 [0.25]	0.0036 U
Detected Inorganics																			
Arsenic	**	**	22.7	mg/kg	6.2	**34**	8	**39**	11	**31**	17	12	11	17	7.6	13	10	**23 [33]**	5.7
Lead	400	800	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Detected Pesticides																			
2,4' DDD	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4'-DDE	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4'-DDT	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
trans-Nonachlor	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDD	1.9	9.6	- -	mg/kg	0.0039 U	0.013	0.0036 U	0.057	0.0039 U	0.0036 U	0.0042 U	0.079	0.0035 U	0.01	0.0043 U	0.024	0.0036 U	0.072 [0.14]	0.01
4,4'-DDE	2.0	9.3	- -	mg/kg	0.0039 U	0.014	0.0036 U	0.069	0.0039 U	0.0092 N	0.0042 U	1.4	0.0035 U	0.1	0.00051 J	0.058	0.0036 U	0.44 [0.36]	0.0013 J
4,4'-DDT	1.9	8.5	- -	mg/kg	0.0039 U	0.071	0.0036 U	0.27	0.0034 J	0.0062	0.0042 U	0.098	0.0035 U	0.033	0.014	0.033	0.0005 J	0.15 [1]	0.02
Aldrin	0.039	0.18	- -	mg/kg	0.002 U	0.0022 U	0.0019 U	0.0038 U	0.002 U	0.0019 U	0.0022 U	0.018 U	0.0018 U	0.0017 U	0.0022 U	0.0018 U	0.0019 U	0.004 U [0.0004 NJ]	0.0018 U
alpha-BHC	0.086	0.36	- -	mg/kg	0.002 U	0.0022 U	0.0019 U	0.00038 J	0.00063 J	0.0019 U	0.0022 U	0.018 U	0.0018 U	0.0017 U	0.0022 U	0.0018 U	0.0019 U	0.0011 NJ [0.0016 J]	0.0018 U
alpha-Chlordane	1.7	7.7	- -	mg/kg	0.002 U	0.00075 J	0.0019 U	0.0018 U	0.002 U	0.0019 U	0.0022 U	0.018 U	0.0018 U	0.021	0.0022 U	0.0018 U	0.0019 U	0.00051 NJ [0.0097]	0.0018 U
beta-BHC	0.3	1.3	- -	mg/kg	0.002 U	0.006 U	0.0019 U	0.0029 U	0.002 U	0.0034 U	0.0022 U	0.018 U	0.0018 U	0.0017 U	0.0022 U	0.0018 U	0.0019 U	0.0041 N [0.028]	0.0018 U
Chlordane (technical)	1.7	7.7	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
delta-BHC	- -	- -	- -	mg/kg	0.002 U	0.0011 NJ	0.0019 U	0.0018 U	0.002 U	0.00063 NJ	0.0022 U	0.018 U	0.0018 U	0.0017 U	0.0022 U	0.0018 U	0.0019 U	0.00075 NJ [0.0035 U]	0.00021 J
Dieldrin	0.034	0.14	- -	mg/kg	0.0039 U	0.0031 J	0.0036 U	0.017	0.0039 U	0.0036 U	0.0042 U	0.0093 J	0.0035 U	0.0013 NJ	0.0043 U	0.0059	0.0036 U	**0.0065 J [0.099]**	0.00056 J
Endosulfan I	470	7000	- -	mg/kg	0.002 U	0.00067 J	0.0019 U	0.0018 U	0.002 U	0.00023 J	0.0022 U	0.018 U	0.0018 U	0.0017 U	0.0022 U	0.0018 U	0.0019 U	0.004 U [0.0035 U]	0.0018 U
Endosulfan II	470	7000	- -	mg/kg	0.0039 U	0.0042 U	0.0036 U	0.0035 U	0.0039 U	0.0036 U	0.0042 U	0.035 U	0.0035 U	0.00044 J	0.0043 U	0.0034 U	0.0036 U	0.0078 U [0.0008 J]	0.0035 U
Endosulfan sulfate	470	7000	- -	mg/kg	0.0004 NJ	0.0016 NJ	0.0036 U	0.00054 J	0.0039 U	0.0036 U	0.0042 U	0.035 U	0.0035 U	0.0033 U	0.0043 U	0.0034 U	0.0036 U	0.0078 U [0.0068 U]	0.0035 U
Endrin	19	250	- -	mg/kg	0.0039 U	0.0016 NJ	0.0036 U	0.00055 NJ	0.0039 U	0.0036 U	0.0042 U	0.035 U	0.0035 U	0.0012 J	0.0043 U	0.0034 U	0.0036 U	0.0078 U [0.0068 U]	0.0035 U
Endrin aldehyde	- -	- -	- -	mg/kg	0.0039 U	0.0042 U	0.0036 U	0.0035 U	0.0039 U	0.0036 U	0.0042 U	0.035 U	0.0035 U	0.0033 U	0.0043 U	0.0034 U	0.0036 U	0.0021 NJ [0.0068 U]	0.0035 U
Endrin ketone	- -	- -	- -	mg/kg	0.0039 U	0.0042 U	0.0036 U	0.0012 J	0.0039 U	0.0019 NJ	0.0042 U	0.035 U	0.0035 U	0.0033 U	0.0043 U	0.0034 U	0.0036 U	0.0078 U [0.0013 J]	0.0035 U
gamma-BHC (Lindane)	0.57	2.5	- -	mg/kg	0.002 U	0.0011 J	0.0019 U	0.0018 U	0.002 U	0.0019 U	0.0022 U	0.018 U	0.0018 U	0.0017 U	0.0022 U	0.0018 U	0.0019 U	0.00053 J [0.00049 J]	0.0018 U
gamma-Chlordane	1.7	7.7	- -	mg/kg	0.002 U	0.00086 J	0.0019 U	0.0018 U	0.002 U	0.0019 U	0.0022 U	0.018 U	0.0018 U	0.018	0.0022 U	0.0018 U	0.0019 U	0.004 U [0.01 U]	0.0018 U
Heptachlor	0.13	0.63	- -	mg/kg	0.002 U	0.0022 U	0.0019 U	0.0018 NJ	0.002 U	0.00036 NJ	0.0022 U	0.018 U	0.0018 U	0.0017 U	0.0022 U	0.0018 U	0.0019 U	0.00055 J [0.0035 U]	0.0018 U
Heptachlor epoxide	0.07	0.33	- -	mg/kg	0.002 U	0.0022 U	0.0019 U	0.0064 U	0.002 U	0.0019 U	0.0022 U	0.018 U	0.0018 U	0.0017 U	0.0022 U	0.0018 U	0.0019 U	0.004 U [0.0035 U]	0.0018 U
Hexachlorobenzene	0.21	0.96	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methoxychlor	320	4,100	- -	mg/kg	0.02 U	0.022 U	0.019 U	0.018 U	0.02 U	0.019 U	0.022 U	0.18 U	0.018 U	0.0021 NJ	0.022 U	0.018 U	0.019 U	0.04 U [0.035 U]	0.018 U
Toxaphene	0.49	2.1	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table C-1
Summary of Soil Sample Analytical Results for all Depth Ranges
Corrective Action Plan Addendum
Former Black Leaf Chemical Site, Louisville, Kentucky

Location ID:	USEPA	USEPA	Kentucky		BLC040	BLC040	BLC041	BLC041	BLC042	BLC042	BLC043	BLC043	BLC044	BLC044	BLC045	BLC045	BLC046	BLC046	BLC047
Sample Depth(Feet):	Residential	Industrial	Arsenic																
Date Collected:	Soil RSL Nov	Soil RSL	Background		09/22/11	10/24/11	09/22/11	10/24/11	09/22/11	10/24/11	09/22/11	10/24/11	09/22/11	10/24/11	09/22/11	10/24/11	09/22/11	10/24/11	09/22/11
Sample Name:	2017	Nov 2017	Guidance	Units	BLC-SS40	BLC-SS40	BLC-SS-41	BLC-SS-41	BLC-SS-42	BLC-SS-42	BLC-SS-43	BLC-SS-43	BLC-SS-44	BLC-SS-44	BLC-SS-45	BLC-SS-45	BLC-SS-46	BLC-SS-46	BLC-SS-47
Detected Semivolatile Organics																			
1,1'-Biphenyl	47	200	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4,5-Tetrachlorobenzene	23	350	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3&4-Methylphenol	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acetophenone	7,800	120,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1-methyl-Naphthalene	18	73	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4,5-Trichlorophenol	6,300	82,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dimethylphenol	1,300	16,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzaldehyde	170	820	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	240	3,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,6-Dinitro-2-methylphenol	5.1	66	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthene	3,600	45,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthylene	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Anthracene	18,000	230,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene	1.1	21	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	0.11	2.1	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	1.1	21	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(g,h,i)perylene	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	11	210	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzoic acid	250,000	3,300,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbazole	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	110	2,100	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibenzo(a,h)anthracene	0.11	2.1	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibenzofuran	73	1,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Di-n-butylphthalate	6,300	82,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	2,400	30,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluorene	2,400	30,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	1.1	21	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	3.8	17	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pentachlorophenol	1	4	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phenol	19,000	250,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pyrene	1,800	23,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Detected Inorganics																			
Arsenic	**	**	22.7	mg/kg	6.08	NA	**29**	NA	10.9	NA	**53.6**	NA	5.4	NA	16 [20.6]	NA	22.6	NA	**54.3**
Lead	400	800	- -	mg/kg	78.2	NA	75.8	NA	63.7	NA	80.2	NA	22.3	NA	**77.5 [576]**	NA	216	NA	**768**
Detected Pesticides																			
2,4' DDD	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4'-DDE	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4'-DDT	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
trans-Nonachlor	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDD	1.9	9.6	- -	mg/kg	NA	0.0039 U	NA	0.0042 U	NA	0.0042 U	NA	0.0041 U	NA	0.028 J	NA	0.025 J [0.034 J]	NA	0.0065 J	NA
4,4'-DDE	2.0	9.3	- -	mg/kg	NA	0.022 J	NA	0.0051 U	NA	0.0072 J	NA	0.007 J	NA	0.093	NA	0.77 [0.82]	NA	0.16	NA
4,4'-DDT	1.9	8.5	- -	mg/kg	NA	0.024 J	NA	0.006 U	NA	0.0061 U	NA	0.0059 U	NA	0.11	NA	0.38 [0.42]	NA	0.058	NA
Aldrin	0.039	0.18	- -	mg/kg	NA	0.0047 U	NA	0.0051 U	NA	0.0051 U	NA	0.0049 U	NA	0.0043 U	NA	0.0049 U [0.0051 U]	NA	0.0048 U	NA
alpha-BHC	0.086	0.36	- -	mg/kg	NA	0.0059 U	NA	0.0063 U	NA	0.0064 U	NA	0.0062 U	NA	0.0054 U	NA	0.0061 U [0.0064 U]	NA	0.0061 U	NA
alpha-Chlordane	1.7	7.7	- -	mg/kg	NA	0.0035 U	NA	0.0038 U	NA	0.0038 U	NA	0.0037 U	NA	0.0032 U	NA	0.0036 U [0.0038 U]	NA	0.0036 U	NA
beta-BHC	0.3	1.3	- -	mg/kg	NA	0.0042 U	NA	0.0045 U	NA	0.0045 U	NA	0.0044 U	NA	0.0039 U	NA	0.0043 U [0.0045 U]	NA	0.0043 U	NA
Chlordane (technical)	1.7	7.7	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
delta-BHC	- -	- -	- -	mg/kg	NA	0.0024 U	NA	0.0026 U	NA	0.0026 U	NA	0.0025 U	NA	0.0022 U	NA	0.0024 U [0.0026 U]	NA	0.0024 U	NA
Dieldrin	0.034	0.14	- -	mg/kg	NA	0.0065 U	NA	0.007 U	NA	0.0071 U	NA	0.0068 U	NA	0.0078 J	NA	0.012 J [0.011 J]	NA	0.0067 U	NA
Endosulfan I	470	7000	- -	mg/kg	NA	0.0048 U	NA	0.0052 U	NA	0.0052 U	NA	0.005 U	NA	0.0044 U	NA	0.005 U [0.0052 U]	NA	0.005 U	NA
Endosulfan II	470	7000	- -	mg/kg	NA	0.0044 U	NA	0.0047 U	NA	0.0048 U	NA	0.0046 U	NA	0.0041 U	NA	0.0045 U [0.0048 U]	NA	0.0045 U	NA
Endosulfan sulfate	470	7000	- -	mg/kg	NA	0.0042 U	NA	0.0045 U	NA	0.0045 U	NA	0.0044 U	NA	0.0039 U	NA	0.0043 U [0.0046 U]	NA	0.0043 U	NA
Endrin	19	250	- -	mg/kg	NA	0.0051 U	NA	0.0055 U	NA	0.0056 U	NA	0.0054 U	NA	0.0047 U	NA	0.0053 U [0.0056 U]	NA	0.0053 U	NA
Endrin aldehyde	- -	- -	- -	mg/kg	NA	0.0043 U	NA	0.0047 U	NA	0.0047 U	NA	0.0046 U	NA	0.004 U	NA	0.0045 U [0.0047 U]	NA	0.0045 U	NA
Endrin ketone	- -	- -	- -	mg/kg	NA	0.0042 U	NA	0.0045 U	NA	0.0045 U	NA	0.0044 U	NA	0.0038 U	NA	0.0043 U [0.0045 U]	NA	0.0043 U	NA
gamma-BHC (Lindane)	0.57	2.5	- -	mg/kg	NA	0.0053 U	NA	0.0058 U	NA	0.0058 U	NA	0.0056 U	NA	0.0049 U	NA	0.0055 U [0.0058 U]	NA	0.0055 U	NA
gamma-Chlordane	1.7	7.7	- -	mg/kg	NA	0.0043 U	NA	0.0047 U	NA	0.0047 U	NA	0.0046 U	NA	0.004 U	NA	0.0045 U [0.0047 U]	NA	0.0045 U	NA
Heptachlor	0.13	0.63	- -	mg/kg	NA	0.0068 U	NA	0.0074 U	NA	0.0074 U	NA	0.0072 U	NA	0.0063 U	NA	0.0071 U [0.0074 U]	NA	0.0071 U	NA
Heptachlor epoxide	0.07	0.33	- -	mg/kg	NA	0.004 U	NA	0.0043 U	NA	0.0043 U	NA	0.0042 U	NA	0.0037 U	NA	0.0041 U [0.0043 U]	NA	0.0041 U	NA
Hexachlorobenzene	0.21	0.96	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methoxychlor	320	4,100	- -	mg/kg	NA	0.023 U	NA	0.025 U	NA	0.025 U	NA	0.024 U	NA	0.021 U	NA	0.024 U [0.025 U]	NA	0.024 U	NA
Toxaphene	0.49	2.1	- -	mg/kg	NA	0.042 U	NA	0.046 U	NA	0.046 U	NA	0.044 U	NA	0.039 U	NA	0.044 U [0.046 U]	NA	0.044 U	NA

Table C-1
Summary of Soil Sample Analytical Results for all Depth Ranges
Corrective Action Plan Addendum
Former Black Leaf Chemical Site, Louisville, Kentucky

Location ID:	USEPA	USEPA	Kentucky		BLC047	BLC048	BLC048	BLC049	BLC049	BLC050	BLC050	BLC051	BLC051	BL-SB-100	BL-SB-100	BL-SB-100	BL-SB-101	BL-SB-101
Sample Depth(Feet):	Residential	Industrial	Arsenic											0 - 1	1 - 2	2 - 4	0 - 1	1 - 2
Date Collected:	Soil RSL Nov	Soil RSL	Background		10/24/11	09/22/11	10/24/11	09/22/11	10/24/11	09/22/11	10/24/11	09/22/11	10/24/11	09/20/14	09/20/14	09/20/14	09/20/14	09/20/14
Sample Name:	2017	Nov 2017	Guidance	Units	BLC-SS-47	BLC-SS-48	BLC-SS-48	BLC-SS-49	BLC-SS-49	BLC-SS-50	BLC-SS-50	BLC-SS-51	BLC-SS-51	BL-SB-100_0_1	BL-SB-100_1_2	BL-SB-100_2_4	BL-SB-101_0_1	BL-SB-101_1_2
Detected Semivolatile Organics																		
1,1'-Biphenyl	47	200	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4,5-Tetrachlorobenzene	23	350	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3&4-Methylphenol	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acetophenone	7,800	120,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1-methyl-Naphthalene	18	73	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.346	0.0167 U	NA	1.39	0.0339 J
2,4,5-Trichlorophenol	6,300	82,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dimethylphenol	1,300	16,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzaldehyde	170	820	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	240	3,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.712	0.0191 U	NA	1.64	0.0383 J
4,6-Dinitro-2-methylphenol	5.1	66	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthene	3,600	45,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.0244 U	0.0119 U	NA	0.0617 U	0.012 U
Acenaphthylene	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.106 J	0.0107 U	NA	0.0556 U	0.0108 U
Anthracene	18,000	230,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.26	0.0107 U	NA	0.111 J	0.0194 J
Benzo(a)anthracene	1.1	21	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.303	0.0382 J	0.0147 U	0.234 J	0.06 J
Benzo(a)pyrene	0.11	2.1	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.3**	0.0143 U	0.0118 U	**0.281 J**	0.0548 J
Benzo(b)fluoranthene	1.1	21	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.402	0.0428 J	0.0118 U	0.473	0.0726 J
Benzo(g,h,i)perylene	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.32	0.0107 U	NA	0.0556 U	0.0108 U
Benzo(k)fluoranthene	11	210	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.154 J	0.0167 U	NA	0.243 J	0.0379 J
Benzoic acid	250,000	3,300,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbazole	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	110	2,100	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.355	0.0391 J	NA	0.309 J	0.0587 J
Dibenzo(a,h)anthracene	0.11	2.1	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.0171 U	0.00836 U	NA	0.0432 U	0.00839 U
Dibenzofuran	73	1,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Di-n-butylphthalate	6,300	82,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	2,400	30,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.244	0.0761 J	NA	0.271 J	0.108
Fluorene	2,400	30,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.0293 U	0.0143 U	NA	0.0741 U	0.0144 U
Indeno(1,2,3-cd)pyrene	1.1	21	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.173	0.0119 U	0.00982 U	0.0617 U	0.012 U
Naphthalene	3.8	17	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.139 J	0.0107 U	NA	1.17	0.0282 J
Pentachlorophenol	1	4	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.4	0.043 J	NA	0.873	0.086
Phenol	19,000	250,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pyrene	1,800	23,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.843	0.0629 J	NA	0.27 J	0.0835
Detected Inorganics																		
Arsenic	**	**	22.7	mg/kg	NA	**38.1**	NA	6.67 J	NA	18	NA	22.7	NA	12.9 J	8.99 J	NA	15.8 J	8.23 J
Lead	400	800	- -	mg/kg	NA	196	NA	54.4	NA	282	NA	**765**	NA	49.7 J	27.3 J	NA	71.7 J	44.9 J
Detected Pesticides																		
2,4' DDD	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4'-DDE	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4'-DDT	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
trans-Nonachlor	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDD	1.9	9.6	- -	mg/kg	0.004 U	NA	0.0085 J	NA	0.0093 J	NA	0.0041 U	NA	0.0077 J	0.0111 J	0.00517 U	NA	0.0052 U	0.00521 U
4,4'-DDE	2.0	9.3	- -	mg/kg	0.052	NA	0.11	NA	0.13	NA	0.018 J	NA	0.034 J	0.0061 U	0.00602 U	NA	0.00604 U	0.00606 U
4,4'-DDT	1.9	8.5	- -	mg/kg	0.041	NA	0.058	NA	0.084	NA	0.024 J	NA	0.077 J	0.0165 J	0.0102 U	NA	0.0103 U	0.0103 U
Aldrin	0.039	0.18	- -	mg/kg	0.0049 U	NA	0.0051 U	NA	0.0047 U	NA	0.005 U	NA	0.0048 U	0.00378 U	0.00373 U	NA	0.00375 U	0.00376 U
alpha-BHC	0.086	0.36	- -	mg/kg	0.0061 U	NA	0.0064 U	NA	0.0058 U	NA	0.0062 U	NA	0.006 U	0.00244 U	0.00241 U	NA	0.00242 U	0.00242 U
alpha-Chlordane	1.7	7.7	- -	mg/kg	0.0036 U	NA	0.0038 U	NA	0.0035 U	NA	0.0037 U	NA	0.0036 U	0.00524 U	0.00517 U	NA	0.0052 U	0.00521 U
beta-BHC	0.3	1.3	- -	mg/kg	0.0043 U	NA	0.0046 U	NA	0.0042 U	NA	0.0044 U	NA	0.0043 U	0.00244 U	0.00241 U	NA	0.00242 U	0.00242 U
Chlordane (technical)	1.7	7.7	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.443 U	0.437 U	NA	0.439 U	0.44 U
delta-BHC	- -	- -	- -	mg/kg	0.0025 U	NA	0.0026 U	NA	0.0024 U	NA	0.0025 U	NA	0.0024 U	0.00463 U	0.00457 U	NA	0.00459 U	0.0046 U
Dieldrin	0.034	0.14	- -	mg/kg	0.0067 U	NA	0.0071 U	NA	0.0065 U	NA	0.0069 U	NA	0.0066 U	0.00488 U	0.00481 U	NA	0.00484 U	0.00485 U
Endosulfan I	470	7000	- -	mg/kg	0.005 U	NA	0.0053 U	NA	0.0048 U	NA	0.0051 U	NA	0.0049 U	0.00573 U	0.00566 U	NA	0.00568 U	0.00569 U
Endosulfan II	470	7000	- -	mg/kg	0.0046 U	NA	0.0048 U	NA	0.0044 U	NA	0.0047 U	NA	0.0045 U	0.00671 U	0.00662 U	NA	0.00665 U	0.00666 U
Endosulfan sulfate	470	7000	- -	mg/kg	0.0043 U	NA	0.0046 U	NA	0.0042 U	NA	0.0044 U	NA	0.0043 U	0.0061 U	0.00602 U	NA	0.00604 U	0.00606 U
Endrin	19	250	- -	mg/kg	0.0053 U	NA	0.0056 U	NA	0.0051 U	NA	0.0054 U	NA	0.0052 U	0.00524 U	0.00517 U	NA	0.0052 U	0.00521 U
Endrin aldehyde	- -	- -	- -	mg/kg	0.0045 U	NA	0.0048 U	NA	0.0043 U	NA	0.0046 U	NA	0.0044 U	0.00622 U	0.00614 U	NA	0.00617 U	0.00618 U
Endrin ketone	- -	- -	- -	mg/kg	0.0043 U	NA	0.0046 U	NA	0.0042 U	NA	0.0044 U	NA	0.0042 U	0.00719 U	0.0071 U	NA	0.00713 U	0.00715 U
gamma-BHC (Lindane)	0.57	2.5	- -	mg/kg	0.0056 U	NA	0.0059 U	NA	0.0053 U	NA	0.0057 U	NA	0.0055 U	0.00475 U	0.00469 U	NA	0.00471 U	0.00473 U
gamma-Chlordane	1.7	7.7	- -	mg/kg	0.0045 U	NA	0.0047 U	NA	0.0043 U	NA	0.0046 U	NA	0.0044 U	0.00963 U	0.00951 U	NA	0.00955 U	0.00957 U
Heptachlor	0.13	0.63	- -	mg/kg	0.0071 U	NA	0.0075 U	NA	0.0068 U	NA	0.0072 U	NA	0.007 U	0.00512 U	0.00505 U	NA	0.00508 U	0.00509 U
Heptachlor epoxide	0.07	0.33	- -	mg/kg	0.0041 U	NA	0.0049 J	NA	0.004 U	NA	0.0042 U	NA	0.0041 U	0.00792 U	0.00782 U	NA	0.00786 U	0.00788 U
Hexachlorobenzene	0.21	0.96	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methoxychlor	320	4,100	- -	mg/kg	0.024 U	NA	0.025 U	NA	0.023 U	NA	0.025 U	NA	0.024 U	0.00597 U	0.0059 U	NA	0.00592 U	0.00594 U
Toxaphene	0.49	2.1	- -	mg/kg	0.044 U	NA	0.046 U	NA	0.042 U	NA	0.045 U	NA	0.043 U	0.514 U	0.508 U	NA	0.51 U	0.511 U

Table C-1
Summary of Soil Sample Analytical Results for all Depth Ranges
Corrective Action Plan Addendum
Former Black Leaf Chemical Site, Louisville, Kentucky

Location ID:	USEPA	USEPA	Kentucky		BL-SB-101	BL-SB-101	BL-SB-102	BL-SB-102R	BL-SB-102R	BL-SB-102R	BL-SB-102R	BL-SB-102R	BL-SB-102R	BL-SB-102R
Sample Depth(Feet):	Residential	Industrial	Arsenic		2 - 4	4 - 6	0 - 1	0 - 1	1 - 2	2 - 4	4 - 6	10 - 12	12 - 14	14 - 16
Date Collected:	Soil RSL Nov	Soil RSL	Background		09/20/14	09/20/14	09/20/14	09/30/14	09/30/14	09/30/14	09/30/14	09/30/14	09/30/14	09/30/14
Sample Name:	2017	Nov 2017	Guidance	Units	BL-SB-101_2_4	BL-SB-101_4_6	BL-SB-102_0_1	BL-SB-102R_0_1	BL-SB-102R_1_2	BL-SB-102R_2_4	BL-SB-102R_4_6	BL-SB-102R_10_12	BL-SB-102R_12_14	BL-SB-102R_14_16
Detected Semivolatile Organics														
1,1'-Biphenyl	47	200	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4,5-Tetrachlorobenzene	23	350	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3&4-Methylphenol	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acetophenone	7,800	120,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1-methyl-Naphthalene	18	73	- -	mg/kg	NA	NA	0.362	0.705 J	0.0595 J	NA	NA	0.0137 U [0.0139 U]	0.014 U	0.014 U
2,4,5-Trichlorophenol	6,300	82,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dimethylphenol	1,300	16,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzaldehyde	170	820	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	240	3,000	- -	mg/kg	NA	NA	0.44	0.864 J	0.066 J	NA	NA	0.0157 U [0.0159 U]	0.016 U	0.016 U
4,6-Dinitro-2-methylphenol	5.1	66	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthene	3,600	45,000	- -	mg/kg	NA	NA	0.0105 U	0.00976 UJ	0.00985 UJ	NA	NA	0.00982 U [0.00995 U]	0.00999 U	0.00998 U
Acenaphthylene	- -	- -	- -	mg/kg	NA	NA	0.155	0.0535 J	0.0569 J	NA	NA	0.00884 U [0.00895 U]	0.00899 U	0.00898 U
Anthracene	18,000	230,000	- -	mg/kg	NA	NA	0.0884	0.0536 J	0.0754 J	NA	NA	0.00884 U [0.00895 U]	0.00899 U	0.00898 U
Benzo(a)anthracene	1.1	21	- -	mg/kg	0.0147 U	NA	0.214	0.128 J	0.412 J	0.0177 UJ	0.0177 UJ	0.0147 U [0.0149 U]	0.015 U	0.015 U
Benzo(a)pyrene	0.11	2.1	- -	mg/kg	0.0117 U	0.0113 U	**0.256**	0.11 J	**0.428 J**	0.0142 UJ	0.0142 UJ	0.0118 U [0.0119 U]	0.012 U	0.012 U
Benzo(b)fluoranthene	1.1	21	- -	mg/kg	0.0117 U	NA	0.563	0.216 J	0.57 J	0.0142 UJ	0.0142 UJ	0.0118 U [0.0119 U]	0.012 U	0.012 U
Benzo(g,h,i)perylene	- -	- -	- -	mg/kg	NA	NA	0.203	0.0781 J	0.282 J	NA	NA	0.00884 U [0.00895 U]	0.00899 U	0.00898 U
Benzo(k)fluoranthene	11	210	- -	mg/kg	NA	NA	0.193	0.0704 J	0.238 J	NA	NA	0.0137 U [0.0139 U]	0.014 U	0.014 U
Benzoic acid	250,000	3,300,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbazole	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	110	2,100	- -	mg/kg	NA	NA	0.265	0.167 J	0.47 J	NA	NA	0.00884 U [0.00895 U]	0.00899 U	0.00898 U
Dibenzo(a,h)anthracene	0.11	2.1	- -	mg/kg	NA	NA	0.056 J	0.00683 UJ	0.079 J	0.00826 UJ	0.00828 UJ	0.00687 U [0.00696 U]	0.00699 U	0.00699 U
Dibenzofuran	73	1,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Di-n-butylphthalate	6,300	82,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	2,400	30,000	- -	mg/kg	NA	NA	0.261	0.155 J	0.81 J	NA	NA	0.00884 U [0.00895 U]	0.00899 U	0.00898 U
Fluorene	2,400	30,000	- -	mg/kg	NA	NA	0.0126 U	0.0117 UJ	0.0118 UJ	NA	NA	0.0118 U [0.0119 U]	0.012 U	0.012 U
Indeno(1,2,3-cd)pyrene	1.1	21	- -	mg/kg	NA	NA	0.18	0.0636 J	0.244 J	0.0118 UJ	0.0118 UJ	0.00982 U [0.00995 U]	0.00999 U	0.00998 U
Naphthalene	3.8	17	- -	mg/kg	NA	NA	0.278	0.506 J	0.0467 J	NA	NA	0.00884 U [0.00895 U]	0.00899 U	0.00898 U
Pentachlorophenol	1	4	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	- -	- -	- -	mg/kg	NA	NA	0.254	0.464 J	0.456 J	NA	NA	0.00884 U [0.00895 U]	0.00899 U	0.00898 U
Phenol	19,000	250,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pyrene	1,800	23,000	- -	mg/kg	NA	NA	0.407	0.17 J	0.705 J	NA	NA	0.0118 U [0.0119 U]	0.012 U	0.012 U
Detected Inorganics														
Arsenic	**	**	22.7	mg/kg	NA	NA	1.64 J	8.12	5.6	NA	NA	9.81 [12.2]	8.09	11.3
Lead	400	800	- -	mg/kg	NA	NA	7.53 J	11.7 J	81.1 J	NA	NA	10.4 [10.8]	8.09	10.3
Detected Pesticides														
2,4' DDD	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4'-DDE	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4'-DDT	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
trans-Nonachlor	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDD	1.9	9.6	- -	mg/kg	NA	NA	0.0101 J	0.00417 UJ	0.0171 J	NA	NA	0.000429 U [0.000423 U]	0.000414 U	0.000428 U
4,4'-DDE	2.0	9.3	- -	mg/kg	NA	NA	0.0597	0.21 J	0.017 UJ	NA	NA	0.000499 U [0.000492 U]	0.000482 U	0.000498 U
4,4'-DDT	1.9	8.5	- -	mg/kg	NA	NA	0.0451	0.142 J	0.018 J	NA	NA	0.000849 U [0.000836 U]	0.000819 U	0.000846 U
Aldrin	0.039	0.18	- -	mg/kg	NA	NA	0.0033 U	0.003 UJ	0.0098 J	NA	NA	0.00031 U [0.000305 U]	0.000299 U	0.000309 U
alpha-BHC	0.086	0.36	- -	mg/kg	NA	NA	0.00213 U	0.00194 UJ	0.00921 J	NA	NA	0.0002 U [0.000197 U]	0.000193 U	0.000199 U
alpha-Chlordane	1.7	7.7	- -	mg/kg	NA	NA	0.00458 U	0.00417 UJ	0.00869 J	NA	NA	0.000429 U [0.000423 U]	0.000414 U	0.000428 U
beta-BHC	0.3	1.3	- -	mg/kg	NA	NA	0.00213 U	0.00194 UJ	0.00936 J	NA	NA	0.0002 U [0.000197 U]	0.000193 U	0.000199 U
Chlordane (technical)	1.7	7.7	- -	mg/kg	NA	NA	0.386 U	0.352 UJ	0.362 UJ	NA	NA	0.0362 U [0.0357 U]	0.035 U	0.0361 U
delta-BHC	- -	- -	- -	mg/kg	NA	NA	0.00404 U	0.00368 UJ	0.00874 J	NA	NA	0.000379 U [0.000374 U]	0.000366 U	0.000378 U
Dieldrin	0.034	0.14	- -	mg/kg	NA	NA	**0.0903**	0.0162 J	0.00904 J	NA	NA	0.000399 U [0.000393 U]	0.000385 U	0.000398 U
Endosulfan I	470	7000	- -	mg/kg	NA	NA	0.005 U	0.00455 UJ	0.0101 J	NA	NA	0.000469 U [0.000462 U]	0.000453 U	0.000468 U
Endosulfan II	470	7000	- -	mg/kg	NA	NA	0.00585 U	0.00533 UJ	0.00903 J	NA	NA	0.000549 U [0.000541 U]	0.00053 U	0.000547 U
Endosulfan sulfate	470	7000	- -	mg/kg	NA	NA	0.00532 U	0.00484 UJ	0.0131 J	NA	NA	0.000499 U [0.000492 U]	0.000482 U	0.000498 U
Endrin	19	250	- -	mg/kg	NA	NA	0.00458 U	0.00417 UJ	0.00919 J	NA	NA	0.000429 U [0.000423 U]	0.000414 U	0.000428 U
Endrin aldehyde	- -	- -	- -	mg/kg	NA	NA	0.00543 U	0.00494 UJ	0.00859 J	NA	NA	0.000509 UJ [0.000502 U]	0.000491 U	0.000508 U
Endrin ketone	- -	- -	- -	mg/kg	NA	NA	0.00628 U	0.00572 UJ	0.0112 J	NA	NA	0.000589 U [0.00058 U]	0.000568 U	0.000587 U
gamma-BHC (Lindane)	0.57	2.5	- -	mg/kg	NA	NA	0.00415 U	0.00378 UJ	0.00942 J	NA	NA	0.000389 U [0.000384 U]	0.000376 U	0.000388 U
gamma-Chlordane	1.7	7.7	- -	mg/kg	NA	NA	0.00841 U	0.00765 UJ	0.00789 UJ	NA	NA	0.000789 U [0.000777 U]	0.000761 U	0.000786 U
Heptachlor	0.13	0.63	- -	mg/kg	NA	NA	0.00447 U	0.00407 UJ	0.0103 J	NA	NA	0.000419 U [0.000413 U]	0.000405 U	0.000418 U
Heptachlor epoxide	0.07	0.33	- -	mg/kg	NA	NA	0.00692 U	0.0063 UJ	0.00939 J	NA	NA	0.000649 U [0.000639 U]	0.000626 U	0.000647 U
Hexachlorobenzene	0.21	0.96	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methoxychlor	320	4,100	- -	mg/kg	NA	NA	0.00521 U	0.00475 UJ	0.0329 UJ	NA	NA	0.000489 U [0.000482 U]	0.000472 U	0.000488 U
Toxaphene	0.49	2.1	- -	mg/kg	NA	NA	0.449 U	0.409 UJ	0.421 UJ	NA	NA	0.0421 U [0.0415 U]	0.0407 U	0.042 U

Table C-1
Summary of Soil Sample Analytical Results for all Depth Ranges
Corrective Action Plan Addendum
Former Black Leaf Chemical Site, Louisville, Kentucky

Location ID:	USEPA Residential	USEPA Industrial	Kentucky Arsenic		BL-SB-103	BL-SB-103	BL-SB-103	BL-SB-104	BL-SB-104	BL-SB-105	BL-SB-105	BL-SB-106	BL-SB-106	BL-SB-106	BL-SB-106	BL-SB-107
Sample Depth(Feet):					0 - 1	1 - 2	2 - 4	0 - 1	1 - 2	0 - 1	1 - 2	0 - 1	1 - 2	2 - 4	4 - 6	0 - 1
Date Collected:	Soil RSL Nov	Soil RSL	Background		09/19/14	09/19/14	09/19/14	09/29/14	09/29/14	09/20/14	09/20/14	09/19/14	09/19/14	09/19/14	09/20/14	09/20/14
Sample Name:	2017	Nov 2017	Guidance	Units	BL-SB-103_0_1	BL-SB-103_1_2	BL-SB-103_2_4	BL-SB-104_0_1	BL-SB-104_1_2	BL-SB-105_0_1	BL-SB-105_1_2	BL-SB-106_0_1	BL-SB-106_1_2	BL-SB-106_2_4	BL-SB-106_4_6	BL-SB-107_0_1
Detected Semivolatile Organics																
1,1'-Biphenyl	47	200	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4,5-Tetrachlorobenzene	23	350	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3&4-Methylphenol	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acetophenone	7,800	120,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1-methyl-Naphthalene	18	73	- -	mg/kg	0.139 J	0.0134 U	NA	0.0148 U	0.0309 J	0.0175 U	0.0167 U	0.396	0.0319 J	NA	NA	0.0783 U
2,4,5-Trichlorophenol	6,300	82,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dimethylphenol	1,300	16,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzaldehyde	170	820	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	240	3,000	- -	mg/kg	0.156 J	0.0153 U	NA	0.017 U	0.0365 J	0.02 U	0.0191 U	0.495	0.0354 J	NA	NA	0.0895 U
4,6-Dinitro-2-methylphenol	5.1	66	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthene	3,600	45,000	- -	mg/kg	0.0466 U	0.00959 U	NA	0.0106 U	0.0461 J	0.0125 U	0.0119 U	0.00986 U	0.00976 U	NA	NA	0.204 J
Acenaphthylene	- -	- -	- -	mg/kg	0.042 U	0.00863 U	NA	0.00954 U	0.00886 U	0.0112 U	0.0107 U	0.033 J	0.0483 J	NA	NA	0.0503 U
Anthracene	18,000	230,000	- -	mg/kg	0.042 U	0.00863 U	NA	0.00954 U	0.182	0.0112 U	0.0107 U	0.0206 J	0.0336 J	NA	NA	0.253 J
Benzo(a)anthracene	1.1	21	- -	mg/kg	0.07 U	0.0144 U	NA	0.0334 J	0.256	0.0187 U	0.0179 U	0.0936	0.128	NA	NA	**1.15**
Benzo(a)pyrene	0.11	2.1	- -	mg/kg	0.056 U	0.0115 U	NA	0.0127 U	**0.188**	0.015 U	0.0143 U	0.0942	**0.162**	0.0119 U	0.012 U	**1.21**
Benzo(b)fluoranthene	1.1	21	- -	mg/kg	0.168 J	0.0115 U	0.0119 U	0.0522 J	0.258	0.0418 J	0.0143 U	0.173	0.329	0.0119 U	0.012 U	**1.82**
Benzo(g,h,i)perylene	- -	- -	- -	mg/kg	0.042 U	0.00863 U	NA	0.00954 U	0.121	0.0112 U	0.0107 U	0.0718	0.109	NA	NA	0.948
Benzo(k)fluoranthene	11	210	- -	mg/kg	0.0663 J	0.0134 U	NA	0.0197 J	0.0878	0.0186 J	0.0167 U	0.0617 J	0.115	NA	NA	0.826
Benzoic acid	250,000	3,300,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbazole	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	110	2,100	- -	mg/kg	0.042 U	0.00863 U	NA	0.0433 J	0.258	0.0112 U	0.0107 U	0.115	0.177	NA	NA	1.26
Dibenzo(a,h)anthracene	0.11	2.1	- -	mg/kg	0.0326 U	0.00671 U	NA	0.00742 U	0.0397 J	0.00874 U	0.00835 U	0.0069 U	0.00684 U	NA	NA	**0.217 J**
Dibenzofuran	73	1,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Di-n-butylphthalate	6,300	82,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	2,400	30,000	- -	mg/kg	0.174 J	0.00863 U	NA	0.0699 J	0.537	0.0632 J	0.0107 U	0.127	0.157	NA	NA	2.91
Fluorene	2,400	30,000	- -	mg/kg	0.056 U	0.0115 U	NA	0.0127 U	0.0802	0.015 U	0.0143 U	0.0118 U	0.0117 U	NA	NA	0.0671 U
Indeno(1,2,3-cd)pyrene	1.1	21	- -	mg/kg	0.0466 U	0.00959 U	NA	0.0106 U	0.0986	0.0125 U	0.0119 U	0.0636 J	0.103	NA	NA	0.769
Naphthalene	3.8	17	- -	mg/kg	0.042 U	0.00863 U	NA	0.00954 U	0.0391 J	0.0112 U	0.0107 U	0.31	0.0281 J	NA	NA	0.0503 U
Pentachlorophenol	1	4	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	- -	- -	- -	mg/kg	0.042 U	0.00863 U	NA	0.0463 J	0.641	0.0429 J	0.0107 U	0.239	0.0637 J	NA	NA	1.66
Phenol	19,000	250,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pyrene	1,800	23,000	- -	mg/kg	0.164 J	0.0115 U	NA	0.061 J	0.478	0.0533 J	0.0143 U	0.14	0.157	NA	NA	2.32
Detected Inorganics																
Arsenic	**	**	22.7	mg/kg	17.3 J	7.95 J	NA	0.929 U	12.4	6.92 J	12 J	8.52 J	43.6 J	11.5 J	15.7	12.1 J
Lead	400	800	- -	mg/kg	42.8	45.7	NA	16.4	44.8	44.5 J	28.5 J	32.9	164	NA	NA	198 J
Detected Pesticides																
2,4' DDD	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4'-DDE	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4'-DDT	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
trans-Nonachlor	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDD	1.9	9.6	- -	mg/kg	0.00521 U	0.000499 U	NA	0.00448 UJ	0.00458 UJ	0.00543 U	0.0051 U	0.00452 U	0.00551 U	NA	NA	0.00952 U
4,4'-DDE	2.0	9.3	- -	mg/kg	0.00985 J	0.00058 U	NA	0.00521 UJ	0.00532 UJ	0.00632 U	0.00593 U	0.0143 J	0.00641 U	NA	NA	0.0917 J
4,4'-DDT	1.9	8.5	- -	mg/kg	0.0103 U	0.000986 U	NA	0.00885 UJ	0.00905 UJ	0.0107 U	0.0101 U	0.00893 U	0.0109 U	NA	NA	0.0364 J
Aldrin	0.039	0.18	- -	mg/kg	0.00376 U	0.00036 U	NA	0.00323 UJ	0.0033 UJ	0.00392 U	0.00368 U	0.00326 U	0.00398 U	NA	NA	0.00687 U
alpha-BHC	0.086	0.36	- -	mg/kg	0.00242 U	0.000232 U	NA	0.00208 UJ	0.00213 UJ	0.00253 U	0.00237 U	0.0021 U	0.00256 U	NA	NA	0.00443 U
alpha-Chlordane	1.7	7.7	- -	mg/kg	0.00521 U	0.000499 U	NA	0.00448 UJ	0.00458 UJ	0.00543 U	0.0051 U	0.00452 U	0.00551 U	NA	NA	0.00952 U
beta-BHC	0.3	1.3	- -	mg/kg	0.00242 U	0.000232 U	NA	0.00208 UJ	0.00213 UJ	0.00253 U	0.00237 U	0.0021 U	0.00256 U	NA	NA	0.00443 U
Chlordane (technical)	1.7	7.7	- -	mg/kg	0.44 U	0.0421 U	NA	0.378 UJ	0.386 UJ	0.459 U	0.431 U	0.382 U	0.465 U	NA	NA	0.804 U
delta-BHC	- -	- -	- -	mg/kg	0.0046 U	0.000441 U	NA	0.00396 UJ	0.00404 UJ	0.0048 U	0.00451 U	0.00399 U	0.00487 U	NA	NA	0.00842 U
Dieldrin	0.034	0.14	- -	mg/kg	0.00485 U	0.000464 U	NA	0.00417 UJ	0.00426 UJ	0.00505 U	0.00475 U	0.0042 U	0.00513 U	NA	NA	0.00886 U
Endosulfan I	470	7000	- -	mg/kg	0.00569 U	0.000545 U	NA	0.00489 UJ	0.005 UJ	0.00594 U	0.00558 U	0.00494 U	0.00603 U	NA	NA	0.0104 U
Endosulfan II	470	7000	- -	mg/kg	0.00666 U	0.000638 U	NA	0.00573 UJ	0.00585 UJ	0.00695 U	0.00653 U	0.00578 U	0.00705 U	NA	NA	0.0122 U
Endosulfan sulfate	470	7000	- -	mg/kg	0.00606 U	0.00058 U	NA	0.00521 UJ	0.00532 UJ	0.00632 U	0.00593 U	0.00525 U	0.00641 U	NA	NA	0.0111 U
Endrin	19	250	- -	mg/kg	0.00521 UJ	0.000499 UJ	NA	0.00448 UJ	0.00458 UJ	0.00543 U	0.0051 U	0.00452 U	0.00551 UJ	NA	NA	0.00952 U
Endrin aldehyde	- -	- -	- -	mg/kg	0.00618 U	0.000592 U	NA	0.00531 UJ	0.00543 UJ	0.00644 U	0.00605 U	0.00536 U	0.00654 U	NA	NA	0.0113 U
Endrin ketone	- -	- -	- -	mg/kg	0.00715 U	0.000685 U	NA	0.00614 UJ	0.00628 UJ	0.00745 U	0.007 U	0.0062 U	0.00757 U	NA	NA	0.0131 U
gamma-BHC (Lindane)	0.57	2.5	- -	mg/kg	0.00473 U	0.000453 U	NA	0.00406 UJ	0.00415 UJ	0.00493 U	0.00463 U	0.0041 U	0.005 U	NA	NA	0.00864 U
gamma-Chlordane	1.7	7.7	- -	mg/kg	0.00957 U	0.000917 U	NA	0.00823 UJ	0.00841 UJ	0.00998 U	0.00937 U	0.0083 U	0.0101 U	NA	NA	0.0175 U
Heptachlor	0.13	0.63	- -	mg/kg	0.00509 U	0.000487 U	NA	0.00437 UJ	0.00447 UJ	0.00531 U	0.00498 U	0.00441 U	0.00539 U	NA	NA	0.0093 U
Heptachlor epoxide	0.07	0.33	- -	mg/kg	0.00788 U	0.000754 U	NA	0.00677 UJ	0.00692 UJ	0.00821 U	0.00771 U	0.00683 U	0.00833 U	NA	NA	0.0144 U
Hexachlorobenzene	0.21	0.96	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methoxychlor	320	4,100	- -	mg/kg	0.00594 U	0.000569 U	NA	0.0051 UJ	0.00521 UJ	0.00619 U	0.00581 U	0.00515 U	0.00628 U	NA	NA	0.0109 U
Toxaphene	0.49	2.1	- -	mg/kg	0.511 U	0.049 U	NA	0.439 UJ	0.449 UJ	0.533 U	0.501 U	0.444 U	0.541 U	NA	NA	0.935 U

Table C-1
Summary of Soil Sample Analytical Results for all Depth Ranges
Corrective Action Plan Addendum
Former Black Leaf Chemical Site, Louisville, Kentucky

Location ID:	USEPA Residential	USEPA Industrial	Kentucky Arsenic		BL-SB-107	BL-SB-107	BL-SB-107	BL-SB-108	BL-SB-108	BL-SB-108	BL-SB-108	BL-SB-108	BL-SB-108	BL-SB-109	BL-SB-109
Sample Depth(Feet):					1 - 2	2 - 4	4 - 6	0 - 1	1 - 2	2 - 4	10 - 12	12 - 14	14 - 16	0 - 1	1 - 2
Date Collected:	Soil RSL Nov	Soil RSL	Background		09/20/14	09/20/14	09/20/14	09/20/14	09/20/14	09/20/14	09/20/14	09/20/14	09/20/14	09/20/14	09/20/14
Sample Name:	2017	Nov 2017	Guidance	Units	BL-SB-107_1_2	BL-SB-107_2_4	BL-SB-107_4_6	BL-SB-108_0_1	BL-SB-108_1_2	BL-SB-108_2_4	BL-SB-108_10_12	BL-SB-108_12_14	BL-SB-108_14_16	BL-SB-109_0_1	BL-SB-109_1_2
Detected Semivolatile Organics															
1,1'-Biphenyl	47	200	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4,5-Tetrachlorobenzene	23	350	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3&4-Methylphenol	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acetophenone	7,800	120,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1-methyl-Naphthalene	18	73	- -	mg/kg	0.0884	NA	NA	0.0275 U	0.013 U	NA	0.0157 U [0.0157 U]	0.0161 U	0.0157 U	0.0403 J	0.0178 U
2,4,5-Trichlorophenol	6,300	82,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dimethylphenol	1,300	16,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzaldehyde	170	820	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	240	3,000	- -	mg/kg	0.106	NA	NA	0.0314 U	0.0149 U	NA	0.0179 U [0.018 U]	0.0184 U	0.018 U	0.041 J	0.0204 U
4,6-Dinitro-2-methylphenol	5.1	66	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthene	3,600	45,000	- -	mg/kg	0.0109 U	NA	NA	0.0196 U	0.00931 U	NA	0.0112 U [0.0112 U]	0.0115 U	0.0112 U	0.0112 U	0.0127 U
Acenaphthylene	- -	- -	- -	mg/kg	0.00982 U	NA	NA	0.0177 U	0.00838 U	NA	0.0101 U [0.0101 U]	0.0103 U	0.0101 U	0.0101 U	0.0115 U
Anthracene	18,000	230,000	- -	mg/kg	0.0115 J	NA	NA	0.0177 U	0.00838 U	NA	0.0101 U [0.0101 U]	0.0103 U	0.0101 U	0.0132 J	0.0128 J
Benzo(a)anthracene	1.1	21	- -	mg/kg	0.0532 J	0.0135 U	NA	0.148	0.014 U	NA	0.0168 U [0.0169 U]	0.0172 U	0.0169 U	0.0769	0.0555 J
Benzo(a)pyrene	0.11	2.1	- -	mg/kg	0.0508 J	0.0108 U	0.0119 U	**0.146**	0.0112 U	0.0115 U	0.0134 U [0.0135 U]	0.0138 U	0.0135 U	0.0782	0.0524 J
Benzo(b)fluoranthene	1.1	21	- -	mg/kg	0.0958	0.0108 U	NA	0.24	0.0112 U	0.0115 U	0.0134 U [0.0135 U]	0.0138 U	0.0135 U	0.131	0.0616 J
Benzo(g,h,i)perylene	- -	- -	- -	mg/kg	0.06 J	NA	NA	0.0996 J	0.00838 U	NA	0.0101 U [0.0101 U]	0.0103 U	0.0101 U	0.0642 J	0.0115 U
Benzo(k)fluoranthene	11	210	- -	mg/kg	0.0363 J	NA	NA	0.0891 J	0.013 U	NA	0.0157 U [0.0157 U]	0.0161 U	0.0157 U	0.0433 J	0.0266 J
Benzoic acid	250,000	3,300,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbazole	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	110	2,100	- -	mg/kg	0.0694 J	NA	NA	0.151	0.00838 U	NA	0.0101 U [0.0101 U]	0.0103 U	0.0101 U	0.0919	0.0663 J
Dibenzo(a,h)anthracene	0.11	2.1	- -	mg/kg	0.00763 U	0.00631 U	NA	0.0137 U	0.00652 U	NA	0.00784 U [0.00786 U]	0.00804 U	0.00787 U	0.00785 U	0.00892 U
Dibenzofuran	73	1,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Di-n-butylphthalate	6,300	82,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	2,400	30,000	- -	mg/kg	0.089	NA	NA	0.363	0.00838 U	NA	0.0101 U [0.0101 U]	0.0103 U	0.0101 U	0.169	0.108
Fluorene	2,400	30,000	- -	mg/kg	0.0131 U	NA	NA	0.0236 U	0.0112 U	NA	0.0134 U [0.0135 U]	0.0138 U	0.0135 U	0.0135 U	0.0153 U
Indeno(1,2,3-cd)pyrene	1.1	21	- -	mg/kg	0.0404 J	0.00901 U	NA	0.0897 J	0.00931 U	NA	0.0112 U [0.0112 U]	0.0115 U	0.0112 U	0.0501 J	0.0127 U
Naphthalene	3.8	17	- -	mg/kg	0.0675 J	NA	NA	0.0177 U	0.00838 U	NA	0.0101 U [0.0101 U]	0.0103 U	0.0101 U	0.0101 U	0.0115 U
Pentachlorophenol	1	4	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	- -	- -	- -	mg/kg	0.0853	NA	NA	0.0177 U	0.00838 U	NA	0.0101 U [0.0101 U]	0.0103 U	0.0101 U	0.0851	0.0749 J
Phenol	19,000	250,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pyrene	1,800	23,000	- -	mg/kg	0.0765	NA	NA	0.363	0.0112 U	NA	0.0134 U [0.0135 U]	0.0138 U	0.0135 U	0.139	0.122
Detected Inorganics															
Arsenic	**	**	22.7	mg/kg	6.78 J	NA	NA	**28.4 J**	5.18 J	14.6	9.41 [11.3]	12.9	6.82	8.41 J	11.1 J
Lead	400	800	- -	mg/kg	30.4 J	NA	NA	**412 J**	18.2 J	15	11.5 [13.3]	14.6	7.33	48.3 J	60.6 J
Detected Pesticides															
2,4' DDD	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4'-DDE	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4'-DDT	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
trans-Nonachlor	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDD	1.9	9.6	- -	mg/kg	0.00466 U	NA	NA	0.00832 UJ	0.000416 U	NA	0.000493 U [0.000482 U]	0.000488 U	0.000475 U	0.00474 U	0.00548 U
4,4'-DDE	2.0	9.3	- -	mg/kg	0.0256	NA	NA	0.00968 UJ	0.000484 U	NA	0.000573 U [0.000561 U]	0.000567 U	0.000552 U	0.00551 U	0.00637 U
4,4'-DDT	1.9	8.5	- -	mg/kg	0.0092 U	NA	NA	0.0165 UJ	0.000822 U	NA	0.00417 [0.000953 U]	0.000964 U	0.000939 U	0.00937 U	0.0108 U
Aldrin	0.039	0.18	- -	mg/kg	0.00336 U	NA	NA	0.006 UJ	0.0003 U	NA	0.000355 U [0.000348 U]	0.000352 U	0.000342 U	0.00342 U	0.00395 U
alpha-BHC	0.086	0.36	- -	mg/kg	0.00217 U	NA	NA	0.00387 UJ	0.000193 U	NA	0.000229 U [0.000224 U]	0.000227 U	0.000221 U	0.00221 U	0.00255 U
alpha-Chlordane	1.7	7.7	- -	mg/kg	0.00466 U	NA	NA	0.00832 UJ	0.000416 U	NA	0.000493 U [0.000482 U]	0.000488 U	0.000475 U	0.00474 U	0.00548 U
beta-BHC	0.3	1.3	- -	mg/kg	0.00217 U	NA	NA	0.00387 UJ	0.000193 U	NA	0.000229 U [0.000224 U]	0.000227 U	0.000221 U	0.00221 U	0.00255 U
Chlordane (technical)	1.7	7.7	- -	mg/kg	0.393 U	NA	NA	0.703 UJ	0.0351 U	NA	0.0416 U [0.0407 U]	0.0412 U	0.0401 U	0.4 U	0.462 U
delta-BHC	- -	- -	- -	mg/kg	0.00411 U	NA	NA	0.00736 UJ	0.000368 U	NA	0.000436 U [0.000426 U]	0.000431 U	0.00042 U	0.00419 U	0.00484 U
Dieldrin	0.034	0.14	- -	mg/kg	0.00433 U	NA	NA	0.00774 UJ	0.000387 U	NA	0.000459 U [0.000449 U]	0.000454 U	0.000442 U	0.00441 U	0.00509 U
Endosulfan I	470	7000	- -	mg/kg	0.00509 U	NA	NA	0.0091 UJ	0.000455 U	NA	0.000539 U [0.000527 U]	0.000533 U	0.000519 U	0.00518 U	0.00598 U
Endosulfan II	470	7000	- -	mg/kg	0.00596 U	NA	NA	0.0106 UJ	0.000532 U	NA	0.000631 U [0.000617 U]	0.000624 U	0.000607 U	0.00607 U	0.007 U
Endosulfan sulfate	470	7000	- -	mg/kg	0.00541 U	NA	NA	0.00968 UJ	0.000484 U	NA	0.000573 U [0.000561 U]	0.000567 U	0.000552 U	0.00551 U	0.00637 U
Endrin	19	250	- -	mg/kg	0.00466 U	NA	NA	0.00832 UJ	0.000416 U	NA	0.000493 U [0.000482 U]	0.000488 U	0.000475 U	0.00474 U	0.00548 U
Endrin aldehyde	- -	- -	- -	mg/kg	0.00552 U	NA	NA	0.00987 UJ	0.000493 U	NA	0.000585 U [0.000572 U]	0.000578 U	0.000563 U	0.00562 U	0.00649 U
Endrin ketone	- -	- -	- -	mg/kg	0.00639 U	NA	NA	0.0114 UJ	0.000571 U	NA	0.000676 U [0.000662 U]	0.000669 U	0.000652 U	0.00651 U	0.00751 U
gamma-BHC (Lindane)	0.57	2.5	- -	mg/kg	0.00422 U	NA	NA	0.00755 UJ	0.000377 U	NA	0.000447 U [0.000437 U]	0.000442 U	0.000431 U	0.0043 U	0.00497 U
gamma-Chlordane	1.7	7.7	- -	mg/kg	0.00855 U	NA	NA	0.0153 UJ	0.000764 U	NA	0.000906 U [0.000886 U]	0.000896 U	0.000873 U	0.00871 U	0.0101 U
Heptachlor	0.13	0.63	- -	mg/kg	0.00455 U	NA	NA	0.00813 UJ	0.000406 U	NA	0.000482 U [0.000471 U]	0.000476 U	0.000464 U	0.00463 U	0.00535 U
Heptachlor epoxide	0.07	0.33	- -	mg/kg	0.00704 U	NA	NA	0.0126 UJ	0.000629 U	NA	0.000745 U [0.000729 U]	0.000737 U	0.000718 U	0.00717 U	0.00828 U
Hexachlorobenzene	0.21	0.96	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methoxychlor	320	4,100	- -	mg/kg	0.00531 U	NA	NA	0.00949 UJ	0.000474 U	NA	0.000562 U [0.00055 U]	0.000556 U	0.000541 U	0.0054 U	0.00624 U
Toxaphene	0.49	2.1	- -	mg/kg	0.457 U	NA	NA	0.817 UJ	0.0408 U	NA	0.0484 U [0.0473 U]	0.0479 U	0.0466 U	0.465 U	0.537 U

Table C-1
Summary of Soil Sample Analytical Results for all Depth Ranges
Corrective Action Plan Addendum
Former Black Leaf Chemical Site, Louisville, Kentucky

Location ID:	USEPA	USEPA	Kentucky		BL-SB-109	BL-SB-109	BL-SB-110	BL-SB-110	BL-SB-110	BL-SB-110	BL-SB-110	BL-SB-110	BL-SB-111	BL-SB-111	BL-SB-111	BL-SB-111
Sample Depth(Feet):	Residential	Industrial	Arsenic		2 - 4	4 - 6	0 - 1	1 - 2	2 - 4	4 - 6	6 - 8	8 - 10	0 - 1	1 - 2	2 - 4	4 - 6
Date Collected:	Soil RSL Nov	Soil RSL	Background		09/20/14	09/20/14	09/19/14	09/19/14	09/19/14	09/19/14	09/19/14	09/19/14	09/19/14	09/19/14	09/19/14	09/19/14
Sample Name:	2017	Nov 2017	Guidance	Units	BL-SB-109_2_4	BL-SB-109_4_6	BL-SB-110_0_1	BL-SB-110_1_2	BL-SB-110_2_4	BL-SB-110_4_6	BL-SB-110_6_8	BL-SB-110_8_10	BL-SB-111_0_1	BL-SB-111_1_2	BL-SB-111_2_4	BL-SB-111_4_6
Detected Semivolatile Organics																
1,1'-Biphenyl	47	200	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4,5-Tetrachlorobenzene	23	350	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3&4-Methylphenol	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acetophenone	7,800	120,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1-methyl-Naphthalene	18	73	- -	mg/kg	NA	NA	0.0133 U	0.027 U	NA	NA	NA	NA	0.0137 U	0.0139 U	NA	NA
2,4,5-Trichlorophenol	6,300	82,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dimethylphenol	1,300	16,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzaldehyde	170	820	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	240	3,000	- -	mg/kg	NA	NA	0.0151 U	0.0309 U	NA	NA	NA	NA	0.0156 U	0.0159 U	NA	NA
4,6-Dinitro-2-methylphenol	5.1	66	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthene	3,600	45,000	- -	mg/kg	NA	NA	0.0433 J	0.0193 U	NA	NA	NA	NA	0.00976 U	0.00992 U	NA	NA
Acenaphthylene	- -	- -	- -	mg/kg	NA	NA	0.0522 J	0.0174 U	NA	NA	NA	NA	0.00878 U	0.00892 U	NA	NA
Anthracene	18,000	230,000	- -	mg/kg	NA	NA	0.143	0.0174 U	NA	NA	NA	NA	0.00878 U	0.0123 J	NA	NA
Benzo(a)anthracene	1.1	21	- -	mg/kg	NA	NA	0.533	0.0522 J	0.015 U	NA	NA	NA	0.0325 J	0.0469 J	NA	NA
Benzo(a)pyrene	0.11	2.1	- -	mg/kg	0.0118 U	0.0116 U	**0.496**	0.07 J	0.012 U	0.0199 J	0.0148 U	0.0147 U	0.0336 J	0.0429 J	0.012 U	0.0119 U
Benzo(b)fluoranthene	1.1	21	- -	mg/kg	NA	NA	0.686	0.129	0.012 U	NA	NA	NA	0.0538 J	0.0712	NA	NA
Benzo(g,h,i)perylene	- -	- -	- -	mg/kg	NA	NA	0.472	0.116 J	NA	NA	NA	NA	0.00878 U	0.00892 U	NA	NA
Benzo(k)fluoranthene	11	210	- -	mg/kg	NA	NA	0.239	0.0444 J	NA	NA	NA	NA	0.0206 J	0.0257 J	NA	NA
Benzoic acid	250,000	3,300,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbazole	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	110	2,100	- -	mg/kg	NA	NA	0.488	0.0979 J	NA	NA	NA	NA	0.0365 J	0.0549 J	NA	NA
Dibenzo(a,h)anthracene	0.11	2.1	- -	mg/kg	NA	NA	0.0913	0.0135 U	0.00698 U	NA	NA	NA	0.00683 U	0.00694 U	NA	NA
Dibenzofuran	73	1,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Di-n-butylphthalate	6,300	82,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	2,400	30,000	- -	mg/kg	NA	NA	1.14	0.204	NA	NA	NA	NA	0.0649 J	0.129	NA	NA
Fluorene	2,400	30,000	- -	mg/kg	NA	NA	0.0435 J	0.0231 U	NA	NA	NA	NA	0.0117 U	0.0119 U	NA	NA
Indeno(1,2,3-cd)pyrene	1.1	21	- -	mg/kg	NA	NA	0.329	0.0193 U	0.00997 U	NA	NA	NA	0.00976 U	0.00992 U	NA	NA
Naphthalene	3.8	17	- -	mg/kg	NA	NA	0.00852 U	0.0174 U	NA	NA	NA	NA	0.00878 U	0.00892 U	NA	NA
Pentachlorophenol	1	4	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	- -	- -	- -	mg/kg	NA	NA	0.606	0.135	NA	NA	NA	NA	0.034 J	0.0944	NA	NA
Phenol	19,000	250,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pyrene	1,800	23,000	- -	mg/kg	NA	NA	0.952	0.158	NA	NA	NA	NA	0.0547 J	0.0949	NA	NA
Detected Inorganics																
Arsenic	**	**	22.7	mg/kg	NA	NA	14.8 J	8.4 J	NA	NA	NA	NA	8.21 J	8.95 J	NA	NA
Lead	400	800	- -	mg/kg	NA	NA	107	76.8	NA	NA	NA	NA	43.5	27.3	NA	NA
Detected Pesticides																
2,4' DDD	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4'-DDE	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4'-DDT	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
trans-Nonachlor	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDD	1.9	9.6	- -	mg/kg	NA	NA	0.00501 U	0.00509 U	NA	NA	NA	NA	0.00515 U	0.00544 U	NA	NA
4,4'-DDE	2.0	9.3	- -	mg/kg	NA	NA	0.00583 U	0.00592 U	NA	NA	NA	NA	0.00598 U	0.00632 U	NA	NA
4,4'-DDT	1.9	8.5	- -	mg/kg	NA	NA	0.00991 U	0.0101 U	NA	NA	NA	NA	0.0102 U	0.0108 U	NA	NA
Aldrin	0.039	0.18	- -	mg/kg	NA	NA	0.00361 U	0.00367 U	NA	NA	NA	NA	0.00371 U	0.00392 U	NA	NA
alpha-BHC	0.086	0.36	- -	mg/kg	NA	NA	0.00233 U	0.00237 U	NA	NA	NA	NA	0.00239 U	0.00253 U	NA	NA
alpha-Chlordane	1.7	7.7	- -	mg/kg	NA	NA	0.00501 U	0.00509 U	NA	NA	NA	NA	0.00515 U	0.00544 U	NA	NA
beta-BHC	0.3	1.3	- -	mg/kg	NA	NA	0.00233 U	0.00237 U	NA	NA	NA	NA	0.00239 U	0.00253 U	NA	NA
Chlordane (technical)	1.7	7.7	- -	mg/kg	NA	NA	0.423 U	0.43 U	NA	NA	NA	NA	0.434 U	0.459 U	NA	NA
delta-BHC	- -	- -	- -	mg/kg	NA	NA	0.00443 U	0.0045 U	NA	NA	NA	NA	0.00455 U	0.00481 U	NA	NA
Dieldrin	0.034	0.14	- -	mg/kg	NA	NA	0.00466 U	0.00474 U	NA	NA	NA	NA	0.00479 U	0.00506 U	NA	NA
Endosulfan I	470	7000	- -	mg/kg	NA	NA	0.00548 U	0.00557 U	NA	NA	NA	NA	0.00562 U	0.00594 U	NA	NA
Endosulfan II	470	7000	- -	mg/kg	NA	NA	0.00641 U	0.00651 U	NA	NA	NA	NA	0.00658 U	0.00696 U	NA	NA
Endosulfan sulfate	470	7000	- -	mg/kg	NA	NA	0.00583 U	0.00592 U	NA	NA	NA	NA	0.00598 U	0.00632 U	NA	NA
Endrin	19	250	- -	mg/kg	NA	NA	0.00501 U	0.00509 U	NA	NA	NA	NA	0.00515 U	0.00544 U	NA	NA
Endrin aldehyde	- -	- -	- -	mg/kg	NA	NA	0.00595 U	0.00604 U	NA	NA	NA	NA	0.0061 U	0.00645 U	NA	NA
Endrin ketone	- -	- -	- -	mg/kg	NA	NA	0.00688 U	0.00699 U	NA	NA	NA	NA	0.00706 U	0.00746 U	NA	NA
gamma-BHC (Lindane)	0.57	2.5	- -	mg/kg	NA	NA	0.00455 U	0.00462 U	NA	NA	NA	NA	0.00467 U	0.00493 U	NA	NA
gamma-Chlordane	1.7	7.7	- -	mg/kg	NA	NA	0.00921 U	0.00936 U	NA	NA	NA	NA	0.00945 U	0.00999 U	NA	NA
Heptachlor	0.13	0.63	- -	mg/kg	NA	NA	0.0049 U	0.00497 U	NA	NA	NA	NA	0.00503 U	0.00531 U	NA	NA
Heptachlor epoxide	0.07	0.33	- -	mg/kg	NA	NA	0.00758 U	0.0077 U	NA	NA	NA	NA	0.00778 U	0.00822 U	NA	NA
Hexachlorobenzene	0.21	0.96	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methoxychlor	320	4,100	- -	mg/kg	NA	NA	0.00571 U	0.0058 U	NA	NA	NA	NA	0.00586 U	0.0062 U	NA	NA
Toxaphene	0.49	2.1	- -	mg/kg	NA	NA	0.492 U	0.5 U	NA	NA	NA	NA	0.505 U	0.534 U	NA	NA

Table C-1
Summary of Soil Sample Analytical Results for all Depth Ranges
Corrective Action Plan Addendum
Former Black Leaf Chemical Site, Louisville, Kentucky

Location ID: / Sample Depth(Feet): / Date Collected: / Sample Name:	USEPA Residential Soil RSL Nov 2017	USEPA Industrial Soil RSL Nov 2017	Kentucky Arsenic Background Guidance	Units	BL-SB-112 10 - 12 09/19/14 BL-SB-112_10_12	BL-SB-112 12 - 14 09/19/14 BL-SB-112_12_14	BL-SB-112 14 - 16 09/19/14 BL-SB-112_14_16	BL-SB-113 0 - 1 09/19/14 BL-SB-113_0_1	BL-SB-113 1 - 2 09/19/14 BL-SB-113_1_2	BL-SB-113 2 - 4 09/19/14 BL-SB-113_2_4	BL-SB-113 8 - 10 09/19/14 BL-SB-113_8_10	BL-SB-114 0 - 1 09/19/14 BL-SB-114_0_1	BL-SB-115 0 - 1 09/19/14 BL-SB-115_0_1	BL-SB-115 1 - 2 09/19/14 BL-SB-115_1_2	BL-SB-115 2 - 4 09/19/14 BL-SB-115_2_4
Detected Semivolatile Organics															
1,1'-Biphenyl	47	200	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4,5-Tetrachlorobenzene	23	350	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3&4-Methylphenol	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acetophenone	7,800	120,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1-methyl-Naphthalene	18	73	- -	mg/kg	0.0134 U	0.0131 U	0.0139 U	0.0371 J	0.0133 U	NA	0.0135 U [0.0135 U]	0.0385 J	0.0139 U	0.0136 U	NA
2,4,5-Trichlorophenol	6,300	82,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dimethylphenol	1,300	16,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzaldehyde	170	820	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	240	3,000	- -	mg/kg	0.0153 U	0.0149 U	0.0159 U	0.0402 J	0.0152 U	NA	0.0155 U [0.0154 U]	0.0413 J	0.0159 U	0.0156 U	NA
4,6-Dinitro-2-methylphenol	5.1	66	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthene	3,600	45,000	- -	mg/kg	0.00957 U	0.00933 U	0.00992 U	0.0652 J	0.00953 U	NA	0.00967 U [0.00963 U]	0.0099 U	0.00993 U	0.00972 U	NA
Acenaphthylene	- -	- -	- -	mg/kg	0.00861 U	0.00839 U	0.00892 U	0.00891 U	0.00858 U	NA	0.0087 U [0.00867 U]	0.00891 U	0.00894 U	0.00875 U	NA
Anthracene	18,000	230,000	- -	mg/kg	0.00861 U	0.00839 U	0.00892 U	0.263	0.0156 J	NA	0.0087 U [0.00867 U]	0.0444 J	0.0323 J	0.00875 U	NA
Benzo(a)anthracene	1.1	21	- -	mg/kg	0.0143 U	0.014 U	0.0149 U	0.648	0.0384 J	0.0149 U	0.0145 U [0.0144 U]	0.182	0.0488 J	0.0146 U	NA
Benzo(a)pyrene	0.11	2.1	- -	mg/kg	0.0115 U	0.0112 U	0.0119 U	**0.447**	0.0114 U	0.012 U	0.0116 U [0.0116 U]	**0.19**	0.0412 J	0.0117 U	0.0119 U
Benzo(b)fluoranthene	1.1	21	- -	mg/kg	0.0115 U	0.0112 U	0.0119 U	0.887	0.0447 J	0.012 U	0.0116 U [0.0116 U]	0.276	0.0651 J	0.0117 U	NA
Benzo(g,h,i)perylene	- -	- -	- -	mg/kg	0.00861 U	0.00839 U	0.00892 U	0.434	0.00858 U	NA	0.0087 U [0.00867 U]	0.146	0.00894 U	0.00875 U	NA
Benzo(k)fluoranthene	11	210	- -	mg/kg	0.0134 U	0.0131 U	0.0139 U	0.343	0.0165 J	NA	0.0135 U [0.0135 U]	0.118	0.0226 J	0.0136 U	NA
Benzoic acid	250,000	3,300,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbazole	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	110	2,100	- -	mg/kg	0.00861 U	0.00839 U	0.00892 U	0.689	0.0355 J	NA	0.0087 U [0.00867 U]	0.212	0.0457 J	0.00875 U	NA
Dibenzo(a,h)anthracene	0.11	2.1	- -	mg/kg	0.0067 U	0.00653 U	0.00694 U	0.0879	0.00667 U	0.00697 U	0.00677 U [0.00674 U]	0.00693 U	0.00695 U	0.0068 U	NA
Dibenzofuran	73	1,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Di-n-butylphthalate	6,300	82,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	2,400	30,000	- -	mg/kg	0.00861 U	0.00839 U	0.00892 U	1.81	0.0981	NA	0.0087 U [0.00867 U]	0.443	0.113	0.00875 U	NA
Fluorene	2,400	30,000	- -	mg/kg	0.0115 U	0.0112 U	0.0119 U	0.0678	0.0114 U	NA	0.0116 U [0.0116 U]	0.0119 U	0.0119 U	0.0117 U	NA
Indeno(1,2,3-cd)pyrene	1.1	21	- -	mg/kg	0.00957 U	0.00933 U	0.00992 U	0.371	0.00953 U	0.00996 U	0.00967 U [0.00963 U]	0.121	0.00993 U	0.00972 U	NA
Naphthalene	3.8	17	- -	mg/kg	0.00861 U	0.00839 U	0.00892 U	0.0727	0.00858 U	NA	0.0087 U [0.00867 U]	0.00891 U	0.00894 U	0.00875 U	NA
Pentachlorophenol	1	4	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	- -	- -	- -	mg/kg	0.00861 U	0.00839 U	0.00892 U	1.41	0.0794	NA	0.0087 U [0.00867 U]	0.274	0.0898	0.00875 U	NA
Phenol	19,000	250,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pyrene	1,800	23,000	- -	mg/kg	0.0115 U	0.0112 U	0.0119 U	1.37	0.0718	NA	0.0116 U [0.0116 U]	0.348	0.0871	0.0117 U	NA
Detected Inorganics															
Arsenic	**	**	22.7	mg/kg	7.13 J	6.49 J	9.76 J	**62.2 J**	13.3 J	16.9 J	9.59 J [8.25 J]	8.36 J	8.11 J	9.62 J	NA
Lead	400	800	- -	mg/kg	7.07	7.93	6.66 J	19.4	14.6	NA	8.38 [12.6]	20.3	40.4	14.7	NA
Detected Pesticides															
2,4' DDD	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4'-DDE	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4'-DDT	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
trans-Nonachlor	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDD	1.9	9.6	- -	mg/kg	0.000452 U	0.00046 U	0.000428 U	**2.53 D**	0.0165	0.000428 U	0.000509 U [0.000497 U]	0.00606 J	0.0126	0.000518 U	NA
4,4'-DDE	2.0	9.3	- -	mg/kg	0.000525 U	0.000535 U	0.000498 U	0.0973	0.00228	NA	0.000592 U [0.000578 U]	0.0273	0.0413	0.000602 U	NA
4,4'-DDT	1.9	8.5	- -	mg/kg	0.000893 U	0.000909 U	0.000847 U	1.2 DJ	0.0172	NA	0.00101 U [0.000983 U]	0.0122 J	0.014	0.0109	NA
Aldrin	0.039	0.18	- -	mg/kg	0.000326 U	0.000332 U	0.000309 U	0.0036 U	0.00037 U	NA	0.000367 U [0.000358 U]	0.00322 U	0.000379 U	0.000373 U	NA
alpha-BHC	0.086	0.36	- -	mg/kg	0.00021 U	0.000214 U	0.000199 U	0.00233 U	0.000239 U	NA	0.000237 U [0.000231 U]	0.00208 U	0.000245 U	0.000241 U	NA
alpha-Chlordane	1.7	7.7	- -	mg/kg	0.000452 U	0.00046 U	0.000428 U	0.0518	0.000513 U	NA	0.000509 U [0.000497 U]	0.00447 U	0.000526 U	0.000518 U	NA
beta-BHC	0.3	1.3	- -	mg/kg	0.00021 U	0.000214 U	0.000199 U	0.00233 U	0.000239 U	NA	0.000237 U [0.000231 U]	0.00208 U	0.000245 U	0.000241 U	NA
Chlordane (technical)	1.7	7.7	- -	mg/kg	0.0381 U	0.0388 U	0.0362 U	0.422 U	0.0433 U	NA	0.043 U [0.042 U]	0.378 U	0.0444 U	0.0437 U	NA
delta-BHC	- -	- -	- -	mg/kg	0.000399 U	0.000406 U	0.000379 U	0.00442 U	0.000453 U	NA	0.00045 U [0.000439 U]	0.00395 U	0.000465 U	0.000458 U	NA
Dieldrin	0.034	0.14	- -	mg/kg	0.00042 U	0.000428 U	0.000398 U	**0.228 J**	0.00206	0.000398 U	0.000473 U [0.000462 U]	0.00416 U	0.00143 J	0.000482 U	NA
Endosulfan I	470	7000	- -	mg/kg	0.000494 U	0.000503 U	0.000468 U	0.00546 U	0.000561 U	NA	0.000556 U [0.000543 U]	0.00489 U	0.000575 U	0.000566 U	NA
Endosulfan II	470	7000	- -	mg/kg	0.000578 U	0.000588 U	0.000548 U	0.00639 U	0.000656 U	NA	0.000651 U [0.000636 U]	0.00572 U	0.000673 U	0.000662 U	NA
Endosulfan sulfate	470	7000	- -	mg/kg	0.000525 U	0.000535 U	0.000498 U	0.00581 U	0.000597 U	NA	0.000592 U [0.000578 U]	0.0052 U	0.000612 U	0.000602 U	NA
Endrin	19	250	- -	mg/kg	0.000452 UJ	0.00046 UJ	0.000428 U	0.005 U	0.000513 UJ	NA	0.000509 UJ [0.000497 UJ]	0.00447 UJ	0.000526 UJ	0.000518 U	NA
Endrin aldehyde	- -	- -	- -	mg/kg	0.000536 U	0.000546 U	0.000508 U	0.00593 U	0.000609 U	NA	0.000604 U [0.00059 U]	0.0053 U	0.000624 U	0.000614 U	NA
Endrin ketone	- -	- -	- -	mg/kg	0.00062 U	0.000631 U	0.000588 U	0.00686 U	0.000704 U	NA	0.000698 U [0.000682 U]	0.00614 U	0.000722 U	0.000711 U	NA
gamma-BHC (Lindane)	0.57	2.5	- -	mg/kg	0.00041 U	0.000417 U	0.000389 U	0.00453 U	0.000465 U	NA	0.000462 U [0.000451 U]	0.00406 U	0.000477 U	0.00047 U	NA
gamma-Chlordane	1.7	7.7	- -	mg/kg	0.00083 U	0.000845 U	0.000787 U	0.0435 J	0.000943 U	NA	0.000935 U [0.000913 U]	0.00822 U	0.000966 U	0.000951 U	NA
Heptachlor	0.13	0.63	- -	mg/kg	0.000441 U	0.000449 U	0.000418 U	0.00488 U	0.000501 U	NA	0.000497 U [0.000485 U]	0.00437 U	0.000514 U	0.000506 U	NA
Heptachlor epoxide	0.07	0.33	- -	mg/kg	0.000683 U	0.000695 U	0.000648 U	0.00756 U	0.000776 U	NA	0.000769 U [0.000751 U]	0.00676 U	0.000795 U	0.000783 U	NA
Hexachlorobenzene	0.21	0.96	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methoxychlor	320	4,100	- -	mg/kg	0.000515 U	0.000524 U	0.000488 U	0.0057 U	0.000585 U	NA	0.00058 U [0.000566 U]	0.0051 U	0.000599 U	0.00059 U	NA
Toxaphene	0.49	2.1	- -	mg/kg	0.0443 U	0.0451 U	0.042 U	**4.81**	0.0504 U	0.042 U	0.0499 U [0.0488 U]	0.439 U	0.0516 U	0.0508 U	NA

Table C-1
Summary of Soil Sample Analytical Results for all Depth Ranges
Corrective Action Plan Addendum
Former Black Leaf Chemical Site, Louisville, Kentucky

Location ID:	USEPA Residential	USEPA Industrial	Kentucky Arsenic		BL-SB-115	BL-SB-116	BL-SB-116	BL-SB-116	BL-SB-117	BL-SB-117	BL-SB-117	BL-SB-117	BL-SB-118	BL-SB-118R	BL-SB-118R
Sample Depth(Feet):					8 - 10	0 - 1	1 - 2	8 - 10	0 - 1	1 - 2	2 - 4	8 - 10	0 - 1	0 - 1	1 - 2
Date Collected:	Soil RSL Nov	Soil RSL	Background		09/19/14	09/21/14	09/21/14	09/21/14	09/21/14	09/21/14	09/21/14	09/21/14	09/19/14	09/30/14	09/30/14
Sample Name:	2017	Nov 2017	Guidance	Units	BL-SB-115_8_10	BL-SB-116_0_1	BL-SB-116_1_2	BL-SB-116_8_10	BL-SB-117_0_1	BL-SB-117_1_2	BL-SB-117_2_4	BL-SB-117_8_10	BL-SB-118_0_1	BL-SB-118R_0_1	BL-SB-118R_1_2
Detected Semivolatile Organics															
1,1'-Biphenyl	47	200	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4,5-Tetrachlorobenzene	23	350	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3&4-Methylphenol	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acetophenone	7,800	120,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1-methyl-Naphthalene	18	73	- -	mg/kg	0.0137 U	0.0152 U	0.0158 U	0.0175 U	0.0151 U	0.0155 U	NA	0.0169 U	0.0133 U	0.0284 J	0.0136 UJ
2,4,5-Trichlorophenol	6,300	82,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dimethylphenol	1,300	16,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzaldehyde	170	820	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	240	3,000	- -	mg/kg	0.0157 U	0.0174 U	0.018 U	0.02 U	0.0173 U	0.0177 U	NA	0.0193 U	0.0153 U	0.0318 J	0.0155 UJ
4,6-Dinitro-2-methylphenol	5.1	66	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthene	3,600	45,000	- -	mg/kg	0.00979 U	0.0109 U	0.0113 U	0.0125 U	0.0108 U	0.0111 U	NA	0.0121 U	0.00954 U	0.00937 UJ	0.00969 UJ
Acenaphthylene	- -	- -	- -	mg/kg	0.00881 U	0.00979 U	0.0101 U	0.0112 U	0.00973 U	0.00997 U	NA	0.0109 U	0.00858 U	0.00844 UJ	0.00872 UJ
Anthracene	18,000	230,000	- -	mg/kg	0.00881 U	0.00979 U	0.0101 U	0.0112 U	0.0197 J	0.00997 U	NA	0.0109 U	0.00858 U	0.0161 J	0.0358 J
Benzo(a)anthracene	1.1	21	- -	mg/kg	0.0147 U	0.0163 U	0.0169 U	0.0187 U	0.0587 J	0.0166 U	NA	0.0181 U	0.0143 U	0.0773 J	0.14 J
Benzo(a)pyrene	0.11	2.1	- -	mg/kg	0.0117 U	0.0131 U	0.0135 U	0.015 U	0.0507 J	0.0133 U	R	0.0145 U	0.0114 U	0.0744 J	**0.145 J**
Benzo(b)fluoranthene	1.1	21	- -	mg/kg	0.0117 U	0.0131 U	0.0135 U	0.015 U	0.0752	0.0133 U	NA	0.0145 U	0.0364 J	0.121 J	0.243 J
Benzo(g,h,i)perylene	- -	- -	- -	mg/kg	0.00881 U	0.00979 U	0.0101 U	0.0112 U	0.0392 J	0.00997 U	NA	0.0109 U	0.00858 U	0.064 J	0.108 J
Benzo(k)fluoranthene	11	210	- -	mg/kg	0.0137 U	0.0152 U	0.0158 U	0.0175 U	0.0317 J	0.0155 U	NA	0.0169 U	0.0144 J	0.0364 J	0.0923 J
Benzoic acid	250,000	3,300,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbazole	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	110	2,100	- -	mg/kg	0.00881 U	0.00979 U	0.0101 U	0.0112 U	0.062 J	0.00997 U	NA	0.0109 U	0.00858 U	0.0817 J	0.159 J
Dibenzo(a,h)anthracene	0.11	2.1	- -	mg/kg	0.00685 U	0.00762 U	0.00788 U	0.00875 U	0.00757 U	0.00776 U	NA	0.00846 U	0.00667 U	0.00656 UJ	0.00678 UJ
Dibenzofuran	73	1,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Di-n-butylphthalate	6,300	82,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	2,400	30,000	- -	mg/kg	0.00881 U	0.00979 U	0.0101 U	0.0112 U	0.143	0.00997 U	NA	0.0109 U	0.00858 U	0.135 J	0.236 J
Fluorene	2,400	30,000	- -	mg/kg	0.0117 U	0.0131 U	0.0135 U	0.015 U	0.013 U	0.0133 U	NA	0.0145 U	0.0114 U	0.0112 UJ	0.0116 UJ
Indeno(1,2,3-cd)pyrene	1.1	21	- -	mg/kg	0.00979 U	0.0109 U	0.0113 U	0.0125 U	0.0108 U	0.0111 U	NA	0.0121 U	0.00954 U	0.0532 J	0.0961 J
Naphthalene	3.8	17	- -	mg/kg	0.00881 U	0.00979 U	0.0101 U	0.0112 U	0.00973 U	0.00997 U	NA	0.0109 U	0.00858 U	0.00844 UJ	0.00872 UJ
Pentachlorophenol	1	4	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	- -	- -	- -	mg/kg	0.00881 U	0.00979 U	0.0101 U	0.0112 U	0.0993	0.00997 U	NA	0.0109 U	0.00858 U	0.069 J	0.0992 J
Phenol	19,000	250,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pyrene	1,800	23,000	- -	mg/kg	0.0117 U	0.0131 U	0.0135 U	0.015 U	0.124	0.0133 U	NA	0.0145 U	0.0114 U	0.116 J	0.217 J
Detected Inorganics															
Arsenic	**	**	22.7	mg/kg	11.4 J	12.4 J	10.5 J	13.6	7.44 J	5.25 J	NA	14.1	7.25 J	10.1	10
Lead	400	800	- -	mg/kg	12.2	32.3 J	51.2 J	15.5	17.2 J	14.1 J	NA	17.9	19.3	0.546 U	21.8 J
Detected Pesticides															
2,4' DDD	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4'-DDE	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4'-DDT	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
trans-Nonachlor	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDD	1.9	9.6	- -	mg/kg	0.000495 U	0.000951 J	0.000425 U	0.000399 U	0.00428 U	0.00413 U	NA	0.000426 U	0.0123 J	0.0146 J	0.00425 UJ
4,4'-DDE	2.0	9.3	- -	mg/kg	0.000576 U	0.0202	0.000495 U	0.000464 U	0.045	0.0048 U	NA	0.000496 U	0.0655	0.0471 J	0.0112 J
4,4'-DDT	1.9	8.5	- -	mg/kg	0.000979 U	0.00247 J	0.000841 U	0.000788 U	0.0176	0.00816 U	NA	0.000842 U	0.0511	0.0544 J	0.0293 J
Aldrin	0.039	0.18	- -	mg/kg	0.000357 U	0.000337 U	0.000307 U	0.000287 U	0.00309 U	0.00298 U	NA	0.000307 U	0.00326 U	0.0029 UJ	0.00306 UJ
alpha-BHC	0.086	0.36	- -	mg/kg	0.00023 U	0.000217 U	0.000198 U	0.000185 U	0.00199 U	0.00192 U	NA	0.000198 U	0.0021 U	0.00187 UJ	0.00197 UJ
alpha-Chlordane	1.7	7.7	- -	mg/kg	0.000495 U	0.000467 U	0.000425 U	0.000399 U	0.00428 U	0.00413 U	NA	0.000426 U	0.00452 U	0.00402 UJ	0.00425 UJ
beta-BHC	0.3	1.3	- -	mg/kg	0.00023 U	0.000818 J	0.000198 U	0.000185 U	0.00199 U	0.00192 U	NA	0.000198 U	0.0021 U	0.00187 UJ	0.00197 UJ
Chlordane (technical)	1.7	7.7	- -	mg/kg	0.0418 U	0.0395 U	0.0359 U	0.0337 U	0.362 U	0.349 U	NA	0.036 U	0.382 U	0.34 UJ	0.358 UJ
delta-BHC	- -	- -	- -	mg/kg	0.000438 U	0.000413 U	0.000376 U	0.000352 U	0.00379 U	0.00365 U	NA	0.000377 U	0.004 U	0.00356 UJ	0.00375 UJ
Dieldrin	0.034	0.14	- -	mg/kg	0.000461 U	0.00141 J	0.000396 U	0.000371 U	0.00398 U	0.00384 U	NA	0.000396 U	0.00554 J	0.00374 UJ	0.00395 UJ
Endosulfan I	470	7000	- -	mg/kg	0.000541 U	0.000511 U	0.000465 U	0.000436 U	0.00468 U	0.00451 U	NA	0.000466 U	0.00494 U	0.0044 UJ	0.00464 UJ
Endosulfan II	470	7000	- -	mg/kg	0.000634 U	0.000598 U	0.000544 U	0.00051 U	0.00548 U	0.00528 U	NA	0.000545 U	0.00579 U	0.00515 UJ	0.00543 UJ
Endosulfan sulfate	470	7000	- -	mg/kg	0.000576 U	0.000544 U	0.000495 U	0.000464 U	0.00498 U	0.0048 U	NA	0.000496 U	0.00526 U	0.00468 UJ	0.00494 UJ
Endrin	19	250	- -	mg/kg	0.000495 U	0.000467 U	0.000425 U	0.000399 U	0.00428 U	0.00413 U	NA	0.000426 U	0.00452 UJ	0.00402 UJ	0.00425 UJ
Endrin aldehyde	- -	- -	- -	mg/kg	0.000587 U	0.000554 U	0.000504 U	0.000473 U	0.00508 U	0.0049 U	NA	0.000505 U	0.00536 U	0.00477 UJ	0.00504 UJ
Endrin ketone	- -	- -	- -	mg/kg	0.00068 U	0.000641 U	0.000584 U	0.000547 U	0.00588 U	0.00566 U	NA	0.000585 U	0.00621 U	0.00552 UJ	0.00583 UJ
gamma-BHC (Lindane)	0.57	2.5	- -	mg/kg	0.000449 U	0.000424 U	0.000386 U	0.000362 U	0.00389 U	0.00374 U	NA	0.000387 U	0.0041 U	0.00365 UJ	0.00385 UJ
gamma-Chlordane	1.7	7.7	- -	mg/kg	0.00091 U	0.000859 U	0.000781 U	0.000733 U	0.00787 U	0.00758 U	NA	0.000783 U	0.00831 U	0.00739 UJ	0.0078 UJ
Heptachlor	0.13	0.63	- -	mg/kg	0.000484 U	0.000457 U	0.000415 U	0.000389 U	0.00418 U	0.00403 U	NA	0.000416 U	0.00442 U	0.00393 UJ	0.00415 UJ
Heptachlor epoxide	0.07	0.33	- -	mg/kg	0.000749 U	0.00247 JN	0.000643 U	0.000603 U	0.00648 U	0.00624 U	NA	0.000644 U	0.00684 U	0.00608 UJ	0.00642 UJ
Hexachlorobenzene	0.21	0.96	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methoxychlor	320	4,100	- -	mg/kg	0.000564 U	0.000533 U	0.000485 U	0.000454 U	0.00488 U	0.0047 U	NA	0.000486 U	0.00515 U	0.00458 UJ	0.00484 UJ
Toxaphene	0.49	2.1	- -	mg/kg	0.0486 U	0.0459 U	0.0417 U	0.0391 U	0.42 U	0.405 U	NA	0.0418 U	0.444 U	0.395 UJ	0.417 UJ

Table C-1
Summary of Soil Sample Analytical Results for all Depth Ranges
Corrective Action Plan Addendum
Former Black Leaf Chemical Site, Louisville, Kentucky

Location ID: / Sample Depth(Feet): / Date Collected: / Sample Name:	USEPA Residential Soil RSL Nov 2017	USEPA Industrial Soil RSL Nov 2017	Kentucky Arsenic Background Guidance	Units	BL-SB-118R 2 - 4 09/30/14 BL-SB-118R_2_4	BL-SB-118R 4 - 6 09/30/14 BL-SB-118R_4_6	BL-SB-118R 8 - 10 09/30/14 BL-SB-118R_8_10	BL-SB-119 0 - 1 09/19/14 BL-SB-119_0_1	BL-SB-119 1 - 2 09/19/14 BL-SB-119_1_2	BL-SB-119 2 - 4 09/19/14 BL-SB-119_2_4	BL-SB-119 4 - 6 09/19/14 BL-SB-119_4_6	BL-SB-119 6 - 8 09/19/14 BL-SB-119_6_8	BL-SB-119 8 - 10 09/19/14 BL-SB-119_8_10	BL-SB-119 10 - 12 06/25/15 BL-SB-119_10_12	BL-SB-119 12 - 14 06/25/15 BL-SB-119_12_14
Detected Semivolatile Organics															
1,1'-Biphenyl	47	200	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4,5-Tetrachlorobenzene	23	350	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3&4-Methylphenol	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acetophenone	7,800	120,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1-methyl-Naphthalene	18	73	- -	mg/kg	NA	NA	0.0139 U	0.0996 J	0.0472 J	NA	NA	NA	0.014 U	NA	NA
2,4,5-Trichlorophenol	6,300	82,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dimethylphenol	1,300	16,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzaldehyde	170	820	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	240	3,000	- -	mg/kg	NA	NA	0.0159 U	0.123 J	0.0581 J	NA	NA	NA	0.0159 U	NA	NA
4,6-Dinitro-2-methylphenol	5.1	66	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthene	3,600	45,000	- -	mg/kg	NA	NA	0.00996 U	0.0605 J	0.00952 U	NA	NA	NA	0.00996 U	NA	NA
Acenaphthylene	- -	- -	- -	mg/kg	NA	NA	0.00896 U	0.0958 J	0.00857 U	NA	NA	NA	0.00897 U	NA	NA
Anthracene	18,000	230,000	- -	mg/kg	NA	NA	0.00896 U	0.27	0.0463 J	NA	NA	NA	0.00964 J	NA	NA
Benzo(a)anthracene	1.1	21	- -	mg/kg	NA	NA	0.0149 U	0.852	0.176	0.015 U	0.0148 U	NA	0.0351 J	NA	NA
Benzo(a)pyrene	0.11	2.1	- -	mg/kg	0.0143 UJ	0.0147 UJ	0.012 U	**0.929**	**0.134**	0.012 U	0.0119 U	NA	0.0338 J	0.0119 U	0.012 U
Benzo(b)fluoranthene	1.1	21	- -	mg/kg	0.0143 UJ	0.0147 UJ	0.012 U	**1.49**	0.272	0.012 U	0.0119 U	NA	0.0484 J	NA	NA
Benzo(g,h,i)perylene	- -	- -	- -	mg/kg	NA	NA	0.00896 U	0.706	0.122	NA	NA	NA	0.00897 U	NA	NA
Benzo(k)fluoranthene	11	210	- -	mg/kg	NA	NA	0.0139 U	0.573	0.0367 J	NA	NA	NA	0.0229 J	NA	NA
Benzoic acid	250,000	3,300,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbazole	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	110	2,100	- -	mg/kg	NA	NA	0.00896 U	0.937	0.201	NA	NA	NA	0.0353 J	NA	NA
Dibenzo(a,h)anthracene	0.11	2.1	- -	mg/kg	NA	NA	0.00697 U	**0.145**	0.00666 U	0.00698 U	NA	NA	0.00698 U	NA	NA
Dibenzofuran	73	1,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Di-n-butylphthalate	6,300	82,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	2,400	30,000	- -	mg/kg	NA	NA	0.00896 U	1.77	0.391	NA	NA	NA	0.0647 J	NA	NA
Fluorene	2,400	30,000	- -	mg/kg	NA	NA	0.012 U	0.0683 J	0.0114 U	NA	NA	NA	0.012 U	NA	NA
Indeno(1,2,3-cd)pyrene	1.1	21	- -	mg/kg	NA	NA	0.00996 U	0.597	0.111	0.00997 U	NA	NA	0.00996 U	NA	NA
Naphthalene	3.8	17	- -	mg/kg	NA	NA	0.00896 U	0.0959 J	0.0398 J	NA	NA	NA	0.00897 U	NA	NA
Pentachlorophenol	1	4	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	- -	- -	- -	mg/kg	NA	NA	0.00896 U	1.01	0.195	NA	NA	NA	0.0413 J	NA	NA
Phenol	19,000	250,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pyrene	1,800	23,000	- -	mg/kg	NA	NA	0.012 U	1.5	0.319	NA	NA	NA	0.0569 J	NA	NA
Detected Inorganics															
Arsenic	**	**	22.7	mg/kg	NA	NA	14	17.4 J	**54.4 J**	17.1 J	10.8 J	NA	9.05 J	NA	NA
Lead	400	800	- -	mg/kg	NA	NA	11.9	56.8	20.9	NA	NA	NA	12.2	NA	NA
Detected Pesticides															
2,4' DDD	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4'-DDE	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4'-DDT	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
trans-Nonachlor	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDD	1.9	9.6	- -	mg/kg	NA	NA	0.000427 U	0.457	0.0533	NA	NA	NA	0.089	NA	NA
4,4'-DDE	2.0	9.3	- -	mg/kg	NA	NA	0.000497 U	1.45 D	0.571	NA	NA	NA	0.107	NA	NA
4,4'-DDT	1.9	8.5	- -	mg/kg	NA	NA	0.000845 U	**10.3 D**	0.362	0.187	NA	NA	0.509	NA	NA
Aldrin	0.039	0.18	- -	mg/kg	NA	NA	0.000308 U	0.00333 U	0.00329 U	NA	NA	NA	0.00333 U	NA	NA
alpha-BHC	0.086	0.36	- -	mg/kg	NA	NA	0.000199 U	0.00933 J	0.0051 J	NA	NA	NA	0.00215 U	NA	NA
alpha-Chlordane	1.7	7.7	- -	mg/kg	NA	NA	0.000427 U	0.00462 U	0.00457 U	NA	NA	NA	0.00462 U	NA	NA
beta-BHC	0.3	1.3	- -	mg/kg	NA	NA	0.000199 U	0.0975	0.018 J	NA	NA	NA	0.00215 U	NA	NA
Chlordane (technical)	1.7	7.7	- -	mg/kg	NA	NA	0.0361 U	0.39 U	0.386 U	NA	NA	NA	0.39 U	NA	NA
delta-BHC	- -	- -	- -	mg/kg	NA	NA	0.000378 U	0.00408 U	0.00404 U	NA	NA	NA	0.00408 U	NA	NA
Dieldrin	0.034	0.14	- -	mg/kg	NA	NA	0.000398 U	**1.88 D**	0.0244	**0.0379**	0.0112 J	0.000422 U	**0.0962**	0.000396 U	0.000399 U
Endosulfan I	470	7000	- -	mg/kg	NA	NA	0.000467 U	0.00505 U	0.00499 U	NA	NA	NA	0.00505 U	NA	NA
Endosulfan II	470	7000	- -	mg/kg	NA	NA	0.000547 U	0.00591 U	0.00584 U	NA	NA	NA	0.00591 U	NA	NA
Endosulfan sulfate	470	7000	- -	mg/kg	NA	NA	0.000497 U	0.00537 U	0.00531 U	NA	NA	NA	0.00537 U	NA	NA
Endrin	19	250	- -	mg/kg	NA	NA	0.000427 U	0.00462 UJ	0.00457 UJ	NA	NA	NA	0.00462 UJ	NA	NA
Endrin aldehyde	- -	- -	- -	mg/kg	NA	NA	0.000507 U	0.00548 U	0.00542 U	NA	NA	NA	0.00548 U	NA	NA
Endrin ketone	- -	- -	- -	mg/kg	NA	NA	0.000586 U	0.00634 U	0.00627 U	NA	NA	NA	0.00634 U	NA	NA
gamma-BHC (Lindane)	0.57	2.5	- -	mg/kg	NA	NA	0.000388 U	0.00419 U	0.00414 U	NA	NA	NA	0.00419 U	NA	NA
gamma-Chlordane	1.7	7.7	- -	mg/kg	NA	NA	0.000785 U	0.0486 JN	0.00839 U	NA	NA	NA	0.00849 U	NA	NA
Heptachlor	0.13	0.63	- -	mg/kg	NA	NA	0.000417 U	0.00451 U	0.00446 U	NA	NA	NA	0.00451 U	NA	NA
Heptachlor epoxide	0.07	0.33	- -	mg/kg	NA	NA	0.000646 U	0.00698 U	0.00691 U	NA	NA	NA	0.00698 U	NA	NA
Hexachlorobenzene	0.21	0.96	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methoxychlor	320	4,100	- -	mg/kg	NA	NA	0.000487 U	0.0354 U	0.00521 U	NA	NA	NA	0.00526 U	NA	NA
Toxaphene	0.49	2.1	- -	mg/kg	NA	NA	0.0419 U	0.453 U	0.448 U	NA	NA	NA	0.453 U	NA	NA

Table C-1
Summary of Soil Sample Analytical Results for all Depth Ranges
Corrective Action Plan Addendum
Former Black Leaf Chemical Site, Louisville, Kentucky

Location ID:	USEPA	USEPA	Kentucky		BL-SB-120	BL-SB-120	BL-SB-120	BL-SB-121	BL-SB-121	BL-SB-121	BL-SB-121	BL-SB-122	BL-SB-122	BL-SB-122	BL-SB-122
Sample Depth(Feet):	Residential	Industrial	Arsenic		0 - 1	1 - 2	8 - 10	0 - 1	1 - 2	2 - 4	8 - 10	0 - 1	1 - 2	2 - 4	4 - 6
Date Collected:	Soil RSL Nov	Soil RSL	Background		09/19/14	09/19/14	09/20/14	09/18/14	09/18/14	09/18/14	09/18/14	09/18/14	09/18/14	09/18/14	09/18/14
Sample Name:	2017	Nov 2017	Guidance	Units	BL-SB-120_0_1	BL-SB-120_1_2	BL-SB-120_8_10	BL-SB-121_0_1	BL-SB-121_1_2	BL-SB-121_2_4	BL-SB-121_8_10	BL-SB-122_0_1	BL-SB-122_1_2	BL-SB-122_2_4	BL-SB-122_4_6
Detected Semivolatile Organics															
1,1'-Biphenyl	47	200	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4,5-Tetrachlorobenzene	23	350	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3&4-Methylphenol	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acetophenone	7,800	120,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1-methyl-Naphthalene	18	73	- -	mg/kg	0.0135 U	0.0138 U	0.0154 U	0.0784 J	0.0196 U	NA	0.018 U	0.0906 J	0.133	NA	NA
2,4,5-Trichlorophenol	6,300	82,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dimethylphenol	1,300	16,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzaldehyde	170	820	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	240	3,000	- -	mg/kg	0.0154 U	0.0158 U	0.0176 U	0.0361 U	0.0224 U	NA	0.0206 U	0.109 J	0.172	NA	NA
4,6-Dinitro-2-methylphenol	5.1	66	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthene	3,600	45,000	- -	mg/kg	0.00962 U	0.00988 U	0.011 U	0.0225 U	0.014 U	NA	0.0129 U	0.0215 U	0.0122 U	NA	NA
Acenaphthylene	- -	- -	- -	mg/kg	0.00866 U	0.00889 U	0.00989 U	0.0203 U	0.0126 U	NA	0.0116 U	0.197	0.213	NA	NA
Anthracene	18,000	230,000	- -	mg/kg	0.00866 U	0.00889 U	0.00989 U	0.0878 J	0.0126 U	NA	0.0116 U	0.147	0.184	NA	NA
Benzo(a)anthracene	1.1	21	- -	mg/kg	0.0144 U	0.0148 U	0.0165 U	0.275	0.021 U	0.0145 U	0.0193 U	0.435	0.473	0.0144 U	0.0145 U
Benzo(a)pyrene	0.11	2.1	- -	mg/kg	0.0115 U	0.0119 U	0.0132 U	**0.291**	0.0168 U	0.0116 U	0.0154 U	**0.713**	**0.672**	0.0116 U	0.0116 U
Benzo(b)fluoranthene	1.1	21	- -	mg/kg	0.0115 U	0.0119 U	0.0132 U	0.41	0.0168 U	0.0116 U	0.0154 U	**1.26**	**1.97**	0.0116 U	0.0116 U
Benzo(g,h,i)perylene	- -	- -	- -	mg/kg	0.00866 U	0.00889 U	0.00989 U	0.281	0.0126 U	NA	0.0116 U	1.09	0.606	NA	NA
Benzo(k)fluoranthene	11	210	- -	mg/kg	0.0135 U	0.0138 U	0.0154 U	0.168	0.0196 U	NA	0.018 U	0.421	0.555	NA	NA
Benzoic acid	250,000	3,300,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbazole	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	110	2,100	- -	mg/kg	0.00866 U	0.00889 U	0.00989 U	0.343	0.0126 U	NA	0.0116 U	0.584	0.709	NA	NA
Dibenzo(a,h)anthracene	0.11	2.1	- -	mg/kg	0.00673 U	0.00692 U	0.00769 U	0.0158 U	0.00981 U	NA	0.009 U	**0.176**	**0.209**	0.00674 U	0.00679 U
Dibenzofuran	73	1,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Di-n-butylphthalate	6,300	82,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	2,400	30,000	- -	mg/kg	0.00866 U	0.00889 U	0.00989 U	0.554	0.0474 J	NA	0.0116 U	0.635	0.364	NA	NA
Fluorene	2,400	30,000	- -	mg/kg	0.0115 U	0.0119 U	0.0132 U	0.027 U	0.0168 U	NA	0.0154 U	0.0258 U	0.0147 U	NA	NA
Indeno(1,2,3-cd)pyrene	1.1	21	- -	mg/kg	0.00962 U	0.00988 U	0.011 U	0.181	0.014 U	0.00966 U	0.0129 U	0.754	0.573	0.00963 U	0.00969 U
Naphthalene	3.8	17	- -	mg/kg	0.00866 U	0.00889 U	0.00989 U	0.0203 U	0.0126 U	NA	0.0116 U	0.0193 U	0.138	NA	NA
Pentachlorophenol	1	4	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	- -	- -	- -	mg/kg	0.00866 U	0.00889 U	0.00989 U	0.385	0.0126 U	NA	0.0116 U	0.247	0.195	NA	NA
Phenol	19,000	250,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pyrene	1,800	23,000	- -	mg/kg	0.0115 U	0.0119 U	0.0132 U	0.556	0.0168 U	NA	0.0154 U	0.668	0.537	NA	NA
Detected Inorganics															
Arsenic	**	**	22.7	mg/kg	15.8 J	13.7 J	6.61	**30.2 J**	13.7 J	12	11.3	**200 J**	**152 J**	14.2	16.8
Lead	400	800	- -	mg/kg	16.5	16.3	8.08	79.3 J	1.02 J	NA	8.14	119 J	21.1 J	NA	NA
Detected Pesticides															
2,4' DDD	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4'-DDE	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4'-DDT	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
trans-Nonachlor	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDD	1.9	9.6	- -	mg/kg	0.00532 U	0.00537 U	0.000473 U	0.0419	0.000512 U	NA	0.000467 U	0.293	0.0808 J	NA	NA
4,4'-DDE	2.0	9.3	- -	mg/kg	0.00618 U	0.00625 U	0.000549 U	0.288	0.00223	NA	0.000543 U	**4.68 D**	0.741 D	0.00257	NA
4,4'-DDT	1.9	8.5	- -	mg/kg	0.0105 U	0.0106 U	0.00132 J	0.134 J	0.00101 U	NA	0.000924 U	**3.82 D**	1.43 D	0.00397	NA
Aldrin	0.039	0.18	- -	mg/kg	0.00383 U	0.00387 U	0.000341 U	0.00355 U	0.000369 U	NA	0.000337 U	0.00337 U	0.00378 U	NA	NA
alpha-BHC	0.086	0.36	- -	mg/kg	0.00247 U	0.0025 U	0.00022 U	0.00229 U	0.000238 U	NA	0.000217 U	0.00638 J	0.0233 J	NA	NA
alpha-Chlordane	1.7	7.7	- -	mg/kg	0.00532 U	0.00537 U	0.000473 U	0.00492 U	0.000512 U	NA	0.000467 U	0.0185 U	0.00524 U	NA	NA
beta-BHC	0.3	1.3	- -	mg/kg	0.00247 U	0.0025 U	0.00022 U	0.00929 J	0.000238 U	NA	0.000217 U	0.108	0.185	NA	NA
Chlordane (technical)	1.7	7.7	- -	mg/kg	0.449 U	0.453 U	0.0399 U	0.415 U	0.0432 U	NA	0.0395 U	0.394 U	0.442 U	NA	NA
delta-BHC	- -	- -	- -	mg/kg	0.0047 U	0.00475 U	0.000418 U	0.00435 U	0.000452 U	NA	0.000413 U	0.00413 U	0.00463 U	NA	NA
Dieldrin	0.034	0.14	- -	mg/kg	0.00495 U	0.005 U	0.000545 J	0.0154 J	0.000476 U	NA	0.000435 U	**1.26 D**	**0.407**	0.00145 J	0.00658
Endosulfan I	470	7000	- -	mg/kg	0.00581 U	0.00587 U	0.000516 U	0.00538 U	0.000559 U	NA	0.000511 U	0.0051 U	0.00573 U	NA	NA
Endosulfan II	470	7000	- -	mg/kg	0.0068 U	0.00687 U	0.000604 U	0.00629 U	0.000654 U	NA	0.000598 U	0.00597 U	0.0067 U	NA	NA
Endosulfan sulfate	470	7000	- -	mg/kg	0.00618 U	0.00625 U	0.000549 U	0.00572 U	0.000595 UJ	NA	0.000543 U	0.00543 U	0.00609 U	NA	NA
Endrin	19	250	- -	mg/kg	0.00532 U	0.00537 U	0.000473 U	0.00492 U	0.000512 U	NA	0.000467 U	0.00467 U	0.00524 U	NA	NA
Endrin aldehyde	- -	- -	- -	mg/kg	0.00631 U	0.00637 U	0.00056 U	0.00584 U	0.000607 U	NA	0.000554 U	0.00554 U	0.00621 U	NA	NA
Endrin ketone	- -	- -	- -	mg/kg	0.0073 U	0.00737 U	0.000648 U	0.00675 U	0.000702 U	NA	0.000641 U	0.0104 J	0.00719 U	NA	NA
gamma-BHC (Lindane)	0.57	2.5	- -	mg/kg	0.00482 U	0.00487 U	0.000429 U	0.00446 U	0.000464 U	NA	0.000424 U	0.00616 J	0.0224	NA	NA
gamma-Chlordane	1.7	7.7	- -	mg/kg	0.00977 U	0.00987 U	0.000868 U	0.00904 U	0.00094 U	NA	0.000859 U	0.0525 JN	0.00962 U	NA	NA
Heptachlor	0.13	0.63	- -	mg/kg	0.00519 U	0.00525 U	0.000462 U	0.00481 U	0.0005 U	NA	0.000457 U	0.00456 U	0.00512 U	NA	NA
Heptachlor epoxide	0.07	0.33	- -	mg/kg	0.00804 U	0.00812 U	0.000714 U	0.00744 U	0.000773 U	NA	0.000707 U	0.00706 U	0.00792 U	NA	NA
Hexachlorobenzene	0.21	0.96	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methoxychlor	320	4,100	- -	mg/kg	0.00606 U	0.00612 U	0.000538 U	0.00561 U	0.000583 U	NA	0.000533 U	0.00532 U	0.00597 U	NA	NA
Toxaphene	0.49	2.1	- -	mg/kg	0.522 U	0.527 U	0.0464 U	**1.48**	0.0502 U	0.0393 U	0.0459 U	0.458 U	0.514 U	NA	NA

Table C-1
Summary of Soil Sample Analytical Results for all Depth Ranges
Corrective Action Plan Addendum
Former Black Leaf Chemical Site, Louisville, Kentucky

Location ID:	USEPA Residential	USEPA Industrial	Kentucky Arsenic		BL-SB-122	BL-SB-123	BL-SB-123	BL-SB-123	BL-SB-123	BL-SB-123	BL-SB-123	BL-SB-123	BL-SB-124	BL-SB-124	BL-SB-124
Sample Depth(Feet):					8 - 10	0 - 1	1 - 2	2 - 4	4 - 6	6 - 8	8 - 10	10 - 12	0 - 1	1 - 2	2 - 4
Date Collected:	Soil RSL Nov	Soil RSL	Background		09/18/14	09/18/14	09/18/14	09/18/14	09/18/14	09/18/14	09/18/14	06/25/15	09/20/14	09/20/14	09/20/14
Sample Name:	2017	Nov 2017	Guidance	Units	BL-SB-122_8_10	BL-SB-123_0_1	BL-SB-123_1_2	BL-SB-123_2_4	BL-SB-123_4_6	BL-SB-123_6_8	BL-SB-123_8_10	BL-SB-123_10_12	BL-SB-124_0_1	BL-SB-124_1_2	BL-SB-124_2_4
Detected Semivolatile Organics															
1,1'-Biphenyl	47	200	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4,5-Tetrachlorobenzene	23	350	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3&4-Methylphenol	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acetophenone	7,800	120,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1-methyl-Naphthalene	18	73	- -	mg/kg	0.0155 U	0.0344 U	0.071 J	NA	NA	NA	0.017 U	NA	0.0849 U	0.0165 U	NA
2,4,5-Trichlorophenol	6,300	82,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dimethylphenol	1,300	16,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzaldehyde	170	820	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	240	3,000	- -	mg/kg	0.0178 U	0.0393 U	0.0773 J	NA	NA	NA	0.0195 U	NA	0.097 U	0.0188 U	NA
4,6-Dinitro-2-methylphenol	5.1	66	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthene	3,600	45,000	- -	mg/kg	0.0111 U	0.0245 U	0.012 U	NA	NA	NA	0.0122 U	NA	0.215 J	0.0118 U	NA
Acenaphthylene	- -	- -	- -	mg/kg	0.00999 U	0.0221 U	0.0108 U	NA	NA	NA	0.0109 U	NA	0.0546 U	0.0106 U	NA
Anthracene	18,000	230,000	- -	mg/kg	0.00999 U	0.236	0.0166 J	NA	NA	NA	0.0109 U	NA	0.373 J	0.0106 U	NA
Benzo(a)anthracene	1.1	21	- -	mg/kg	0.0167 U	0.892	0.0389 J	0.014 U	NA	NA	0.0182 U	NA	**1.14**	0.0177 U	0.0147 U
Benzo(a)pyrene	0.11	2.1	- -	mg/kg	0.0133 U	**1.06**	0.0418 J	0.0112 U	0.0116 U	NA	0.0146 U	NA	**1.22**	0.0141 U	0.0117 U
Benzo(b)fluoranthene	1.1	21	- -	mg/kg	0.0133 U	**1.68**	0.0743 J	0.0112 U	NA	NA	0.0146 U	NA	**1.76**	0.0402 J	0.0117 U
Benzo(g,h,i)perylene	- -	- -	- -	mg/kg	0.00999 U	1.13	0.0108 U	NA	NA	NA	0.0109 U	NA	0.817	0.0106 U	NA
Benzo(k)fluoranthene	11	210	- -	mg/kg	0.0155 U	0.593	0.027 J	NA	NA	NA	0.017 U	NA	0.809	0.018 J	NA
Benzoic acid	250,000	3,300,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbazole	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	110	2,100	- -	mg/kg	0.00999 U	0.978	0.0428 J	NA	NA	NA	0.0109 U	NA	1.37	0.0106 U	NA
Dibenzo(a,h)anthracene	0.11	2.1	- -	mg/kg	0.00777 U	**0.259**	0.00843 U	0.00652 U	NA	NA	0.00852 U	NA	**0.216 J**	0.00824 U	0.00685 U
Dibenzofuran	73	1,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Di-n-butylphthalate	6,300	82,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	2,400	30,000	- -	mg/kg	0.00999 U	1.77	0.0522 J	NA	NA	NA	0.0109 U	NA	3.22	0.0437 J	NA
Fluorene	2,400	30,000	- -	mg/kg	0.0133 U	0.0295 U	0.0145 U	NA	NA	NA	0.0146 U	NA	0.0728 U	0.0141 U	NA
Indeno(1,2,3-cd)pyrene	1.1	21	- -	mg/kg	0.0111 U	0.884	0.012 U	0.00931 U	NA	NA	0.0122 U	NA	0.661	0.0118 U	0.00978 U
Naphthalene	3.8	17	- -	mg/kg	0.00999 U	0.0221 U	0.0108 U	NA	NA	NA	0.0109 U	NA	0.0546 U	0.0106 U	NA
Pentachlorophenol	1	4	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	- -	- -	- -	mg/kg	0.00999 U	1.05	0.081	NA	NA	NA	0.0109 U	NA	2.3	0.0106 U	NA
Phenol	19,000	250,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pyrene	1,800	23,000	- -	mg/kg	0.0133 U	2.49	0.0559 J	NA	NA	NA	0.0146 U	NA	2.54	0.0141 U	NA
Detected Inorganics															
Arsenic	**	**	22.7	mg/kg	6.83	11.2 J	18.4 J	NA	NA	NA	16.4	NA	**337 J**	**56.7 J**	**36**
Lead	400	800	- -	mg/kg	6.5	27.6 J	27.9 J	NA	NA	NA	15.8	NA	242 J	23.8 J	NA
Detected Pesticides															
2,4' DDD	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4'-DDE	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4'-DDT	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
trans-Nonachlor	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDD	1.9	9.6	- -	mg/kg	0.00577 J	0.00535 U	0.131 D	NA	NA	NA	0.000525 U	NA	0.00519 U	0.000494 U	NA
4,4'-DDE	2.0	9.3	- -	mg/kg	0.0067	**116 DJ**	0.517 D	0.0113	NA	NA	0.00101 J	NA	0.209	0.0123	NA
4,4'-DDT	1.9	8.5	- -	mg/kg	0.134 D	**2,740 DJ**	**2.68 D**	0.0504 D	0.307	NA	0.00454	NA	0.151	0.0101	NA
Aldrin	0.039	0.18	- -	mg/kg	0.000341 U	**0.0847 J**	0.000365 U	0.000299 U	NA	NA	0.000379 U	NA	0.00374 U	0.000356 U	NA
alpha-BHC	0.086	0.36	- -	mg/kg	0.00022 U	**0.153 J**	0.0219 JN	0.000193 U	NA	NA	0.000244 U	NA	0.00241 U	0.00023 U	NA
alpha-Chlordane	1.7	7.7	- -	mg/kg	0.000472 U	0.00535 U	0.000507 U	NA	NA	NA	0.000525 U	NA	0.00519 U	0.000494 U	NA
beta-BHC	0.3	1.3	- -	mg/kg	0.00134 J	**71 DJ**	0.161 DJ	0.00474	NA	NA	0.0079	NA	0.00241 U	0.00023 U	NA
Chlordane (technical)	1.7	7.7	- -	mg/kg	0.0399 U	**45.3 DJ**	0.132	NA	NA	NA	0.0443 U	NA	0.438 U	0.0417 U	NA
delta-BHC	- -	- -	- -	mg/kg	0.000418 U	0.16 J	0.002 U	NA	NA	NA	0.000464 U	NA	0.00458 U	0.000436 U	NA
Dieldrin	0.034	0.14	- -	mg/kg	0.000694 J	**73.5 DJ**	**0.262 D**	0.00747	**0.0385**	**0.0739**	0.000489 U	0.000399 U	0.0205 U	0.000459 U	NA
Endosulfan I	470	7000	- -	mg/kg	0.000516 U	0.375 JN	0.000554 U	NA	NA	NA	0.000574 U	NA	0.00567 U	0.000539 U	NA
Endosulfan II	470	7000	- -	mg/kg	0.000604 U	0.00684 U	0.000648 U	NA	NA	NA	0.000672 U	NA	0.00663 U	0.000631 U	NA
Endosulfan sulfate	470	7000	- -	mg/kg	0.000549 U	0.00622 U	0.00059 U	NA	NA	NA	0.000611 U	NA	0.00603 U	0.000574 U	NA
Endrin	19	250	- -	mg/kg	0.000472 U	0.0535 U	0.0132	NA	NA	NA	0.000525 U	NA	0.00519 U	0.000494 U	NA
Endrin aldehyde	- -	- -	- -	mg/kg	0.00056 U	0.00634 U	0.000601 U	NA	NA	NA	0.000623 U	NA	0.00615 U	0.000585 U	NA
Endrin ketone	- -	- -	- -	mg/kg	0.000648 U	1.14 DJ	0.00692	NA	NA	NA	0.000721 U	NA	0.00712 U	0.000677 U	NA
gamma-BHC (Lindane)	0.57	2.5	- -	mg/kg	0.000429 U	0.12 J	0.014 JN	NA	NA	NA	0.000476 U	NA	0.0047 U	0.000448 U	NA
gamma-Chlordane	1.7	7.7	- -	mg/kg	0.000868 U	**4.42 JN**	0.0296	NA	NA	NA	0.000965 U	NA	0.00953 U	0.000907 U	NA
Heptachlor	0.13	0.63	- -	mg/kg	0.000461 U	0.00522 U	0.000495 U	NA	NA	NA	0.000513 U	NA	0.00507 U	0.000482 U	NA
Heptachlor epoxide	0.07	0.33	- -	mg/kg	0.000714 U	**0.244 JN**	0.000766 U	0.000626 U	NA	NA	0.000794 U	NA	0.00784 U	0.000746 U	NA
Hexachlorobenzene	0.21	0.96	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methoxychlor	320	4,100	- -	mg/kg	0.000538 U	0.00609 U	0.000578 U	NA	NA	NA	0.000599 U	NA	0.00591 U	0.000562 U	NA
Toxaphene	0.49	2.1	- -	mg/kg	0.0464 U	0.525 U	0.0498 U	NA	NA	NA	0.0516 U	NA	0.509 U	0.0484 U	NA

Table C-1
Summary of Soil Sample Analytical Results for all Depth Ranges
Corrective Action Plan Addendum
Former Black Leaf Chemical Site, Louisville, Kentucky

Location ID:	USEPA	USEPA	Kentucky		BL-SB-124	BL-SB-124	BL-SB-124	BL-SB-125	BL-SB-126	BL-SB-126R	BL-SB-126R	BL-SB-126R	BL-SB-126R	BL-SB-126R	BL-SB-126R
Sample Depth(Feet):	Residential	Industrial	Arsenic		4 - 6	6 - 8	8 - 10	0 - 1	0 - 1	0 - 1	1 - 2	2 - 4	4 - 6	6 - 8	8 - 10
Date Collected:	Soil RSL Nov	Soil RSL	Background		09/20/14	09/20/14	09/20/14	09/19/14	09/18/14	09/29/14	09/29/14	09/29/14	09/30/14	09/30/14	09/30/14
Sample Name:	2017	Nov 2017	Guidance	Units	BL-SB-124_4_6	BL-SB-124_6_8	BL-SB-124_8_10	BL-SB-125_0_1	BL-SB-126_0_1	BL-SB-126R_0_1	BL-SB-126R_1_2	BL-SB-126R_2_4	BL-SB-126R_4_6	BL-SB-126R_6_8	BL-SB-126R_8_10
Detected Semivolatile Organics															
1,1'-Biphenyl	47	200	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4,5-Tetrachlorobenzene	23	350	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3&4-Methylphenol	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acetophenone	7,800	120,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1-methyl-Naphthalene	18	73	- -	mg/kg	NA	NA	0.0148 U	0.177 J	0.0144 U	0.0333 U	0.0153 U	0.0139 U	0.0139 U	0.0139 U	0.014 U
2,4,5-Trichlorophenol	6,300	82,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dimethylphenol	1,300	16,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzaldehyde	170	820	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	240	3,000	- -	mg/kg	NA	NA	0.0169 U	0.24 J	0.0165 U	0.038 U	0.0175 U	0.0159 U	0.0159 U	0.0158 U	0.016 U
4,6-Dinitro-2-methylphenol	5.1	66	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthene	3,600	45,000	- -	mg/kg	NA	NA	0.0106 U	0.366	0.0103 U	0.0238 U	0.0109 U	0.00995 U	0.00994 U	0.0099 U	0.00999 U
Acenaphthylene	- -	- -	- -	mg/kg	NA	NA	0.0095 U	2.56	0.00928 U	0.0214 U	0.00982 U	0.00895 U	0.00895 U	0.00891 U	0.00899 U
Anthracene	18,000	230,000	- -	mg/kg	NA	NA	0.0095 U	5.08	0.086	0.0214 U	0.0209 J	0.00895 U	0.00895 U	0.00891 U	0.00899 U
Benzo(a)anthracene	1.1	21	- -	mg/kg	NA	NA	0.0378 J	**8.73**	0.425	0.165	0.079	0.0149 U	0.0149 U	0.0148 U	0.015 U
Benzo(a)pyrene	0.11	2.1	- -	mg/kg	NA	NA	0.0127 U	**9.18**	**0.429**	**0.226**	0.0815	0.0119 U	0.0119 U	0.0119 U	0.012 U
Benzo(b)fluoranthene	1.1	21	- -	mg/kg	NA	NA	0.0631 J	**16.2**	0.655	0.397	0.13	0.0119 U	0.0119 U	0.0119 U	0.012 U
Benzo(g,h,i)perylene	- -	- -	- -	mg/kg	NA	NA	0.0095 U	5.78	0.368	0.158 J	0.0613 J	0.00895 U	0.00895 U	0.00891 U	0.00899 U
Benzo(k)fluoranthene	11	210	- -	mg/kg	NA	NA	0.0148 U	6.13	0.26	0.155 J	0.0413 J	0.0139 U	0.0139 U	0.0139 U	0.014 U
Benzoic acid	250,000	3,300,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbazole	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	110	2,100	- -	mg/kg	NA	NA	0.0448 J	9.99	0.447	0.187	0.0878	0.00895 U	0.00895 U	0.00891 U	0.00899 U
Dibenzo(a,h)anthracene	0.11	2.1	- -	mg/kg	NA	NA	0.00739 U	**1.87**	0.0876	0.0166 U	0.00764 U	0.00696 U	0.00696 U	0.00693 U	0.00699 U
Dibenzofuran	73	1,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Di-n-butylphthalate	6,300	82,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	2,400	30,000	- -	mg/kg	NA	NA	0.0746	13.8	0.857	0.284	0.164	0.00895 U	0.00895 U	0.00891 U	0.00899 U
Fluorene	2,400	30,000	- -	mg/kg	NA	NA	0.0127 U	0.572	0.0124 U	0.0285 U	0.0131 U	0.0119 U	0.0119 U	0.0119 U	0.012 U
Indeno(1,2,3-cd)pyrene	1.1	21	- -	mg/kg	NA	NA	0.0106 U	**5.91**	0.294	0.138 J	0.0525 J	0.00995 U	0.00994 U	0.0099 U	0.00999 U
Naphthalene	3.8	17	- -	mg/kg	NA	NA	0.0095 U	0.175 J	0.00928 U	0.0214 U	0.00982 U	0.00895 U	0.00895 U	0.00891 U	0.00899 U
Pentachlorophenol	1	4	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	- -	- -	- -	mg/kg	NA	NA	0.0095 U	7.2	0.414	0.139 J	0.1	0.00895 U	0.00895 U	0.00891 U	0.00899 U
Phenol	19,000	250,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pyrene	1,800	23,000	- -	mg/kg	NA	NA	0.0697 J	12.4	0.834	0.921	0.159	0.0119 U	0.0119 U	0.0119 U	0.012 U
Detected Inorganics															
Arsenic	**	**	22.7	mg/kg	**23**	5.02	6.6	14.4 J	14.7 J	**36.1**	**79.6**	**26.1**	9.43	14.8	17.2
Lead	400	800	- -	mg/kg	NA	0.518 U	6.75	14	12.6 J	68.5 J	31.8	24.3	18.3	13.3	15.9
Detected Pesticides															
2,4' DDD	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4'-DDE	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4'-DDT	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
trans-Nonachlor	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDD	1.9	9.6	- -	mg/kg	NA	NA	0.000452 U	0.0649	0.104	**177 DJ**	1.54 DJ	0.152 D	0.00889	0.000411 U	0.000409 U
4,4'-DDE	2.0	9.3	- -	mg/kg	NA	NA	0.00198	0.171	0.667 D	**34.1 DJ**	0.999 DJ	0.096 D	0.0163	0.000477 U	0.000475 U
4,4'-DDT	1.9	8.5	- -	mg/kg	NA	NA	0.00197	0.295	0.653 D	**1,390 DJ**	**17.8 DJ**	**4.14 D**	0.12 D	0.00319	0.000808 U
Aldrin	0.039	0.18	- -	mg/kg	NA	NA	0.000326 U	0.00363 U	0.00322 U	0.0375 UJ	0.0033 UJ	0.000301 U	0.000309 U	0.000296 U	0.000295 U
alpha-BHC	0.086	0.36	- -	mg/kg	NA	NA	0.00021 U	0.00234 U	0.00208 U	0.206 UJ	0.00213 UJ	0.00569	0.0002 U	0.000191 U	0.00019 U
alpha-Chlordane	1.7	7.7	- -	mg/kg	NA	NA	0.000452 U	0.00504 U	0.00447 U	0.0521 UJ	0.00458 UJ	0.000418 U	0.000429 U	0.000411 U	0.000409 U
beta-BHC	0.3	1.3	- -	mg/kg	NA	NA	0.00021 U	0.00234 U	0.00208 U	**16.2 DJ**	**0.657 DJ**	0.0935 D	0.00861	0.00502	0.00232 J
Chlordane (technical)	1.7	7.7	- -	mg/kg	NA	NA	0.0382 U	0.426 U	0.377 U	4.4 UJ	0.387 UJ	0.0853	0.0362 U	0.0347 U	0.0345 U
delta-BHC	- -	- -	- -	mg/kg	NA	NA	0.0004 U	0.00445 U	0.00395 U	0.046 UJ	0.00405 UJ	0.00037 U	0.000379 U	0.000363 U	0.000361 U
Dieldrin	0.034	0.14	- -	mg/kg	NA	NA	0.000421 U	**0.0504**	**0.0616**	**7.56 DJ**	**0.258 JN**	**0.0496 D**	0.00909	0.000382 U	0.00038 U
Endosulfan I	470	7000	- -	mg/kg	NA	NA	0.000494 U	0.00551 U	0.00488 U	0.0569 UJ	0.00501 UJ	0.000457 U	0.000469 U	0.000449 U	0.000447 U
Endosulfan II	470	7000	- -	mg/kg	NA	NA	0.000578 U	0.00645 U	0.00571 U	0.0666 UJ	0.00586 UJ	0.000535 U	0.000549 U	0.000525 U	0.000523 U
Endosulfan sulfate	470	7000	- -	mg/kg	NA	NA	0.000526 U	0.0153 J	0.00519 U	0.0605 UJ	0.00533 UJ	0.000486 U	0.000499 U	0.000477 U	0.000475 U
Endrin	19	250	- -	mg/kg	NA	NA	0.000452 U	0.00504 UJ	0.00447 U	0.0521 UJ	0.00458 UJ	0.000418 U	0.000429 U	0.000411 U	0.000409 U
Endrin aldehyde	- -	- -	- -	mg/kg	NA	NA	0.000536 U	0.00598 U	0.0053 U	0.0618 UJ	0.00544 UJ	0.000496 U	0.000509 U	0.000487 U	0.000485 U
Endrin ketone	- -	- -	- -	mg/kg	NA	NA	0.00062 U	0.00692 U	0.00613 U	0.0714 UJ	0.00629 UJ	0.000574 U	0.000589 U	0.000563 U	0.000561 U
gamma-BHC (Lindane)	0.57	2.5	- -	mg/kg	NA	NA	0.00041 U	0.00457 U	0.00405 U	0.0619 J	0.0416 UJ	0.00188 JN	0.000389 U	0.000372 U	0.000371 U
gamma-Chlordane	1.7	7.7	- -	mg/kg	NA	NA	0.000831 U	0.00926 U	0.00821 U	0.0957 UJ	0.00842 UJ	0.0301	0.000789 U	0.000754 U	0.000751 U
Heptachlor	0.13	0.63	- -	mg/kg	NA	NA	0.000442 U	0.00492 U	0.00436 U	0.0509 UJ	0.00448 UJ	0.000408 U	0.000419 U	0.000401 U	0.000399 U
Heptachlor epoxide	0.07	0.33	- -	mg/kg	NA	NA	0.000684 U	0.00762 U	0.00675 U	0.0787 UJ	0.00693 UJ	0.000632 U	0.000649 U	0.000621 U	0.000618 U
Hexachlorobenzene	0.21	0.96	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methoxychlor	320	4,100	- -	mg/kg	NA	NA	0.000515 U	0.00574 U	0.00509 U	0.0593 UJ	0.00522 UJ	0.000476 U	0.000489 U	0.000468 U	0.000466 U
Toxaphene	0.49	2.1	- -	mg/kg	NA	NA	0.0444 U	0.495 U	0.438 U	5.11 UJ	0.45 UJ	0.041 U	0.0421 U	0.0403 U	0.0401 U

Table C-1
Summary of Soil Sample Analytical Results for all Depth Ranges
Corrective Action Plan Addendum
Former Black Leaf Chemical Site, Louisville, Kentucky

Location ID: / Sample Depth(Feet): / Date Collected: / Sample Name:	USEPA Residential Soil RSL Nov 2017	USEPA Industrial Soil RSL Nov 2017	Kentucky Arsenic Background Guidance	Units	BL-SB-126R 10 - 12 09/30/14 BL-SB-126R_10_12	BL-SB-126R 12 - 14 09/30/14 BL-SB-126R_12_14	BL-SB-126R 14 - 16 09/30/14 BL-SB-126R_14_16	BL-SB-127 0 - 1 09/21/14 BL-SB-127_0_1	BL-SB-127 1 - 2 09/21/14 BL-SB-127_1_2	BL-SB-127 8 - 10 09/21/14 BL-SB-127_8_10	BL-SB-128 0 - 1 09/21/14 BL-SB-128_0_1	BL-SB-128 1 - 2 09/21/14 BL-SB-128_1_2	BL-SB-128 8 - 10 09/21/14 BL-SB-128_8_10	BL-SB-129 0 - 1 09/21/14 BL-SB-129_0_1	BL-SB-129 1 - 2 09/21/14 BL-SB-129_1_2
Detected Semivolatile Organics															
1,1'-Biphenyl	47	200	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4,5-Tetrachlorobenzene	23	350	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3&4-Methylphenol	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acetophenone	7,800	120,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1-methyl-Naphthalene	18	73	- -	mg/kg	0.0139 U	0.0139 U	0.0139 U	0.0157 U	0.0163 U	0.017 U	0.0155 U	0.0163 U	0.0162 U	0.015 U	0.0152 U
2,4,5-Trichlorophenol	6,300	82,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dimethylphenol	1,300	16,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzaldehyde	170	820	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	240	3,000	- -	mg/kg	0.0159 U	0.0159 U	0.0159 U	0.018 U	0.0186 U	0.0194 U	0.0177 U	0.0187 U	0.0186 U	0.0172 U	0.0174 U
4,6-Dinitro-2-methylphenol	5.1	66	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthene	3,600	45,000	- -	mg/kg	0.00996 U	0.00994 U	0.00991 U	0.0112 U	0.0116 U	0.0122 U	0.0111 U	0.0117 U	0.0116 U	0.0107 U	0.0109 U
Acenaphthylene	- -	- -	- -	mg/kg	0.00896 U	0.00895 U	0.00892 U	0.0101 U	0.0105 U	0.0109 U	0.00998 U	0.0105 U	0.0104 U	0.00965 U	0.00978 U
Anthracene	18,000	230,000	- -	mg/kg	0.00896 U	0.00895 U	0.00892 U	0.0101 U	0.0105 U	0.0109 U	0.00998 U	0.0105 U	0.0104 U	0.00965 U	0.00978 U
Benzo(a)anthracene	1.1	21	- -	mg/kg	0.0149 U	0.0149 U	0.0149 U	0.0168 U	0.0174 U	0.0182 U	0.0166 U	0.0175 U	0.0174 U	0.0161 U	0.0163 U
Benzo(a)pyrene	0.11	2.1	- -	mg/kg	0.0119 U	0.0119 U	0.0119 U	0.0135 U	0.0139 U	0.0146 U	0.0133 U	0.014 U	0.0139 U	0.0129 U	0.013 U
Benzo(b)fluoranthene	1.1	21	- -	mg/kg	0.0119 U	0.0119 U	0.0119 U	0.0135 U	0.0139 U	0.0146 U	0.0133 U	0.014 U	0.0139 U	0.0129 U	0.013 U
Benzo(g,h,i)perylene	- -	- -	- -	mg/kg	0.00896 U	0.00895 U	0.00892 U	0.0101 U	0.0105 U	0.0109 U	0.00998 U	0.0105 U	0.0104 U	0.00965 U	0.00978 U
Benzo(k)fluoranthene	11	210	- -	mg/kg	0.0139 U	0.0139 U	0.0139 U	0.0157 U	0.0163 U	0.017 U	0.0155 U	0.0163 U	0.0162 U	0.015 U	0.0152 U
Benzoic acid	250,000	3,300,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbazole	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	110	2,100	- -	mg/kg	0.00896 U	0.00895 U	0.00892 U	0.0101 U	0.0105 U	0.0109 U	0.00998 U	0.0105 U	0.0104 U	0.00965 U	0.00978 U
Dibenzo(a,h)anthracene	0.11	2.1	- -	mg/kg	0.00697 U	0.00696 U	0.00694 U	0.00786 U	0.00814 U	0.00851 U	0.00776 U	0.00817 U	0.00812 U	0.00751 U	0.00761 U
Dibenzofuran	73	1,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Di-n-butylphthalate	6,300	82,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	2,400	30,000	- -	mg/kg	0.00896 U	0.00895 U	0.00892 U	0.0101 U	0.0105 U	0.0109 U	0.00998 U	0.0105 U	0.0104 U	0.00965 U	0.00978 U
Fluorene	2,400	30,000	- -	mg/kg	0.0119 U	0.0119 U	0.0119 U	0.0135 U	0.0139 U	0.0146 U	0.0133 U	0.014 U	0.0139 U	0.0129 U	0.013 U
Indeno(1,2,3-cd)pyrene	1.1	21	- -	mg/kg	0.00996 U	0.00994 U	0.00991 U	0.0112 U	0.0116 U	0.0122 U	0.0111 U	0.0117 U	0.0116 U	0.0107 U	0.0109 U
Naphthalene	3.8	17	- -	mg/kg	0.00896 U	0.00895 U	0.00892 U	0.0101 U	0.0105 U	0.0109 U	0.00998 U	0.0105 U	0.0104 U	0.00965 U	0.00978 U
Pentachlorophenol	1	4	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	- -	- -	- -	mg/kg	0.00896 U	0.00895 U	0.00892 U	0.0101 U	0.0105 U	0.0109 U	0.00998 U	0.0105 U	0.0104 U	0.00965 U	0.00978 U
Phenol	19,000	250,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pyrene	1,800	23,000	- -	mg/kg	0.0119 U	0.0119 U	0.0119 U	0.0135 U	0.0139 U	0.0146 U	0.0133 U	0.014 U	0.0139 U	0.0129 U	0.013 U
Detected Inorganics															
Arsenic	**	**	22.7	mg/kg	14.1	14.4	10.1	10.7 J	8.88 J	17.1	10.5 J	6.33 J	16.7	7.04 J	9.95 J
Lead	400	800	- -	mg/kg	12.3	11.5	8.95	27.9 J	19.6 J	19.3	17.6 J	19 J	17.4	23.2 J	32.6 J
Detected Pesticides															
2,4' DDD	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4'-DDE	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4'-DDT	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
trans-Nonachlor	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDD	1.9	9.6	- -	mg/kg	0.000416 U	0.00122 J	0.000422 U	0.000404 U	0.00036 U	0.000409 U	0.00425 U	0.000406 U	0.000405 U	0.0865	0.00057 J
4,4'-DDE	2.0	9.3	- -	mg/kg	0.000483 U	0.00351	0.000491 U	0.00047 U	0.000418 U	0.000475 U	0.00494 U	0.000472 U	0.000471 U	0.227 D	0.000888 J
4,4'-DDT	1.9	8.5	- -	mg/kg	0.000821 U	0.025	0.0012 J	0.000799 U	0.000711 U	0.000808 U	0.0084 U	0.00161 U	0.000801 U	0.991 D	0.00819
Aldrin	0.039	0.18	- -	mg/kg	0.0003 U	0.000306 U	0.000304 U	0.000291 U	0.000259 U	0.000295 U	0.00306 U	0.000293 U	0.000292 U	0.00102 U	0.000279 U
alpha-BHC	0.086	0.36	- -	mg/kg	0.000193 U	0.000197 U	0.000196 U	0.000188 U	0.000167 U	0.00019 U	0.00198 U	0.000189 U	0.000189 U	0.00364 J	0.00018 U
alpha-Chlordane	1.7	7.7	- -	mg/kg	0.000416 U	0.000424 U	0.000422 U	0.000404 U	0.00036 U	0.000409 U	0.00425 U	0.000406 U	0.000405 U	0.0108 J	0.000387 U
beta-BHC	0.3	1.3	- -	mg/kg	0.00314 J	0.00355	0.00712	0.000188 U	0.000167 U	0.00019 U	0.00198 U	0.000189 U	0.00115 J	0.0363	0.00018 U
Chlordane (technical)	1.7	7.7	- -	mg/kg	0.0351 U	0.0358 U	0.0356 U	0.0341 U	0.0304 U	0.0345 U	0.359 U	0.0343 U	0.0342 U	0.119 U	0.0327 U
delta-BHC	- -	- -	- -	mg/kg	0.000367 U	0.000374 U	0.000373 U	0.000357 U	0.000318 U	0.000361 U	0.00375 U	0.000359 U	0.000358 U	0.00125 U	0.000342 U
Dieldrin	0.034	0.14	- -	mg/kg	0.000745 J	0.000786 J	0.000393 U	0.000376 U	0.000335 U	0.00038 U	0.00395 U	0.000378 U	0.000377 U	**0.118**	0.00036 U
Endosulfan I	470	7000	- -	mg/kg	0.000454 U	0.000463 U	0.000461 U	0.000442 U	0.000393 U	0.000447 U	0.00464 U	0.000444 U	0.000443 U	0.00154 U	0.000423 U
Endosulfan II	470	7000	- -	mg/kg	0.000532 U	0.000542 U	0.00054 U	0.000517 U	0.00046 U	0.000523 U	0.00543 U	0.000519 U	0.000518 U	0.0018 U	0.000495 U
Endosulfan sulfate	470	7000	- -	mg/kg	0.000483 U	0.000493 U	0.000491 U	0.00047 U	0.000418 U	0.000475 U	0.00494 U	0.000472 U	0.000471 U	0.00164 U	0.00045 U
Endrin	19	250	- -	mg/kg	0.000416 U	0.000424 U	0.000422 U	0.000404 U	0.00036 U	0.000409 U	0.00425 U	0.000406 U	0.000405 U	0.00141 U	0.000387 U
Endrin aldehyde	- -	- -	- -	mg/kg	0.000493 U	0.000503 U	0.000501 U	0.00048 U	0.000427 U	0.000485 U	0.00504 U	0.000482 U	0.000481 U	0.00167 U	0.000459 U
Endrin ketone	- -	- -	- -	mg/kg	0.00057 U	0.000581 U	0.000579 U	0.000555 U	0.000494 U	0.000561 U	0.00583 U	0.000557 U	0.000556 U	0.00193 U	0.000532 U
gamma-BHC (Lindane)	0.57	2.5	- -	mg/kg	0.000377 U	0.000384 U	0.000383 U	0.000367 U	0.000326 U	0.000371 U	0.00385 U	0.000368 U	0.000368 U	0.00969	0.000351 U
gamma-Chlordane	1.7	7.7	- -	mg/kg	0.000763 U	0.000779 U	0.000775 U	0.000743 U	0.000661 U	0.000751 U	0.0078 U	0.000746 U	0.000745 U	0.0183 J	0.000712 U
Heptachlor	0.13	0.63	- -	mg/kg	0.000406 U	0.000414 U	0.000412 U	0.000395 U	0.000351 U	0.000399 U	0.00415 U	0.000397 U	0.000396 U	0.00138 U	0.000378 U
Heptachlor epoxide	0.07	0.33	- -	mg/kg	0.000628 U	0.000641 U	0.000638 U	0.000611 U	0.000544 U	0.000618 U	0.00642 U	0.000614 U	0.000613 U	0.00213 U	0.000586 U
Hexachlorobenzene	0.21	0.96	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methoxychlor	320	4,100	- -	mg/kg	0.000474 U	0.000483 U	0.000481 U	0.000461 U	0.00041 U	0.000466 U	0.00484 U	0.000463 U	0.000462 U	0.00161 U	0.000441 U
Toxaphene	0.49	2.1	- -	mg/kg	0.0408 U	0.0416 U	0.0414 U	0.0397 U	0.0353 U	0.0401 U	0.417 U	0.0399 U	0.0398 U	0.138 U	0.038 U

Table C-1
Summary of Soil Sample Analytical Results for all Depth Ranges
Corrective Action Plan Addendum
Former Black Leaf Chemical Site, Louisville, Kentucky

Location ID:	USEPA	USEPA	Kentucky		BL-SB-129	BL-SB-129	BL-SB-130	BL-SB-131	BL-SB-132	BL-SB-132	BL-SB-132	BL-SB-133	BL-SB-133	BL-SB-133	BL-SB-133
Sample Depth(Feet):	Residential	Industrial	Arsenic		2 - 4	8 - 10	0 - 1	0 - 1	0 - 1	1 - 2	2 - 4	0 - 1	1 - 2	2 - 4	4 - 6
Date Collected:	Soil RSL Nov	Soil RSL	Background		09/21/14	09/21/14	09/18/14	09/18/14	09/18/14	09/18/14	09/18/14	09/18/14	09/18/14	09/18/14	09/18/14
Sample Name:	2017	Nov 2017	Guidance	Units	BL-SB-129_2_4	BL-SB-129_8_10	BL-SB-130_0_1	BL-SB-131_0_1	BL-SB-132_0_1	BL-SB-132_1_2	BL-SB-132_2_4	BL-SB-133_0_1	BL-SB-133_1_2	BL-SB-133_2_4	BL-SB-133_4_6
Detected Semivolatile Organics															
1,1'-Biphenyl	47	200	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4,5-Tetrachlorobenzene	23	350	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3&4-Methylphenol	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acetophenone	7,800	120,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1-methyl-Naphthalene	18	73	- -	mg/kg	NA	0.0157 U	0.0146 U	0.61	0.016 U	0.016 U	NA	0.0976 J	0.0163 U	NA	NA
2,4,5-Trichlorophenol	6,300	82,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dimethylphenol	1,300	16,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzaldehyde	170	820	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	240	3,000	- -	mg/kg	NA	0.018 U	0.0167 U	0.897	0.0183 U	0.0183 U	NA	0.12 J	0.0187 U	NA	NA
4,6-Dinitro-2-methylphenol	5.1	66	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthene	3,600	45,000	- -	mg/kg	NA	0.0112 U	0.0104 U	2.51	0.0114 U	0.0114 U	NA	0.0234 U	0.0117 U	NA	NA
Acenaphthylene	- -	- -	- -	mg/kg	NA	0.0101 U	0.00937 U	0.0203 U	0.0103 U	0.0103 U	NA	0.0315 J	0.0105 U	NA	NA
Anthracene	18,000	230,000	- -	mg/kg	NA	0.0101 U	0.0515 J	4.58	0.0339 J	0.0103 U	NA	0.0268 J	0.0105 U	NA	NA
Benzo(a)anthracene	1.1	21	- -	mg/kg	NA	0.0169 U	0.151	**7**	0.185	0.0171 U	0.0147 U	0.162	0.0175 U	0.0148 U	NA
Benzo(a)pyrene	0.11	2.1	- -	mg/kg	NA	0.0135 U	**0.139**	**5.62**	**0.195**	0.0137 U	0.0118 U	**0.446**	0.014 U	0.0118 U	NA
Benzo(b)fluoranthene	1.1	21	- -	mg/kg	NA	0.0135 U	0.202	**8.52 D**	0.296	0.0137 U	0.0118 U	0.691	0.014 U	0.0118 U	NA
Benzo(g,h,i)perylene	- -	- -	- -	mg/kg	NA	0.0101 U	0.112	3.53	0.132	0.0103 U	NA	0.806	0.0105 U	NA	NA
Benzo(k)fluoranthene	11	210	- -	mg/kg	NA	0.0157 U	0.084	2.92	0.119	0.016 U	NA	0.281	0.0163 U	NA	NA
Benzoic acid	250,000	3,300,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbazole	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	110	2,100	- -	mg/kg	NA	0.0101 U	0.164	7	0.224	0.0103 U	NA	0.244	0.0105 U	NA	NA
Dibenzo(a,h)anthracene	0.11	2.1	- -	mg/kg	NA	0.00787 U	0.00729 U	**1.03**	0.008 U	0.008 U	NA	**0.199**	0.00817 U	0.00689 U	NA
Dibenzofuran	73	1,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Di-n-butylphthalate	6,300	82,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	2,400	30,000	- -	mg/kg	NA	0.0101 U	0.341	19.8 D	0.321	0.0103 U	NA	0.259	0.0105 U	NA	NA
Fluorene	2,400	30,000	- -	mg/kg	NA	0.0135 U	0.0125 U	2.8	0.0137 U	0.0137 U	NA	0.0281 U	0.014 U	NA	NA
Indeno(1,2,3-cd)pyrene	1.1	21	- -	mg/kg	NA	0.0112 U	0.0878	**3.15**	0.115	0.0114 U	NA	0.585	0.0117 U	0.00985 U	NA
Naphthalene	3.8	17	- -	mg/kg	NA	0.0101 U	0.00937 U	2.05	0.0103 U	0.0103 U	NA	0.102 J	0.0105 U	NA	NA
Pentachlorophenol	1	4	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	- -	- -	- -	mg/kg	NA	0.0101 U	0.237	20.6 D	0.151	0.0103 U	NA	0.145 J	0.0105 U	NA	NA
Phenol	19,000	250,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pyrene	1,800	23,000	- -	mg/kg	NA	0.0135 U	0.343	15.6 D	0.346	0.0381 J	NA	0.267	0.014 U	NA	NA
Detected Inorganics															
Arsenic	**	**	22.7	mg/kg	NA	15	9.13 J	13 J	16.5 J	7.12 J	NA	16.8 J	**58.1 J**	16.1	12.8
Lead	400	800	- -	mg/kg	NA	17.4	29.4 J	14.3 J	44.2 J	9.55 J	NA	23 J	40.3 J	NA	NA
Detected Pesticides															
2,4' DDD	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4'-DDE	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4'-DDT	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
trans-Nonachlor	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDD	1.9	9.6	- -	mg/kg	NA	0.000415 U	**3.44 D**	**3.56 D**	0.00194 U	0.00252	NA	0.0129 J	0.000509 U	NA	NA
4,4'-DDE	2.0	9.3	- -	mg/kg	NA	0.000482 U	**3.07 D**	1.08 D	0.119 D	0.0289	NA	0.259	0.0022	NA	NA
4,4'-DDT	1.9	8.5	- -	mg/kg	NA	0.00421	**72.9 D**	**9.67 D**	0.0393	0.0219 J	NA	0.225	0.00201 U	NA	NA
Aldrin	0.039	0.18	- -	mg/kg	NA	0.000299 U	0.000322 U	0.00354 U	0.000355 U	0.000352 U	NA	0.00364 U	0.000367 U	NA	NA
alpha-BHC	0.086	0.36	- -	mg/kg	NA	0.000193 U	0.0208 U	0.063	0.000229 U	0.000227 U	NA	0.00235 U	0.000237 U	NA	NA
alpha-Chlordane	1.7	7.7	- -	mg/kg	NA	0.000415 U	0.000447 U	0.0049 U	0.000492 U	0.000488 U	NA	0.00505 U	0.000509 U	NA	NA
beta-BHC	0.3	1.3	- -	mg/kg	NA	0.000193 U	**0.636 D**	0.188	0.000229 U	0.00189 J	NA	0.0788	0.000237 U	NA	NA
Chlordane (technical)	1.7	7.7	- -	mg/kg	NA	0.035 U	3.77 U	0.414 U	0.0415 U	0.0412 U	NA	0.426 U	0.0429 U	NA	NA
delta-BHC	- -	- -	- -	mg/kg	NA	0.000367 U	0.000395 U	0.00433 U	0.000435 U	0.000431 U	NA	0.00446 U	0.00045 U	NA	NA
Dieldrin	0.034	0.14	- -	mg/kg	0.0168	0.000386 U	**0.402 D**	**0.272**	0.00194 U	0.00193 U	NA	**0.0396**	0.000473 U	0.000387 UJ	NA
Endosulfan I	470	7000	- -	mg/kg	NA	0.000453 U	0.000489 U	0.00536 U	0.000538 U	0.000533 U	NA	0.00552 U	0.000556 U	NA	NA
Endosulfan II	470	7000	- -	mg/kg	NA	0.000531 U	0.000572 U	0.00627 U	0.000629 U	0.000624 U	NA	0.00646 U	0.000651 U	NA	NA
Endosulfan sulfate	470	7000	- -	mg/kg	NA	0.000482 U	0.00052 U	0.0057 U	0.000572 U	0.000567 U	NA	0.00587 U	0.000592 U	NA	NA
Endrin	19	250	- -	mg/kg	NA	0.000415 U	0.000447 U	0.0049 U	0.000492 U	0.000488 U	NA	0.00505 U	0.000509 U	NA	NA
Endrin aldehyde	- -	- -	- -	mg/kg	NA	0.000492 U	0.00053 U	0.00582 U	0.000583 U	0.000578 U	NA	0.00599 U	0.000603 U	NA	NA
Endrin ketone	- -	- -	- -	mg/kg	NA	0.000569 U	0.000613 U	0.00673 U	0.000675 U	0.000669 U	NA	0.00693 U	0.000698 U	NA	NA
gamma-BHC (Lindane)	0.57	2.5	- -	mg/kg	NA	0.000376 U	0.0406 U	0.00445 U	0.000446 U	0.000442 U	NA	0.00458 U	0.000461 U	NA	NA
gamma-Chlordane	1.7	7.7	- -	mg/kg	NA	0.000762 U	0.248 D	0.0454 JN	0.000903 U	0.000896 U	NA	0.00927 U	0.000935 U	NA	NA
Heptachlor	0.13	0.63	- -	mg/kg	NA	0.000405 U	0.000437 U	0.00479 U	0.00048 U	0.000476 U	NA	0.00493 U	0.000497 U	NA	NA
Heptachlor epoxide	0.07	0.33	- -	mg/kg	NA	0.000627 U	0.000676 U	0.00741 U	0.000743 U	0.000737 U	NA	0.00763 U	0.000769 U	NA	NA
Hexachlorobenzene	0.21	0.96	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methoxychlor	320	4,100	- -	mg/kg	NA	0.000473 U	0.00051 U	0.00559 U	0.00056 U	0.000556 U	NA	0.00575 U	0.00058 U	NA	NA
Toxaphene	0.49	2.1	- -	mg/kg	NA	0.0407 U	0.0439 U	0.481 U	0.0483 U	0.0479 U	NA	0.495 U	0.0499 U	NA	NA

Table C-1
Summary of Soil Sample Analytical Results for all Depth Ranges
Corrective Action Plan Addendum
Former Black Leaf Chemical Site, Louisville, Kentucky

Location ID:	USEPA Residential	USEPA Industrial	Kentucky Arsenic		BL-SB-133	BL-SB-134	BL-SB-134	BL-SB-134	BL-SB-134	BL-SB-135	BL-SB-135	BL-SB-135	BL-SB-135	BL-SB-135	BL-SB-136
Sample Depth(Feet):					8 - 10	0 - 1	1 - 2	2 - 4	8 - 10	0 - 1	1 - 2	2 - 4	4 - 6	8 - 10	0 - 1
Date Collected:	Soil RSL Nov	Soil RSL	Background		09/18/14	09/21/14	09/21/14	09/21/14	09/21/14	09/18/14	09/18/14	09/18/14	09/18/14	09/18/14	09/18/14
Sample Name:	2017	Nov 2017	Guidance	Units	BL-SB-133_8_10	BL-SB-134_0_1	BL-SB-134_1_2	BL-SB-134_2_4	BL-SB-134_8_10	BL-SB-135_0_1	BL-SB-135_1_2	BL-SB-135_2_4	BL-SB-135_4_6	BL-SB-135_8_10	BL-SB-136_0_1
Detected Semivolatile Organics															
1,1'-Biphenyl	47	200	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4,5-Tetrachlorobenzene	23	350	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3&4-Methylphenol	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acetophenone	7,800	120,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1-methyl-Naphthalene	18	73	- -	mg/kg	0.0153 U	0.0155 U	0.0161 U [0.0161 U]	NA	0.0155 U	0.209	0.516	NA	NA	0.0157 U	0.0625 J
2,4,5-Trichlorophenol	6,300	82,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dimethylphenol	1,300	16,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzaldehyde	170	820	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	240	3,000	- -	mg/kg	0.0175 U	0.0177 U	0.0184 U [0.0184 U]	NA	0.0177 U	0.248	0.658	NA	NA	0.0179 U	0.0761
4,6-Dinitro-2-methylphenol	5.1	66	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthene	3,600	45,000	- -	mg/kg	0.0109 U	0.011 U	0.0115 U [0.0115 U]	NA	0.0111 U	0.0112 U	0.012 U	NA	NA	0.0112 U	0.0113 U
Acenaphthylene	- -	- -	- -	mg/kg	0.00982 U	0.00994 U	0.0103 U [0.0104 U]	NA	0.00995 U	0.0101 U	0.0108 U	NA	NA	0.0101 U	0.0101 U
Anthracene	18,000	230,000	- -	mg/kg	0.00982 U	0.00994 U	0.0103 U [0.0104 U]	NA	0.00995 U	0.086	0.0185 J	NA	NA	0.0101 U	0.0196 J
Benzo(a)anthracene	1.1	21	- -	mg/kg	0.0164 U	0.0166 U	0.0172 U [0.0173 U]	NA	0.0166 U	0.342	0.0808	0.0149 U	NA	0.0168 U	0.0437 J
Benzo(a)pyrene	0.11	2.1	- -	mg/kg	0.0131 U	0.0133 U	0.0138 U [0.0138 U]	NA	0.0133 U	**0.314**	0.0699 J	0.0119 U	0.0117 U	0.0134 U	0.0445 J
Benzo(b)fluoranthene	1.1	21	- -	mg/kg	0.0131 U	0.0133 U	0.0138 U [0.0138 U]	NA	0.0133 U	0.479	0.106	0.0119 U	NA	0.0134 U	0.0892
Benzo(g,h,i)perylene	- -	- -	- -	mg/kg	0.00982 U	0.00994 U	0.0103 U [0.0104 U]	NA	0.00995 U	0.233	0.0552 J	NA	NA	0.0101 U	0.0101 U
Benzo(k)fluoranthene	11	210	- -	mg/kg	0.0153 U	0.0155 U	0.0161 U [0.0161 U]	NA	0.0155 U	0.191	0.0359 J	NA	NA	0.0157 U	0.0346 J
Benzoic acid	250,000	3,300,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbazole	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	110	2,100	- -	mg/kg	0.00982 U	0.00994 U	0.0103 U [0.0104 U]	NA	0.00995 U	0.365	0.0867	NA	NA	0.0101 U	0.0595 J
Dibenzo(a,h)anthracene	0.11	2.1	- -	mg/kg	0.00764 U	0.00773 U	0.00803 U [0.00805 U]	NA	0.00774 U	0.0453 J	0.00839 U	0.00695 U	NA	0.00783 U	0.00788 U
Dibenzofuran	73	1,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Di-n-butylphthalate	6,300	82,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	2,400	30,000	- -	mg/kg	0.00982 U	0.00994 U	0.0103 U [0.0104 U]	NA	0.00995 U	0.701	0.132	NA	NA	0.0101 U	0.0604 J
Fluorene	2,400	30,000	- -	mg/kg	0.0131 U	0.0133 U	0.0138 U [0.0138 U]	NA	0.0133 U	0.0134 U	0.0144 U	NA	NA	0.0134 U	0.0135 U
Indeno(1,2,3-cd)pyrene	1.1	21	- -	mg/kg	0.0109 U	0.011 U	0.0115 U [0.0115 U]	NA	0.0111 U	0.193	0.0404 J	0.00992 U	NA	0.0112 U	0.0113 U
Naphthalene	3.8	17	- -	mg/kg	0.00982 U	0.00994 U	0.0103 U [0.0104 U]	NA	0.00995 U	0.15	0.483	NA	NA	0.0101 U	0.0101 U
Pentachlorophenol	1	4	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	- -	- -	- -	mg/kg	0.00982 U	0.00994 U	0.0103 U [0.0104 U]	NA	0.00995 U	0.501	0.303	NA	NA	0.0101 U	0.078
Phenol	19,000	250,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pyrene	1,800	23,000	- -	mg/kg	0.0131 U	0.0133 U	0.0138 U [0.0138 U]	NA	0.0133 U	0.664	0.134	NA	NA	0.0134 U	0.0664 J
Detected Inorganics															
Arsenic	**	**	22.7	mg/kg	11.2	8.83 J	8.33 J [8.72]	NA	12.1	**30.7 J**	**31.1 J**	14.4	8.18	9.02	13.3 J
Lead	400	800	- -	mg/kg	9.14	21.8 J	38.9 J [54.9]	NA	14.3	61 J	64.3 J	NA	NA	8.52	25.7 J
Detected Pesticides															
2,4' DDD	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4'-DDE	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4'-DDT	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
trans-Nonachlor	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDD	1.9	9.6	- -	mg/kg	0.000483 U	0.0137 J	0.00151 U [0.00167 U]	NA	0.000427 U	0.044	0.1 DJ	NA	NA	0.00049 U	0.0377
4,4'-DDE	2.0	9.3	- -	mg/kg	0.000561 U	0.199 D	0.00766 [0.00722]	NA	0.000496 U	0.944 D	**2.32 D**	0.0011 J	0.000487 U	0.000938 J	0.866 D
4,4'-DDT	1.9	8.5	- -	mg/kg	0.000955 U	0.107 D	0.0059 J [0.00601]	NA	0.000844 U	0.459 J	1.35 D	NA	NA	0.0026	0.109
Aldrin	0.039	0.18	- -	mg/kg	0.000348 U	0.000305 U	0.000276 U [0.000305 U]	NA	0.000308 U	0.00352 U	0.000379 U	NA	NA	0.000353 U	0.0035 U
alpha-BHC	0.086	0.36	- -	mg/kg	0.000225 U	0.000197 U	0.000178 U [0.000196 U]	NA	0.000199 U	0.00227 U	0.071 D	NA	NA	0.000228 U	0.00226 U
alpha-Chlordane	1.7	7.7	- -	mg/kg	0.000483 U	0.00167 U	0.000382 U [0.000422 U]	NA	0.000427 U	0.00488 U	0.0205 JN	NA	NA	0.00049 U	0.00485 U
beta-BHC	0.3	1.3	- -	mg/kg	0.000225 U	0.00326 JN	0.000178 U [0.000196 U]	NA	0.000367 J	0.00227 U	**0.485 D**	0.0106	0.000195 U	0.000228 U	0.00493 J
Chlordane (technical)	1.7	7.7	- -	mg/kg	0.0408 U	0.0357 U	0.0323 U [0.0357 U]	NA	0.036 U	0.412 U	0.444 U	NA	NA	0.0414 U	0.41 U
delta-BHC	- -	- -	- -	mg/kg	0.000427 U	0.000374 U	0.000338 U [0.000373 U]	NA	0.000377 U	0.00431 U	0.0138	NA	NA	0.000433 U	0.00429 U
Dieldrin	0.034	0.14	- -	mg/kg	0.000449 U	**0.0446**	0.0016 [0.00155 J]	0.000397 U	0.000527 J	**0.041**	**0.215 D**	0.000392 U	0.00039 U	0.000456 U	0.0244
Endosulfan I	470	7000	- -	mg/kg	0.000528 U	0.000463 U	0.000418 U [0.000462 U]	NA	0.000466 U	0.00534 U	0.000575 U	NA	NA	0.000535 U	0.00531 U
Endosulfan II	470	7000	- -	mg/kg	0.000618 U	0.000541 U	0.000489 U [0.00054 U]	NA	0.000546 U	0.00625 U	0.000672 U	NA	NA	0.000627 U	0.00621 U
Endosulfan sulfate	470	7000	- -	mg/kg	0.000561 U	0.000492 U	0.000444 U [0.000491 U]	NA	0.000496 U	0.00568 U	0.000611 U	NA	NA	0.00057 U	0.00565 U
Endrin	19	250	- -	mg/kg	0.000483 U	0.000423 U	0.000382 U [0.000422 U]	NA	0.000427 U	0.00488 U	0.000526 U	NA	NA	0.00049 U	0.00485 U
Endrin aldehyde	- -	- -	- -	mg/kg	0.000573 U	0.000502 U	0.000453 U [0.000501 U]	NA	0.000506 U	0.00579 U	0.000624 U	NA	NA	0.000581 U	0.00576 U
Endrin ketone	- -	- -	- -	mg/kg	0.000663 U	0.000581 U	0.000524 U [0.00058 U]	NA	0.000586 U	0.0067 U	0.0057	NA	NA	0.000672 U	0.00666 U
gamma-BHC (Lindane)	0.57	2.5	- -	mg/kg	0.000438 U	0.000384 U	0.000347 U [0.000383 U]	NA	0.000387 U	0.00443 U	0.0354	NA	NA	0.000444 U	0.0044 U
gamma-Chlordane	1.7	7.7	- -	mg/kg	0.000887 U	0.000778 U	0.000702 U [0.000776 U]	NA	0.000784 U	0.00897 U	0.0611	NA	NA	0.0009 U	0.00892 U
Heptachlor	0.13	0.63	- -	mg/kg	0.000472 U	0.000413 U	0.000373 U [0.000413 U]	NA	0.000417 U	0.00477 U	0.000513 U	NA	NA	0.000479 U	0.00474 U
Heptachlor epoxide	0.07	0.33	- -	mg/kg	0.00073 U	0.00064 U	0.000578 U [0.000639 U]	NA	0.000645 U	0.00738 U	0.000795 U	NA	NA	0.000741 U	0.00734 U
Hexachlorobenzene	0.21	0.96	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methoxychlor	320	4,100	- -	mg/kg	0.00055 U	0.000482 U	0.000436 U [0.000481 U]	NA	0.000486 U	0.00556 U	0.000599 U	NA	NA	0.000558 U	0.00553 U
Toxaphene	0.49	2.1	- -	mg/kg	0.0474 U	0.0415 U	0.0375 U [0.0415 U]	NA	0.0419 U	0.479 U	0.0516 U	NA	NA	0.0481 U	0.476 U

Table C-1
Summary of Soil Sample Analytical Results for all Depth Ranges
Corrective Action Plan Addendum
Former Black Leaf Chemical Site, Louisville, Kentucky

Location ID: Sample Depth(Feet): Date Collected: Sample Name:	USEPA Residential Soil RSL Nov 2017	USEPA Industrial Soil RSL Nov 2017	Kentucky Arsenic Background Guidance	Units	BL-SB-136 1 - 2 09/18/14 BL-SB-136_1_2	BL-SB-136 2 - 4 09/18/14 BL-SB-136_2_4	BL-SB-136 4 - 6 09/18/14 BL-SB-136_4_6	BL-SB-137 0 - 1 09/17/14 BL-SB-137_0_1	BL-SB-137 1 - 2 09/17/14 BL-SB-137_1_2	BL-SB-137 2 - 4 09/17/14 BL-SB-137_2_4	BL-SB-137 8 - 10 09/17/14 BL-SB-137_8_10	BL-SB-138 0 - 1 09/17/14 BL-SB-138_0_1	BL-SB-139 0 - 1 09/16/14 BL-SB-139_0_1	BL-SB-139 1 - 2 09/16/14 BL-SB-139_1_2	BL-SB-140 0 - 1 09/16/14 BL-SB-140_0_1
Detected Semivolatile Organics															
1,1'-Biphenyl	47	200	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4,5-Tetrachlorobenzene	23	350	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3&4-Methylphenol	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acetophenone	7,800	120,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1-methyl-Naphthalene	18	73	- -	mg/kg	0.0155 U [0.0187 U]	NA	NA	0.0134 U	0.0137 U [0.0137 U]	NA	0.0138 U	0.0218 J	0.0139 U	0.0139 U	0.0135 U
2,4,5-Trichlorophenol	6,300	82,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dimethylphenol	1,300	16,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzaldehyde	170	820	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	240	3,000	- -	mg/kg	0.0177 U [0.0214 U]	NA	NA	0.0153 U	0.0156 U [0.0157 U]	NA	0.0158 U	0.0228 J	0.0158 U	0.0159 U	0.0154 U
4,6-Dinitro-2-methylphenol	5.1	66	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthene	3,600	45,000	- -	mg/kg	0.0111 U [0.0134 U]	NA	NA	0.00957 U	0.00975 U [0.0098 U]	NA	0.00985 U	0.00959 U	0.0099 U	0.00995 U	0.00961 U
Acenaphthylene	- -	- -	- -	mg/kg	0.00995 U [0.012 U]	NA	NA	0.0663	0.00878 U [0.00882 U]	NA	0.00886 U	0.00864 U	0.00891 U	0.00895 U	0.00865 U
Anthracene	18,000	230,000	- -	mg/kg	0.00998 J [0.012 U]	NA	NA	0.0574 J	0.00878 U [0.00882 U]	NA	0.00886 U	0.0456 J	0.00891 U	0.00895 U	0.00865 U
Benzo(a)anthracene	1.1	21	- -	mg/kg	0.0607 J [0.0201 U]	NA	NA	0.187	0.0146 U [0.0147 U]	0.0178 U	0.0148 U	0.131	0.0148 U	0.0149 U	0.0144 U
Benzo(a)pyrene	0.11	2.1	- -	mg/kg	0.0873 [0.016 U]	0.0113 U	0.0117 U	**0.22**	0.0117 U [0.0118 U]	0.0142 U	0.0118 U	**0.139**	0.0119 U	0.0119 U	0.0115 U
Benzo(b)fluoranthene	1.1	21	- -	mg/kg	0.0932 [0.016 U]	NA	NA	0.445	0.0117 U [0.0118 U]	0.0142 U	0.0118 U	0.213	0.04 J	0.0377 J	0.0714
Benzo(g,h,i)perylene	- -	- -	- -	mg/kg	0.0545 J [0.012 U]	NA	NA	0.148	0.00878 U [0.00882 U]	NA	0.00886 U	0.108	0.00891 U	0.00895 U	0.00865 U
Benzo(k)fluoranthene	11	210	- -	mg/kg	0.0394 J [0.0187 U]	NA	NA	0.162	0.0137 U [0.0137 U]	NA	0.0138 U	0.0893	0.0139 U	0.0139 U	0.0173 J
Benzoic acid	250,000	3,300,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbazole	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	110	2,100	- -	mg/kg	0.0634 J [0.012 U]	NA	NA	0.251	0.00878 U [0.00882 U]	NA	0.00886 U	0.146	0.00891 U	0.00895 U	0.00865 U
Dibenzo(a,h)anthracene	0.11	2.1	- -	mg/kg	0.00774 U [0.00936 U]	NA	NA	0.0495 J	0.00683 U [0.00686 U]	0.0083 U	0.00689 U	0.00672 U	0.00693 U	0.00696 U	0.00673 U
Dibenzofuran	73	1,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Di-n-butylphthalate	6,300	82,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	2,400	30,000	- -	mg/kg	0.0746 [0.012 U]	NA	NA	0.236	0.00878 U [0.00882 U]	NA	0.00886 U	0.295	0.00891 U	0.00895 U	0.00865 U
Fluorene	2,400	30,000	- -	mg/kg	0.0133 U [0.016 U]	NA	NA	0.0115 U	0.0117 U [0.0118 U]	NA	0.0118 U	0.0115 U	0.0119 U	0.0119 U	0.0115 U
Indeno(1,2,3-cd)pyrene	1.1	21	- -	mg/kg	0.043 J [0.0134 U]	NA	NA	0.135	0.00975 U [0.0098 U]	NA	0.00985 U	0.0898	0.0099 U	0.0335 J	0.0409 J
Naphthalene	3.8	17	- -	mg/kg	0.00995 U [0.012 U]	NA	NA	0.00861 U	0.00878 U [0.00882 U]	NA	0.00886 U	0.00864 U	0.00891 U	0.00895 U	0.00865 U
Pentachlorophenol	1	4	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	- -	- -	- -	mg/kg	0.0463 J [0.012 U]	NA	NA	0.0637 J	0.00878 U [0.00882 U]	NA	0.00886 U	0.177	0.00891 U	0.00895 U	0.0154 J
Phenol	19,000	250,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pyrene	1,800	23,000	- -	mg/kg	0.092 [0.016 U]	NA	NA	0.294	0.0117 U [0.0118 U]	NA	0.0118 U	0.254	0.0119 U	0.0119 U	0.038 J
Detected Inorganics															
Arsenic	**	**	22.7	mg/kg	11.7 J [11.3 J]	NA	NA	**112 J**	10.1 J [7.96 J]	9.77	15.2 J	0.971 UJ	15.7	10.6	10.8
Lead	400	800	- -	mg/kg	38.5 J [44.8 J]	NA	NA	31.6 J	132 [9.83 J]	NA	177 J	7.61 J	8.1 J	28.6 J	17.8 J
Detected Pesticides															
2,4' DDD	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4'-DDE	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4'-DDT	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
trans-Nonachlor	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDD	1.9	9.6	- -	mg/kg	0.000872 J [0.000489 U]	NA	NA	0.12	0.325 [0.216]	NA	0.000425 U	0.218	0.00288	0.00346 J	0.000421 U
4,4'-DDE	2.0	9.3	- -	mg/kg	0.0103 J [0.00378 J]	NA	NA	0.701	0.501 D [0.419]	NA	0.000494 U	0.187	0.0235	0.00369	0.00771
4,4'-DDT	1.9	8.5	- -	mg/kg	0.00248 JN [0.00193 U]	NA	NA	0.683	0.307 [0.145]	NA	0.00084 U	0.152	0.00269 J	0.00161 J	0.000833 UJ
Aldrin	0.039	0.18	- -	mg/kg	0.000348 U [0.000353 U]	NA	NA	0.00613 U	0.0031 U [0.00303 U]	NA	0.000306 U	0.00306 U	0.000298 U	0.000308 U	0.000304 U
alpha-BHC	0.086	0.36	- -	mg/kg	0.000225 U [0.000228 U]	NA	NA	0.00395 U	0.002 U [0.00195 U]	NA	0.000198 U	0.00197 U	0.000192 U	0.000199 U	0.000196 U
alpha-Chlordane	1.7	7.7	- -	mg/kg	0.000483 U [0.000489 U]	NA	NA	0.0085 U	0.00429 U [0.0042 U]	NA	0.000425 U	0.00424 U	0.000413 U	0.000427 U	0.000421 U
beta-BHC	0.3	1.3	- -	mg/kg	0.000671 J [0.00375 UB]	NA	NA	0.00395 U	0.0134 J [0.0138 J]	NA	0.000198 U	0.00197 U	0.000192 U	0.000199 U	0.000196 U
Chlordane (technical)	1.7	7.7	- -	mg/kg	0.0408 U [0.0413 U]	NA	NA	0.718 U	0.363 U [0.355 U]	NA	0.0359 U	0.358 U	0.0348 U	0.0361 U	0.0356 U
delta-BHC	- -	- -	- -	mg/kg	0.000427 U [0.000432 U]	NA	NA	0.00751 U	0.0038 U [0.00371 U]	NA	0.000375 U	0.00375 U	0.000365 U	0.000378 U	0.000372 U
Dieldrin	0.034	0.14	- -	mg/kg	0.000679 J [0.000455 U]	NA	NA	0.00791 U	0.004 U [0.00391 U]	NA	0.000395 U	0.00395 U	0.000384 U	0.000397 U	0.000392 U
Endosulfan I	470	7000	- -	mg/kg	0.000528 U [0.000535 U]	NA	NA	0.00929 U	0.00469 U [0.00459 U]	NA	0.000464 U	0.00464 U	0.000451 U	0.000467 U	0.00046 U
Endosulfan II	470	7000	- -	mg/kg	0.000617 U [0.000626 U]	NA	NA	0.0109 U	0.00549 U [0.00537 U]	NA	0.000543 U	0.00543 U	0.000528 U	0.000547 U	0.000539 U
Endosulfan sulfate	470	7000	- -	mg/kg	0.000561 U [0.000569 U]	NA	NA	0.00989 U	0.00499 U [0.00488 U]	NA	0.000494 U	0.00494 U	0.00048 U	0.000497 U	0.00049 U
Endrin	19	250	- -	mg/kg	0.000483 U [0.000489 U]	NA	NA	0.0085 U	0.00429 U [0.0042 U]	NA	0.000425 U	0.00424 U	0.000413 U	0.000427 U	0.000421 U
Endrin aldehyde	- -	- -	- -	mg/kg	0.000573 U [0.00058 U]	NA	NA	0.0101 U	0.00509 U [0.00498 U]	NA	0.000504 U	0.00503 U	0.000489 U	0.000507 U	0.0005 U
Endrin ketone	- -	- -	- -	mg/kg	0.000662 U [0.000671 U]	NA	NA	0.0117 U	0.00589 U [0.00576 U]	NA	0.000583 U	0.00582 U	0.000566 U	0.000586 U	0.000578 U
gamma-BHC (Lindane)	0.57	2.5	- -	mg/kg	0.000438 U [0.000444 U]	NA	NA	0.00771 U	0.0039 U [0.00381 U]	NA	0.000385 U	0.00385 U	0.000374 U	0.000388 U	0.000382 U
gamma-Chlordane	1.7	7.7	- -	mg/kg	0.000887 U [0.000899 U]	NA	NA	0.0156 U	0.00789 U [0.00772 U]	NA	0.00078 U	0.0078 U	0.000758 U	0.000785 U	0.000774 U
Heptachlor	0.13	0.63	- -	mg/kg	0.000471 U [0.000478 U]	NA	NA	0.0083 U	0.00419 U [0.0041 U]	NA	0.000415 U	0.00415 U	0.000403 U	0.000417 U	0.000412 U
Heptachlor epoxide	0.07	0.33	- -	mg/kg	0.00073 U [0.00074 U]	NA	NA	0.0129 U	0.00649 U [0.00635 U]	NA	0.000642 U	0.00642 U	0.000624 U	0.000646 U	0.000637 U
Hexachlorobenzene	0.21	0.96	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methoxychlor	320	4,100	- -	mg/kg	0.00055 U [0.000558 U]	NA	NA	0.00969 U	0.00489 U [0.00479 U]	NA	0.000484 U	0.00484 U	0.00047 UJ	0.000487 UJ	0.00048 UJ
Toxaphene	0.49	2.1	- -	mg/kg	0.0474 U [0.048 U]	NA	NA	0.834 U	0.421 U [0.412 U]	NA	0.0417 U	0.417 U	0.0405 U	0.0419 U	0.0413 U

Table C-1
Summary of Soil Sample Analytical Results for all Depth Ranges
Corrective Action Plan Addendum
Former Black Leaf Chemical Site, Louisville, Kentucky

Location ID: Sample Depth(Feet): Date Collected: Sample Name:	USEPA Residential Soil RSL Nov 2017	USEPA Industrial Soil RSL Nov 2017	Kentucky Arsenic Background Guidance	Units	BL-SB-140 1 - 2 09/16/14 BL-SB-140_1_2	BL-SB-141 0 - 1 09/17/14 BL-SB-141_0_1	BL-SB-141 1 - 2 09/17/14 BL-SB-141_1_2	BL-SB-141 2 - 4 09/17/14 BL-SB-141_2_4	BL-SB-142 0 - 1 09/17/14 BL-SB-142_0_1	BL-SB-142 1 - 2 09/17/14 BL-SB-142_1_2	BL-SB-142 2 - 4 09/17/14 BL-SB-142_2_4	BL-SB-142 4 - 6 09/17/14 BL-SB-142_4_6	BL-SB-143 0 - 1 09/16/14 BL-SB-143_0_1	BL-SB-143 1 - 2 09/16/14 BL-SB-143_1_2	BL-SB-143 2 - 4 09/16/14 BL-SB-143_2_4	BL-SB-143 4 - 6 09/16/14 BL-SB-143_4_6
Detected Semivolatile Organics																
1,1'-Biphenyl	47	200	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4,5-Tetrachlorobenzene	23	350	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3&4-Methylphenol	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acetophenone	7,800	120,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1-methyl-Naphthalene	18	73	- -	mg/kg	0.014 U	0.036 J	0.0135 U	0.0137 U	0.0139 U	0.0139 U	NA	NA	0.0134 U	0.0287 J	NA	NA
2,4,5-Trichlorophenol	6,300	82,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dimethylphenol	1,300	16,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzaldehyde	170	820	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	240	3,000	- -	mg/kg	0.016 U	0.0432 J	0.0154 U	0.0156 U	0.0406 J	0.0159 U	NA	NA	0.0153 U	0.0332 J	NA	NA
4,6-Dinitro-2-methylphenol	5.1	66	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthene	3,600	45,000	- -	mg/kg	0.00999 U	0.00964 U	0.00962 U	0.00977 U	0.00996 U	0.00996 U	NA	NA	0.00955 U	0.0608 J	NA	NA
Acenaphthylene	- -	- -	- -	mg/kg	0.00899 U	0.0673	0.00866 U	0.0088 U	0.0498 J	0.00897 U	NA	NA	0.0086 U	0.0358 J	NA	NA
Anthracene	18,000	230,000	- -	mg/kg	0.00899 U	0.056 J	0.00866 U	0.0088 U	0.0416 J	0.00897 U	NA	NA	0.0323 J	0.147	NA	NA
Benzo(a)anthracene	1.1	21	- -	mg/kg	0.015 U	0.141	0.0144 U	0.0147 U	0.137	0.0149 U	NA	NA	0.154	0.322	0.0852 U	0.0172 U
Benzo(a)pyrene	0.11	2.1	- -	mg/kg	0.012 U	**0.197**	0.0115 U	0.0117 U	**0.201**	0.012 U	0.0143 U	NA	**0.145**	**0.334**	0.0681 U	0.0137 U
Benzo(b)fluoranthene	1.1	21	- -	mg/kg	0.012 U	0.415	0.0115 U	0.0117 U	0.356	0.012 U	0.0143 U	NA	0.274	0.474	0.128 J	0.0137 U
Benzo(g,h,i)perylene	- -	- -	- -	mg/kg	0.00899 U	0.162	0.00866 U	0.0088 U	0.138	0.00897 U	NA	NA	0.103	0.204	NA	NA
Benzo(k)fluoranthene	11	210	- -	mg/kg	0.014 U	0.125	0.0135 U	0.0137 U	0.141	0.0139 U	NA	NA	0.0877	0.155	NA	NA
Benzoic acid	250,000	3,300,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbazole	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	110	2,100	- -	mg/kg	0.00899 U	0.193	0.00866 U	0.0088 U	0.207	0.00897 U	NA	NA	0.192	0.363	NA	NA
Dibenzo(a,h)anthracene	0.11	2.1	- -	mg/kg	0.007 U	0.0496 J	0.00673 U	0.00684 U	0.0384 J	0.00697 U	0.00837 U	NA	0.0525 J	0.0667	0.0397 U	0.00802 U
Dibenzofuran	73	1,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Di-n-butylphthalate	6,300	82,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	2,400	30,000	- -	mg/kg	0.00899 U	0.172	0.00866 U	0.0088 U	0.149	0.00897 U	NA	NA	0.358	0.708	NA	NA
Fluorene	2,400	30,000	- -	mg/kg	0.012 U	0.0116 U	0.0115 U	0.0117 U	0.012 U	0.012 U	NA	NA	0.0115 U	0.0691	NA	NA
Indeno(1,2,3-cd)pyrene	1.1	21	- -	mg/kg	0.00999 U	0.136	0.00962 U	0.00977 U	0.128	0.00996 U	NA	NA	0.108	0.193	0.0568 U	0.0115 U
Naphthalene	3.8	17	- -	mg/kg	0.00899 U	0.00868 U	0.00866 U	0.0088 U	0.00896 U	0.00897 U	NA	NA	0.0086 U	0.0498 J	NA	NA
Pentachlorophenol	1	4	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	- -	- -	- -	mg/kg	0.00899 U	0.0607 J	0.00866 U	0.0088 U	0.0456 J	0.00897 U	NA	NA	0.134	0.583	NA	NA
Phenol	19,000	250,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pyrene	1,800	23,000	- -	mg/kg	0.012 U	0.196	0.0115 U	0.0117 U	0.16	0.012 U	NA	NA	0.324	0.652	NA	NA
Detected Inorganics																
Arsenic	**	**	22.7	mg/kg	11.9	**30.8 J**	12.9 J	1.52 J	**41.4 J**	**69.3 J**	7.92	14.1	4.86	11.5	NA	NA
Lead	400	800	- -	mg/kg	70.6 J	118 J	22.6 J	3.89 J	**744 J**	5.32 J	14.1	NA	8 J	83.2 J	NA	NA
Detected Pesticides																
2,4' DDD	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4'-DDE	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4'-DDT	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
trans-Nonachlor	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDD	1.9	9.6	- -	mg/kg	0.0114	0.0131 J	0.000429 U	0.00042 U	0.141	0.292 D	NA	NA	0.000425 U	0.00773 J	NA	NA
4,4'-DDE	2.0	9.3	- -	mg/kg	0.0005 U	0.0647	0.000499 U	0.000489 U	0.442	0.221 D	NA	NA	0.000494 U	0.00758 J	NA	NA
4,4'-DDT	1.9	8.5	- -	mg/kg	0.0118 J	0.115	0.000848 U	0.000831 U	0.121	**6.18 D**	0.0519 D	0.178 D	0.00145 J	0.0143 J	NA	NA
Aldrin	0.039	0.18	- -	mg/kg	0.00031 U	0.00303 U	0.000309 U	0.000303 U	0.00308 U	0.000301 U	NA	NA	0.000306 U	0.000307 U	NA	NA
alpha-BHC	0.086	0.36	- -	mg/kg	0.0002 U	0.00196 U	0.0002 U	0.000195 U	0.00198 U	0.00165 U	NA	NA	0.000198 U	0.000198 U	NA	NA
alpha-Chlordane	1.7	7.7	- -	mg/kg	0.00043 U	0.00421 U	0.000429 U	0.00042 U	0.00427 U	0.0019 JN	NA	NA	0.000425 U	0.000426 U	NA	NA
beta-BHC	0.3	1.3	- -	mg/kg	0.0002 U	0.00196 U	0.0002 U	0.000195 U	0.00614 J	0.0115 J	NA	NA	0.000198 U	0.000198 U	NA	NA
Chlordane (technical)	1.7	7.7	- -	mg/kg	0.0363 U	0.355 U	0.0362 U	0.0355 U	0.36 U	0.0935	NA	NA	0.0359 U	0.0359 U	NA	NA
delta-BHC	- -	- -	- -	mg/kg	0.00038 U	0.00372 U	0.000379 U	0.000371 U	0.00377 U	0.000369 U	NA	NA	0.000376 U	0.000376 U	NA	NA
Dieldrin	0.034	0.14	- -	mg/kg	0.0004 U	0.00391 U	0.000399 U	0.000391 U	0.00639 J	**0.0576 D**	0.00677	0.000866 J	0.000395 U	0.000396 U	NA	NA
Endosulfan I	470	7000	- -	mg/kg	0.00047 U	0.0046 U	0.000469 U	0.000459 U	0.00466 U	0.000456 U	NA	NA	0.000464 U	0.000465 U	NA	NA
Endosulfan II	470	7000	- -	mg/kg	0.00055 U	0.00538 U	0.000549 U	0.000538 U	0.00546 U	0.000534 U	NA	NA	0.000544 U	0.000545 U	NA	NA
Endosulfan sulfate	470	7000	- -	mg/kg	0.0005 U	0.00489 U	0.000499 U	0.000489 U	0.00496 U	0.000485 U	NA	NA	0.000494 U	0.000495 U	NA	NA
Endrin	19	250	- -	mg/kg	0.00043 U	0.00421 U	0.000429 U	0.00042 U	0.00427 U	0.000417 U	NA	NA	0.000425 U	0.000426 U	NA	NA
Endrin aldehyde	- -	- -	- -	mg/kg	0.00051 U	0.00499 U	0.000509 U	0.000498 U	0.00506 U	0.000495 U	NA	NA	0.000504 U	0.000505 U	NA	NA
Endrin ketone	- -	- -	- -	mg/kg	0.000589 U	0.00577 U	0.000589 U	0.000577 U	0.00586 U	0.000572 U	NA	NA	0.000583 U	0.000584 U	NA	NA
gamma-BHC (Lindane)	0.57	2.5	- -	mg/kg	0.00039 U	0.00382 U	0.000389 U	0.000381 U	0.00387 U	0.000378 U	NA	NA	0.000385 U	0.000386 U	NA	NA
gamma-Chlordane	1.7	7.7	- -	mg/kg	0.000789 U	0.00773 U	0.000788 U	0.000772 U	0.00784 U	0.00642 JN	NA	NA	0.000781 U	0.000782 U	NA	NA
Heptachlor	0.13	0.63	- -	mg/kg	0.00042 U	0.00411 U	0.000419 U	0.00041 U	0.00417 U	0.000407 U	NA	NA	0.000415 U	0.000416 U	NA	NA
Heptachlor epoxide	0.07	0.33	- -	mg/kg	0.000649 U	0.00636 U	0.000649 U	0.000635 U	0.00645 U	0.000631 U	NA	NA	0.000642 U	0.000644 U	NA	NA
Hexachlorobenzene	0.21	0.96	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methoxychlor	320	4,100	- -	mg/kg	0.00049 UJ	0.0048 U	0.000489 U	0.000479 U	0.00486 U	0.0032 U	NA	NA	0.000484 UJ	0.000485 UJ	NA	NA
Toxaphene	0.49	2.1	- -	mg/kg	0.0422 U	0.413 U	0.0421 U	0.0412 U	0.419 U	**0.791 J**	0.042 U	0.0419 U	0.0417 U	0.0418 U	NA	NA

Table C-1
Summary of Soil Sample Analytical Results for all Depth Ranges
Corrective Action Plan Addendum
Former Black Leaf Chemical Site, Louisville, Kentucky

Location ID:	USEPA	USEPA	Kentucky		BL-SB-144	BL-SB-144	BL-SB-144	BL-SB-145	BL-SB-145	BL-SB-145	BL-SB-145	BL-SB-145	BL-SB-145	BL-SB-146	BL-SB-146R
Sample Depth(Feet):	Residential	Industrial	Arsenic		10 - 12	12 - 14	14 - 16	0 - 1	1 - 2	2 - 4	4 - 6	6 - 8	8 - 10	0 - 1	0 - 1
Date Collected:	Soil RSL Nov	Soil RSL	Background		09/16/14	09/16/14	09/16/14	09/16/14	09/16/14	09/16/14	09/16/14	09/20/14	09/16/14	09/17/14	09/30/14
Sample Name:	2017	Nov 2017	Guidance	Units	BL-SB-144_10_12	BL-SB-144_12_14	BL-SB-144_14_16	BL-SB-145_0_1	BL-SB-145_1_2	BL-SB-145_2_4	BL-SB-145_4_6	BL-SB-145_6_8	BL-SB-145_8_10	BL-SB-146_0_1	BL-SB-146R_0_1
Detected Semivolatile Organics															
1,1'-Biphenyl	47	200	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4,5-Tetrachlorobenzene	23	350	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3&4-Methylphenol	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acetophenone	7,800	120,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1-methyl-Naphthalene	18	73	- -	mg/kg	0.0138 U [0.0139 U]	0.0139 U	0.0137 U	0.0139 U	0.0139 U	NA	NA	NA	NA	0.0371 J	0.014 UJ
2,4,5-Trichlorophenol	6,300	82,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dimethylphenol	1,300	16,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzaldehyde	170	820	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	240	3,000	- -	mg/kg	0.0157 U [0.0159 U]	0.0159 U	0.0157 U	0.0158 U	0.0158 U	NA	NA	NA	NA	0.0443 J	0.016 UJ
4,6-Dinitro-2-methylphenol	5.1	66	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthene	3,600	45,000	- -	mg/kg	0.00984 U [0.00996 U]	0.00992 U	0.00979 U	0.0099 U	0.0099 U	NA	NA	NA	NA	0.00971 U	0.00999 UJ
Acenaphthylene	- -	- -	- -	mg/kg	0.00885 U [0.00896 U]	0.00893 U	0.00881 U	0.00891 U	0.00891 U	NA	NA	NA	NA	0.0702	0.00899 UJ
Anthracene	18,000	230,000	- -	mg/kg	0.00885 U [0.00896 U]	0.00893 U	0.00881 U	0.0104 J	0.0203 J	NA	NA	NA	NA	0.0467 J	0.0205 J
Benzo(a)anthracene	1.1	21	- -	mg/kg	0.0148 U [0.0149 U]	0.0149 U	0.0147 U	0.0492 J	0.127	NA	NA	NA	NA	0.0818	0.0573 J
Benzo(a)pyrene	0.11	2.1	- -	mg/kg	0.0118 U [0.0119 U]	0.0119 U	0.0117 U	0.0461 J	0.0946	**0.359**	**0.209 J**	0.0148 U	0.0143 U	0.091	0.0549 J
Benzo(b)fluoranthene	1.1	21	- -	mg/kg	0.0118 U [0.0119 U]	0.0119 U	0.0117 U	0.0902	0.197	0.466	0.253 J	0.0148 U	0.0143 U	0.175	0.0926 J
Benzo(g,h,i)perylene	- -	- -	- -	mg/kg	0.00885 U [0.00896 U]	0.00893 U	0.00881 U	0.00891 U	0.0857	NA	NA	NA	NA	0.0871	0.0411 J
Benzo(k)fluoranthene	11	210	- -	mg/kg	0.0138 U [0.0139 U]	0.0139 U	0.0137 U	0.0272 J	0.0705	NA	NA	NA	NA	0.0605 J	0.0314 J
Benzoic acid	250,000	3,300,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbazole	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	110	2,100	- -	mg/kg	0.00885 U [0.00896 U]	0.00893 U	0.00881 U	0.0523 J	0.136	NA	NA	NA	NA	0.103	0.0585 J
Dibenzo(a,h)anthracene	0.11	2.1	- -	mg/kg	0.00689 U [0.00697 U]	0.00695 U	0.00685 U	0.00693 U	0.048 J	0.0334 U	0.0397 U	NA	NA	0.0068 U	0.00699 UJ
Dibenzofuran	73	1,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Di-n-butylphthalate	6,300	82,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	2,400	30,000	- -	mg/kg	0.00885 U [0.00896 U]	0.00893 U	0.00881 U	0.0982	0.278	NA	NA	NA	NA	0.148	0.0974 J
Fluorene	2,400	30,000	- -	mg/kg	0.0118 U [0.0119 U]	0.0119 U	0.0117 U	0.0119 U	0.0119 U	NA	NA	NA	NA	0.0117 U	0.012 UJ
Indeno(1,2,3-cd)pyrene	1.1	21	- -	mg/kg	0.00984 U [0.00996 U]	0.00992 U	0.00979 U	0.0507 J	0.0929	NA	NA	NA	NA	0.072	0.0377 J
Naphthalene	3.8	17	- -	mg/kg	0.00885 U [0.00896 U]	0.00893 U	0.00881 U	0.00891 U	0.00891 U	NA	NA	NA	NA	0.0301 J	0.00899 UJ
Pentachlorophenol	1	4	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	- -	- -	- -	mg/kg	0.00885 U [0.00896 U]	0.00893 U	0.00881 U	0.053 J	0.118	NA	NA	NA	NA	0.0837	0.0492 J
Phenol	19,000	250,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pyrene	1,800	23,000	- -	mg/kg	0.0118 U [0.0119 U]	0.0119 U	0.0117 U	0.0879	0.258	NA	NA	NA	NA	0.125	0.0897 J
Detected Inorganics															
Arsenic	**	**	22.7	mg/kg	12.1 [9.39]	12.3	8.73	11.7	8.22	NA	NA	NA	NA	**97.4 J**	8.13
Lead	400	800	- -	mg/kg	18.8 [19.9]	16.1	15.2	**507 J**	66 J	102	NA	NA	NA	66.1 J	96.6 J
Detected Pesticides															
2,4' DDD	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4'-DDE	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4'-DDT	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
trans-Nonachlor	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDD	1.9	9.6	- -	mg/kg	0.000408 U [0.000418 U]	0.000426 U	0.000427 U	0.00443 JN	0.000418 U	NA	NA	NA	NA	0.00429 U	0.0043 UJ
4,4'-DDE	2.0	9.3	- -	mg/kg	0.000475 U [0.000486 U]	0.000495 U	0.000497 U	0.0081 J	0.00371 J	NA	NA	NA	NA	0.00499 U	0.005 UJ
4,4'-DDT	1.9	8.5	- -	mg/kg	0.000807 U [0.00165 U]	0.000841 U	0.000845 U	0.0318 J	0.0089 J	NA	NA	NA	NA	0.00848 U	0.00849 UJ
Aldrin	0.039	0.18	- -	mg/kg	0.000294 U [0.000301 U]	0.000307 U	0.000308 U	0.000281 U	0.000301 U	NA	NA	NA	NA	0.00309 U	0.0031 UJ
alpha-BHC	0.086	0.36	- -	mg/kg	0.00019 U [0.000194 U]	0.000198 U	0.000199 U	0.000181 U	0.000194 U	NA	NA	NA	NA	0.00199 U	0.002 UJ
alpha-Chlordane	1.7	7.7	- -	mg/kg	0.000408 U [0.000418 U]	0.000426 U	0.000427 U	0.00039 U	0.000418 U	NA	NA	NA	NA	0.00429 U	0.0043 UJ
beta-BHC	0.3	1.3	- -	mg/kg	0.00019 U [0.000194 U]	0.000198 U	0.000199 U	0.000181 U	0.000194 U	NA	NA	NA	NA	0.00199 U	0.002 UJ
Chlordane (technical)	1.7	7.7	- -	mg/kg	0.0345 U [0.0353 U]	0.0359 U	0.0361 U	0.0329 U	0.0353 U	NA	NA	NA	NA	0.362 U	0.363 UJ
delta-BHC	- -	- -	- -	mg/kg	0.000361 U [0.000369 U]	0.000376 U	0.000378 U	0.000345 U	0.000369 U	NA	NA	NA	NA	0.00379 U	0.0038 UJ
Dieldrin	0.034	0.14	- -	mg/kg	0.00038 U [0.000388 U]	0.000396 U	0.000398 U	0.000363 U	0.000389 U	NA	NA	NA	NA	0.00399 U	0.004 UJ
Endosulfan I	470	7000	- -	mg/kg	0.000446 U [0.000456 U]	0.000465 U	0.000467 U	0.000426 U	0.000457 U	NA	NA	NA	NA	0.00469 U	0.0047 UJ
Endosulfan II	470	7000	- -	mg/kg	0.000522 U [0.000534 U]	0.000544 U	0.000547 U	0.000499 U	0.000534 U	NA	NA	NA	NA	0.00549 U	0.0055 UJ
Endosulfan sulfate	470	7000	- -	mg/kg	0.000475 U [0.000486 U]	0.000495 U	0.000497 U	0.000453 U	0.000486 U	NA	NA	NA	NA	0.00499 U	0.005 UJ
Endrin	19	250	- -	mg/kg	0.000408 U [0.000418 U]	0.000426 U	0.000427 U	0.00039 U	0.000418 U	NA	NA	NA	NA	0.00429 U	0.0043 UJ
Endrin aldehyde	- -	- -	- -	mg/kg	0.000484 U [0.000495 U]	0.000505 U	0.000507 U	0.000463 U	0.000496 U	NA	NA	NA	NA	0.00509 U	0.0051 UJ
Endrin ketone	- -	- -	- -	mg/kg	0.00056 U [0.000573 U]	0.000584 U	0.000586 U	0.000535 U	0.000573 U	NA	NA	NA	NA	0.00589 U	0.0059 UJ
gamma-BHC (Lindane)	0.57	2.5	- -	mg/kg	0.00037 U [0.000379 U]	0.000386 U	0.000388 U	0.000354 U	0.000379 U	NA	NA	NA	NA	0.00389 U	0.0039 UJ
gamma-Chlordane	1.7	7.7	- -	mg/kg	0.00075 U [0.000767 U]	0.000782 U	0.000785 U	0.000717 U	0.00165 U	NA	NA	NA	NA	0.00788 U	0.00789 UJ
Heptachlor	0.13	0.63	- -	mg/kg	0.000399 U [0.000408 U]	0.000416 U	0.000417 U	0.000381 U	0.000408 U	NA	NA	NA	NA	0.00419 U	0.0042 UJ
Heptachlor epoxide	0.07	0.33	- -	mg/kg	0.000617 U [0.000631 U]	0.000643 U	0.000646 U	0.00059 U	0.000632 U	NA	NA	NA	NA	0.00648 U	0.00649 UJ
Hexachlorobenzene	0.21	0.96	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methoxychlor	320	4,100	- -	mg/kg	0.000465 U [0.000476 U]	0.000485 U	0.000487 U	0.000444 U	0.000476 UJ	NA	NA	NA	NA	0.00489 U	0.0049 UJ
Toxaphene	0.49	2.1	- -	mg/kg	0.0401 U [0.041 U]	0.0418 U	0.0419 U	0.0383 U	0.041 U	NA	NA	NA	NA	0.421 U	0.422 UJ

Table C-1
Summary of Soil Sample Analytical Results for all Depth Ranges
Corrective Action Plan Addendum
Former Black Leaf Chemical Site, Louisville, Kentucky

Location ID:	USEPA Residential	USEPA Industrial	Kentucky Arsenic		BL-SB-146R	BL-SB-146R	BL-SB-146R	BL-SB-147	BL-SB-147	BL-SB-147	BL-SB-147	BL-SB-148	BL-SB-148	BL-SB-148R	BL-SB-148R
Sample Depth(Feet):					1 - 2	2 - 4	4 - 6	0 - 1	1 - 2	2 - 4	4 - 6	0 - 1	1 - 2	0 - 1	1 - 2
Date Collected:	Soil RSL Nov	Soil RSL	Background		09/30/14	09/30/14	09/30/14	09/17/14	09/17/14	09/17/14	09/17/14	09/16/14	09/16/14	09/30/14	09/30/14
Sample Name:	2017	Nov 2017	Guidance	Units	BL-SB-146R_1_2	BL-SB-146R_2_4	BL-SB-146R_4_6	BL-SB-147_0_1	BL-SB-147_1_2	BL-SB-147_2_4	BL-SB-147_4_6	BL-SB-148_0_1	BL-SB-148_1_2	BL-SB-148R_0_1	BL-SB-148R_1_2
Detected Semivolatile Organics															
1,1'-Biphenyl	47	200	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4,5-Tetrachlorobenzene	23	350	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3&4-Methylphenol	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acetophenone	7,800	120,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1-methyl-Naphthalene	18	73	- -	mg/kg	0.0137 UJ	NA	NA	0.0855	0.0339 J	NA	NA	0.0338 J	0.139 U	0.126 J	0.766 J
2,4,5-Trichlorophenol	6,300	82,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dimethylphenol	1,300	16,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzaldehyde	170	820	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	240	3,000	- -	mg/kg	0.0157 UJ	NA	NA	0.0985	0.0368 J	NA	NA	0.0463 J	0.159 U	0.168 J	0.767 J
4,6-Dinitro-2-methylphenol	5.1	66	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthene	3,600	45,000	- -	mg/kg	0.00982 UJ	NA	NA	0.00956 U	0.00987 U	NA	NA	0.00968 U	0.0992 U	0.00972 UJ	2.88 J
Acenaphthylene	- -	- -	- -	mg/kg	0.00883 UJ	NA	NA	0.0086 U	0.0464 J	NA	NA	0.00871 U	0.0892 U	0.0913 J	0.878 J
Anthracene	18,000	230,000	- -	mg/kg	0.0181 J	NA	NA	0.0186 J	0.0797	NA	NA	0.0168 J	0.181 J	0.106 J	10.1 J
Benzo(a)anthracene	1.1	21	- -	mg/kg	0.0485 J	NA	NA	0.0506 J	0.17	0.0176 U	0.0169 U	0.0752	0.628 J	0.362 J	**16.4 DJ**
Benzo(a)pyrene	0.11	2.1	- -	mg/kg	0.0469 J	0.0143 UJ	0.0135 UJ	0.0503 J	**0.196**	0.0141 U	0.0135 U	0.0696	**0.606 J**	**0.44 J**	**14.8 J**
Benzo(b)fluoranthene	1.1	21	- -	mg/kg	0.0764 J	NA	NA	0.0824	0.364	0.0141 U	0.0135 U	0.121	1.03	0.744 J	**19.3 DJ**
Benzo(g,h,i)perylene	- -	- -	- -	mg/kg	0.0338 J	NA	NA	0.0086 U	0.145	NA	NA	0.0433 J	0.327 J	0.306 J	9.4 J
Benzo(k)fluoranthene	11	210	- -	mg/kg	0.0252 J	NA	NA	0.0321 J	0.107	NA	NA	0.0353 J	0.277 J	0.269 J	2.9 J
Benzoic acid	250,000	3,300,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbazole	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	110	2,100	- -	mg/kg	0.0475 J	NA	NA	0.0499 J	0.207	NA	NA	0.0798	0.687	0.398 J	15.4 J
Dibenzo(a,h)anthracene	0.11	2.1	- -	mg/kg	0.00687 UJ	NA	NA	0.00669 U	0.0445 J	0.00823 U	0.0079 U	0.0344 J	**0.337 J**	0.0879 J	**1.07 J**
Dibenzofuran	73	1,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Di-n-butylphthalate	6,300	82,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	2,400	30,000	- -	mg/kg	0.0839 J	NA	NA	0.0783	0.25	NA	NA	0.138	1.27	0.508 J	43.5 DJ
Fluorene	2,400	30,000	- -	mg/kg	0.0118 UJ	NA	NA	0.0115 U	0.0118 U	NA	NA	0.0116 U	0.119 U	0.0117 UJ	4.76 J
Indeno(1,2,3-cd)pyrene	1.1	21	- -	mg/kg	0.00982 UJ	NA	NA	0.00956 U	0.138	0.0118 U	0.0113 U	0.0601 J	0.531 J	0.284 J	**8.8 J**
Naphthalene	3.8	17	- -	mg/kg	0.00883 UJ	NA	NA	0.0546 J	0.00888 U	NA	NA	0.00871 U	0.0892 U	0.0972 J	0.574 J
Pentachlorophenol	1	4	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	- -	- -	- -	mg/kg	0.0497 J	NA	NA	0.0963	0.171	NA	NA	0.081	0.771	0.241 J	37 DJ
Phenol	19,000	250,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pyrene	1,800	23,000	- -	mg/kg	0.0744 J	NA	NA	0.0723	0.239	NA	NA	0.136	1.15	0.494 J	34.8 DJ
Detected Inorganics															
Arsenic	**	**	22.7	mg/kg	9.24	NA	NA	**37.5 J**	15.6 J	13.8	NA	8.19	20.1	9.54	12.5
Lead	400	800	- -	mg/kg	6.49 J	NA	NA	110 J	9.22	NA	NA	27.1 J	187 J	3.44 J	56.6 J
Detected Pesticides															
2,4' DDD	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4'-DDE	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4'-DDT	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
trans-Nonachlor	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDD	1.9	9.6	- -	mg/kg	0.00426 UJ	NA	NA	0.00427 U	0.0084 U	NA	NA	0.00165 U	0.0484	0.0167 J	0.0504 DJ
4,4'-DDE	2.0	9.3	- -	mg/kg	0.0065 J	NA	NA	0.0692	0.00976 U	NA	NA	0.00165 U	0.0169 U	0.0918 J	0.0401 J
4,4'-DDT	1.9	8.5	- -	mg/kg	0.0376 J	NA	NA	0.0412	0.0166 U	NA	NA	0.00362 J	0.0332 J	0.0541 J	0.616 DJ
Aldrin	0.039	0.18	- -	mg/kg	0.00307 UJ	NA	NA	0.00308 U	0.00605 U	NA	NA	0.000302 U	0.00308 U	0.00304 UJ	0.00307 UJ
alpha-BHC	0.086	0.36	- -	mg/kg	0.00198 UJ	NA	NA	0.00199 U	0.00391 U	NA	NA	0.000195 U	0.00199 U	0.00196 UJ	0.00198 UJ
alpha-Chlordane	1.7	7.7	- -	mg/kg	0.00426 UJ	NA	NA	0.00427 U	0.0084 U	NA	NA	0.000418 U	0.00428 U	0.00422 UJ	0.00426 UJ
beta-BHC	0.3	1.3	- -	mg/kg	0.00198 UJ	NA	NA	0.00199 U	0.00391 U	NA	NA	0.000195 U	0.00199 U	0.00196 UJ	0.0327 UJ
Chlordane (technical)	1.7	7.7	- -	mg/kg	0.36 UJ	NA	NA	0.361 U	0.709 U	NA	NA	0.0353 U	0.361 U	0.356 UJ	0.36 UJ
delta-BHC	- -	- -	- -	mg/kg	0.00376 UJ	NA	NA	0.00378 U	0.00742 U	NA	NA	0.00037 U	0.00378 U	0.00373 UJ	0.00376 UJ
Dieldrin	0.034	0.14	- -	mg/kg	0.00396 UJ	NA	NA	0.00398 U	0.00781 U	NA	NA	0.000389 U	0.00398 U	0.00392 UJ	0.0168 UJ
Endosulfan I	470	7000	- -	mg/kg	0.00466 UJ	NA	NA	0.00467 U	0.00918 U	NA	NA	0.000457 U	0.00467 U	0.00461 UJ	0.00465 UJ
Endosulfan II	470	7000	- -	mg/kg	0.00545 UJ	NA	NA	0.00547 U	0.0107 U	NA	NA	0.000535 U	0.00547 U	0.00539 UJ	0.00545 UJ
Endosulfan sulfate	470	7000	- -	mg/kg	0.00495 UJ	NA	NA	0.00497 U	0.00976 U	NA	NA	0.000486 U	0.00497 U	0.0049 UJ	0.00495 UJ
Endrin	19	250	- -	mg/kg	0.00426 UJ	NA	NA	0.00427 U	0.0084 U	NA	NA	0.000418 U	0.00428 U	0.00422 UJ	0.00426 UJ
Endrin aldehyde	- -	- -	- -	mg/kg	0.00505 UJ	NA	NA	0.00507 U	0.00996 U	NA	NA	0.000496 U	0.00507 U	0.005 UJ	0.00505 UJ
Endrin ketone	- -	- -	- -	mg/kg	0.00584 UJ	NA	NA	0.00587 U	0.0115 U	NA	NA	0.000574 U	0.00587 U	0.00578 UJ	0.00584 UJ
gamma-BHC (Lindane)	0.57	2.5	- -	mg/kg	0.00386 UJ	NA	NA	0.00388 U	0.00762 U	NA	NA	0.000379 U	0.00388 U	0.00382 UJ	0.00386 UJ
gamma-Chlordane	1.7	7.7	- -	mg/kg	0.00783 UJ	NA	NA	0.00785 U	0.0154 U	NA	NA	0.000768 U	0.00786 U	0.00774 UJ	0.00782 UJ
Heptachlor	0.13	0.63	- -	mg/kg	0.00416 UJ	NA	NA	0.00418 U	0.0082 U	NA	NA	0.000409 U	0.00418 U	0.00412 UJ	0.00416 UJ
Heptachlor epoxide	0.07	0.33	- -	mg/kg	0.00644 UJ	NA	NA	0.00646 U	0.0127 U	NA	NA	0.000632 U	0.00647 U	0.00637 UJ	0.00644 UJ
Hexachlorobenzene	0.21	0.96	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methoxychlor	320	4,100	- -	mg/kg	0.00485 UJ	NA	NA	0.00487 U	0.00957 U	NA	NA	0.000477 U	0.00487 U	0.0048 UJ	0.00485 UJ
Toxaphene	0.49	2.1	- -	mg/kg	0.418 UJ	NA	NA	0.42 U	0.824 U	NA	NA	0.041 U	0.42 U	0.414 UJ	0.418 UJ

Table C-1
Summary of Soil Sample Analytical Results for all Depth Ranges
Corrective Action Plan Addendum
Former Black Leaf Chemical Site, Louisville, Kentucky

Location ID: / Sample Depth(Feet): / Date Collected: / Sample Name:	USEPA Residential Soil RSL Nov 2017	USEPA Industrial Soil RSL Nov 2017	Kentucky Arsenic Background Guidance	Units	BL-SB-148R 2 - 4 09/30/14 BL-SB-148R_2_4	BL-SB-148R 4 - 6 09/30/14 BL-SB-148R_4_6	BL-SB-148R 6 - 8 09/30/14 BL-SB-148R_6_8	BL-SB-149 0 - 1 09/16/14 BL-SB-149_0_1	BL-SB-149 1 - 2 09/16/14 BL-SB-149_1_2	BL-SB-149 2 - 4 09/16/14 BL-SB-149_2_4	BL-SB-149 4 - 6 09/16/14 BL-SB-149_4_6	BL-SB-150 0 - 1 09/17/14 BL-SB-150_0_1	BL-SB-150 1 - 2 09/17/14 BL-SB-150_1_2	BL-SB-150 2 - 4 09/17/14 BL-SB-150_2_4	BL-SB-150 4 - 6 09/17/14 BL-SB-150_4_6
Detected Semivolatile Organics															
1,1'-Biphenyl	47	200	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4,5-Tetrachlorobenzene	23	350	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3&4-Methylphenol	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acetophenone	7,800	120,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1-methyl-Naphthalene	18	73	- -	mg/kg	NA	NA	NA	0.139 U	0.031 J	NA	NA	0.0386 J [0.0332 J]	0.116	NA	NA
2,4,5-Trichlorophenol	6,300	82,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dimethylphenol	1,300	16,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzaldehyde	170	820	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	240	3,000	- -	mg/kg	NA	NA	NA	0.159 U	0.0359 J	NA	NA	0.045 J [0.0412 J]	0.144	NA	NA
4,6-Dinitro-2-methylphenol	5.1	66	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthene	3,600	45,000	- -	mg/kg	NA	NA	NA	0.0994 U	0.00997 U	NA	NA	0.0157 J [0.0165 J]	0.303	NA	NA
Acenaphthylene	- -	- -	- -	mg/kg	NA	NA	NA	0.0895 U	0.0545 J	NA	NA	0.12 [0.0895]	0.0795	NA	NA
Anthracene	18,000	230,000	- -	mg/kg	NA	NA	NA	0.0895 U	0.0498 J	NA	NA	0.146 [0.102]	0.596	NA	NA
Benzo(a)anthracene	1.1	21	- -	mg/kg	**1.37 J**	0.0401 J	0.0177 UJ	0.149 U	0.147	NA	NA	0.396 [0.312]	**1.45**	0.0183 U	0.0167 U
Benzo(a)pyrene	0.11	2.1	- -	mg/kg	**1.06 J**	0.0145 UJ	0.0142 UJ	0.119 U	**0.187**	0.0142 U	0.0136 U	**0.43 [0.326]**	**1.25**	0.0147 U	0.0133 U
Benzo(b)fluoranthene	1.1	21	- -	mg/kg	**1.49 J**	0.0429 J	0.0142 UJ	0.381 J	0.354	0.0142 U	0.0136 U	0.729 [0.58]	**1.84**	0.0147 U	0.0133 U
Benzo(g,h,i)perylene	- -	- -	- -	mg/kg	NA	NA	NA	0.0895 U	0.138	NA	NA	0.298 [0.226]	0.747	NA	NA
Benzo(k)fluoranthene	11	210	- -	mg/kg	0.179 J	0.021 J	NA	0.139 U	0.11	NA	NA	0.318 [0.199]	0.704	NA	NA
Benzoic acid	250,000	3,300,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbazole	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	110	2,100	- -	mg/kg	1.35 J	0.0441 J	NA	0.0895 U	0.191	NA	NA	0.431 [0.37]	1.5	NA	NA
Dibenzo(a,h)anthracene	0.11	2.1	- -	mg/kg	**0.186 J**	0.00845 UJ	0.00828 UJ	0.0696 U	0.0648 J	0.00826 U	0.00791 U	0.0947 [0.0595 J]	**0.258**	0.00855 U	0.00777 U
Dibenzofuran	73	1,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Di-n-butylphthalate	6,300	82,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	2,400	30,000	- -	mg/kg	NA	NA	NA	0.0895 U	0.198	NA	NA	0.567 [0.565]	2.72	NA	NA
Fluorene	2,400	30,000	- -	mg/kg	NA	NA	NA	0.119 U	0.012 U	NA	NA	0.0228 J [0.0119 U]	0.383	NA	NA
Indeno(1,2,3-cd)pyrene	1.1	21	- -	mg/kg	0.56 J	0.0121 UJ	0.0118 UJ	0.0994 U	0.135	NA	NA	0.271 [0.208]	0.685	0.0122 U	0.0111 U
Naphthalene	3.8	17	- -	mg/kg	NA	NA	NA	0.0895 U	0.0264 J	NA	NA	0.0411 J [0.0388 J]	0.365	NA	NA
Pentachlorophenol	1	4	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	- -	- -	- -	mg/kg	NA	NA	NA	0.0895 U	0.0912	NA	NA	0.308 [0.276]	2.48	NA	NA
Phenol	19,000	250,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pyrene	1,800	23,000	- -	mg/kg	NA	NA	NA	0.119 U	0.227	NA	NA	0.496 [0.47]	2.21	NA	NA
Detected Inorganics															
Arsenic	**	**	22.7	mg/kg	NA	NA	NA	14.3	**178**	15.6	13.4	**88.2 J [6.98 J]**	12.1 J	14.4	NA
Lead	400	800	- -	mg/kg	NA	NA	NA	52.9 J	101 J	NA	NA	88.2 J [218 J]	116 J	NA	NA
Detected Pesticides															
2,4' DDD	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4'-DDE	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4'-DDT	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
trans-Nonachlor	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDD	1.9	9.6	- -	mg/kg	NA	NA	NA	0.012 JN	0.00734 JN	NA	NA	0.00967 J [0.0151 J]	0.00402 U	NA	NA
4,4'-DDE	2.0	9.3	- -	mg/kg	NA	NA	NA	0.000487 U	0.0184 J	NA	NA	0.0671 [0.157]	0.00468 U	NA	NA
4,4'-DDT	1.9	8.5	- -	mg/kg	NA	NA	NA	0.0205 J	0.0141 J	NA	NA	0.0491 [0.0789]	0.00795 U	NA	NA
Aldrin	0.039	0.18	- -	mg/kg	NA	NA	NA	0.000302 U	0.000296 U	NA	NA	0.00303 U [0.00307 U]	0.0029 U	NA	NA
alpha-BHC	0.086	0.36	- -	mg/kg	NA	NA	NA	0.00166 U	0.000191 U	NA	NA	0.00195 U [0.00198 U]	0.00187 U	NA	NA
alpha-Chlordane	1.7	7.7	- -	mg/kg	NA	NA	NA	0.000419 U	0.000411 U	NA	NA	0.0042 U [0.00425 U]	0.00402 U	NA	NA
beta-BHC	0.3	1.3	- -	mg/kg	NA	NA	NA	0.00322 U	0.000191 U	NA	NA	0.00195 U [0.00198 U]	0.00187 U	NA	NA
Chlordane (technical)	1.7	7.7	- -	mg/kg	NA	NA	NA	0.0354 U	0.0347 U	NA	NA	0.355 U [0.359 U]	0.34 U	NA	NA
delta-BHC	- -	- -	- -	mg/kg	NA	NA	NA	0.00037 U	0.000363 U	NA	NA	0.00371 U [0.00376 U]	0.00356 U	NA	NA
Dieldrin	0.034	0.14	- -	mg/kg	NA	NA	NA	0.00422 JN	0.00162 U	NA	NA	0.00391 U [0.00396 U]	0.00374 U	NA	NA
Endosulfan I	470	7000	- -	mg/kg	NA	NA	NA	0.000458 U	0.000449 U	NA	NA	0.00459 U [0.00465 U]	0.0044 U	NA	NA
Endosulfan II	470	7000	- -	mg/kg	NA	NA	NA	0.000536 U	0.000526 U	NA	NA	0.00538 U [0.00544 U]	0.00515 U	NA	NA
Endosulfan sulfate	470	7000	- -	mg/kg	NA	NA	NA	0.000487 U	0.000478 U	NA	NA	0.00489 U [0.00494 U]	0.00468 U	NA	NA
Endrin	19	250	- -	mg/kg	NA	NA	NA	0.000419 U	0.000411 U	NA	NA	0.0042 U [0.00425 U]	0.00402 U	NA	NA
Endrin aldehyde	- -	- -	- -	mg/kg	NA	NA	NA	0.000497 U	0.000487 U	NA	NA	0.00498 U [0.00504 U]	0.00477 U	NA	NA
Endrin ketone	- -	- -	- -	mg/kg	NA	NA	NA	0.000575 U	0.000564 U	NA	NA	0.00577 U [0.00583 U]	0.00552 U	NA	NA
gamma-BHC (Lindane)	0.57	2.5	- -	mg/kg	NA	NA	NA	0.00038 U	0.000373 U	NA	NA	0.00381 U [0.00386 U]	0.00365 U	NA	NA
gamma-Chlordane	1.7	7.7	- -	mg/kg	NA	NA	NA	0.00077 U	0.000755 U	NA	NA	0.00772 U [0.00781 U]	0.00739 U	NA	NA
Heptachlor	0.13	0.63	- -	mg/kg	NA	NA	NA	0.00166 U	0.000401 U	NA	NA	0.0041 U [0.00415 U]	0.00393 U	NA	NA
Heptachlor epoxide	0.07	0.33	- -	mg/kg	NA	NA	NA	0.000634 U	0.000621 U	NA	NA	0.00635 U [0.00643 U]	0.00608 U	NA	NA
Hexachlorobenzene	0.21	0.96	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methoxychlor	320	4,100	- -	mg/kg	NA	NA	NA	0.000478 UJ	0.000468 UJ	NA	NA	0.00479 U [0.00485 U]	0.00458 U	NA	NA
Toxaphene	0.49	2.1	- -	mg/kg	NA	NA	NA	0.0411 U	0.0403 U	NA	NA	0.412 U [0.417 U]	0.395 U	NA	NA

Table C-1
Summary of Soil Sample Analytical Results for all Depth Ranges
Corrective Action Plan Addendum
Former Black Leaf Chemical Site, Louisville, Kentucky

Location ID:	USEPA	USEPA	Kentucky		BL-SB-151	BL-SB-151	BL-SB-151	BL-SB-151	BL-SB-151A	BL-SB-151B	BL-SB-151C	BL-SB-151R	BL-SB-151R	BL-SB-151R	BL-SB-151R
Sample Depth(Feet):	Residential	Industrial	Arsenic		0 - 1	1 - 2	2 - 3	2 - 3	2 - 4	2 - 4	2 - 4	0 - 1	1 - 2	2 - 4	4 - 6
Date Collected:	Soil RSL Nov	Soil RSL	Background		09/16/14	09/16/14	09/16/14	06/24/15	06/24/15	06/24/15	06/24/15	09/30/14	09/30/14	09/30/14	09/30/14
Sample Name:	2017	Nov 2017	Guidance	Units	BL-SB-151_0_1	BL-SB-151_1_2	BL-SB-151_2_3	BL-SB-151_2_3	BL-SB-151A_2_4	BL-SB-151B_2_4	BL-SB-151C_2_4	BL-SB-151R_0_1	BL-SB-151R_1_2	BL-SB-151R_2_4	BL-SB-151R_4_6
Detected Semivolatile Organics															
1,1'-Biphenyl	47	200	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4,5-Tetrachlorobenzene	23	350	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3&4-Methylphenol	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acetophenone	7,800	120,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1-methyl-Naphthalene	18	73	- -	mg/kg	0.138 U	0.0211 J	0.0138 U	NA	NA	NA	NA	0.124 J	0.0475 J	NA	NA
2,4,5-Trichlorophenol	6,300	82,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dimethylphenol	1,300	16,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzaldehyde	170	820	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	240	3,000	- -	mg/kg	0.157 U	0.0198 J	0.0158 U	NA	NA	NA	NA	0.156 J	0.0569 J	NA	NA
4,6-Dinitro-2-methylphenol	5.1	66	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthene	3,600	45,000	- -	mg/kg	0.0984 U	0.0561 J	0.0227 J	NA	NA	NA	NA	0.0198 UJ	0.00975 UJ	NA	NA
Acenaphthylene	- -	- -	- -	mg/kg	0.0973 J	0.0116 J	0.00886 U	NA	NA	NA	NA	0.136 J	0.0579 J	NA	NA
Anthracene	18,000	230,000	- -	mg/kg	0.176 J	0.158	0.068	NA	NA	NA	NA	0.195 J	0.0708 J	NA	NA
Benzo(a)anthracene	1.1	21	- -	mg/kg	0.671	0.399	0.238	NA	NA	NA	NA	0.742 J	0.256 J	**1.13 J**	0.0182 UJ
Benzo(a)pyrene	0.11	2.1	- -	mg/kg	**0.69**	**0.41**	**0.245**	NA	NA	NA	NA	**0.2 J**	**0.355 J**	**1.04 J**	0.0146 UJ
Benzo(b)fluoranthene	1.1	21	- -	mg/kg	**1.26**	0.473	0.299	NA	NA	NA	NA	**1.29 J**	0.621 J	**1.38 J**	0.0146 UJ
Benzo(g,h,i)perylene	- -	- -	- -	mg/kg	0.459 J	0.244	0.152	NA	NA	NA	NA	0.494 J	0.254 J	NA	NA
Benzo(k)fluoranthene	11	210	- -	mg/kg	0.392 J	0.222	0.124	NA	NA	NA	NA	0.187 J	0.196 J	NA	NA
Benzoic acid	250,000	3,300,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbazole	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	110	2,100	- -	mg/kg	0.763	0.39	0.223	NA	NA	NA	NA	0.854 J	0.322 J	NA	NA
Dibenzo(a,h)anthracene	0.11	2.1	- -	mg/kg	**0.346 J**	0.0667	0.0581 J	NA	NA	NA	NA	**0.128 J**	0.0454 J	**0.19 J**	0.00849 UJ
Dibenzofuran	73	1,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Di-n-butylphthalate	6,300	82,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	2,400	30,000	- -	mg/kg	1.31	0.847	0.461	NA	NA	NA	NA	1.3 J	0.483 J	NA	NA
Fluorene	2,400	30,000	- -	mg/kg	0.118 U	0.0576 J	0.0178 J	NA	NA	NA	NA	0.0238 UJ	0.0117 UJ	NA	NA
Indeno(1,2,3-cd)pyrene	1.1	21	- -	mg/kg	0.593 J	0.222	0.143	NA	NA	NA	NA	0.449 J	0.222 J	0.558 J	0.0121 UJ
Naphthalene	3.8	17	- -	mg/kg	0.0885 U	0.0184 J	0.0133 J	NA	NA	NA	NA	0.0922 J	0.04 J	NA	NA
Pentachlorophenol	1	4	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	- -	- -	- -	mg/kg	0.773	0.67	0.264	NA	NA	NA	NA	0.591 J	0.297 J	NA	NA
Phenol	19,000	250,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pyrene	1,800	23,000	- -	mg/kg	1.29	0.811	0.453	NA	NA	NA	NA	1.17 J	0.591 J	NA	NA
Detected Inorganics															
Arsenic	**	**	22.7	mg/kg	12.8	22.4	1.13 U	NA	NA	NA	NA	14.5	**56.4**	10.9	9.89
Lead	400	800	- -	mg/kg	390 J	137 J	**45,500**	25.8	56.4	55.6	74.4	159 J	67.7 J	NA	NA
Detected Pesticides															
2,4' DDD	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4'-DDE	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4'-DDT	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
trans-Nonachlor	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDD	1.9	9.6	- -	mg/kg	0.0043 U	0.00166 U	0.000415 U	NA	NA	NA	NA	0.0308 J	**30.8 DJ**	0.00491 UJ	0.000512 UJ
4,4'-DDE	2.0	9.3	- -	mg/kg	0.005 U	0.000488 U	0.000482 U	NA	NA	NA	NA	0.131 J	**24.5 DJ**	0.00571 UJ	0.000595 UJ
4,4'-DDT	1.9	8.5	- -	mg/kg	0.0085 U	0.000829 U	0.00082 U	NA	NA	NA	NA	0.0663 J	**591 DJ**	0.0097 UJ	0.00692 J
Aldrin	0.039	0.18	- -	mg/kg	0.0031 U	0.000302 U	0.000299 U	NA	NA	NA	NA	0.00307 UJ	0.0305 UJ	NA	NA
alpha-BHC	0.086	0.36	- -	mg/kg	0.002 U	0.000195 U	0.000193 U	NA	NA	NA	NA	0.00198 UJ	**0.164 J**	0.00228 UJ	0.000238 UJ
alpha-Chlordane	1.7	7.7	- -	mg/kg	0.0043 U	0.000419 U	0.000415 U	NA	NA	NA	NA	0.00426 UJ	0.0423 UJ	NA	NA
beta-BHC	0.3	1.3	- -	mg/kg	0.002 U	0.000195 U	0.000193 U	NA	NA	NA	NA	0.00198 UJ	**7.76 DJ**	0.00228 UJ	0.000238 UJ
Chlordane (technical)	1.7	7.7	- -	mg/kg	0.363 U	0.0354 U	0.035 U	NA	NA	NA	NA	0.36 UJ	357 UJ	NA	NA
delta-BHC	- -	- -	- -	mg/kg	0.0038 U	0.000371 U	0.000366 U	NA	NA	NA	NA	0.00377 UJ	0.0374 UJ	NA	NA
Dieldrin	0.034	0.14	- -	mg/kg	0.004 U	0.00039 U	0.000386 U	NA	NA	NA	NA	0.00397 UJ	**8.76 DJ**	0.00457 UJ	0.000476 UJ
Endosulfan I	470	7000	- -	mg/kg	0.0047 U	0.000458 U	0.000453 U	NA	NA	NA	NA	0.00466 UJ	0.0462 UJ	NA	NA
Endosulfan II	470	7000	- -	mg/kg	0.0055 U	0.000536 U	0.00053 U	NA	NA	NA	NA	0.00545 UJ	0.0541 UJ	NA	NA
Endosulfan sulfate	470	7000	- -	mg/kg	0.005 U	0.000488 U	0.000482 U	NA	NA	NA	NA	0.00496 UJ	0.0492 UJ	NA	NA
Endrin	19	250	- -	mg/kg	0.0043 U	0.000419 U	0.000415 U	NA	NA	NA	NA	0.00426 UJ	0.0423 UJ	NA	NA
Endrin aldehyde	- -	- -	- -	mg/kg	0.0051 U	0.000497 U	0.000492 U	NA	NA	NA	NA	0.00506 UJ	0.0501 UJ	NA	NA
Endrin ketone	- -	- -	- -	mg/kg	0.0059 U	0.000575 U	0.000569 U	NA	NA	NA	NA	0.00585 UJ	0.058 UJ	NA	NA
gamma-BHC (Lindane)	0.57	2.5	- -	mg/kg	0.0039 U	0.00038 U	0.000376 U	NA	NA	NA	NA	0.00387 UJ	0.0453 J	NA	NA
gamma-Chlordane	1.7	7.7	- -	mg/kg	0.0079 U	0.00077 U	0.000762 U	NA	NA	NA	NA	0.00783 UJ	**2.94 J**	NA	NA
Heptachlor	0.13	0.63	- -	mg/kg	0.0042 U	0.00041 U	0.000405 U	NA	NA	NA	NA	0.00417 UJ	0.0413 UJ	NA	NA
Heptachlor epoxide	0.07	0.33	- -	mg/kg	0.0065 U	0.000634 U	0.000627 U	NA	NA	NA	NA	0.00645 UJ	0.0639 UJ	NA	NA
Hexachlorobenzene	0.21	0.96	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methoxychlor	320	4,100	- -	mg/kg	0.0049 U	0.00322 U	0.00318 U	NA	NA	NA	NA	0.00486 UJ	0.0482 UJ	NA	NA
Toxaphene	0.49	2.1	- -	mg/kg	0.422 U	0.0412 U	0.0407 U	NA	NA	NA	NA	0.418 UJ	4.15 UJ	NA	NA

Table C-1
Summary of Soil Sample Analytical Results for all Depth Ranges
Corrective Action Plan Addendum
Former Black Leaf Chemical Site, Louisville, Kentucky

Location ID:	USEPA Residential	USEPA Industrial	Kentucky Arsenic		BL-SB-151R	BL-SB-152	BL-SB-152R	BL-SB-152R	BL-SB-152R	BL-SB-152R	BL-SB-152R	BL-SB-152R	BL-SB-152R	BL-SB-152R	BL-SB-153
Sample Depth(Feet):			Background		6 - 8	0 - 1	0 - 1	1 - 2	2 - 4	4 - 6	6 - 8	8 - 10	8 - 10	10 - 12	0 - 1
Date Collected:	Soil RSL Nov	Soil RSL	Guidance		09/30/14	09/16/14	09/30/14	09/30/14	09/30/14	09/30/14	09/30/14	09/30/14	06/24/15	06/24/15	09/17/14
Sample Name:	2017	Nov 2017		Units	BL-SB-151R_6_8	BL-SB-152_0_1	BL-SB-152R_0_1	BL-SB-152R_1_2	BL-SB-152R_2_4	BL-SB-152R_4_6	BL-SB-152R_6_8	BL-SB-152R_8_10	BL-SB-152R_8_10	BL-SB-152R_10_12	BL-SB-153_0_1
Detected Semivolatile Organics															
1,1'-Biphenyl	47	200	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4,5-Tetrachlorobenzene	23	350	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3&4-Methylphenol	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acetophenone	7,800	120,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1-methyl-Naphthalene	18	73	- -	mg/kg	NA	0.0296 J	0.0138 UJ	0.0138 UJ	NA	NA	NA	NA	NA	NA	0.0367 J
2,4,5-Trichlorophenol	6,300	82,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dimethylphenol	1,300	16,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzaldehyde	170	820	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	240	3,000	- -	mg/kg	NA	0.0374 J	0.0157 UJ	0.0158 UJ	NA	NA	NA	NA	NA	NA	0.0479 J
4,6-Dinitro-2-methylphenol	5.1	66	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthene	3,600	45,000	- -	mg/kg	NA	0.00984 U	0.00984 UJ	0.00988 UJ	NA	NA	NA	NA	NA	NA	0.00987 U
Acenaphthylene	- -	- -	- -	mg/kg	NA	0.00886 U	0.0784 J	0.00889 UJ	NA	NA	NA	NA	NA	NA	0.14
Anthracene	18,000	230,000	- -	mg/kg	NA	0.0242 J	0.0843 J	0.00889 UJ	NA	NA	NA	NA	NA	NA	0.0847
Benzo(a)anthracene	1.1	21	- -	mg/kg	0.018 UJ	0.0771	0.336 J	0.0148 UJ	0.255 J	0.0176 UJ	0.184 J	R	0.015 U	0.0147 U	0.441
Benzo(a)pyrene	0.11	2.1	- -	mg/kg	0.0144 UJ	0.0801	**0.336 J**	0.0119 UJ	**0.149 J**	0.0141 UJ	**0.146 J**	R	0.012 U	0.0117 U	**0.386**
Benzo(b)fluoranthene	1.1	21	- -	mg/kg	0.0144 UJ	0.149	0.583 J	0.0119 UJ	0.304 J	0.0141 UJ	0.195 J	R	0.012 U	0.0117 U	0.758
Benzo(g,h,i)perylene	- -	- -	- -	mg/kg	NA	0.0554 J	0.224 J	0.00889 UJ	NA	NA	NA	NA	NA	NA	0.286
Benzo(k)fluoranthene	11	210	- -	mg/kg	NA	0.0561 J	0.221 J	0.0138 UJ	NA	NA	NA	NA	NA	NA	0.207
Benzoic acid	250,000	3,300,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbazole	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	110	2,100	- -	mg/kg	NA	0.0836	0.361 J	0.00889 UJ	NA	NA	NA	NA	NA	NA	0.704
Dibenzo(a,h)anthracene	0.11	2.1	- -	mg/kg	0.0084 UJ	0.0375 J	0.0542 J	0.00692 UJ	0.0442 J	0.00822 UJ	0.00805 UJ	NA	NA	NA	0.104
Dibenzofuran	73	1,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Di-n-butylphthalate	6,300	82,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	2,400	30,000	- -	mg/kg	NA	0.105	0.577 J	0.00889 UJ	NA	NA	NA	NA	NA	NA	0.588
Fluorene	2,400	30,000	- -	mg/kg	NA	0.0118 U	0.0118 UJ	0.0119 UJ	NA	NA	NA	NA	NA	NA	0.0118 U
Indeno(1,2,3-cd)pyrene	1.1	21	- -	mg/kg	0.012 UJ	0.0714	0.215 J	0.00988 UJ	0.121 J	NA	NA	NA	NA	NA	0.238
Naphthalene	3.8	17	- -	mg/kg	NA	0.023 J	0.00885 UJ	0.00889 UJ	NA	NA	NA	NA	NA	NA	0.0403 J
Pentachlorophenol	1	4	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	- -	- -	- -	mg/kg	NA	0.0555 J	0.165 J	0.00889 UJ	NA	NA	NA	NA	NA	NA	0.172
Phenol	19,000	250,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pyrene	1,800	23,000	- -	mg/kg	NA	0.111	0.513 J	0.0119 UJ	NA	NA	NA	NA	NA	NA	0.589
Detected Inorganics															
Arsenic	**	**	22.7	mg/kg	NA	12.6	15.5	5.18	NA	NA	NA	NA	NA	NA	**157 J**
Lead	400	800	- -	mg/kg	NA	26.6 J	64.2 J	7.9 J	NA	NA	NA	NA	NA	NA	153 J
Detected Pesticides															
2,4' DDD	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4'-DDE	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4'-DDT	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
trans-Nonachlor	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDD	1.9	9.6	- -	mg/kg	NA	0.00167 U	0.00424 UJ	0.00408 UJ	NA	NA	NA	NA	NA	NA	0.00423 U
4,4'-DDE	2.0	9.3	- -	mg/kg	NA	0.00386 JN	0.00493 UJ	0.00474 UJ	NA	NA	NA	NA	NA	NA	0.0167 U
4,4'-DDT	1.9	8.5	- -	mg/kg	NA	0.00516 J	0.0172 J	0.00807 UJ	NA	NA	NA	NA	NA	NA	0.0224
Aldrin	0.039	0.18	- -	mg/kg	NA	0.000304 U	0.00306 UJ	0.00294 UJ	NA	NA	NA	NA	NA	NA	0.00305 U
alpha-BHC	0.086	0.36	- -	mg/kg	NA	0.000196 U	0.00197 UJ	0.0019 UJ	NA	NA	NA	NA	NA	NA	0.00197 U
alpha-Chlordane	1.7	7.7	- -	mg/kg	NA	0.000421 U	0.00424 UJ	0.00408 UJ	NA	NA	NA	NA	NA	NA	0.00423 U
beta-BHC	0.3	1.3	- -	mg/kg	NA	0.000196 U	0.00197 UJ	0.0019 UJ	NA	NA	NA	NA	NA	NA	0.00197 U
Chlordane (technical)	1.7	7.7	- -	mg/kg	NA	0.0356 U	0.358 UJ	0.344 UJ	NA	NA	NA	NA	NA	NA	0.357 U
delta-BHC	- -	- -	- -	mg/kg	NA	0.000372 U	0.00375 UJ	0.00361 UJ	NA	NA	NA	NA	NA	NA	0.00374 U
Dieldrin	0.034	0.14	- -	mg/kg	NA	0.00167 U	0.00394 UJ	0.0038 UJ	NA	NA	NA	NA	NA	NA	0.00394 U
Endosulfan I	470	7000	- -	mg/kg	NA	0.000461 U	0.00463 UJ	0.00446 UJ	NA	NA	NA	NA	NA	NA	0.00463 U
Endosulfan II	470	7000	- -	mg/kg	NA	0.000539 U	0.00542 UJ	0.00522 UJ	NA	NA	NA	NA	NA	NA	0.00542 U
Endosulfan sulfate	470	7000	- -	mg/kg	NA	0.00049 U	0.00493 UJ	0.00474 UJ	NA	NA	NA	NA	NA	NA	0.00492 U
Endrin	19	250	- -	mg/kg	NA	0.000421 U	0.00424 UJ	0.00408 UJ	NA	NA	NA	NA	NA	NA	0.00423 U
Endrin aldehyde	- -	- -	- -	mg/kg	NA	0.0005 U	0.00503 UJ	0.00484 UJ	NA	NA	NA	NA	NA	NA	0.00502 U
Endrin ketone	- -	- -	- -	mg/kg	NA	0.000578 U	0.00581 UJ	0.0056 UJ	NA	NA	NA	NA	NA	NA	0.00581 U
gamma-BHC (Lindane)	0.57	2.5	- -	mg/kg	NA	0.000382 U	0.00384 UJ	0.0037 UJ	NA	NA	NA	NA	NA	NA	0.00384 U
gamma-Chlordane	1.7	7.7	- -	mg/kg	NA	0.000774 U	0.00779 UJ	0.0075 UJ	NA	NA	NA	NA	NA	NA	0.00778 U
Heptachlor	0.13	0.63	- -	mg/kg	NA	0.00424	0.00414 UJ	0.00399 UJ	NA	NA	NA	NA	NA	NA	0.00414 U
Heptachlor epoxide	0.07	0.33	- -	mg/kg	NA	0.00167 U	0.00641 UJ	0.00617 UJ	NA	NA	NA	NA	NA	NA	0.0064 U
Hexachlorobenzene	0.21	0.96	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methoxychlor	320	4,100	- -	mg/kg	NA	0.00048 UJ	0.00483 UJ	0.00465 UJ	NA	NA	NA	NA	NA	NA	0.00483 U
Toxaphene	0.49	2.1	- -	mg/kg	NA	0.0414 U	0.416 UJ	0.4 UJ	NA	NA	NA	NA	NA	NA	0.416 U

Table C-1
Summary of Soil Sample Analytical Results for all Depth Ranges
Corrective Action Plan Addendum
Former Black Leaf Chemical Site, Louisville, Kentucky

Location ID:	USEPA	USEPA	Kentucky		BL-SB-153	BL-SB-153	BL-SB-154	BL-SB-154	BL-SB-154	BL-SB-154	SB-A1	SB-A2	SB-A3	SB-A4	SB-A5	SB-A6	SB-A7
Sample Depth(Feet):	Residential	Industrial	Arsenic		1 - 2	2 - 4	0 - 1	1 - 2	2 - 4	4 - 6	11 - 12	8 - 11	9 - 12	9 - 12	10 - 12	10 - 12	8 - 12
Date Collected:	Soil RSL Nov	Soil RSL	Background		09/17/14	09/17/14	09/17/14	09/17/14	09/17/14	09/17/14	12/06/11	12/06/11	12/06/11	12/06/11	12/06/11	12/06/11	12/06/11
Sample Name:	2017	Nov 2017	Guidance	Units	BL-SB-153_1_2	BL-SB-153_2_4	BL-SB-154_0_1	BL-SB-154_1_2	BL-SB-154_2_4	BL-SB-154_4_6	SB-A1	SB-A2	SB-A3	SB-A4	SB-A5	SB-A6	SB-A7
Detected Semivolatile Organics																	
1,1'-Biphenyl	47	200	- -	mg/kg	NA	NA	NA	NA	NA	NA	ND	ND	ND	ND	ND	ND	ND [ND]
1,2,4,5-Tetrachlorobenzene	23	350	- -	mg/kg	NA	NA	NA	NA	NA	NA	ND	ND	ND	ND	ND	ND	ND [ND]
3&4-Methylphenol	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	ND	ND	ND	ND	ND	ND	ND [ND]
Acetophenone	7,800	120,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	ND	ND	ND	ND	ND	ND	ND [ND]
1-methyl-Naphthalene	18	73	- -	mg/kg	0.0137 U	NA	0.0378 J	0.0977 [0.0546 J]	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4,5-Trichlorophenol	6,300	82,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	ND	ND	ND	ND	ND	ND	ND [ND]
2,4-Dimethylphenol	1,300	16,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	ND	ND	ND	ND	ND	ND	ND [ND]
Benzaldehyde	170	820	- -	mg/kg	NA	NA	NA	NA	NA	NA	ND	ND	ND	ND	ND	ND	ND [ND]
2-Methylnaphthalene	240	3,000	- -	mg/kg	0.0157 U	NA	0.0464 J	0.125 [0.0697]	NA	NA	ND	ND	ND	ND	ND	ND	ND [ND]
4,6-Dinitro-2-methylphenol	5.1	66	- -	mg/kg	NA	NA	NA	NA	NA	NA	ND	ND	0.517 J	ND	ND	ND	ND [ND]
Acenaphthene	3,600	45,000	- -	mg/kg	0.00982 U	NA	0.0099 U	0.01 U [0.0099 U]	NA	NA	ND	ND	ND	ND	ND	ND	ND [ND]
Acenaphthylene	- -	- -	- -	mg/kg	0.00884 U	NA	0.00891 U	0.009 U [0.00891 U]	NA	NA	NA	NA	NA	NA	NA	NA	NA
Anthracene	18,000	230,000	- -	mg/kg	0.00884 U	NA	0.0324 J	0.028 J [0.0176 J]	NA	NA	ND	ND	ND	ND	ND	ND	ND [ND]
Benzo(a)anthracene	1.1	21	- -	mg/kg	0.0147 U	0.0185 U	0.0774	0.0823 [0.0549 J]	NA	NA	ND	ND	ND	ND	ND	ND	ND [ND]
Benzo(a)pyrene	0.11	2.1	- -	mg/kg	0.0118 U	0.0148 U	0.101	0.0868 [0.0579 J]	0.0136 U	0.0143 U	0.0583 JB	0.0523 JB	0.0651 JB	0.1 U	0.056 UQ	0.058 U	0.058 U [0.0604 J]
Benzo(b)fluoranthene	1.1	21	- -	mg/kg	0.0118 U	0.0148 U	0.172	0.165 [0.0924]	0.0136 U	0.0143 U	0.189 B	0.175 B	0.2 B	ND	ND	ND	NA
Benzo(g,h,i)perylene	- -	- -	- -	mg/kg	0.00884 U	NA	0.0623 J	0.0685 [0.0383 J]	NA	NA	0.235	0.213	0.243	ND	ND	ND	NA
Benzo(k)fluoranthene	11	210	- -	mg/kg	0.0137 U	NA	0.0714	0.06 J [0.0437 J]	NA	NA	ND	ND	ND	ND	ND	ND	NA
Benzoic acid	250,000	3,300,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	0.531 JB	0.434 JB	0.504 JB	0.896 JB	ND	0.555 JB	0.537 JB [0.56 JB]
Carbazole	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	110	2,100	- -	mg/kg	0.00884 U	NA	0.104	0.106 [0.0642 J]	NA	NA	ND	ND	ND	ND	ND	ND	NA
Dibenzo(a,h)anthracene	0.11	2.1	- -	mg/kg	0.00687 U	0.00866 U	0.00693 U	0.007 U [0.00693 U]	NA	NA	**0.265**	0.052 U	**0.275**	0.1 U	0.056 UQ	0.058 U	**0.058 U [0.282]**
Dibenzofuran	73	1,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	ND	ND	ND	ND	ND	ND	ND [ND]
Di-n-butylphthalate	6,300	82,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	ND	ND	0.743 B	ND	ND	0.29 JB	ND [ND]
Fluoranthene	2,400	30,000	- -	mg/kg	0.00884 U	NA	0.0937	0.134 [0.0869]	NA	NA	ND	ND	ND	ND	ND	ND	ND [ND]
Fluorene	2,400	30,000	- -	mg/kg	0.0118 U	NA	0.0119 U	0.012 U [0.0119 U]	NA	NA	ND	ND	ND	ND	ND	ND	ND [ND]
Indeno(1,2,3-cd)pyrene	1.1	21	- -	mg/kg	0.00982 U	0.0124 U	0.0581 J	0.0558 J [0.0356 J]	NA	NA	0.413	0.377	0.426	ND	ND	ND	ND [0.434]
Naphthalene	3.8	17	- -	mg/kg	0.00884 U	NA	0.00891 U	0.0831 [0.045 J]	NA	NA	ND	ND	ND	ND	ND	ND	ND [ND]
Pentachlorophenol	1	4	- -	mg/kg	NA	NA	NA	NA	NA	NA	0.285	ND	0.296 JB	ND	ND	0.314 JB	ND [ND]
Phenanthrene	- -	- -	- -	mg/kg	0.00884 U	NA	0.0484 J	0.122 [0.0578 J]	NA	NA	ND	ND	ND	ND	ND	ND	ND [ND]
Phenol	19,000	250,000	- -	mg/kg	NA	NA	NA	NA	NA	NA	ND	ND	ND	ND	ND	ND	ND [ND]
Pyrene	1,800	23,000	- -	mg/kg	0.0118 U	NA	0.109	0.129 [0.0765]	NA	NA	ND	ND	ND	ND	ND	ND	ND [ND]
Detected Inorganics																	
Arsenic	**	**	22.7	mg/kg	15.3 J	18.2	4.24 J	1.06 UJ [7.86 J]	NA	NA	8.22	13.4	10.3	8.16	9.6	10.6	15 [11.9]
Lead	400	800	- -	mg/kg	14.8 J	NA	152 J	3.31 J [268 J]	NA	NA	7.1	11.6	7.68	7.9	7.92	9.17	11.8 [10.6]
Detected Pesticides																	
2,4' DDD	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	ND	ND	ND	ND	ND	ND	ND [ND]
2,4'-DDE	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	ND	ND	ND	ND	ND	ND	ND [ND]
2,4'-DDT	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	ND	ND	ND	ND	ND	ND	ND [0.0219]
trans-Nonachlor	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	ND	ND	ND	ND	ND	ND	ND [ND]
4,4'-DDD	1.9	9.6	- -	mg/kg	0.00042 U	NA	0.00409 U	0.00427 U [0.00424 U]	NA	NA	ND	ND	ND	ND	ND	ND	ND [ND]
4,4'-DDE	2.0	9.3	- -	mg/kg	0.000489 U	NA	0.00476 U	0.00497 U [0.01 J]	NA	NA	ND	ND	ND	ND	ND	ND	ND [0.0866 D]
4,4'-DDT	1.9	8.5	- -	mg/kg	0.00083 U	NA	0.00808 U	0.00845 U [0.0104 J]	NA	NA	ND	ND	ND	ND	ND	ND	0.00538 J [0.055 D]
Aldrin	0.039	0.18	- -	mg/kg	0.000303 U	NA	0.00295 U	0.00308 U [0.00306 U]	NA	NA	ND	ND	ND	ND	ND	ND	ND [ND]
alpha-BHC	0.086	0.36	- -	mg/kg	0.000195 U	NA	0.0019 U	0.00199 U [0.00197 U]	NA	NA	ND	ND	ND	ND	ND	ND	ND [ND]
alpha-Chlordane	1.7	7.7	- -	mg/kg	0.00042 U	NA	0.00409 U	0.00427 U [0.00424 U]	NA	NA	ND	ND	ND	ND	ND	ND	ND [ND]
beta-BHC	0.3	1.3	- -	mg/kg	0.000195 U	NA	0.0019 U	0.00199 U [0.00197 U]	NA	NA	ND	ND	ND	ND	ND	ND	ND [ND]
Chlordane (technical)	1.7	7.7	- -	mg/kg	0.0355 U	NA	0.345 U	0.361 U [0.358 U]	NA	NA	NA	NA	NA	NA	NA	NA	NA
delta-BHC	- -	- -	- -	mg/kg	0.000371 U	NA	0.00361 U	0.00378 U [0.00375 U]	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dieldrin	0.034	0.14	- -	mg/kg	0.000391 U	NA	0.0038 U	0.00398 U [0.00395 U]	NA	NA	ND	ND	ND	ND	ND	ND	ND [ND]
Endosulfan I	470	7000	- -	mg/kg	0.000459 U	NA	0.00447 U	0.00467 U [0.00464 U]	NA	NA	NA	NA	NA	NA	NA	NA	NA
Endosulfan II	470	7000	- -	mg/kg	0.000537 U	NA	0.00523 U	0.00547 U [0.00543 U]	NA	NA	NA	NA	NA	NA	NA	NA	NA
Endosulfan sulfate	470	7000	- -	mg/kg	0.000489 U	NA	0.00476 U	0.00497 U [0.00493 U]	NA	NA	NA	NA	NA	NA	NA	NA	NA
Endrin	19	250	- -	mg/kg	0.00042 U	NA	0.00409 U	0.00427 U [0.00424 U]	NA	NA	ND	ND	ND	ND	ND	ND	ND [ND]
Endrin aldehyde	- -	- -	- -	mg/kg	0.000498 U	NA	0.00485 U	0.00507 U [0.00503 U]	NA	NA	ND	ND	ND	ND	ND	ND	ND [ND]
Endrin ketone	- -	- -	- -	mg/kg	0.000576 U	NA	0.00561 U	0.00586 U [0.00582 U]	NA	NA	NA	NA	NA	NA	NA	NA	NA
gamma-BHC (Lindane)	0.57	2.5	- -	mg/kg	0.000381 U	NA	0.00371 U	0.00388 U [0.00385 U]	NA	NA	ND	ND	ND	ND	ND	ND	ND [ND]
gamma-Chlordane	1.7	7.7	- -	mg/kg	0.000772 U	NA	0.00751 U	0.00785 U [0.00779 U]	NA	NA	ND	ND	ND	ND	ND	ND	ND [ND]
Heptachlor	0.13	0.63	- -	mg/kg	0.00041 U	NA	0.00399 U	0.00417 U [0.00414 U]	NA	NA	ND	ND	ND	ND	ND	ND	ND [ND]
Heptachlor epoxide	0.07	0.33	- -	mg/kg	0.000635 U	NA	0.00618 U	0.00646 U [0.00641 U]	NA	NA	ND	ND	ND	ND	ND	ND	ND [ND]
Hexachlorobenzene	0.21	0.96	- -	mg/kg	NA	NA	NA	NA	NA	NA	ND	ND	ND	ND	ND	ND	ND [ND]
Methoxychlor	320	4,100	- -	mg/kg	0.000479 U	NA	0.00466 U	0.00487 U [0.00483 U]	NA	NA	ND	ND	ND	ND	ND	ND	ND [ND]
Toxaphene	0.49	2.1	- -	mg/kg	0.0412 U	NA	0.401 U	0.419 U [0.416 U]	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table C-1
Summary of Soil Sample Analytical Results for all Depth Ranges
Corrective Action Plan Addendum
Former Black Leaf Chemical Site, Louisville, Kentucky

Location ID:	USEPA Residential	USEPA Industrial	Kentucky Arsenic		SB-A8	SB-A9	SS-A1	SS-A2	SS-A3	SS-A4	SS-A5	SS-A6	SS-A7	SS-A8	SS-A9
Sample Depth(Feet):					10 - 12	10 - 12	0 - 4	0 - 4	0 - 4	0 - 4	0 - 4	0 - 4	0 - 4	0 - 1	0 - 1
Date Collected:	Soil RSL Nov	Soil RSL	Background		12/06/11	12/06/11	12/06/11	12/06/11	12/06/11	12/06/11	12/06/11	12/06/11	12/06/11	12/06/11	12/06/11
Sample Name:	2017	Nov 2017	Guidance	Units	SB-A8	SB-A9	SS-A1	SS-A2	SS-A3	SS-A4	SS-A5	SS-A6	SS-A7	SS-A8	SS-A9
Detected Semivolatile Organics															
1,1'-Biphenyl	47	200	- -	mg/kg	ND	ND	ND	ND	ND	ND	ND [ND]	ND	ND	ND	ND
1,2,4,5-Tetrachlorobenzene	23	350	- -	mg/kg	ND	ND	ND	ND	ND	ND	ND [ND]	ND	ND	ND	ND
3&4-Methylphenol	- -	- -	- -	mg/kg	ND	ND	0.321	ND	ND	ND	ND [ND]	ND	ND	ND	ND
Acetophenone	7,800	120,000	- -	mg/kg	ND	ND	ND	ND	ND	ND	ND [0.238 J]	ND	ND	ND	ND
1-methyl-Naphthalene	18	73	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4,5-Trichlorophenol	6,300	82,000	- -	mg/kg	ND	ND	ND	ND	ND	ND	ND [ND]	ND	ND	ND	ND
2,4-Dimethylphenol	1,300	16,000	- -	mg/kg	ND	ND	0.354	ND	ND	ND	ND [ND]	ND	ND	ND	ND
Benzaldehyde	170	820	- -	mg/kg	ND	ND	ND	ND	ND	ND	ND [ND]	ND	ND	ND	ND
2-Methylnaphthalene	240	3,000	- -	mg/kg	ND	ND	9.4	ND	ND	ND	ND [1.17]	ND	ND	ND	0.872
4,6-Dinitro-2-methylphenol	5.1	66	- -	mg/kg	ND	ND	ND	ND	ND	ND	ND [ND]	ND	ND	ND	ND
Acenaphthene	3,600	45,000	- -	mg/kg	ND	ND	ND	ND	ND	ND	ND [ND]	ND	ND	ND	ND
Acenaphthylene	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Anthracene	18,000	230,000	- -	mg/kg	ND	ND	0.408	ND	ND	ND	ND [ND]	ND	ND	ND	ND
Benzo(a)anthracene	1.1	21	- -	mg/kg	ND	ND	0.727	ND	0.0831 J	ND	ND [0.0868 J]	ND	ND	ND	ND
Benzo(a)pyrene	0.11	2.1	- -	mg/kg	0.057 U	0.063 U	**0.556 B**	0.0658 JB	**0.202 B**	0.0589 JB	**0.198 B [0.145]**	**0.15**	0.0679 J	0.0632 J	**0.125**
Benzo(b)fluoranthene	1.1	21	- -	mg/kg	0.191	ND	0.812 B	0.208 B	0.457 B	0.193 B	0.474 B [0.357]	0.322	0.215	0.205	0.276
Benzo(g,h,i)perylene	- -	- -	- -	mg/kg	ND	ND	0.579	0.247	0.336	0.237	0.503 [0.297]	0.331	0.258	ND	0.274
Benzo(k)fluoranthene	11	210	- -	mg/kg	ND	ND	0.105 J	ND	ND	ND	ND [ND]	ND	ND	ND	ND
Benzoic acid	250,000	3,300,000	- -	mg/kg	0.561 JB	0.683 B	ND	0.535 JB	0.529 JB	0.503 JB	0.883 JB [0.775 B]	0.587 JB	0.601 B	0.608 B	0.597 B
Carbazole	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	110	2,100	- -	mg/kg	ND	ND	0.747	ND	0.13 J	ND	0.116 J [0.131 J]	0.0978 J	ND	ND	0.0683 J
Dibenzo(a,h)anthracene	0.11	2.1	- -	mg/kg	0.057 U	0.063 U	**0.342**	0.059 U	0.059 U	0.058 U	**0.478 [0.292]**	**0.303**	0.06 U	0.06 U	**0.284**
Dibenzofuran	73	1,000	- -	mg/kg	ND	ND	2.57	ND	ND	ND	ND [ND]	ND	ND	ND	ND
Di-n-butylphthalate	6,300	82,000	- -	mg/kg	0.341 JB	ND	ND	ND	0.591 J	ND	ND [0.338 JB]	ND	0.265 JB	ND	0.25 JB
Fluoranthene	2,400	30,000	- -	mg/kg	ND	ND	0.743	ND	0.0701 J	ND	ND [0.128 J]	0.0983 J	ND	ND	ND
Fluorene	2,400	30,000	- -	mg/kg	ND	ND	0.164	ND	ND	ND	ND [ND]	ND	ND	ND	ND
Indeno(1,2,3-cd)pyrene	1.1	21	- -	mg/kg	ND	ND	0.518	0.433	0.527	0.42	0.766 [0.463]	0.514	0.446	0.438	0.457
Naphthalene	3.8	17	- -	mg/kg	ND	ND	**6.25**	ND	ND	ND	0.0989 J [0.747]	ND	ND	ND	0.271
Pentachlorophenol	1	4	- -	mg/kg	0.287 JB	0.298 JB	ND	0.292 JB	0.298 JB	0.28 JB	0.452 JB [ND]	ND	0.321 JB	0.292 JB	ND
Phenanthrene	- -	- -	- -	mg/kg	ND	ND	4.81	ND	ND	ND	0.161 [0.652]	0.109 J	ND	ND	0.472
Phenol	19,000	250,000	- -	mg/kg	ND	ND	0.266	ND	ND	ND	ND [ND]	ND	ND	ND	ND
Pyrene	1,800	23,000	- -	mg/kg	ND	ND	0.81	ND	0.107 J	ND	ND [0.122 J]	0.106 J	ND	ND	ND
Detected Inorganics															
Arsenic	**	**	22.7	mg/kg	10.7	20.8	9.79 Q	14.8	8.98	11.8	13.5 [8.7]	7.22	8.91	14.6	13.8
Lead	400	800	- -	mg/kg	9.6	16.3	19.8 Q	36.8	40.8	13.9	48.7 [30.9]	32.1	32.4	14.9	18.7
Detected Pesticides															
2,4' DDD	- -	- -	- -	mg/kg	ND	ND	ND	ND	ND	ND	ND [0.656 D]	ND	ND	ND	ND
2,4'-DDE	- -	- -	- -	mg/kg	ND	ND	ND	ND	ND	ND	ND [1.05 DE]	ND	ND	ND	ND
2,4'-DDT	- -	- -	- -	mg/kg	ND	ND	ND	ND	ND	ND	ND [6.31 D]	ND	ND	ND	ND
trans-Nonachlor	- -	- -	- -	mg/kg	ND	ND	0.0198	ND	0.00589	ND	0.00335 J [ND]	ND	ND	ND	ND
4,4'-DDD	1.9	9.6	- -	mg/kg	ND	ND	ND	ND	ND	ND	**ND [5.17]**	ND	ND	ND	ND
4,4'-DDE	2.0	9.3	- -	mg/kg	ND	ND	ND	ND	0.0224	ND	0.442 D [0.503 J]	0.00602 J	ND	ND	0.0041 J
4,4'-DDT	1.9	8.5	- -	mg/kg	ND	ND	0.00807 J	ND	0.0141	ND	**0.0985 D [24.9 D]**	ND	ND	ND	ND
Aldrin	0.039	0.18	- -	mg/kg	ND	ND	ND	ND	ND	ND	ND [ND]	ND	ND	ND	ND
alpha-BHC	0.086	0.36	- -	mg/kg	ND	ND	ND	ND	ND	ND	ND [0.0115]	ND	ND	ND	ND
alpha-Chlordane	1.7	7.7	- -	mg/kg	ND	ND	ND	ND	ND	ND	ND [0.115 D]	ND	ND	ND	ND
beta-BHC	0.3	1.3	- -	mg/kg	ND	ND	ND	ND	ND	ND	0.0132 [0.0277]	ND	ND	ND	ND
Chlordane (technical)	1.7	7.7	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
delta-BHC	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dieldrin	0.034	0.14	- -	mg/kg	ND	ND	ND	ND	0.00383 J	ND	**0.00956 [0.268 D]**	0.00236 J	ND	ND	ND
Endosulfan I	470	7000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Endosulfan II	470	7000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Endosulfan sulfate	470	7000	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Endrin	19	250	- -	mg/kg	ND	ND	ND	ND	ND	ND	ND [0.0108]	ND	ND	ND	ND
Endrin aldehyde	- -	- -	- -	mg/kg	ND	ND	0.00651 N	ND	ND	ND	ND [ND]	ND	ND	ND	ND
Endrin ketone	- -	- -	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
gamma-BHC (Lindane)	0.57	2.5	- -	mg/kg	ND	ND	ND	ND	ND	ND	ND [ND]	ND	ND	ND	ND
gamma-Chlordane	1.7	7.7	- -	mg/kg	ND	ND	ND	ND	ND	ND	ND [0.159 DNJ]	ND	ND	ND	ND
Heptachlor	0.13	0.63	- -	mg/kg	ND	ND	ND	ND	ND	ND	ND [ND]	ND	ND	ND	ND
Heptachlor epoxide	0.07	0.33	- -	mg/kg	ND	ND	ND	ND	ND	ND	ND [ND]	ND	ND	ND	ND
Hexachlorobenzene	0.21	0.96	- -	mg/kg	ND	ND	0.0266	0.0179	ND	ND	ND [ND]	ND	ND	ND	ND
Methoxychlor	320	4,100	- -	mg/kg	ND	ND	ND	ND	ND	ND	ND [ND]	ND	ND	ND	ND
Toxaphene	0.49	2.1	- -	mg/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes:
mg/kg = milligrams per kilogram
U = not detected
J = estimated value
H = sample analyzed outside of hold time
B = compound found in the blank and the sample
N = Spike sample recovery not within control limits
R = Rejected
Q = QC Limits Exceeded
D = Reanalyzed at a Higher Dilution
NA = Not Analyzed
USEPA = United States Environmental Protection Agency
RSL = Regional Screening Level
1. Green-shaded concentrations exceed USEPA Residential RSLs (Nov 2017).
2. Grey-shaded concentrations exceed USEPA Industrial RSLs (Nov 2017)
3. Duplicate concentrations are presented in brackets.
** Arsenic criteria is based on the Arsenic Background Guidance (KDEP RAS 2008). Shaded values for arsenic are greater than the 95th percentile of 22.7 mg/kg as stated in the guidance.

Table C-2
Summary of Detected Sediment Sample Analytical Results
Corrective Action Plan Addendum
Former Black Leaf Chemical Site, Louisville, Kentucky

Location ID: Sample Depth(Feet): Date Collected: Sample Name:	USEPA Residential Soil RSL Nov 2017	USEPA Industrial Soil RSL Nov 2017	Kentucky Arsenic Background Guidance	Units	BL-CB-1 0 - 1 09/20/14 BL-CB-1_0_1	BL-CB-02 0 - 1 09/21/14 BL-CB-02_0_1	BL-CB-03 0 - 1 09/21/14 BL-CB-03_0_1	BL-CB-4 0 - 1 09/20/14 BL-CB-4_0_1	BL-CB-5 0 - 1 09/20/14 BL-CB-5_0_1	BL-CB-06 0 - 1 09/21/14 BL-CB-06_0_1	BL-CB-07 0 - 1 09/21/14 BL-CB-07_0_1	BL-CB-08 0 - 1 09/21/14 BL-CB-08_0_1	BL-CB-09 0 - 1 09/21/14 BL-CB-09_0_1
Semivolatile Organics					1	2	3	4	5	6	7	8	9
1-methyl-Naphthalene	18	73	- -	mg/kg	0.0318 U	0.047 U	0.0762 U	0.258 U	0.0769 U	0.326 J	0.296 U	0.153 U	0.0901 UJ
2-Methylnaphthalene	240	3,000	- -	mg/kg	0.0363 U	0.0537 U	0.0871 U	0.295 U	0.0879 U	0.459 J	0.339 U	0.175 U	0.103 UJ
Acenaphthene	3,600	45,000	- -	mg/kg	0.0227 U	0.0335 U	0.0544 U	0.832 J	0.0549 U	0.689 J	0.212 U	0.109 U	0.0644 UJ
Acenaphthylene	- -	- -	- -	mg/kg	0.0204 U	0.0302 U	0.049 U	0.166 U	0.0495 U	0.118 U	0.19 U	0.0985 U	0.0579 UJ
Anthracene	18,000	230,000	- -	mg/kg	0.0204 U	0.0302 U	0.0715 J	1.31	0.106 J	1.19	0.548 J	0.372 J	0.237 J
Benzo(a)anthracene	1.1	21	- -	mg/kg	0.0341 U	0.0503 U	0.231 J	**4.22**	0.483	**3.49**	**2.11**	**1.29**	**1.25 J**
Benzo(a)pyrene	0.11	2.1	- -	mg/kg	0.0273 U	0.0402 U	**0.182 J**	**3.58**	**0.472**	**3.16**	**1.96**	**1.66**	**0.52 J**
Benzo(b)fluoranthene	1.1	21	- -	mg/kg	0.0273 U	0.0402 U	0.303 J	**5.63**	0.771	**4.83**	**2.99**	**3.39**	0.932 J
Benzo(g,h,i)perylene	- -	- -	- -	mg/kg	0.0204 U	0.0302 U	0.049 U	2.44	0.328 J	2.1	1.43	1.31	0.365 J
Benzo(k)fluoranthene	11	210	- -	mg/kg	0.0318 U	0.047 U	0.1 J	2.33	0.276 J	2.16	1.29 J	1.11	0.195 J
Chrysene	110	2,100	- -	mg/kg	0.0204 U	0.0302 U	0.22 J	4.57	0.586	4.43	2.53	1.75	0.543 J
Dibenzo(a,h)anthracene	0.11	2.1	- -	mg/kg	0.0159 U	0.0235 U	0.0381 U	0.129 U	0.0385 U	**0.491 J**	0.148 U	**0.445 J**	0.0451 UJ
Fluoranthene	2,400	30,000	- -	mg/kg	0.0204 U	0.168 J	0.483	11	1.23	9.99	4.92	2.06	1.48 J
Fluorene	2,400	30,000	- -	mg/kg	0.0273 U	0.0402 U	0.0653 U	0.458 J	0.0659 U	0.623 J	0.254 U	0.131 U	0.0773 UJ
Indeno(1,2,3-cd)pyrene	1.1	21	- -	mg/kg	0.0227 U	0.0335 U	0.0544 U	**2.05**	0.269 J	**1.84**	**1.2 J**	**1.16**	0.31 J
Naphthalene	3.8	17	- -	mg/kg	0.0204 U	0.0302 U	0.049 U	0.166 U	0.0495 U	0.271 J	0.19 U	0.0985 U	0.0579 UJ
Phenanthrene	- -	- -	- -	mg/kg	0.0204 U	0.123 J	0.327 J	7.75	0.691	8.69	3.21	0.987	1.01 J
Pyrene	1,800	23,000	- -	mg/kg	0.0273 U	0.144 J	0.443	9.16	1.03	8.8	4.43	2.1	1.15 J
Inorganics													
Arsenic	**	**	22.7	mg/kg	1.86 J	1.55 J	2.08 J	3.04 J	1.29 J	4.02 J	2.64 J	21.8 J	3.19 J
Lead	400	800	- -	mg/kg	7.09 J	19.2 J	24.8 J	99.6 J	59.5 J	119 J	48.5 J	**552 J**	45 J
Pesticides													
4,4'-DDD	1.9	9.6	- -	mg/kg	0.152	0.00426 U	0.0214 UJ	0.00859 U	0.00846 U	0.0429 UJ	0.043 UJ	0.14	0.0429 UJ
4,4'-DDE	2.0	9.3	- -	mg/kg	0.0388	0.00496 U	0.0249 UJ	0.00998 U	0.00984 U	0.0499 UJ	0.05 UJ	0.409	0.0499 UJ
4,4'-DDT	1.9	8.5	- -	mg/kg	0.0197	0.00843 U	0.0423 UJ	0.017 U	0.0167 U	0.0849 UJ	0.085 UJ	0.559	0.0849 UJ
Dieldrin	0.034	0.14	- -	mg/kg	0.00397 U	0.00397 U	0.0199 UJ	0.00799 U	0.00787 U	0.0399 UJ	0.04 UJ	**0.0343**	0.0399 UJ

Notes:
J = estimated value
U = not detected
mg/kg = milligrams per kilogram
USEPA = United States Environmental Protection Agency
RSL = Regional Screening Level
1. Green-shaded concentrations exceed USEPA Residential RSLs (November 2017).
2. Grey-shaded concentrations exceed USEPA Industrial RSLs (November 2017).
3. Duplicate concentrations are presented in brackets.
** Arsenic criteria is based on the Arsenic Background Guidance (KDEP RAS 2008). Shaded values for arsenic are greater than the 95th percentile of 22.7 mg/kg as stated in the guidance.

Table C-2
Summary of Detected Sediment Sample Analytical Results
Corrective Action Plan Addendum
Former Black Leaf Chemical Site, Louisville, Kentucky

Location ID: Sample Depth(Feet): Date Collected: Sample Name:	USEPA Residential Soil RSL Nov 2017	USEPA Industrial Soil RSL Nov 2017	Kentucky Arsenic Background Guidance	Units	BL-CB-10 0 - 1 09/21/14 BL-CB-10_0_1	BL-MH-12 0 - 1 09/21/14 BL-MH-12_0_1	BL-MH-13 0 - 1 09/21/14 BL-MH-13_0_1	BL-CB-14 0 - 1 09/20/14 BL-CB-14_0_1	BL-MH-15 0 - 1 09/20/14 BL-MH-15_0_1
Semivolatile Organics					10	12	13	11	14
1-methyl-Naphthalene	18	73	- -	mg/kg	0.0193 U	0.0147 U	0.0157 U	0.0286 U	0.0803 U
2-Methylnaphthalene	240	3,000	- -	mg/kg	0.022 U	0.0168 U	0.0179 U	0.0327 U	0.0918 U
Acenaphthene	3,600	45,000	- -	mg/kg	0.0138 U	0.0105 U	0.0112 U	0.0204 U	0.0573 U
Acenaphthylene	- -	- -	- -	mg/kg	0.0124 U	0.00946 U	0.0101 U	0.0184 U	0.476
Anthracene	18,000	230,000	- -	mg/kg	0.0334 J	0.0345 J	0.0518 J	0.156	0.839
Benzo(a)anthracene	1.1	21	- -	mg/kg	0.0847 J	0.175	0.249	0.986	**3.6**
Benzo(a)pyrene	0.11	2.1	- -	mg/kg	0.0724 J	**0.137**	**0.243**	**0.848**	**3.15**
Benzo(b)fluoranthene	1.1	21	- -	mg/kg	0.104	0.287	0.404	**1.37**	**4.94**
Benzo(g,h,i)perylene	- -	- -	- -	mg/kg	0.0497 J	0.106	0.176	0.57	1.81
Benzo(k)fluoranthene	11	210	- -	mg/kg	0.0434 J	0.105	0.165	0.486	1.87
Chrysene	110	2,100	- -	mg/kg	0.095	0.225	0.289	1.1	3.91
Dibenzo(a,h)anthracene	0.11	2.1	- -	mg/kg	0.00963 U	0.00736 U	0.0518 J	**0.141**	**0.524**
Fluoranthene	2,400	30,000	- -	mg/kg	0.221	0.32	0.512	2.09	7.17
Fluorene	2,400	30,000	- -	mg/kg	0.0165 U	0.0126 U	0.0134 U	0.0245 U	0.213 J
Indeno(1,2,3-cd)pyrene	1.1	21	- -	mg/kg	0.0138 U	0.105	0.148	0.5	**1.76**
Naphthalene	3.8	17	- -	mg/kg	0.0124 U	0.00946 U	0.0101 U	0.0184 U	0.0516 U
Phenanthrene	- -	- -	- -	mg/kg	0.177	0.167	0.198	1.06	3.22
Pyrene	1,800	23,000	- -	mg/kg	0.19	0.3	0.517	1.93	6.34
Inorganics									
Arsenic	**	**	22.7	mg/kg	3.96 J	0.938 UJ	1.01 UJ	**42.8 J**	**59.9 J**
Lead	400	800	- -	mg/kg	28.2 J	5.11 J	25.4 J	254 J	89.7 J
Pesticides									
4,4'-DDD	1.9	9.6	- -	mg/kg	0.00427 U	0.00429 U	0.00428 U	0.0169 U	0.0168 U
4,4'-DDE	2.0	9.3	- -	mg/kg	0.0088 J	0.0136 J	0.0128 J	0.0169 U	0.0386 J
4,4'-DDT	1.9	8.5	- -	mg/kg	0.00845 U	0.00848 U	0.0113 J	0.0128 J	0.0723
Dieldrin	0.034	0.14	- -	mg/kg	0.00398 U	0.00399 U	0.00398 U	0.00398 U	0.00396 U

Notes:
J = estimated value
U = not detected
mg/kg = milligrams per kilogram
USEPA = United States Environmental Protection Agency
RSL = Regional Screening Level
1. Green-shaded concentrations exceed USEPA Residential RSLs (November 2017).
2. Grey-shaded concentrations exceed USEPA Industrial RSLs (November 2017).
3. Duplicate concentrations are presented in brackets.
** Arsenic criteria is based on the Arsenic Background Guidance (KDEP RAS 2008). Shaded values for arsenic are greater than the 95th percentile of 22.7 mg/kg as stated in the guidance.

APPENDIX D

Arsenic Evaluation Calculations

KDEP RAS 2008 Memorandum Statistics Summary (0-1 feet)
Former Black Leaf Chemical Site, Louisville, Kentucky

KDEP RAS 2008 Memorandum Requirements	Baseline		After Proposed Samples Removed	
Mean arsenic concentration (should be less than 13.12 mg/kg)	25.06	mg/kg	10.65	mg/kg
Percentage of data points less than 10.6 mg/kg (should be less than 50%)	68%	%	50%	%
Percentage of data points greater than 22.7 mg/kg (should be 0%)	25%	%	0%	%

RA-70 Memorandum Statistics Calculations for Baseline Soil (0-1 feet)
Former Black Leaf Chemical Site, Louisville, Kentucky

25.06	mg/kg	AVERAGE
41.17	mg/kg	STANDARD DEVIATION

Using RA-70 Memorandum Values:

110	Total number of samples in dataset
75	Total number of samples greater than (>) 10.6 mg/kg.
68%	Percent of samples greater than (>) 10.6 mg/kg.
27	Total number of samples greater than (>) 22.7 mg/kg.
25%	Percent of samples greater than (>) 22.7 mg/kg.

Notes:

Non-detected samples were retained in the dataset as half of the detection limit (USEPA 1998, KYDEP 2004).
The maximum of duplicate samples was included in the dataset/calculations.
Pink/red cells have conditional formatting for the following rules:

- Site arithmetic mean (average) cannot exceed 13.12 mg/kg
- Percent of samples greater than 10.6 mg/kg (or 60th percentile) should not exceed 50%
- Percent of samples greater than 22.7 mg/kg (or 95% percentile) should not exceed 0%

0-1 ft bgs Dataset:

Sample Name:	Sample Depth (Feet):	Date Collected:	Arsenic (mg/kg)	Grubb's Test Z-Score:
BLC-SS-01	0 - 1	10/25/2010	7.4	0.43
BLC-SS-02	0 - 1	10/25/2010	11	0.34
BLC-SS-03	0 - 1	10/25/2010	5.6	0.47
BLC-SS-04	0 - 1	10/25/2010	9.5	0.38
BLC-SS-05	0 - 1	10/25/2010	8.7	0.40
BLC-SS-06	0 - 1	10/25/2010	15	0.24
BLC-SS-07	0 - 1	10/25/2010	24	0.03
BLC-SS-08	0 - 1	10/25/2010	22	0.07
BLC-SS-09	0 - 1	10/25/2010	5.1	0.48
BLC-SS-10	0 - 1	10/25/2010	9	0.39
BLC-SS-11	0 - 1	10/25/2010	14	0.27
BLC-SS-13	0 - 1	10/27/2010	15	0.24
BLC-SS-14	0 - 1	10/27/2010	15	0.24
BLC-SS-15	0 - 1	10/27/2010	14	0.27
BLC-SS-16	0 - 1	10/27/2010	24	0.03
BLC-SS-17	0 - 1	10/27/2010	15	0.24
BLC-SS-18	0 - 1	10/27/2010	18	0.17
BLC-SS-19	0 - 1	10/25/2010	56	0.75
BLC-SS-20	0 - 1	10/26/2010	40	0.36
BLC-SS-21	0 - 1	10/27/2010	47	0.53
BLC-SS-22	0 - 1	10/27/2010	18	0.17

RA-70 Memorandum Statistics Calculations for Baseline Soil (0-1 feet)
Former Black Leaf Chemical Site, Louisville, Kentucky

Sample Name:	Sample Depth (Feet):	Date Collected:	Arsenic (mg/kg)	Grubb's Test Z-Score:
BLC-SS-23	0 - 1	10/27/2010	13	0.29
BLC-SS-24	0 - 1	10/27/2010	34	0.22
BLC-SS-25	0 - 1	10/27/2010	39	0.34
BLC-SS-26	0 - 1	10/27/2010	31	0.14
BLC-SS-27	0 - 1	10/27/2010	12	0.32
BLC-SS-28	0 - 1	10/27/2010	17	0.20
BLC-SS-29	0 - 1	10/27/2010	13	0.29
BLC-SS-30	0 - 1	10/27/2010	33	0.19
BLC-SS-40		9/22/2011	6.08	0.46
BLC-SS-41		9/22/2011	29	0.10
BLC-SS-42		9/22/2011	10.9	0.34
BLC-SS-43		9/22/2011	53.6	0.69
BLC-SS-44		9/22/2011	5.4	0.48
BLC-SS-45		9/22/2011	20.6	0.11
BLC-SS-46		9/22/2011	22.6	0.06
BLC-SS-47		9/22/2011	54.3	0.71
BLC-SS-48		9/22/2011	38.1	0.32
BLC-SS-49		9/22/2011	6.67	0.45
BLC-SS-50		9/22/2011	18	0.17
BLC-SS-51		9/22/2011	22.7	0.06
SS-A1	0 - 4	12/6/2011	9.79	0.37
SS-A2	0 - 4	12/6/2011	14.8	0.25
SS-A3	0 - 4	12/6/2011	8.98	0.39
SS-A4	0 - 4	12/6/2011	11.8	0.32
SS-A5	0 - 4	12/6/2011	13.5	0.28
SS-A6	0 - 4	12/6/2011	7.22	0.43
SS-A7	0 - 4	12/6/2011	8.91	0.39
SS-A8	0 - 1	12/6/2011	14.6	0.25
SS-A9	0 - 1	12/6/2011	13.8	0.27
BL-SB-100_0_1	0 - 1	9/20/2014	12.9	0.30
BL-SB-101_0_1	0 - 1	9/20/2014	15.8	0.22
BL-SB-102_0_1	0 - 1	9/20/2014	1.64	0.57
BL-SB-102R_0_1	0 - 1	9/30/2014	8.12	0.41
BL-SB-103_0_1	0 - 1	9/19/2014	17.3	0.19
BL-SB-104_0_1	0 - 1	9/29/2014	0.4645	0.60
BL-SB-105_0_1	0 - 1	9/20/2014	6.92	0.44
BL-SB-106_0_1	0 - 1	9/19/2014	8.52	0.40
BL-SB-107_0_1	0 - 1	9/20/2014	12.1	0.31
BL-SB-108_0_1	0 - 1	9/20/2014	28.4	0.08
BL-SB-109_0_1	0 - 1	9/20/2014	8.41	0.40
BL-SB-110_0_1	0 - 1	9/19/2014	14.8	0.25
BL-SB-111_0_1	0 - 1	9/19/2014	8.21	0.41
BL-SB-113_0_1	0 - 1	9/19/2014	62.2	0.90
BL-SB-114_0_1	0 - 1	9/19/2014	8.36	0.41
BL-SB-115_0_1	0 - 1	9/19/2014	8.11	0.41

RA-70 Memorandum Statistics Calculations for Baseline Soil (0-1 feet)
Former Black Leaf Chemical Site, Louisville, Kentucky

Sample Name:	Sample Depth (Feet):	Date Collected:	Arsenic (mg/kg)	Grubb's Test Z-Score:
BL-SB-116_0_1	0 - 1	9/21/2014	12.4	0.31
BL-SB-117_0_1	0 - 1	9/21/2014	7.44	0.43
BL-SB-118_0_1	0 - 1	9/19/2014	7.25	0.43
BL-SB-118R_0_1	0 - 1	9/30/2014	10.1	0.36
BL-SB-119_0_1	0 - 1	9/19/2014	17.4	0.19
BL-SB-120_0_1	0 - 1	9/19/2014	15.8	0.22
BL-SB-121_0_1	0 - 1	9/18/2014	30.2	0.12
BL-SB-122_0_1	0 - 1	9/18/2014	200	4.25
BL-SB-123_0_1	0 - 1	9/18/2014	11.2	0.34
BL-SB-124_0_1	0 - 1	9/20/2014	337	7.58
BL-SB-125_0_1	0 - 1	9/19/2014	14.4	0.26
BL-SB-126_0_1	0 - 1	9/18/2014	14.7	0.25
BL-SB-126R_0_1	0 - 1	9/29/2014	36.1	0.27
BL-SB-127_0_1	0 - 1	9/21/2014	10.7	0.35
BL-SB-128_0_1	0 - 1	9/21/2014	10.5	0.35
BL-SB-129_0_1	0 - 1	9/21/2014	7.04	0.44
BL-SB-130_0_1	0 - 1	9/18/2014	9.13	0.39
BL-SB-131_0_1	0 - 1	9/18/2014	13	0.29
BL-SB-132_0_1	0 - 1	9/18/2014	16.5	0.21
BL-SB-133_0_1	0 - 1	9/18/2014	16.8	0.20
BL-SB-134_0_1	0 - 1	9/21/2014	8.83	0.39
BL-SB-135_0_1	0 - 1	9/18/2014	30.7	0.14
BL-SB-136_0_1	0 - 1	9/18/2014	13.3	0.29
BL-SB-137_0_1	0 - 1	9/17/2014	112	2.11
BL-SB-138_0_1	0 - 1	9/17/2014	0.4855	0.60
BL-SB-139_0_1	0 - 1	9/16/2014	15.7	0.23
BL-SB-140_0_1	0 - 1	9/16/2014	10.8	0.35
BL-SB-141_0_1	0 - 1	9/17/2014	30.8	0.14
BL-SB-142_0_1	0 - 1	9/17/2014	41.4	0.40
BL-SB-143_0_1	0 - 1	9/16/2014	4.86	0.49
BL-SB-145_0_1	0 - 1	9/16/2014	11.7	0.32
BL-SB-146_0_1	0 - 1	9/17/2014	97.4	1.76
BL-SB-146R_0_1	0 - 1	9/30/2014	8.13	0.41
BL-SB-147_0_1	0 - 1	9/17/2014	37.5	0.30
BL-SB-148_0_1	0 - 1	9/16/2014	8.19	0.41
BL-SB-148R_0_1	0 - 1	9/30/2014	9.54	0.38
BL-SB-149_0_1	0 - 1	9/16/2014	14.3	0.26
BL-SB-150_0_1	0 - 1	9/17/2014	88.2	1.53
BL-SB-151_0_1	0 - 1	9/16/2014	12.8	0.30
BL-SB-151R_0_1	0 - 1	9/30/2014	14.5	0.26
BL-SB-152_0_1	0 - 1	9/16/2014	12.6	0.30
BL-SB-152R_0_1	0 - 1	9/30/2014	15.5	0.23
BL-SB-153_0_1	0 - 1	9/17/2014	157	3.20
BL-SB-154_0_1	0 - 1	9/17/2014	4.24	0.51

RA-70 Memorandum Statistics Calculations for Post Removal (0-1 feet)
Former Black Leaf Chemical Site, Louisville, Kentucky

ALL EXCAVATED SAMPLES REMOVED

10.65	mg/kg	AVERAGE
4.54	mg/kg	STANDARD DEVIATION

Using RA-70 Memorandum Values:

56	Total number of samples in dataset
28	Total number of samples greater than (>) 10.6 mg/kg.
50%	Percent of samples greater than (>) 10.6 mg/kg.
0	Total number of samples greater than (>) 22.7 mg/kg.
0%	Percent of samples greater than (>) 22.7 mg/kg.

Description: Proposed excavation samples were removed from the dataset before calculating the arithmetic mean.

Notes:

Yellow samples are proposed excavated samples that are removed from the dataset before evaluation

Non-detected samples were retained in the dataset as half of the detection limit (USEPA 1998, KYDEP 2004).

The maximum of duplicate samples was included in the dataset/calculations.

Pink/red cells have conditional formatting for the following rules:

- Site arithmetic mean (average) cannot exceed 13.12 mg/kg
- Percent of samples greater than 10.6 mg/kg (or 60th percentile) should not exceed 50%
- Percent of samples greater than 22.7 mg/kg (or 95% percentile) should not exceed 0%

0-1 ft bgs Dataset:

Sample Name:	Sample Depth (Feet):	Date Collected:	Arsenic (mg/kg)	Grubb's Test Z-Score:
BLC-SS-01	0 - 1	10/25/2010		
BLC-SS-02	0 - 1	10/25/2010		
BLC-SS-03	0 - 1	10/25/2010		
BLC-SS-04	0 - 1	10/25/2010		
BLC-SS-05	0 - 1	10/25/2010		
BLC-SS-06	0 - 1	10/25/2010	15	0.96
BLC-SS-07	0 - 1	10/25/2010		
BLC-SS-08	0 - 1	10/25/2010		
BLC-SS-09	0 - 1	10/25/2010	5.1	1.22
BLC-SS-10	0 - 1	10/25/2010	9	0.36
BLC-SS-11	0 - 1	10/25/2010		
BLC-SS-13	0 - 1	10/27/2010	15	0.96
BLC-SS-14	0 - 1	10/27/2010		
BLC-SS-15	0 - 1	10/27/2010	14	0.74
BLC-SS-16	0 - 1	10/27/2010		
BLC-SS-17	0 - 1	10/27/2010	15	0.96
BLC-SS-18	0 - 1	10/27/2010		
BLC-SS-19	0 - 1	10/25/2010		
BLC-SS-20	0 - 1	10/26/2010		
BLC-SS-21	0 - 1	10/27/2010		

RA-70 Memorandum Statistics Calculations for Post Removal (0-1 feet)
Former Black Leaf Chemical Site, Louisville, Kentucky

Sample Name:	Sample Depth (Feet):	Date Collected:	Arsenic (mg/kg)	Grubb's Test Z-Score:	
BLC-SS-22	0 - 1	10/27/2010	18	1.62	
BLC-SS-23	0 - 1	10/27/2010	13	0.52	Placed back into evaluation
BLC-SS-24	0 - 1	10/27/2010			
BLC-SS-25	0 - 1	10/27/2010			
BLC-SS-26	0 - 1	10/27/2010			
BLC-SS-27	0 - 1	10/27/2010	12	0.30	
BLC-SS-28	0 - 1	10/27/2010	17	1.40	
BLC-SS-29	0 - 1	10/27/2010	13	0.52	
BLC-SS-30	0 - 1	10/27/2010			
BLC-SS40		9/22/2011	6.08	1.01	
BLC-SS-41		9/22/2011			
BLC-SS-42		9/22/2011	10.9	0.06	
BLC-SS-43		9/22/2011			
BLC-SS-44		9/22/2011	5.4	1.16	
BLC-SS-45		9/22/2011	20.6	2.19	
BLC-SS-46		9/22/2011			
BLC-SS-47		9/22/2011			
BLC-SS-48		9/22/2011			
BLC-SS-49		9/22/2011	6.67	0.88	
BLC-SS-50		9/22/2011	18	1.62	
BLC-SS-51		9/22/2011			
SS-A1	0 - 4	12/6/2011			
SS-A2	0 - 4	12/6/2011	14.8	0.92	
SS-A3	0 - 4	12/6/2011	8.98	0.37	
SS-A4	0 - 4	12/6/2011	11.8	0.25	
SS-A5	0 - 4	12/6/2011			
SS-A6	0 - 4	12/6/2011	7.22	0.75	Placed back into evaluation
SS-A7	0 - 4	12/6/2011	8.91	0.38	
SS-A8	0 - 1	12/6/2011	14.6	0.87	
SS-A9	0 - 1	12/6/2011			
BL-SB-100_0_1	0 - 1	9/20/2014	12.9	0.50	Placed back into evaluation
BL-SB-101_0_1	0 - 1	9/20/2014	15.8	1.14	
BL-SB-102_0_1	0 - 1	9/20/2014	1.64	1.98	
BL-SB-102R_0_1	0 - 1	9/30/2014	8.12	0.56	
BL-SB-103_0_1	0 - 1	9/19/2014	17.3	1.47	
BL-SB-104_0_1	0 - 1	9/29/2014	0.4645	2.24	
BL-SB-105_0_1	0 - 1	9/20/2014	6.92	0.82	
BL-SB-106_0_1	0 - 1	9/19/2014	8.52	0.47	
BL-SB-107_0_1	0 - 1	9/20/2014			
BL-SB-108_0_1	0 - 1	9/20/2014			
BL-SB-109_0_1	0 - 1	9/20/2014	8.41	0.49	
BL-SB-110_0_1	0 - 1	9/19/2014	14.8	0.92	Placed back into evaluation
BL-SB-111_0_1	0 - 1	9/19/2014	8.21	0.54	
BL-SB-113_0_1	0 - 1	9/19/2014			
BL-SB-114_0_1	0 - 1	9/19/2014	8.36	0.50	

RA-70 Memorandum Statistics Calculations for Post Removal (0-1 feet)
Former Black Leaf Chemical Site, Louisville, Kentucky

Sample Name:	Sample Depth (Feet):	Date Collected:	Arsenic (mg/kg)	Grubb's Test Z-Score:	
BL-SB-115_0_1	0 - 1	9/19/2014	8.11	0.56	
BL-SB-116_0_1	0 - 1	9/21/2014	12.4	0.39	
BL-SB-117_0_1	0 - 1	9/21/2014	7.44	0.71	
BL-SB-118_0_1	0 - 1	9/19/2014	7.25	0.75	
BL-SB-118R_0_1	0 - 1	9/30/2014	10.1	0.12	
BL-SB-119_0_1	0 - 1	9/19/2014			
BL-SB-120_0_1	0 - 1	9/19/2014	15.8	1.14	
BL-SB-121_0_1	0 - 1	9/18/2014			
BL-SB-122_0_1	0 - 1	9/18/2014			
BL-SB-123_0_1	0 - 1	9/18/2014			
BL-SB-124_0_1	0 - 1	9/20/2014			
BL-SB-125_0_1	0 - 1	9/19/2014			
BL-SB-126_0_1	0 - 1	9/18/2014			
BL-SB-126R_0_1	0 - 1	9/29/2014			
BL-SB-127_0_1	0 - 1	9/21/2014	10.7	0.01	
BL-SB-128_0_1	0 - 1	9/21/2014	10.5	0.03	
BL-SB-129_0_1	0 - 1	9/21/2014	7.04	0.79	
BL-SB-130_0_1	0 - 1	9/18/2014			
BL-SB-131_0_1	0 - 1	9/18/2014			
BL-SB-132_0_1	0 - 1	9/18/2014	16.5	1.29	
BL-SB-133_0_1	0 - 1	9/18/2014			
BL-SB-134_0_1	0 - 1	9/21/2014	8.83	0.40	
BL-SB-135_0_1	0 - 1	9/18/2014			
BL-SB-136_0_1	0 - 1	9/18/2014	13.3	0.58	
BL-SB-137_0_1	0 - 1	9/17/2014			
BL-SB-138_0_1	0 - 1	9/17/2014	0.4855	2.24	
BL-SB-139_0_1	0 - 1	9/16/2014	15.7	1.11	
BL-SB-140_0_1	0 - 1	9/16/2014	10.8	0.03	
BL-SB-141_0_1	0 - 1	9/17/2014			
BL-SB-142_0_1	0 - 1	9/17/2014			
BL-SB-143_0_1	0 - 1	9/16/2014	4.86	1.27	
BL-SB-145_0_1	0 - 1	9/16/2014	11.7	0.23	
BL-SB-146_0_1	0 - 1	9/17/2014			
BL-SB-146R_0_1	0 - 1	9/30/2014	8.13	0.55	
BL-SB-147_0_1	0 - 1	9/17/2014			
BL-SB-148_0_1	0 - 1	9/16/2014	8.19	0.54	
BL-SB-148R_0_1	0 - 1	9/30/2014			
BL-SB-149_0_1	0 - 1	9/16/2014			
BL-SB-150_0_1	0 - 1	9/17/2014			
BL-SB-151_0_1	0 - 1	9/16/2014			
BL-SB-151R_0_1	0 - 1	9/30/2014			
BL-SB-152_0_1	0 - 1	9/16/2014	12.6	0.43	
BL-SB-152R_0_1	0 - 1	9/30/2014			Removed to meet 50% criteria
BL-SB-153_0_1	0 - 1	9/17/2014			
BL-SB-154_0_1	0 - 1	9/17/2014	4.24	1.41	

APPENDIX E

ProUCL Output

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.110/4/2017 2:47:37 PM
From File	1-16 ft Revision.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Result (4,4'-DDD)

General Statistics

Total Number of Observations	109	Number of Distinct Observations	84
Number of Detects	22	Number of Non-Detects	87
Number of Distinct Detects	22	Number of Distinct Non-Detects	62
Minimum Detect	5.7000E-4	Minimum Non-Detect	3.6000E-4
Maximum Detect	0.325	Maximum Non-Detect	0.0084
Variance Detects	0.0054	Percent Non-Detects	79.82%
Mean Detects	0.038	SD Detects	0.0735
Median Detects	0.0107	CV Detects	1.931
Skewness Detects	3.274	Kurtosis Detects	11.7
Mean of Logged Detects	-4.457	SD of Logged Detects	1.61

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.535	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.911	Detected Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.33	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.184	Detected Data Not Normal at 5% Significance Level

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	0.00801	KM Standard Error of Mean	0.00349
KM SD	0.0356	95% KM (BCA) UCL	0.0143
95% KM (t) UCL	0.0138	95% KM (Percentile Bootstrap) UCL	0.0145
95% KM (z) UCL	0.0138	95% KM Bootstrap t UCL	0.0227
90% KM Chebyshev UCL	0.0185	95% KM Chebyshev UCL	0.0232
97.5% KM Chebyshev UCL	0.0298	99% KM Chebyshev UCL	0.0427

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.886	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.802	Detected Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.217	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.195	Detected Data Not Gamma Distributed at 5% Significance Level

Detected Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.53	k star (bias corrected MLE)	0.488

Theta hat (MLE)	0.0718	Theta star (bias corrected MLE)	0.078
nu hat (MLE)	23.31	nu star (bias corrected)	21.46
Mean (detects)	0.038		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	5.7000E-4	Mean	0.0157
Maximum	0.325	Median	0.01
SD	0.0343	CV	2.191
k hat (MLE)	1.336	k star (bias corrected MLE)	1.306
Theta hat (MLE)	0.0117	Theta star (bias corrected MLE)	0.012
nu hat (MLE)	291.3	nu star (bias corrected)	284.6
Adjusted Level of Significance (β)	0.0478		
Approximate Chi Square Value (284.63, α)	246.6	Adjusted Chi Square Value (284.63, β)	246.1
95% Gamma Approximate UCL (use when n>=50)	0.0181	95% Gamma Adjusted UCL (use when n<50)	0.0181

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.00801	SD (KM)	0.0356
Variance (KM)	0.00127	SE of Mean (KM)	0.00349
k hat (KM)	0.0507	k star (KM)	0.0554
nu hat (KM)	11.05	nu star (KM)	12.08
theta hat (KM)	0.158	theta star (KM)	0.145
80% gamma percentile (KM)	0.00153	90% gamma percentile (KM)	0.0139
95% gamma percentile (KM)	0.044	99% gamma percentile (KM)	0.167

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (12.08, α)	5.277	Adjusted Chi Square Value (12.08, β)	5.217
95% Gamma Approximate KM-UCL (use when n>=50)	0.0183	95% Gamma Adjusted KM-UCL (use when n<50)	0.0186

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.984	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.911	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.107	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.184	Detected Data appear Lognormal at 5% Significance Level	

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.00773	Mean in Log Scale	-9.101
SD in Original Scale	0.0358	SD in Log Scale	2.642
95% t UCL (assumes normality of ROS data)	0.0134	95% Percentile Bootstrap UCL	0.014
95% BCA Bootstrap UCL	0.0167	95% Bootstrap t UCL	0.024
95% H-UCL (Log ROS)	0.0104		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-7.18	KM Geo Mean	7.6150E-4
KM SD (logged)	1.566	95% Critical H Value (KM-Log)	2.8
KM Standard Error of Mean (logged)	0.158	95% H-UCL (KM -Log)	0.00396
KM SD (logged)	1.566	95% Critical H Value (KM-Log)	2.8
KM Standard Error of Mean (logged)	0.158		

DL/2 Statistics

DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	0.00856	Mean in Log Scale	-6.782
SD in Original Scale	0.0357	SD in Log Scale	1.704
95% t UCL (Assumes normality)	0.0142	95% H-Stat UCL	0.00788

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Lognormal Distributed at 5% Significance Level

Suggested UCL to Use

KM H-UCL	0.00396

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

Recommendations are based upon data size, data distribution, and skewness.

These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).

However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Result (4,4'-DDE)

General Statistics

Total Number of Observations	115	Number of Distinct Observations	95
Number of Detects	41	Number of Non-Detects	74
Number of Distinct Detects	40	Number of Distinct Non-Detects	56
Minimum Detect	5.1000E-4	Minimum Non-Detect	4.1800E-4
Maximum Detect	0.501	Maximum Non-Detect	0.017
Variance Detects	0.00639	Percent Non-Detects	64.35%
Mean Detects	0.0276	SD Detects	0.08
Median Detects	0.0065	CV Detects	2.896
Skewness Detects	5.487	Kurtosis Detects	32.51
Mean of Logged Detects	-5.032	SD of Logged Detects	1.571

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.35	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.941	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.367	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.137	Detected Data Not Normal at 5% Significance Level	

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	0.0102	KM Standard Error of Mean	0.00462
KM SD	0.0489	95% KM (BCA) UCL	0.0187
95% KM (t) UCL	0.0179	95% KM (Percentile Bootstrap) UCL	0.0184
95% KM (z) UCL	0.0178	95% KM Bootstrap t UCL	0.0345
90% KM Chebyshev UCL	0.0241	95% KM Chebyshev UCL	0.0304
97.5% KM Chebyshev UCL	0.0391	99% KM Chebyshev UCL	0.0562

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	2.609	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.825	Detected Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.232	**Kolmogorov-Smirnov GOF**	
5% K-S Critical Value	0.147	Detected Data Not Gamma Distributed at 5% Significance Level	

Detected Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.448	k star (bias corrected MLE)	0.431
Theta hat (MLE)	0.0616	Theta star (bias corrected MLE)	0.064
nu hat (MLE)	36.73	nu star (bias corrected)	35.38
Mean (detects)	0.0276		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	5.1000E-4	Mean	0.0163
Maximum	0.501	Median	0.01
SD	0.0481	CV	2.956
k hat (MLE)	0.913	k star (bias corrected MLE)	0.895
Theta hat (MLE)	0.0178	Theta star (bias corrected MLE)	0.0182
nu hat (MLE)	209.9	nu star (bias corrected)	205.8
Adjusted Level of Significance (β)	0.0479		
Approximate Chi Square Value (205.76, α)	173.6	Adjusted Chi Square Value (205.76, β)	173.2
95% Gamma Approximate UCL (use when n>=50)	0.0193	95% Gamma Adjusted UCL (use when n<50)	0.0193

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.0102	SD (KM)	0.0489
Variance (KM)	0.00239	SE of Mean (KM)	0.00462
k hat (KM)	0.0439	k star (KM)	0.0485
nu hat (KM)	10.09	nu star (KM)	11.16
theta hat (KM)	0.233	theta star (KM)	0.211
80% gamma percentile (KM)	0.00125	90% gamma percentile (KM)	0.015
95% gamma percentile (KM)	0.0539	99% gamma percentile (KM)	0.225

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (11.16, α)	4.68	Adjusted Chi Square Value (11.16, β)	4.626
95% Gamma Approximate KM-UCL (use when n>=50)	0.0244	95% Gamma Adjusted KM-UCL (use when n<50)	0.0247

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.958	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.941	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.0951	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.137	Detected Data appear Lognormal at 5% Significance Level

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.00995	Mean in Log Scale	-7.59
SD in Original Scale	0.0492	SD in Log Scale	2.222
95% t UCL (assumes normality of ROS data)	0.0176	95% Percentile Bootstrap UCL	0.0186
95% BCA Bootstrap UCL	0.0247	95% Bootstrap t UCL	0.0347
95% H-UCL (Log ROS)	0.0126		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-6.691	KM Geo Mean	0.00124
KM SD (logged)	1.595	95% Critical H Value (KM-Log)	2.843
KM Standard Error of Mean (logged)	0.156	95% H-UCL (KM -Log)	0.00678
KM SD (logged)	1.595	95% Critical H Value (KM-Log)	2.843
KM Standard Error of Mean (logged)	0.156		

DL/2 Statistics

DL/2 Normal **DL/2 Log-Transformed**

Mean in Original Scale	0.0107	Mean in Log Scale	-6.487
SD in Original Scale	0.049	SD in Log Scale	1.711
95% t UCL (Assumes normality)	0.0183	95% H-Stat UCL	0.0106

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Lognormal Distributed at 5% Significance Level

Suggested UCL to Use	
KM H-UCL	0.00678

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

Recommendations are based upon data size, data distribution, and skewness.

These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).

However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Result (4,4'-DDT)

General Statistics

Total Number of Observations	117	Number of Distinct Observations	99
Number of Detects	53	Number of Non-Detects	64
Number of Distinct Detects	50	Number of Distinct Non-Detects	52
Minimum Detect	5.0000E-4	Minimum Non-Detect	7.1100E-4
Maximum Detect	4.14	Maximum Non-Detect	0.0166
Variance Detects	0.326	Percent Non-Detects	54.7%
Mean Detects	0.138	SD Detects	0.571
Median Detects	0.0172	CV Detects	4.151
Skewness Detects	6.874	Kurtosis Detects	48.82
Mean of Logged Detects	-3.947	SD of Logged Detects	1.78

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.243	**Normal GOF Test on Detected Observations Only**
5% Shapiro Wilk P Value	0	Detected Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.405	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.121	Detected Data Not Normal at 5% Significance Level

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	0.0628	KM Standard Error of Mean	0.0361
KM SD	0.387	95% KM (BCA) UCL	0.138
95% KM (t) UCL	0.123	95% KM (Percentile Bootstrap) UCL	0.133
95% KM (z) UCL	0.122	95% KM Bootstrap t UCL	0.348
90% KM Chebyshev UCL	0.171	95% KM Chebyshev UCL	0.22
97.5% KM Chebyshev UCL	0.288	99% KM Chebyshev UCL	0.422

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	4.33	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.852	Detected Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.245	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.132	Detected Data Not Gamma Distributed at 5% Significance Level

Detected Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.344	k star (bias corrected MLE)	0.337
Theta hat (MLE)	0.401	Theta star (bias corrected MLE)	0.409
nu hat (MLE)	36.41	nu star (bias corrected)	35.68
Mean (detects)	0.138		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	5.0000E-4	Mean	0.0678
Maximum	4.14	Median	0.01
SD	0.388	CV	5.719
k hat (MLE)	0.406	k star (bias corrected MLE)	0.401
Theta hat (MLE)	0.167	Theta star (bias corrected MLE)	0.169
nu hat (MLE)	95.05	nu star (bias corrected)	93.95
Adjusted Level of Significance (β)	0.0479		
Approximate Chi Square Value (93.95, α)	72.6	Adjusted Chi Square Value (93.95, β)	72.36
95% Gamma Approximate UCL (use when n>=50)	0.0878	95% Gamma Adjusted UCL (use when n<50)	0.088

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.0628	SD (KM)	0.387
Variance (KM)	0.15	SE of Mean (KM)	0.0361
k hat (KM)	0.0264	k star (KM)	0.0314
nu hat (KM)	6.166	nu star (KM)	7.341
theta hat (KM)	2.384	theta star (KM)	2.002
80% gamma percentile (KM)	9.3975E-4	90% gamma percentile (KM)	0.0409
95% gamma percentile (KM)	0.253	99% gamma percentile (KM)	1.602

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (7.34, α)	2.36	Adjusted Chi Square Value (7.34, β)	2.325
95% Gamma Approximate KM-UCL (use when n>=50)	0.195	95% Gamma Adjusted KM-UCL (use when n<50)	0.198

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Approximate Test Statistic	0.98	**Shapiro Wilk GOF Test**
5% Shapiro Wilk P Value	0.702	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.0786	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.121	Detected Data appear Lognormal at 5% Significance Level

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.0626	Mean in Log Scale	-6.183
SD in Original Scale	0.389	SD in Log Scale	2.421
95% t UCL (assumes normality of ROS data)	0.122	95% Percentile Bootstrap UCL	0.133
95% BCA Bootstrap UCL	0.175	95% Bootstrap t UCL	0.35
95% H-UCL (Log ROS)	0.0921		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-5.833	KM Geo Mean	0.00293
KM SD (logged)	2.133	95% Critical H Value (KM-Log)	3.497
KM Standard Error of Mean (logged)	0.204	95% H-UCL (KM -Log)	0.057
KM SD (logged)	2.133	95% Critical H Value (KM-Log)	3.497
KM Standard Error of Mean (logged)	0.204		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	0.0634	Mean in Log Scale	-5.519

SD in Original Scale	0.388	SD in Log Scale	2.019
95% t UCL (Assumes normality)	0.123	95% H-Stat UCL	0.0578

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Lognormal Distributed at 5% Significance Level

Suggested UCL to Use	
KM H-UCL	0.057

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

Recommendations are based upon data size, data distribution, and skewness.

These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).

However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Result (alpha-BHC)

General Statistics

Total Number of Observations	109	Number of Distinct Observations	67
Number of Detects	12	Number of Non-Detects	97
Number of Distinct Detects	12	Number of Distinct Non-Detects	55
Minimum Detect	4.5000E-4	Minimum Non-Detect	1.6700E-4
Maximum Detect	0.36	Maximum Non-Detect	0.00391
Variance Detects	0.0104	Percent Non-Detects	88.99%
Mean Detects	0.0375	SD Detects	0.102
Median Detects	0.00805	CV Detects	2.716
Skewness Detects	3.427	Kurtosis Detects	11.81
Mean of Logged Detects	-5.13	SD of Logged Detects	1.889

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.392	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.859	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.454	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.243	Detected Data Not Normal at 5% Significance Level	

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	0.00429	KM Standard Error of Mean	0.00344
KM SD	0.0344	95% KM (BCA) UCL	0.011
95% KM (t) UCL	0.01	95% KM (Percentile Bootstrap) UCL	0.0109
95% KM (z) UCL	0.00995	95% KM Bootstrap t UCL	0.0627
90% KM Chebyshev UCL	0.0146	95% KM Chebyshev UCL	0.0193
97.5% KM Chebyshev UCL	0.0258	99% KM Chebyshev UCL	0.0385

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	1.21	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.812	Detected Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.296	**Kolmogorov-Smirnov GOF**	
5% K-S Critical Value	0.263	Detected Data Not Gamma Distributed at 5% Significance Level	

Detected Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.362	k star (bias corrected MLE)	0.327
Theta hat (MLE)	0.104	Theta star (bias corrected MLE)	0.115
nu hat (MLE)	8.692	nu star (bias corrected)	7.852
Mean (detects)	0.0375		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	4.5000E-4	Mean	0.013
Maximum	0.36	Median	0.01
SD	0.0336	CV	2.582
k hat (MLE)	1.699	k star (bias corrected MLE)	1.658
Theta hat (MLE)	0.00767	Theta star (bias corrected MLE)	0.00786
nu hat (MLE)	370.4	nu star (bias corrected)	361.5
Adjusted Level of Significance (β)	0.0478		
Approximate Chi Square Value (361.53, α)	318.5	Adjusted Chi Square Value (361.53, β)	317.9
95% Gamma Approximate UCL (use when n>=50)	0.0148	95% Gamma Adjusted UCL (use when n<50)	0.0148

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.00429	SD (KM)	0.0344
Variance (KM)	0.00118	SE of Mean (KM)	0.00344
k hat (KM)	0.0156	k star (KM)	0.0213
nu hat (KM)	3.393	nu star (KM)	4.633
theta hat (KM)	0.276	theta star (KM)	0.202
80% gamma percentile (KM)	3.1764E-6	90% gamma percentile (KM)	8.1408E-4
95% gamma percentile (KM)	0.0109	99% gamma percentile (KM)	0.119

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (4.63, α)	0.986	Adjusted Chi Square Value (4.63, β)	0.965
95% Gamma Approximate KM-UCL (use when n>=50)	0.0202	95% Gamma Adjusted KM-UCL (use when n<50)	0.0206

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.925	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.859	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.158	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.243	Detected Data appear Lognormal at 5% Significance Level	

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.00413	Mean in Log Scale	-12.88
SD in Original Scale	0.0346	SD in Log Scale	3.387
95% t UCL (assumes normality of ROS data)	0.00963	95% Percentile Bootstrap UCL	0.0106
95% BCA Bootstrap UCL	0.0145	95% Bootstrap t UCL	0.0648
95% H-UCL (Log ROS)	0.00418		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-8.269	KM Geo Mean	2.5625E-4
KM SD (logged)	1.278	95% Critical H Value (KM-Log)	2.486
KM Standard Error of Mean (logged)	0.131	95% H-UCL (KM -Log)	7.8703E-4
KM SD (logged)	1.278	95% Critical H Value (KM-Log)	2.486
KM Standard Error of Mean (logged)	0.131		

DL/2 Statistics

DL/2 Normal **DL/2 Log-Transformed**

Mean in Original Scale	0.00457	Mean in Log Scale	-7.889
SD in Original Scale	0.0345	SD in Log Scale	1.58
95% t UCL (Assumes normality)	0.0101	95% H-Stat UCL	0.002

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Lognormal Distributed at 5% Significance Level

Suggested UCL to Use
KM H-UCL 7.8703E-4

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

Recommendations are based upon data size, data distribution, and skewness.

These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).

However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Result (Benzo(a)anthracene)

General Statistics

Total Number of Observations	144	Number of Distinct Observations	78
Number of Detects	38	Number of Non-Detects	106
Number of Distinct Detects	38	Number of Distinct Non-Detects	40
Minimum Detect	3.7000E-4	Minimum Non-Detect	0.0035
Maximum Detect	1.45	Maximum Non-Detect	0.0852
Variance Detects	0.133	Percent Non-Detects	73.61%
Mean Detects	0.225	SD Detects	0.365
Median Detects	0.0604	CV Detects	1.626
Skewness Detects	2.416	Kurtosis Detects	5.274
Mean of Logged Detects	-2.914	SD of Logged Detects	2.21

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.623	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.938	Detected Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.281	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.142	Detected Data Not Normal at 5% Significance Level

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	0.0601	KM Standard Error of Mean	0.0177
KM SD	0.21	95% KM (BCA) UCL	0.092
95% KM (t) UCL	0.0894	95% KM (Percentile Bootstrap) UCL	0.0907
95% KM (z) UCL	0.0893	95% KM Bootstrap t UCL	0.106
90% KM Chebyshev UCL	0.113	95% KM Chebyshev UCL	0.137
97.5% KM Chebyshev UCL	0.171	99% KM Chebyshev UCL	0.236

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.617	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.823	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.122	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.152	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.454	k star (bias corrected MLE)	0.436
Theta hat (MLE)	0.495	Theta star (bias corrected MLE)	0.515
nu hat (MLE)	34.5	nu star (bias corrected)	33.11
Mean (detects)	0.225		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	3.7000E-4	Mean	0.0666
Maximum	1.45	Median	0.01
SD	0.209	CV	3.131
k hat (MLE)	0.446	k star (bias corrected MLE)	0.441
Theta hat (MLE)	0.149	Theta star (bias corrected MLE)	0.151
nu hat (MLE)	128.4	nu star (bias corrected)	127.1
Adjusted Level of Significance (β)	0.0483		
Approximate Chi Square Value (127.09, α)	102	Adjusted Chi Square Value (127.09, β)	101.8
95% Gamma Approximate UCL (use when n>=50)	0.083	95% Gamma Adjusted UCL (use when n<50)	0.0831

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.0601	SD (KM)	0.21
Variance (KM)	0.044	SE of Mean (KM)	0.0177
k hat (KM)	0.0823	k star (KM)	0.0852
nu hat (KM)	23.69	nu star (KM)	24.53
theta hat (KM)	0.731	theta star (KM)	0.706
80% gamma percentile (KM)	0.0322	90% gamma percentile (KM)	0.148
95% gamma percentile (KM)	0.35	99% gamma percentile (KM)	1.034

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (24.53, α)	14.25	Adjusted Chi Square Value (24.53, β)	14.17
95% Gamma Approximate KM-UCL (use when n>=50)	0.103	95% Gamma Adjusted KM-UCL (use when n<50)	0.104

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.899	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.938	Detected Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.211	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.142	Detected Data Not Lognormal at 5% Significance Level	

Detected Data Not Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.061	Mean in Log Scale	-5.725
SD in Original Scale	0.21	SD in Log Scale	2.325
95% t UCL (assumes normality of ROS data)	0.09	95% Percentile Bootstrap UCL	0.0924
95% BCA Bootstrap UCL	0.0996	95% Bootstrap t UCL	0.107
95% H-UCL (Log ROS)	0.0996		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-5.973	KM Geo Mean	0.00255
KM SD (logged)	2.234	95% Critical H Value (KM-Log)	3.573
KM Standard Error of Mean (logged)	0.274	95% H-UCL (KM -Log)	0.0603
KM SD (logged)	2.234	95% Critical H Value (KM-Log)	3.573
KM Standard Error of Mean (logged)	0.274		

DL/2 Statistics

DL/2 Normal **DL/2 Log-Transformed**

Mean in Original Scale	0.0645	Mean in Log Scale	-4.522
SD in Original Scale	0.209	SD in Log Scale	1.573
95% t UCL (Assumes normality)	0.0934	95% H-Stat UCL	0.054

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Gamma Distributed at 5% Significance Level

Suggested UCL to Use	
95% KM Approximate Gamma UCL	0.103

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

Recommendations are based upon data size, data distribution, and skewness.

These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).

However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Result (Benzo(a)pyrene)

General Statistics

Total Number of Observations	189	Number of Distinct Observations	87
Number of Detects	38	Number of Non-Detects	151
Number of Distinct Detects	38	Number of Distinct Non-Detects	49
Minimum Detect	0.0199	Minimum Non-Detect	0.0034
Maximum Detect	1.25	Maximum Non-Detect	0.1
Variance Detects	0.0894	Percent Non-Detects	79.89%
Mean Detects	0.23	SD Detects	0.299
Median Detects	0.12	CV Detects	1.299
Skewness Detects	2.302	Kurtosis Detects	4.842
Mean of Logged Detects	-2.054	SD of Logged Detects	1.051

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.661	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.938	Detected Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.27	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.142	Detected Data Not Normal at 5% Significance Level

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	0.0491	KM Standard Error of Mean	0.0118
KM SD	0.161	95% KM (BCA) UCL	0.0692
95% KM (t) UCL	0.0687	95% KM (Percentile Bootstrap) UCL	0.0702
95% KM (z) UCL	0.0686	95% KM Bootstrap t UCL	0.0755
90% KM Chebyshev UCL	0.0846	95% KM Chebyshev UCL	0.101
97.5% KM Chebyshev UCL	0.123	99% KM Chebyshev UCL	0.167

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	1.591	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.778	Detected Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.16	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.148	Detected Data Not Gamma Distributed at 5% Significance Level

Detected Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.987	k star (bias corrected MLE)	0.927
Theta hat (MLE)	0.233	Theta star (bias corrected MLE)	0.248
nu hat (MLE)	75.02	nu star (bias corrected)	70.43
Mean (detects)	0.23		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.0543
Maximum	1.25	Median	0.01
SD	0.159	CV	2.938
k hat (MLE)	0.534	k star (bias corrected MLE)	0.529
Theta hat (MLE)	0.102	Theta star (bias corrected MLE)	0.103
nu hat (MLE)	201.7	nu star (bias corrected)	199.8
Adjusted Level of Significance (β)	0.0487		
Approximate Chi Square Value (199.81, α)	168.1	Adjusted Chi Square Value (199.81, β)	167.9
95% Gamma Approximate UCL (use when n>=50)	0.0645	95% Gamma Adjusted UCL (use when n<50)	0.0646

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.0491	SD (KM)	0.161
Variance (KM)	0.0258	SE of Mean (KM)	0.0118
k hat (KM)	0.0936	k star (KM)	0.0957
nu hat (KM)	35.4	nu star (KM)	36.17
theta hat (KM)	0.525	theta star (KM)	0.513
80% gamma percentile (KM)	0.0319	90% gamma percentile (KM)	0.128
95% gamma percentile (KM)	0.286	99% gamma percentile (KM)	0.798

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (36.17, α)	23.4	Adjusted Chi Square Value (36.17, β)	23.32
95% Gamma Approximate KM-UCL (use when n>=50)	0.0759	95% Gamma Adjusted KM-UCL (use when n<50)	0.0762

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.95	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.938	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.139	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.142	Detected Data appear Lognormal at 5% Significance Level

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.0499	Mean in Log Scale	-5.216
SD in Original Scale	0.161	SD in Log Scale	1.978
95% t UCL (assumes normality of ROS data)	0.0692	95% Percentile Bootstrap UCL	0.0703
95% BCA Bootstrap UCL	0.0752	95% Bootstrap t UCL	0.0785
95% H-UCL (Log ROS)	0.0608		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-4.948	KM Geo Mean	0.0071
KM SD (logged)	1.53	95% Critical H Value (KM-Log)	2.688
KM Standard Error of Mean (logged)	0.113	95% H-UCL (KM -Log)	0.0309
KM SD (logged)	1.53	95% Critical H Value (KM-Log)	2.688
KM Standard Error of Mean (logged)	0.113		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	0.0516	Mean in Log Scale	-4.569

SD in Original Scale	0.16	SD in Log Scale	1.448
95% t UCL (Assumes normality)	0.0709	95% H-Stat UCL	0.039

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Lognormal Distributed at 5% Significance Level

Suggested UCL to Use	
KM H-UCL	0.0309

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

Recommendations are based upon data size, data distribution, and skewness.

These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).

However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Result (Benzo(b)fluoranthene)

General Statistics

Total Number of Observations	167	Number of Distinct Observations	88
Number of Detects	54	Number of Non-Detects	113
Number of Distinct Detects	52	Number of Distinct Non-Detects	36
Minimum Detect	4.3000E-4	Minimum Non-Detect	0.0035
Maximum Detect	1.84	Maximum Non-Detect	0.0168
Variance Detects	0.146	Percent Non-Detects	67.66%
Mean Detects	0.261	SD Detects	0.383
Median Detects	0.17	CV Detects	1.468
Skewness Detects	2.652	Kurtosis Detects	7.294
Mean of Logged Detects	-2.741	SD of Logged Detects	2.388

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.657	**Normal GOF Test on Detected Observations Only**	
5% Shapiro Wilk P Value	1.776E-15	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.248	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.12	Detected Data Not Normal at 5% Significance Level	

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	0.085	KM Standard Error of Mean	0.0193
KM SD	0.247	95% KM (BCA) UCL	0.118
95% KM (t) UCL	0.117	95% KM (Percentile Bootstrap) UCL	0.118
95% KM (z) UCL	0.117	95% KM Bootstrap t UCL	0.13
90% KM Chebyshev UCL	0.143	95% KM Chebyshev UCL	0.169
97.5% KM Chebyshev UCL	0.206	99% KM Chebyshev UCL	0.277

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	1.005	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.824	Detected Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.104	**Kolmogorov-Smirnov GOF**	
5% K-S Critical Value	0.129	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data follow Appr. Gamma Distribution at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.461	k star (bias corrected MLE)	0.448
Theta hat (MLE)	0.565	Theta star (bias corrected MLE)	0.582
nu hat (MLE)	49.78	nu star (bias corrected)	48.34
Mean (detects)	0.261		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	4.3000E-4	Mean	0.091
Maximum	1.84	Median	0.01
SD	0.246	CV	2.703
k hat (MLE)	0.408	k star (bias corrected MLE)	0.405
Theta hat (MLE)	0.223	Theta star (bias corrected MLE)	0.225
nu hat (MLE)	136.4	nu star (bias corrected)	135.3
Adjusted Level of Significance (β)	0.0486		
Approximate Chi Square Value (135.31, α)	109.4	Adjusted Chi Square Value (135.31, β)	109.2
95% Gamma Approximate UCL (use when n>=50)	0.113	95% Gamma Adjusted UCL (use when n<50)	0.113

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.085	SD (KM)	0.247
Variance (KM)	0.0612	SE of Mean (KM)	0.0193
k hat (KM)	0.118	k star (KM)	0.12
nu hat (KM)	39.46	nu star (KM)	40.09
theta hat (KM)	0.719	theta star (KM)	0.708
80% gamma percentile (KM)	0.0746	90% gamma percentile (KM)	0.241
95% gamma percentile (KM)	0.485	99% gamma percentile (KM)	1.23

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (40.09, α)	26.58	Adjusted Chi Square Value (40.09, β)	26.48
95% Gamma Approximate KM-UCL (use when n>=50)	0.128	95% Gamma Adjusted KM-UCL (use when n<50)	0.129

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Approximate Test Statistic	0.837	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk P Value	8.9473E-8	Detected Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.191	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.12	Detected Data Not Lognormal at 5% Significance Level	

Detected Data Not Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.0866	Mean in Log Scale	-5.194
SD in Original Scale	0.248	SD in Log Scale	2.436
95% t UCL (assumes normality of ROS data)	0.118	95% Percentile Bootstrap UCL	0.121
95% BCA Bootstrap UCL	0.128	95% Bootstrap t UCL	0.133
95% H-UCL (Log ROS)	0.218		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-5.709	KM Geo Mean	0.00332
KM SD (logged)	2.517	95% Critical H Value (KM-Log)	3.81
KM Standard Error of Mean (logged)	0.237	95% H-UCL (KM -Log)	0.166
KM SD (logged)	2.517	95% Critical H Value (KM-Log)	3.81
KM Standard Error of Mean (logged)	0.237		

DL/2 Statistics

DL/2 Normal **DL/2 Log-Transformed**

Mean in Original Scale	0.0882	Mean in Log Scale	-4.424
SD in Original Scale	0.247	SD in Log Scale	1.821
95% t UCL (Assumes normality)	0.12	95% H-Stat UCL	0.096

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Approximate Gamma Distributed at 5% Significance Level

Suggested UCL to Use	
95% KM Approximate Gamma UCL	0.128

When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test
When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Result (beta-BHC)

General Statistics

Total Number of Observations	111	Number of Distinct Observations	77
Number of Detects	26	Number of Non-Detects	85
Number of Distinct Detects	26	Number of Distinct Non-Detects	51
Minimum Detect	3.6700E-4	Minimum Non-Detect	1.6700E-4
Maximum Detect	0.097	Maximum Non-Detect	0.00391
Variance Detects	7.3731E-4	Percent Non-Detects	76.58%
Mean Detects	0.0169	SD Detects	0.0272
Median Detects	0.00651	CV Detects	1.608
Skewness Detects	2.385	Kurtosis Detects	4.662
Mean of Logged Detects	-5.004	SD of Logged Detects	1.403

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.587	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.92	Detected Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.312	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.17	Detected Data Not Normal at 5% Significance Level

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	0.00412	KM Standard Error of Mean	0.00142
KM SD	0.0147	95% KM (BCA) UCL	0.00693
95% KM (t) UCL	0.00648	95% KM (Percentile Bootstrap) UCL	0.00654
95% KM (z) UCL	0.00646	95% KM Bootstrap t UCL	0.00976
90% KM Chebyshev UCL	0.00838	95% KM Chebyshev UCL	0.0103
97.5% KM Chebyshev UCL	0.013	99% KM Chebyshev UCL	0.0183

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	1.032	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.793	Detected Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.163	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.179	Detected data appear Gamma Distributed at 5% Significance Level

Detected data follow Appr. Gamma Distribution at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.66	k star (bias corrected MLE)	0.61
Theta hat (MLE)	0.0256	Theta star (bias corrected MLE)	0.0277
nu hat (MLE)	34.34	nu star (bias corrected)	31.71
Mean (detects)	0.0169		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	3.6700E-4	Mean	0.0116
Maximum	0.097	Median	0.01
SD	0.0133	CV	1.143
k hat (MLE)	2.21	k star (bias corrected MLE)	2.156
Theta hat (MLE)	0.00525	Theta star (bias corrected MLE)	0.00539
nu hat (MLE)	490.6	nu star (bias corrected)	478.7
Adjusted Level of Significance (β)	0.0478		
Approximate Chi Square Value (478.69, α)	429	Adjusted Chi Square Value (478.69, β)	428.3
95% Gamma Approximate UCL (use when n>=50)	0.013	95% Gamma Adjusted UCL (use when n<50)	0.013

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.00412	SD (KM)	0.0147
Variance (KM)	2.1600E-4	SE of Mean (KM)	0.00142
k hat (KM)	0.0784	k star (KM)	0.0823
nu hat (KM)	17.41	nu star (KM)	18.27
theta hat (KM)	0.0525	theta star (KM)	0.05
80% gamma percentile (KM)	0.00207	90% gamma percentile (KM)	0.00993
95% gamma percentile (KM)	0.024	99% gamma percentile (KM)	0.0719

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (18.27, α)	9.589	Adjusted Chi Square Value (18.27, β)	9.506
95% Gamma Approximate KM-UCL (use when n>=50)	0.00784	95% Gamma Adjusted KM-UCL (use when n<50)	0.00791

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.978	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.92	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.071	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.17	Detected Data appear Lognormal at 5% Significance Level

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.00403	Mean in Log Scale	-8.668
SD in Original Scale	0.0148	SD in Log Scale	2.342
95% t UCL (assumes normality of ROS data)	0.00636	95% Percentile Bootstrap UCL	0.00636
95% BCA Bootstrap UCL	0.00736	95% Bootstrap t UCL	0.0077
95% H-UCL (Log ROS)	0.00617		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-7.772	KM Geo Mean	4.2130E-4
KM SD (logged)	1.702	95% Critical H Value (KM-Log)	2.96
KM Standard Error of Mean (logged)	0.17	95% H-UCL (KM -Log)	0.0029
KM SD (logged)	1.702	95% Critical H Value (KM-Log)	2.96
KM Standard Error of Mean (logged)	0.17		

DL/2 Statistics

DL/2 Normal **DL/2 Log-Transformed**

Mean in Original Scale	0.00438	Mean in Log Scale	-7.371
SD in Original Scale	0.0147	SD in Log Scale	1.795
95% t UCL (Assumes normality)	0.00669	95% H-Stat UCL	0.00533

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Approximate Gamma Distributed at 5% Significance Level

Suggested UCL to Use	
95% KM Approximate Gamma UCL	0.00784

When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test
When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Result (Dibenzo(a,h)anthracene)

General Statistics

Total Number of Observations	155	Number of Distinct Observations	105
Number of Detects	19	Number of Non-Detects	136
Number of Distinct Detects	19	Number of Distinct Non-Detects	87
Minimum Detect	5.7000E-4	Minimum Non-Detect	0.0034
Maximum Detect	0.342	Maximum Non-Detect	0.1
Variance Detects	0.0155	Percent Non-Detects	87.74%
Mean Detects	0.15	SD Detects	0.125
Median Detects	0.079	CV Detects	0.83
Skewness Detects	0.308	Kurtosis Detects	-1.707
Mean of Logged Detects	-2.57	SD of Logged Detects	1.634

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.855	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.901	Detected Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.242	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.197	Detected Data Not Normal at 5% Significance Level

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	0.0191	KM Standard Error of Mean	0.00536
KM SD	0.0649	95% KM (BCA) UCL	0.0322
95% KM (t) UCL	0.028	95% KM (Percentile Bootstrap) UCL	0.0296
95% KM (z) UCL	0.028	95% KM Bootstrap t UCL	0.0303
90% KM Chebyshev UCL	0.0352	95% KM Chebyshev UCL	0.0425
97.5% KM Chebyshev UCL	0.0526	99% KM Chebyshev UCL	0.0724

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.776	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.774	Detected Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.187	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.205	Detected data appear Gamma Distributed at 5% Significance Level

Detected data follow Appr. Gamma Distribution at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.871	k star (bias corrected MLE)	0.769
Theta hat (MLE)	0.172	Theta star (bias corrected MLE)	0.195
nu hat (MLE)	33.1	nu star (bias corrected)	29.21
Mean (detects)	0.15		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	5.7000E-4	Mean	0.0272
Maximum	0.342	Median	0.01
SD	0.0628	CV	2.31
k hat (MLE)	0.792	k star (bias corrected MLE)	0.781
Theta hat (MLE)	0.0343	Theta star (bias corrected MLE)	0.0348
nu hat (MLE)	245.5	nu star (bias corrected)	242.1
Adjusted Level of Significance (β)	0.0485		
Approximate Chi Square Value (242.09, α)	207.1	Adjusted Chi Square Value (242.09, β)	206.8
95% Gamma Approximate UCL (use when n>=50)	0.0318	95% Gamma Adjusted UCL (use when n<50)	0.0318

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.0191	SD (KM)	0.0649
Variance (KM)	0.00421	SE of Mean (KM)	0.00536
k hat (KM)	0.0871	k star (KM)	0.0897
nu hat (KM)	27	nu star (KM)	27.81
theta hat (KM)	0.22	theta star (KM)	0.213
80% gamma percentile (KM)	0.0112	90% gamma percentile (KM)	0.0484
95% gamma percentile (KM)	0.112	99% gamma percentile (KM)	0.321

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (27.81, α)	16.78	Adjusted Chi Square Value (27.81, β)	16.7
95% Gamma Approximate KM-UCL (use when n>=50)	0.0317	95% Gamma Adjusted KM-UCL (use when n<50)	0.0319

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.808	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.901	Detected Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.186	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.197	Detected Data appear Lognormal at 5% Significance Level	

Detected Data appear Approximate Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.0194	Mean in Log Scale	-6.67
SD in Original Scale	0.065	SD in Log Scale	1.89
95% t UCL (assumes normality of ROS data)	0.028	95% Percentile Bootstrap UCL	0.0286
95% BCA Bootstrap UCL	0.0295	95% Bootstrap t UCL	0.031
95% H-UCL (Log ROS)	0.0123		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-6.802	KM Geo Mean	0.00111
KM SD (logged)	1.726	95% Critical H Value (KM-Log)	2.974
KM Standard Error of Mean (logged)	0.156	95% H-UCL (KM -Log)	0.00746
KM SD (logged)	1.726	95% Critical H Value (KM-Log)	2.974
KM Standard Error of Mean (logged)	0.156		

DL/2 Statistics

DL/2 Normal **DL/2 Log-Transformed**

Mean in Original Scale	0.0234	Mean in Log Scale	-5.17
SD in Original Scale	0.0642	SD in Log Scale	1.302
95% t UCL (Assumes normality)	0.032	95% H-Stat UCL	0.0173

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Approximate Gamma Distributed at 5% Significance Level

Suggested UCL to Use	
95% KM Approximate Gamma UCL	0.0317

When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test
When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Result (Dieldrin)

General Statistics

Total Number of Observations	129	Number of Distinct Observations	102
Number of Detects	35	Number of Non-Detects	94
Number of Distinct Detects	35	Number of Distinct Non-Detects	67
Minimum Detect	4.6000E-4	Minimum Non-Detect	3.3500E-4
Maximum Detect	0.0962	Maximum Non-Detect	0.00781
Variance Detects	4.7263E-4	Percent Non-Detects	72.87%
Mean Detects	0.0121	SD Detects	0.0217
Median Detects	0.00383	CV Detects	1.796
Skewness Detects	2.714	Kurtosis Detects	7.362
Mean of Logged Detects	-5.624	SD of Logged Detects	1.589

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.583	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.934	Detected Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.325	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.148	Detected Data Not Normal at 5% Significance Level

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	0.00359	KM Standard Error of Mean	0.0011
KM SD	0.0123	95% KM (BCA) UCL	0.00556
95% KM (t) UCL	0.00542	95% KM (Percentile Bootstrap) UCL	0.00567
95% KM (z) UCL	0.0054	95% KM Bootstrap t UCL	0.00674
90% KM Chebyshev UCL	0.00689	95% KM Chebyshev UCL	0.00839
97.5% KM Chebyshev UCL	0.0105	99% KM Chebyshev UCL	0.0145

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	1.631	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.81	Detected Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.16	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.157	Detected Data Not Gamma Distributed at 5% Significance Level

Detected Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.521	k star (bias corrected MLE)	0.496
Theta hat (MLE)	0.0232	Theta star (bias corrected MLE)	0.0244
nu hat (MLE)	36.5	nu star (bias corrected)	34.71
Mean (detects)	0.0121		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	4.6000E-4	Mean	0.0106
Maximum	0.0962	Median	0.01
SD	0.0112	CV	1.064
k hat (MLE)	1.653	k star (bias corrected MLE)	1.619
Theta hat (MLE)	0.0064	Theta star (bias corrected MLE)	0.00653
nu hat (MLE)	426.4	nu star (bias corrected)	417.8
Adjusted Level of Significance (β)	0.0481		
Approximate Chi Square Value (417.83, α)	371.4	Adjusted Chi Square Value (417.83, β)	371
95% Gamma Approximate UCL (use when n>=50)	0.0119	95% Gamma Adjusted UCL (use when n<50)	0.0119

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.00359	SD (KM)	0.0123
Variance (KM)	1.5166E-4	SE of Mean (KM)	0.0011
k hat (KM)	0.0851	k star (KM)	0.0883
nu hat (KM)	21.95	nu star (KM)	22.77
theta hat (KM)	0.0422	theta star (KM)	0.0407
80% gamma percentile (KM)	0.00205	90% gamma percentile (KM)	0.00901
95% gamma percentile (KM)	0.0209	99% gamma percentile (KM)	0.0607

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (22.77, α)	12.92	Adjusted Chi Square Value (22.77, β)	12.83
95% Gamma Approximate KM-UCL (use when n>=50)	0.00633	95% Gamma Adjusted KM-UCL (use when n<50)	0.00637

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.923	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.934	Detected Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.13	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.148	Detected Data appear Lognormal at 5% Significance Level	

Detected Data appear Approximate Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.00334	Mean in Log Scale	-8.815
SD in Original Scale	0.0124	SD in Log Scale	2.264
95% t UCL (assumes normality of ROS data)	0.00515	95% Percentile Bootstrap UCL	0.00527
95% BCA Bootstrap UCL	0.00579	95% Bootstrap t UCL	0.00659
95% H-UCL (Log ROS)	0.00395		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-7.275	KM Geo Mean	6.9279E-4
KM SD (logged)	1.334	95% Critical H Value (KM-Log)	2.513
KM Standard Error of Mean (logged)	0.124	95% H-UCL (KM -Log)	0.00227
KM SD (logged)	1.334	95% Critical H Value (KM-Log)	2.513
KM Standard Error of Mean (logged)	0.124		

DL/2 Statistics

DL/2 Normal **DL/2 Log-Transformed**

Mean in Original Scale	0.00401	Mean in Log Scale	-6.994
SD in Original Scale	0.0123	SD in Log Scale	1.519
95% t UCL (Assumes normality)	0.0058	95% H-Stat UCL	0.00418

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Approximate Lognormal Distributed at 5% Significance Level

Suggested UCL to Use	
KM H-UCL	0.00227

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

Recommendations are based upon data size, data distribution, and skewness.

These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).

However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Result (gamma-BHC (Lindane))

General Statistics

Total Number of Observations	106	Number of Distinct Observations	72
Number of Detects	12	Number of Non-Detects	94
Number of Distinct Detects	12	Number of Distinct Non-Detects	61
Minimum Detect	2.1000E-4	Minimum Non-Detect	3.2600E-4
Maximum Detect	0.044	Maximum Non-Detect	0.00762
Variance Detects	2.4413E-4	Percent Non-Detects	88.68%
Mean Detects	0.00968	SD Detects	0.0156
Median Detects	0.00274	CV Detects	1.614
Skewness Detects	1.907	Kurtosis Detects	2.279
Mean of Logged Detects	-5.88	SD of Logged Detects	1.751

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.627	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.859	Detected Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.34	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.243	Detected Data Not Normal at 5% Significance Level

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	0.00135	KM Standard Error of Mean	5.9518E-4
KM SD	0.00585	95% KM (BCA) UCL	0.00255
95% KM (t) UCL	0.00234	95% KM (Percentile Bootstrap) UCL	0.00236
95% KM (z) UCL	0.00233	95% KM Bootstrap t UCL	0.00538
90% KM Chebyshev UCL	0.00314	95% KM Chebyshev UCL	0.00394
97.5% KM Chebyshev UCL	0.00507	99% KM Chebyshev UCL	0.00727

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.549	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.784	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.164	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.259	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.51	k star (bias corrected MLE)	0.438
Theta hat (MLE)	0.019	Theta star (bias corrected MLE)	0.0221
nu hat (MLE)	12.24	nu star (bias corrected)	10.51
Mean (detects)	0.00968		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	2.1000E-4	Mean	0.00996
Maximum	0.044	Median	0.01
SD	0.00506	CV	0.508
k hat (MLE)	3.713	k star (bias corrected MLE)	3.614
Theta hat (MLE)	0.00268	Theta star (bias corrected MLE)	0.00276
nu hat (MLE)	787.2	nu star (bias corrected)	766.3
Adjusted Level of Significance (β)	0.0477		
Approximate Chi Square Value (766.26, α)	703	Adjusted Chi Square Value (766.26, β)	702.2
95% Gamma Approximate UCL (use when n>=50)	0.0109	95% Gamma Adjusted UCL (use when n<50)	0.0109

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.00135	SD (KM)	0.00585
Variance (KM)	3.4252E-5	SE of Mean (KM)	5.9518E-4
k hat (KM)	0.0532	k star (KM)	0.058
nu hat (KM)	11.28	nu star (KM)	12.29
theta hat (KM)	0.0254	theta star (KM)	0.0233
80% gamma percentile (KM)	2.9535E-4	90% gamma percentile (KM)	0.00245
95% gamma percentile (KM)	0.00751	99% gamma percentile (KM)	0.0276

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (12.29, α)	5.42	Adjusted Chi Square Value (12.29, β)	5.357
95% Gamma Approximate KM-UCL (use when n>=50)	0.00306	95% Gamma Adjusted KM-UCL (use when n<50)	0.0031

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.956	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.859	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.108	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.243	Detected Data appear Lognormal at 5% Significance Level	

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.00124	Mean in Log Scale	-8.62
SD in Original Scale	0.0059	SD in Log Scale	1.324
95% t UCL (assumes normality of ROS data)	0.00219	95% Percentile Bootstrap UCL	0.00227
95% BCA Bootstrap UCL	0.00267	95% Bootstrap t UCL	0.00565
95% H-UCL (Log ROS)	6.0150E-4		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-7.993	KM Geo Mean	3.3773E-4
KM SD (logged)	1.001	95% Critical H Value (KM-Log)	2.211
KM Standard Error of Mean (logged)	0.159	95% H-UCL (KM -Log)	6.9178E-4
KM SD (logged)	1.001	95% Critical H Value (KM-Log)	2.211
KM Standard Error of Mean (logged)	0.159		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	0.00179	Mean in Log Scale	-7.488

SD in Original Scale	0.00585	SD in Log Scale	1.261
95% t UCL (Assumes normality)	0.00273	95% H-Stat UCL	0.00168

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Gamma Distributed at 5% Significance Level

Suggested UCL to Use	
95% KM Approximate Gamma UCL	0.00306

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

Recommendations are based upon data size, data distribution, and skewness.

These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).

However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Result (Indeno(1,2,3-cd)pyrene)

General Statistics

Total Number of Observations	144	Number of Distinct Observations	89
Number of Detects	32	Number of Non-Detects	112
Number of Distinct Detects	32	Number of Distinct Non-Detects	58
Minimum Detect	4.3000E-4	Minimum Non-Detect	0.0034
Maximum Detect	0.685	Maximum Non-Detect	0.0568
Variance Detects	0.0468	Percent Non-Detects	77.78%
Mean Detects	0.261	SD Detects	0.216
Median Detects	0.168	CV Detects	0.828
Skewness Detects	0.314	Kurtosis Detects	-1.487
Mean of Logged Detects	-2.099	SD of Logged Detects	1.769

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.872	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.93	Detected Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.208	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.154	Detected Data Not Normal at 5% Significance Level

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	0.059	KM Standard Error of Mean	0.0125
KM SD	0.148	95% KM (BCA) UCL	0.0804
95% KM (t) UCL	0.0797	95% KM (Percentile Bootstrap) UCL	0.0801
95% KM (z) UCL	0.0796	95% KM Bootstrap t UCL	0.0827
90% KM Chebyshev UCL	0.0965	95% KM Chebyshev UCL	0.114
97.5% KM Chebyshev UCL	0.137	99% KM Chebyshev UCL	0.183

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	1.091	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.786	Detected Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.201	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.161	Detected Data Not Gamma Distributed at 5% Significance Level

Detected Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.786	k star (bias corrected MLE)	0.733
Theta hat (MLE)	0.333	Theta star (bias corrected MLE)	0.357
nu hat (MLE)	50.29	nu star (bias corrected)	46.91
Mean (detects)	0.261		

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	4.3000E-4	Mean	0.0659
Maximum	0.685	Median	0.01
SD	0.145	CV	2.205
k hat (MLE)	0.482	k star (bias corrected MLE)	0.477
Theta hat (MLE)	0.137	Theta star (bias corrected MLE)	0.138
nu hat (MLE)	138.9	nu star (bias corrected)	137.3
Adjusted Level of Significance (β)	0.0483		
Approximate Chi Square Value (137.35, α)	111.3	Adjusted Chi Square Value (137.35, β)	111
95% Gamma Approximate UCL (use when n>=50)	0.0814	95% Gamma Adjusted UCL (use when n<50)	0.0816

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.059	SD (KM)	0.148
Variance (KM)	0.0218	SE of Mean (KM)	0.0125
k hat (KM)	0.16	k star (KM)	0.161
nu hat (KM)	46.07	nu star (KM)	46.44
theta hat (KM)	0.369	theta star (KM)	0.366
80% gamma percentile (KM)	0.068	90% gamma percentile (KM)	0.177
95% gamma percentile (KM)	0.32	99% gamma percentile (KM)	0.731

Gamma Kaplan-Meier (KM) Statistics

Approximate Chi Square Value (46.44, α)	31.8	Adjusted Chi Square Value (46.44, β)	31.68
95% Gamma Approximate KM-UCL (use when n>=50)	0.0862	95% Gamma Adjusted KM-UCL (use when n<50)	0.0865

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.814	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.93	Detected Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.188	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.154	Detected Data Not Lognormal at 5% Significance Level	

Detected Data Not Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	0.0604	Mean in Log Scale	-5.384
SD in Original Scale	0.148	SD in Log Scale	2.168
95% t UCL (assumes normality of ROS data)	0.0808	95% Percentile Bootstrap UCL	0.0817
95% BCA Bootstrap UCL	0.0852	95% Bootstrap t UCL	0.0844
95% H-UCL (Log ROS)	0.0906		

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean (logged)	-5.918	KM Geo Mean	0.00269
KM SD (logged)	2.297	95% Critical H Value (KM-Log)	3.651
KM Standard Error of Mean (logged)	0.426	95% H-UCL (KM -Log)	0.0759
KM SD (logged)	2.297	95% Critical H Value (KM-Log)	3.651
KM Standard Error of Mean (logged)	0.426		

DL/2 Statistics

DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	0.0619	Mean in Log Scale	-4.703

SD in Original Scale	0.147	SD in Log Scale	1.678
95% t UCL (Assumes normality)	0.0821	95% H-Stat UCL	0.0558

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Data do not follow a Discernible Distribution at 5% Significance Level

Suggested UCL to Use	
95% KM (Chebyshev) UCL	0.114

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

Recommendations are based upon data size, data distribution, and skewness.

These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).

However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

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