TOEROEK
ASSOCIATES, INC.

April 1, 2021

Mr. Bradley Roberts
Task Order Contracting Officer Representative
U.S. Environmental Protection Agency, Region 7
11201 Renner Blvd.
Lenexa, Kansas 66219

**Subject: Contract No. 68HERH19D0018; Task Order (TO) No. 68E0719F0190**
**Pine Lawn, 6261 Natural Bridge Road, Pine Lawn, Missouri;**
**Analysis of Brownfields Cleanup Alternatives Report (ABCA)**

Dear Mr. Roberts:

Toeroek Associates, Inc. (Toeroek) and our teaming subcontractor, Tetra Tech, Inc. (Tetra Tech), (hereafter "Toeroek Team") are pleased to present the Analysis of Brownfields Cleanup Alternatives report (ABCA) regarding the Pine Lawn site (the subject property) located at 6261 Natural Bridge Road in Pine Lawn, Missouri. This deliverable has been reviewed internally as part of Tetra Tech's quality assurance program, as well as Toeroek's quality assurance program, and is consistent with Toeroek's Quality Management Plan for the Resource Conservation and Recovery Act (RCRA) Enforcement and Permitting Assistance (REPA) contract. Documentation of this review is retained in the Toeroek Team's project files.

If you have any questions or comments, please contact Paul Kieler at 303-407-0266 or Kaitlyn Mitchell at 816-412-1742.

Sincerely,

Paul Kieler
Toeroek Team Program Manager

Kaitlyn Mitchell
Toeroek Team Project Manager

Enclosure: Phase II ESA

cc: Frank Novello, EPA Region 7
Lisa Dunning, EPA Region 7
Heather Wood, Tetra Tech
Toeroek Team Project Files

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# ANALYSIS OF BRONFIELDS CLEANUP ALTERNATIVES REPORT

## PINE LAWN
## 6261 NATURAL BRIDGE ROAD, PINE LAWN, MISSOURI

**Prepared for**

**U.S. ENVIRONMENTAL PROTECTION AGENCY**
**REGION 7**

| | | |
|---|---|---|
| Task Order | : | 68E0719F0190 |
| Subtask | : | 02.03.07 |
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| Contract No. | : | 68HERH19D0018 |
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## CONTENTS

## APPENDICES

**Appendix**



## TABLES

**Table** **Page**

# 1.0 INTRODUCTION

The U.S. Environmental Protection Agency (EPA) tasked Toeroek Associates, Inc. (Toeroek) and its teaming subcontractor, Tetra Tech, Inc. (Tetra Tech), (hereafter "Toeroek Team") to provide technical support to the EPA Region 7 Brownfields Program under Contract 68HERH19D0018, Task Order (TO) 68E0719F0190. EPA Region 7 requested that the Toeroek Team conduct an Analysis of Brownfields Cleanup Alternatives (ABCA) of the Pine Lawn site (the subject property) at 6261 Natural Bridge Road in Pine Lawn, Missouri (see Appendix A, Figure 1). The Toeroek Team has prepared this ABCA based on results of the Hazardous Materials Survey by the Toeroek Team in October 2020. According to the Brownfields Assessment Application (City of Pine Lawn, Missouri 2018), the current property owner, City of Pine Lawn, has shown interest in developing the parcel for residential and/or commercial purposes depending on findings from the Targeted Brownfields Analysis (TBA).

This ABCA presents cleanup alternatives regarding asbestos-containing material (ACM), lead-based paint (LBP), and hazardous materials in the subject property building. Cleanup alternatives considered are based on state and federal regulations. Missouri Department of Natural Resources (MDNR) regulations outline ACM and LBP inspection, reporting, and disposal requirements for demolition or renovation of commercial buildings (MDNR 2017). This ABCA also includes preliminary cost estimates of evaluated cleanup alternatives.

## 2.0 BACKGROUND AND DESCRIPTION

The subject property is at 6261 Natural Bridge Road in Pine Lawn, St. Louis County, Missouri, and is depicted on the Clayton, Missouri, U.S. Geological Survey (USGS) 7.5-minute topographic series map (USGS 1998) (see Appendix A, Figure 1). Coordinates at the approximate center of the subject property are 38.692501 degrees north latitude and 90.278767 degrees west longitude. The subject property is on a 0.08-acre parcel and includes a 1,815-square-foot commercial structure (Toeroek 2020) (see Appendix A, Figure 2).

A Phase I Environmental Site Assessment (ESA) report stated that the subject property and the surrounding properties were developed in the late 1930s. The subject property was listed in city directories as a drug store from around 1941 through 1965 and various other businesses through the 2011 listing. The subject property has been owned by the City of Pine Lawn since 2013 and is currently unused and vacant (Terracon Consultants, Inc. [Terracon] 2019).

The subject property lies in the northwestern suburbs of St. Louis, Missouri. It is bounded to the north by Pine Lawn City Hall, to the east by the Ashleigh Event Center, to the south by Natural Bridge Road and Total Praise and Worship Center and Crème de la Crem for Cocktails beyond, and to the northwest by Rest Ministry (Terracon 2019).

## 3.0 PREVIOUS INVESTIGATIONS

Terracon performed a Phase I ESA at the subject property in July 2019, identifying no recognized environmental concerns (RECs) and did not recommend additional environmental investigation; however, suspect ACM and suspect LBP were observed during the site reconnaissance.

The Toeroek Team conducted a hazardous material survey at the subject property in October 2020 that identified ACM, LBP, and hazardous materials at the buildings on the subject property (Toeroek 2020b). Based on these results, this ABCA presents cleanup alternatives regarding ACM, LBP, and hazardous materials in the subject property buildings.

## 4.0 FUTURE USE

Future use of the subject property is unknown; however, the current property owner has expressed interest in developing the parcel for commercial purposes. The subject property is located in a mixed-use commercial and residential area of the northwestern suburbs of the City of St. Louis, Missouri. ACM, LBP, and hazardous materials should be appropriately addressed prior to building renovation or demolition. No remedial activities have occurred at the subject property to date.

## 5.0 POTENTIAL CLEANUP ALTERNATIVES

The overall goal of any Brownfields cleanup action is to address environmental conditions preventing or impeding the preferred type of subject property redevelopment, and to do so in a manner protective of human health and the environment. This ABCA considers cleanup alternatives that would be based on state and federal regulations regarding ACM and LBP.

The Toeroek Team evaluated Brownfields cleanup alternatives to address environmental impacts identified during the hazardous materials survey (Toeroek 2020b). The purpose of the ABCA is to present viable cleanup alternatives based on site-specific conditions, technical feasibility, and preliminary cost evaluations.

The following sections describe Brownfields cleanup alternatives for addressing ACM, LBP, and hazardous materials, including a "No Action" alternative. Following the description, each alternative is evaluated in terms of its effectiveness, implementability, and cost. The purpose of evaluating each alternative is to determine its advantages and disadvantages relative to the other alternatives in order to identify key tradeoffs that would affect selection of the preferred alternative.

Effectiveness of an alternative refers to its ability to meet objectives of the Brownfields cleanup. Criteria applied to assess effectiveness of an alternative include the following:

- Overall protection of human health and the environment;
- Compliance with applicable or relevant and appropriate requirements (ARAR) and other criteria, advisories, and guidance;
- Long-term effectiveness;
- Reduction of toxicity, mobility, or volume through treatment/removal; and
- Short-term effectiveness.

Criteria applied to assess implementability of an alternative are:

- Technical feasibility;
- Administrative feasibility;
- Availability of services and materials required during implementation of the alternative;
- State acceptance; and
- Community acceptance.

Each alternative is evaluated to determine its estimated cost. The evaluations compare the alternatives' respective direct capital costs, which include equipment, services, and contingency allowances. The purpose of evaluating each alternative is to determine its advantages and disadvantages relative to the other alternatives in order to identify key tradeoffs that would affect selection of the preferred alternative.

## 5.1 EVALUATED CONTAMINATION

Contamination evaluated as part of this ABCA includes ACM, LBP, and hazardous materials.
The sections below discuss contaminants/materials identified during the hazardous materials survey at the subject property.

### 5.1.1 Asbestos-Containing Materials

During the ACM survey, the Toeroek Team collected 32 bulk samples of suspect ACM. Figure 3 in Appendix A shows ACM sample locations. Collections of samples of building materials accorded with National Emissions Standards for Hazardous Air Pollutants (NESHAP) as adopted by EPA and Asbestos Hazard and Emergency Response Act of 1986 (AHERA) protocols. Upon completion of sampling activities, the bulk samples were sent to Eurofins EMLab P&K Laboratories (Eurofins). Suspect ACM samples were analyzed per EPA Method 600/R-93/116 via Polarized Light Microscopy (PLM) analysis. AHERA defines ACM as any material or product that contains more than 1% asbestos. The ACM survey yielded the following significant findings:

> ACM was identified in black roofing tar around the chimney (approximately 20 square feet [SF]) and on the east, south, and west roof perimeters (approximately 210 linear feet [LF]).

### 5.1.2 Lead-Based Paint

During the LBP survey, the Toeroek Team tested 18 surfaces in the subject property buildings. Figure 3 in Appendix A shows locations of LBP detections. The LBP survey accorded with protocols similar to the single-family housing inspection procedures in Department of Housing and Urban Development (HUD) *Guidelines for the Evaluation and Control of LBP in Housing* (HUD Guidelines) (HUD 1997). The Toeroek Team utilized an Innov-X 6000 Alpha Series analyzer to perform the LBP screening. The Innov-X 6000 Alpha Series is an x-ray fluorescence (XRF) spectrum analyzing system for quantitative measurement of lead in paint on various substrates. HUD guidelines suggest that paint applied before 1978 may contain lead. HUD considers LBP as paint with lead levels above 1.0 milligram per square centimeter ($mg/cm^2$).

Approximately 300 SF of various colors of LBP on multiple substrates was identified on the exterior of the building.

### 5.1.3 Hazardous Materials Inventory

The Toeroek Team completed a hazardous materials inventory to quantify items potentially containing hazardous materials inside subject property buildings. Table 1 below summarizes hazardous materials identified inside subject property buildings.

**TABLE 1**

**SUMMARY OF HAZARDOUS MATERIALS INVENTORY**
**PINE LAWN, 6261 NATURAL BRIDGE ROAD, PINE LAWN, MISSOURI**

| Type of Household Hazardous Waste | Assessed Quantity |
|---|---|
| **White Goods:** | |
| Water Heater | 1 |
| Heating, ventilation, and air conditioning (HVAC) Unit | 1 |
| | |
| **Other:** | |
| Flammable Aerosol Cans | 1 |
| Non-flammable Aerosol Cans | 1 |
| Fluorescent Tubes | 12 |
| Polychlorinated biphenyls (PCB)-containing Ballasts | 6 |
| Copy Machines, Printers, Fax Machines, Scanners | 18 |
| Televisions, Computer Monitors | 17 |
| Printing-related liquids (e.g. toner, offset solution and concentrate, developer) | Approximately 15 |

## 5.2 EVALUATION OF CLEANUP ALTERNATIVES

Evaluations of cleanup alternatives are based on the assumed future use scenario at the subject property—commercial development. Based on assumed future use of the subject property for residential and/or commercial purposes, and because plans whether or not to demolish the building are unknown, the Toeroek Team considered three alternatives for cleanup of ACM and LBP, and two options to address hazardous materials. Evaluations took into account MDNR Brownfields/Voluntary Cleanup Program (B/VCP) procedural requirements—because cleanup projects implemented with EPA Brownfields Cleanup funding require participation in the MDNR B/VCP. For reference, fees associated with enrollment in the MDNR B/VCP include a $200 application fee and refundable oversight deposit of $5,000. However, whether the subject property will enroll in the MDNR B/VCP program is unknown. Options to address ACM, LBP, and hazardous materials assume a cleanup prior to demolition of the on-site structures.

### 5.2.1 Asbestos-Containing Material

Regarding ACM, three options were evaluated: (1) no action; (2) retention in place of all ACM not damaged or spilled under management specified in an Operations and Management (O&M) Plan, and abatement of ACM damaged or spilled; and (3) abatement of all ACM wastes. Alternatives 2 and 3 are expected to achieve clearance criteria under the MDNR B/VCP.

**Alternative 1: No Action**

Alternative 1 (no action) would leave ACM in place at the subject property.

Effectiveness

This alternative would not be effective if the subject property building is demolished. Redevelopment of areas containing ACM would have to be restricted to ensure that those materials remain undisturbed. Additionally, in accordance with NESHAP regulations, demolition of the subject property building cannot proceed before proper abatement; therefore, demolition could not occur if this alternative would be selected. This alternative would also be ineffective in achieving the goal of reducing health risks.

Implementation

Implementation of this alternative is straightforward—ACM left in place. Future redevelopment would have to consider the location and condition of the ACM, and ensure that those materials remain undisturbed. Demolition could not occur prior to abatement.

Cost

This alternative would not involve any direct costs.

**Alternative 2: O&M Plan**

Alternative 2 (O&M Plan) would leave in place at the subject property all undamaged ACM. The damaged ACM would require proper abatement by a licensed State of Missouri asbestos abatement contractor in accord with applicable local, state, and federal regulations.

Effectiveness

This alternative would be effective regarding rehabilitation of the subject property building containing ACM. This alternative would also be effective in achieving the goal of reducing health risks. As such,

regular monitoring of ACM remaining in place would be necessary to ensure it is not damaged, and future redevelopment plans would have to consider locations and condition of the remaining ACM, and ensure those materials would not be disturbed.

Implementation

Implementation of this alternative would include leaving ACM in place and properly abating damaged or spilled ACM. An O&M Plan would be developed to document presence and locations of ACM, and future maintenance procedures regarding the ACM. In addition, filing the O&M Plan on the property's chain-of-title as an institutional control (IC).

Cost

Cost of completing an O&M Plan described above would be $4,500. This cost does not include abatement of damaged or spilled ACM.

**Alternative 3: Abatement of ACM**

Alternative 3 would involve, prior to demolition or renovations, proper abatement of ACM identified in the subject property building. Abatement by a licensed State of Missouri asbestos abatement contractor would accord with applicable local, state, and federal regulations and a pre-approved Remedial Action Plan (RAP). Regulatory clearance sampling would be conducted according to a pre-approved Quality Assurance Project Plan (QAPP), and if required, pre/post-abatement inspections by MDNR would occur.

Effectiveness

With removal of all identified ACM, Alternative 3 would address the risk to human health posed by ACM. In addition, full abatement would allow redevelopment of the subject property without restrictions pertaining to disturbance of ACM.

Implementation

Abatement by a licensed State of Missouri asbestos abatement contractor would accord with applicable local, state, and federal regulations. EPA, state, and Occupational Safety and Health Administration (OSHA) requirements must be met during removal of ACM and during demolition due to presence of LBP. These regulations would be addressed in the MDNR B/VCP RAP and Health and Safety Plan.

Cost

Estimated abatement costs were gathered from local vendors. Costs per SF or LF are provided, and include removal and disposal costs. Abatement cost for the ACM associated with the subject property building is estimated at $2,120. Table 2 below summarizes abatement costs for ACM identified in the subject property building.

**TABLE 2**

**ASBESTOS-CONTAINING MATERIALS ABATEMENT COSTS**
**PINE LAWN, 6261 NATURAL BRIDGE ROAD, PINE LAWN, MISSOURI**

| Material Description | Material Locations | Estimated Quantity | Cost/Unit ($/SF, $/LF, or $/EA) | Total Cost |
|---|---|---|---|---|
| Roofing Tar | Chimney | 20 SF | $4.00 | $80 |
| Roofing Tar | South, West, and East Roof Perimeter | 210 LF | $4.00 | $840 |
| Mobilization | | | | $1,200[a] |
| **Total ACM Abatement Cost** | | | | **$2,120** |

Notes:

[a] Due to the minimal amount of ACM present, the abatement contractor likely will charge a mobilization fee.

ACM Asbestos-containing material
EA Each
LF Linear feet
SF Square feet

The estimated cost in Table 2 does not include restoration costs. Additional costs to be considered, particularly if the subject property would be enrolled in the MDNR B/VCP, include those for technical reports (RAP, QAPP, and Final Abatement Report) and collection of clearance samples. Estimated cost of technical plans/reports is $3,500 per plan/report (cost of plans includes consideration of all environmental issues to be addressed by cleanup activities). Additional costs for oversight and clearance sampling are considered variable based on requirements and duration of abatement. Estimated cost associated with oversight and clearance is $2,500. Total cost of Alternative 3 is estimated at $15,000.

### 5.2.2 Lead-Based Paint

Three cleanup alternatives were evaluated to address LBP found on structures associated with the subject property. These alternatives include: (1) no action; (2) removal through demolition; and (3) stabilization and encapsulation. Each approach (excluding no action) is expected to achieve clearance criteria under the MDNR B/VCP. For sites enrolled in the B/VCP, MDNR requires creation of an O&M Plan to document existence, location, and future maintenance procedures regarding LBP left in place. If demolition is decided, per local, state, and federal regulations, the building may be demolished with the LBP present—assuming satisfactory results of a disposal characterization test via Toxicity Characterization Leaching Procedure (TCLP) analysis prior to disposal of the demolition debris.

**Alternative 1: No Action**

Alternative 1 (no action) would leave LBP in place at the subject property.

Effectiveness

This alternative would not be effective if the subject property building is demolished. Restrictions on proposed demolition of materials containing LBP (depending on condition of the LBP) would be necessary to ensure those materials remain undisturbed. This alternative would also be ineffective in achieving the goal of reducing health risks.

Implementation

Implementation of this alternative would be straightforward—leaving the LBP in place.

Cost

This alternative would not involve any direct costs.

**Alternative 2: LBP Removal by Demolition**

Alternative 2 includes removal (by demolition) for proper disposal. All surfaces/components that contain LBP determined to be in good condition can be removed/demolished and sent for disposal as demolition waste—assuming satisfactory results of a disposal characterization test via TCLP analysis prior to disposal of the demolition debris. Application of removal/demolition techniques would be necessary in a manner that does not chip, shred, mulch, or mill the LBP. Under the future site use scenario for the subject property

building (i.e., demolition), this alternative is likely the most appropriate and economically feasible. Regulatory clearance would be obtained through successful implementation of a pre-approved RAP. Any materials not passing the TCLP analysis would require disposal as hazardous waste. Costs specified below assume removal of materials containing LBP and disposal as non-hazardous waste.

This alternative is a direct approach, because LBP would be removed and controls would not be required to manage LBP left in place prior to building demolition. Removal and off-site disposal of LBP-containing material as special (demolition) waste would occur.

Effectiveness

With removal of all identified LBP, Alternative 2 would effectively address the risk to human health posed by the LBP. This alternative would allow demolition of the subject property building without restrictions pertaining to disturbance and management of LBP.

Implementation

Abatement would accord with applicable state and federal regulations. Prior to disposal, demolition debris would require characterization via TCLP analysis. Provided the demolition debris passes TCLP analysis, disposal of materials coated with LBP could be sent for disposal as general construction and demotion waste. Compliance with EPA, state, and OSHA requirements would be necessary during removal of ACM and during demolition due to presence of LBP. These regulations will be addressed in the MDNR B/VCP RAP and Health and Safety Plan.

Cost

Estimated costs of this alternative were gathered from local vendors. Prior to disposal, characterization of demolition debris via TCLP analysis would be requisite. Assuming collection of five samples for TCLP analysis, estimated cost is $2,500. Additional costs to be considered, particularly if the subject property would be enrolled in the MDNR B/VCP, include technical reports (RAP and Final Abatement Report). Estimated cost of technical plans/reports is $3,500 per plan/report (cost of plans includes consideration of all environmental issues to be addressed by cleanup activities). Total cost of Alternative 2 is estimated at $9,500, not including cost of demolition and disposal.

**Alternative 3: LBP Stabilization and Application of Encapsulation**

Alternative 3 includes stabilization of LBP in poor condition (chipping, flaking, etc.) and application of an encapsulant to all LBP surfaces. The encapsulant would be a durable, air- and dust-tight, surface coating material. Application of the encapsulant would ensure that LBP remaining could not leach to the surface and pose a threat to future occupants. In accordance with state regulations, the condition of LBP-containing surfaces should be inspected, and removal of loose (chipped, flaking, etc.) LBP would be required. The removed LBP residue should be segregated for proper disposal. Based on findings of the subject property reconnaissance by the Toeroek Team, numerous surfaces would require stabilization to remove loose LBP.

Waste generation and amount of material sent for disposal would be less than under Alternative 2. Regulatory clearance would be obtained through successful implementation of a pre-approved RAP, a pre-approved QAPP, and pre-/post-encapsulation inspections by MDNR. In addition, collection of dust-wipe samples in accordance with MDNR clearance regulations would be necessary after completion of all interior renovations in order to verify that all lead dust levels are below MDNR clearance levels.

Effectiveness

Encapsulation is a relatively simple process that does not significantly alter structural conditions. This alternative would allow redevelopment of the subject property; however, restrictions (ICs) would apply concerning future disturbance of LBP. For sites enrolled in the MDNR B/VCP, MDNR requires creation of an O&M Plan to document presence and location of LBP, and future maintenance procedures regarding LBP. In addition, filing the O&M Plan on the property's chain-of-title as an IC would be required.

Implementation

Stabilization and encapsulation by a licensed State of Missouri lead abatement contractor would accord with applicable state and federal regulations. Encapsulation is not a viable alternative for surfaces subject to impact or friction. Encapsulation requires follow-up inspections, maintenance, and possible building restrictions. Abatement by a registered lead paint removal contractor would accord with applicable state and federal regulations. Segregation and proper disposal of LBP residue removed during stabilization activities (likely as hazardous waste) would be required. Because this technique can generate a hazardous waste stream, careful consideration of precautions concerning worker health and safety would be necessary.

Cost

Estimated costs were gathered from local vendors. Estimated cost of stabilization and encapsulating is $6.00 per SF. Assuming all surfaces containing LBP would require stabilization/encapsulation, the cost of

Alternative 3 is estimated at $1,800. Additional costs to be considered, particularly if the subject property would be enrolled in the MDNR B/VCP, include three technical reports (RAP, QAPP and Final Abatement Report) and collection of clearance samples. Estimated cost of technical plans/reports is $3,500 per plan/report (cost of plans include consideration of all environmental issues to be addressed by cleanup activities). Additional costs for oversight and clearance sampling are estimated at $5,000. This estimated cost may vary depending on the abatement techniques applied. No restoration costs have been included in the estimate. Total cost for Alternative 3 is estimated at $17,300.

### 5.2.3 Hazardous Materials

For hazardous materials assumed to remain in buildings scheduled for renovation or demolition, two options were evaluated: (1) no action and (2) proper removal and disposal.

**Alternative 1: No Action**

Alternative 1 (no action) would leave hazardous materials in place at the subject property.

Effectiveness

This alternative would not be effective regarding redevelopment of the property, and could pose health risks to future occupants.

Implementation

Implementation of this alternative would require no effort because no containment, treatment, removal, or monitoring of contaminants would occur.

Cost

No costs are associated with this alternative because no activities would occur.

**Alternative 2: Removal of Hazardous Materials**

Alternative 2 would involve removing hazardous materials for proper disposal/recycling prior to rehabilitation or demolition activities. Typically, these materials are classified as universal waste and should be handled by a qualified waste management company.

Effectiveness

Alternative 2 would be effective in removing the items potentially containing hazardous materials.

Implementation

A qualified waste management company would arrange for disposal. Hazardous materials inside subject property buildings would be removed for proper disposal/recycling.

Cost

Estimated disposal/recycling costs were gathered from local vendors and determined via professional judgment. Estimated disposal/recycling cost for the hazardous materials associated with the building is $5,513. Table 3 below lists removal costs for hazardous materials identified in the subject property building.

**TABLE 3**

**HAZARDOUS MATERIALS REMOVAL COSTS**
**PINE LAWN, 6261 NATURAL BRIDGE ROAD, PINE LAWN, MISSOURI**

| Items | Quantity | Costs Per Unit | Estimated Costs |
|---|---|---|---|
| Water Heater | 1 | $75.00 | $75.00 |
| Heating, ventilation, and air conditioning (HVAC) Unit | 1 | $750.00 | $750.00 |
| Flammable Aerosol Cans | 1 | $9.00 | $9.00 |
| Non-flammable Aerosol Cans | 1 | $5.00 | $5.00 |
| Fluorescent Tubes | 12 | $2.50 | $30.00 |
| Polychlorinated biphenyls (PCB)-containing Ballasts | 6 | $4.00 | $24.00 |
| Copy Machines, Printers, Fax Machines, Scanners | 18 | $75.00 | $1,350.00 |
| Televisions, Computer Monitors | 17 | $60.00 | $1,020.00 |
| Printing-related liquids (e.g. toner, offset solution and concentrate, developer) | Approximately 15 | $150.00 | $2,250.00 |
| **Total Estimated Removal/Disposal Cost** | | | **$5,513.00** |

## 5.3 RECOMMENDED CLEANUP ALTERNATIVES

This section recommends cleanup alternatives for ACM, LBP, and hazardous materials at the subject property.

### 5.3.1 Asbestos-Containing Material

Alternative 3—abatement of ACM—is the recommended cleanup alternative for ACM. Future plans at the subject property include either rehabilitation/renovation or demolition; therefore, removal of the identified ACM would be required prior to initiation of those activities.

### 5.3.2 Lead-Based Paint

Alternative 2—LBP removal by demolition—is the recommended cleanup alternative for LBP identified at the subject property. Building materials containing LBP would be demolished and sent for disposal as demolition waste. General construction/demolition workers could implement this alternative. Based on presence of lead, construction/demolition work must accord with OSHA guidelines for protection of workers.

### 5.3.3 Hazardous Materials

Alternative 2—removal of hazardous materials—is the recommended cleanup alternative for hazardous waste in the subject property buildings.

### 5.3.4 Total Cleanup Cost

Table 4 below summarizes total cleanup costs. Based on the recommended cleanup alternatives, estimated total cleanup cost is $35,333, which includes subject property enrollment in the MDNR B/VCP and technical consulting fees. The fee for subject property enrollment in the MDNR B/VCP program is $5,200. Whether the subject property will be enrolled in the MDNR B/VCP program is unknown; however, fees associated with the program have been included for planning purposes.

**TABLE 4**

**SUMMARY OF COSTS**
**PINE LAWN, 6261 NATURAL BRIDGE ROAD, PINE LAWN, MISSOURI**

| Contaminant/Material | Recommended Alternative | Action - Cost | Total Cost |
|---|---|---|---|
| ACM | Alternative 3 – Abatement of ACM | Abatement – $2,120 | $15,120 |
| | | Oversight and Clearance Sampling – $2,500 | |
| | | Technical Reporting – $10,500 | |
| LBP | Alternative 2 – LBP Removal by Demolition | TCLP Analysis – $2,500 | $9,500 |
| | | Technical Reporting – $7,000 | |
| Hazardous Materials | Alternative 2 – Removal of Hazardous Materials | Removal and Disposal/Recycling – $5,513 | $5,513 |
| | | MDNR B/VCP Fees | $5,200 |
| | | **Total Cost** | **$35,333** |

Notes:

ACM Asbestos-containing material
B/VCP Brownfields/Voluntary Cleanup Program
LBP Lead-based paint
MDNR Missouri Department of Natural Resources

TCLP Toxicity Characterization Leaching Procedure

## 6.0 REFERENCES

City of Pine Lawn, Missouri. 2018. Brownfields Assessment Application regarding the 6261 Natural Bridge Road property, submitted to Missouri Department of Natural Resources (MDNR). June 28.

Missouri Department of Natural Resources (MDNR). 2017. Air Pollution Control Program Fact Sheet – Asbestos Requirements for Demolition and Renovation Projects. May.

Terracon Consultants, Inc. (Terracon). 2019. Phase I Environmental Site Assessment. 6261 Natural Bridge Road, Pine Lawn, Missouri. July 11.

Toeroek. 2020. Targeted Brownfields Assessment, Hazardous Materials Survey, Pine Lawn, 6261 Natural Bridge Road, Pine Lawn, Missouri. November 16.

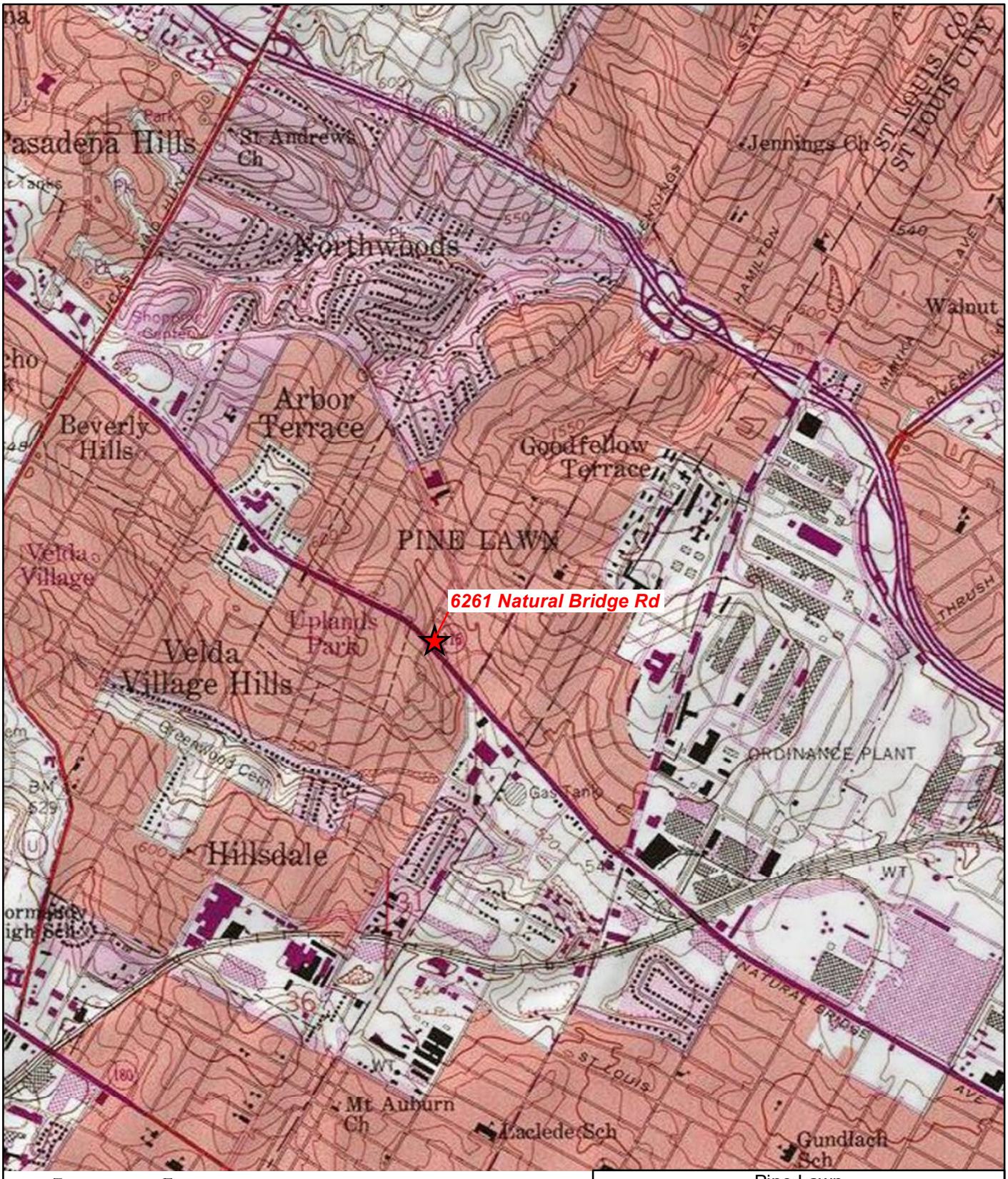
U.S. Department of Housing and Urban Development (HUD). 1997. *Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing*.

U.S. Geological Survey (USGS). 1998. Clayton, Missouri Quadrangle. USGS 7.5-Minute Topographic Series.

U.S. Geological Survey (USGS). 2020. Average concentrations of elements in Saint Louis County, Missouri. https://mrdata.usgs.gov/geochem/county.php?place=f29189&el=As&rf=east-central

# APPENDIX A

# FIGURES





N

0 1,000 2,000

Feet

Source: USGS Clayton, MO 7.5 Minute Topo Quad, 1993

Pine Lawn
6261 Natural Bridge Road
Pine Lawn, Missouri

**Figure 1**
Site Location Map

TETRA TECH

Date: 12/3/2020 Drawn By: Rose Micke Project No:103Z65210190.02.02

X:\P65210190\02\Projects\mxd\ABCA\Figure1.mxd


Legend

Approximate site boundary

N

0 15 30

Feet

Source: Esri, ArcGIS Online, World Imagery, 2017

Pine Lawn
6261 Natural Bridge Road
Pine Lawn, Missouri

**Figure 2**
Site Layout Map

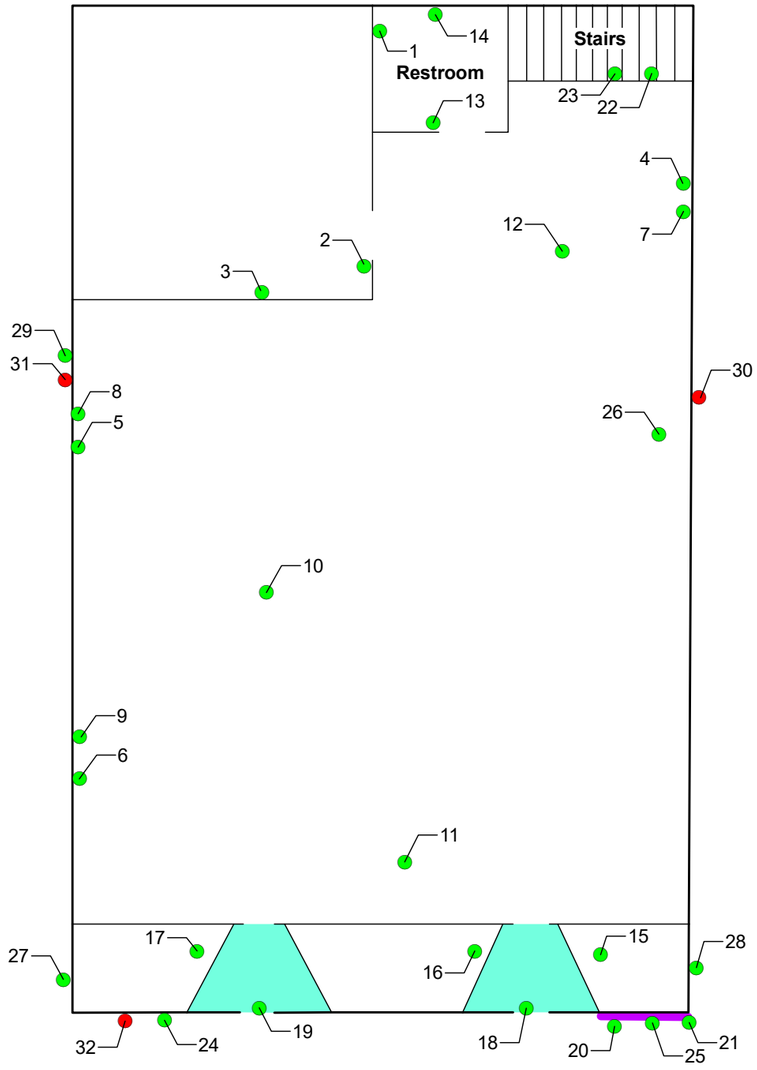
TETRA TECH

Date: 12/3/2020 Drawn By: Nick Wiederholt Project No: 103Z65210190.02.05

X:\P65210190\02\Projects\mxd\ABCA\Figure2.mxd

**Sample Key Table**

| Key | Sample No. |
|---|---|
| Asbestos | |
| 1 | 6261-DWJC-01 |
| 2 | 6261-DWJC-02 |
| 3 | 6261-DWJC-03 |
| 4 | 6261-PLAS-01 |
| 5 | 6261-PLAS-02 |
| 6 | 6261-PLAS-03 |
| 7 | 6261-SC-01 |
| 8 | 6261-SC-02 |
| 9 | 6261-SC-03 |
| 10 | 6261-VFT-01 |
| 11 | 6261-VFT-02 |
| 12 | 6261-VFT-03 |
| 13 | 6261-VFT2-01 |
| 14 | 6261-VFT2-02 |
| 15 | 6261-CM-01 |
| 16 | 6261-CM-01 |
| 17 | 6261-CM-03 |
| 18 | 6261-CFT-01 |
| 19 | 6261-CFT-02 |
| 20 | 6261-CWT-01 |
| 21 | 6261-CWT-02 |
| 22 | 6261-CM2-01 |
| 23 | 6261-CM2-02 |
| 24 | 6261-RR-01 |
| 25 | 6261-RR-02 |
| 26 | 6261-RR-03 |
| 27 | 6261-RF-01 |
| 28 | 6261-RF-02 |
| 29 | 6261-RF-03 |
| 30 | 6261-RT-01 |
| 31 | 6261-RT-02 |
| 32 | 6261-RT-03 |




Legend

- Asbestos-containing material sample location
- Non-asbestos-containing material sample location
- LBP (metal frame)
- LBP (wood soffit)
- LBP Lead-based paint

N

0 4 8

Feet

Pine Lawn
6261 Natural Bridge Road
Pine Lawn, Missouri

**Figure 3**

Sample Location Map

TETRA TECH

Date: 10/22/2020 Drawn By: Nick Wiederholt Project No: 103Z65210190.02.05

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