

ANALYSIS OF BROWNFIELDS CLEANUP ALTERNATIVES

**Old Saw Shop
835 Highway 42
Iberia, MO 65486**

Prepared for:

**Missouri Department of Natural Resources
P.O. Box 176
Jefferson City, MO 65102**

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Prepared by:



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PE Project No. 016.03.003

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Prepared by Professional Environmental Engineers, Inc. (PE)
For the City of Iberia

1.0 INTRODUCTION AND BACKGROUND

This document provides an analysis of brownfields cleanup alternatives (ABCA) for the above-referenced property. Section one includes information on the site location, previous site uses, assessment and remediation activities that have occurred at the site, and the reported planned re-use of the site.

1.1 Site Location

The Old Saw Shop (site) is located at 835 North Lombar Street (Highway 42) in Iberia, Missouri.

1.2 Previous Site Uses and Previous Cleanup Remediation

The site is currently a vacant lot on a 0.5-acre, rectangular-shaped parcel. Historic documents indicate that it was operated as a garage and millinery shop in 1921 and as a saw equipment shop and pool hall in more recent years. The property was acquired by the City of Iberia in November 2015; a former on-site structure (the Old Saw Shop?) appears to have been demolished within the last two years. No previous cleanup or remediation activities have been reported to PE.

1.3 Previous Site Assessment Findings

A Phase I Environmental Site Assessment (ESA) was conducted by Seagull Environmental Technologies, Inc. (Seagull), in 2015/2016; results of the Phase I ESA indicated that asbestos containing material (ACM) and lead based paint (LBP) may be present in the on-site structure along with electrical ballasts that might contain polychlorinated biphenyls (PCBs). A 1,000-gallon, steel, underground storage tank (UST) was closed in place (in 1994) on the adjacent Eads Motors automotive repair shop, located directly west-southwest of the site. Based on its distance, the local topography, and an estimated groundwater flow direction, the UST was identified as a recognized environmental condition (REC) associated with the site. No other RECs were identified in the Phase I ESA (Seagull, 2016).

Limited Phase II ESAs were conducted by SCI Engineering, Inc. (SCI), in July 2016 and June 2017 to investigate potential impact to on-site soil and groundwater. SCI advanced six soil borings at the site (B-1 through B-6). The borings extended to a depth of 8 feet (ft) below ground surface (bgs), at which point they encountered refusal on bedrock. The soils were screened on

approximate 2-foot-vertical intervals using a photoionization detector (PID).with readings ranging from 2.9 to 7.9 parts per million (ppm). Temporary piezometers were installed in each boring in order to collect groundwater samples. Only the piezometers at boring B-1 and B-4 yielded enough water to sample. After collecting the groundwater sample, all temporary piezometers were abandoned. Soil and groundwater samples were analyzed for Resource Conservation and Recovery Act (RCRA) 8 metals (which included arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver) and polynuclear aromatic hydrocarbons (PAHs). SCI compared soil and groundwater analytical results to Missouri Department of Natural Resources (MDNR) Default Target Levels (DTLs) and background metal concentrations for Miller County (SCI, 2017); MDNR DTLs are the most conservative target levels established by the state and are based on unrestricted land use. A figure showing soil boring and groundwater piezometer locations is provided as Attachment 1.

Five soil samples exceeded the background concentration for lead, which is 41.75 milligrams per kilogram (mg/kg) based on the maximum background concentrations in Miller County (SCI, 2017). These samples included B-1 (0-2 ft bgs) at 1,040 mg/kg, B-2 (0-2 ft bgs) at 202 mg/kg, B-2 (4-6 ft bgs) at 132 mg/kg, B-3 (0-2 ft bgs) at 1,180 mg/kg, and B-4 (0-3 ft bgs) at 84.2 mg/kg.

Five soil samples exceeded the background concentration for arsenic, which is 7.57 mg/kg based on the maximum background concentrations in Miller County (SCI, 2017). These include B-4 (0-3 ft bgs) at 8.56 mg/kg, B-4 (6-8 ft bgs) at 14.7 mg/kg, B-5 (0-3 ft bgs) at 10 mg/kg, B-5 (4-6 ft bgs) at 12.9 mg/kg, and B-6 (4-6 ft bgs) at 14.9 mg/kg. All analytical results for soil samples are included in Table 1 in Attachment 2.

The groundwater sample collected at the boring B-1 location exceeded the DTL for lead, which is 0.015 milligrams per liter (mg/L); the groundwater sample from B-1 contained 8.95 mg/L. The groundwater sample collected at the B-4 location exceeded DTLs for PAHs, including benzo(a)anthracene and benzo(b)fluoranthene (which have DTLs of 0.000103 and 0.0000627 mg/L, respectively). The groundwater sample from B-4 contained 0.000109 of benzo(a)anthracene and 0.000104 mg/L of benzo(b)fluoranthene (SCI, 2016 and SCI, 2017). All analytical results for groundwater samples are included in Table 2 in Attachment 2.

Groundwater contamination is not addressed in this ABCA.

1.4 Project Goal

The planned reuse for the site is green space (Seagull, 2017).

2.0 APPLICABLE REGULATIONS AND CLEANUP STANDARDS

This section includes information on cleanup responsibilities and applicable laws/regulations and cleanup standards for this site.

2.1 Cleanup Oversight Responsibility

The responsible party for cleanup is the City of Iberia (property owner). The cleanup would likely be performed by a city contractor and overseen by the MDNR. In addition, all documents prepared for the site would likely be submitted to MDNR for review and comment.

2.2 Cleanup Standards for Major Contaminants

The MDNR Risk-Based Corrective Action (MRBCA) guidance will be used to establish cleanup standards. Since exposure of lead and arsenic in the surface (0-3 feet bgs) is the most likely exposure pathway, the Risk-Based Target Levels (RBTLs) for surface soils (covering ingestion, inhalation, and dermal contact) are expected to be used to determine the extent of contaminated soil at the site. In this ABCA, the background concentration for Miller County for arsenic from Tidball (1984) will be used for determining the extent of soil contamination for purposes of excavation. An MRBCA Tier I Risk Assessment is expected to be completed prior to remediation activities to evaluate exposure routes and receptor risks (and confirm/define applicable cleanup criteria).

2.3 Laws and Regulations Applicable to the Cleanup

Laws and regulations that will likely be applicable to this cleanup include the Federal Small Business Liability Relief and Brownfields Revitalization Act, the Federal Davis-Bacon Act, the MDNR MRBCA standards, and City of Iberia by-laws. Applicable Federal, state, and local laws regarding procurement of contractors to conduct the cleanup would be followed.

In addition, all appropriate permits (e.g., Missouri One-Call, soil transport/disposal manifests) would be obtained by the responsible parties prior to work commencing.

3.0 EVALUATION OF CLEANUP ALTERNATIVES

This section evaluates three cleanup alternatives for the site.

3.1 Cleanup Alternatives Considered

To address contamination at the site, three different alternatives were considered, including: Alternative #1 - No Action; Alternative #2 – MRBCA Risk Assessment and Excavation and Disposal of Contaminated Soil and Alternative #3 - MRBCA Risk Assessment and Installation of a Cap. Cleanup of groundwater is not considered in these alternatives.

3.2 Evaluation of Cleanup Alternatives

To satisfy EPA requirements, the effectiveness, implementability, and cost of each alternative must be considered prior to selecting a recommended cleanup alternative.

3.3 Alternative 1 – No Action

Alternative 1 consists of no remedial action performed on the site.

Assumptions

An MRBCA Risk Assessment would not be conducted in a no-action scenario.

Effectiveness

Performing no action would be ineffective in controlling or preventing the apparent exposure of receptors to contamination at the site.

Implementability

No action is easy to implement since no action would be conducted.

Cost

There will be no costs under Alternative #1.

3.4 Alternative 2 – MRBCA Risk Assessment Plus Excavation and Disposal of Contaminated Soil

Alternative 2 consists of conducting an MRBCA Tier I Risk Assessment followed by removal/disposal of all contaminated surface soil (assumed to be 800 square feet in area based on Tier 1 RBTLs and background arsenic concentration for Miller County) to a depth of three feet below ground surface.

Assumptions

The estimated 800 square foot area of contamination (extending to 3 feet below grade) was estimated based on previous surface soil samples that exceeded the Tier 1 RBTLs for lead (borings B-1 and B-3). Surface soil (0-3 feet bgs) is impacted with arsenic in soil boring B-5 at a concentration above the background concentration for Miller County. It should be noted that arsenic was not analyzed for soil borings B-1 through B-3. Additional sampling is not planned at the site prior to excavation. Following the excavation, confirmation soil samples will be screened with an x-ray fluorescence detector, collected with a direct push rig and submitted for analysis for arsenic and lead. Temporary fencing will be installed around the excavation until analytical results are received from the lab. After confirmation that the contamination has been removed, the temporary fencing will be removed and the excavation will be brought to grade with clean fill.

Effectiveness

Performing a Risk Assessment would assure that contaminated media is cleaned up only to levels that are applicable to this site (if unacceptable risks to human health and the environment are determined to be present). Additional corrective action could be required after performing an MRBCA Risk Assessment.

Excavation of an area of 800 square feet of impacted soils to depth of approximately three ft bgs (approximately 89 cubic yards) would eliminate impacted soils that could be ingested, inhaled, or come into direct contact with human receptors.

Implementability

The MRBCA Risk Assessment is easy to implement. Excavation with off-site disposal is implementable since the site is large enough to accommodate the equipment required to excavate the soil. An area of approximately 800 square feet of soil to a depth of three feet would be excavated and clean fill material would be placed into the excavation. Coordination (e.g., dust suppression and monitoring) during cleanup activities and short-term disturbance to the community (e.g., trucks transporting contaminated soils and backfill) are anticipated. Ongoing monitoring and maintenance would not be required following excavation and offsite disposal.

Cost

The cost to implement Alternative #2 is estimated to be approximately \$41,660. Details of the cost estimate, along with the assumptions made, are provided in Attachment 3.

3.5 Alternative 3 – MRBCA Risk Assessment and Installation of a Cap

Alternative 3 consists of conducting an MRBCA Tier I Risk Assessment followed by placement of an asphalt cap as a barrier between receptors and known contaminants at the surface.

Assumptions

After completion of the risk assessment, an asphalt cap 3-4 inches thick covering approximately 800 square feet (area that would be excavated under cleanup alternative 2) would be placed on top of the contaminated soil. This cap would be a permanent feature of the site and would require routine inspections/maintenance to assure protectiveness of the remedy. Costs for inspection of the cap are not included in this ABCA.

Effectiveness

Performing a Risk Assessment would assure that contaminated media is cleaned up only to levels that are applicable to this site (if unacceptable risks to human health and the environment are determined to be present). The cap would prevent contaminated soil from coming into contact with receptors on the site.

Implementability

The MRBCA Risk Assessment is easy to implement. Approximately 800 square feet of soil would be covered by a cap, which would be relatively easy to implement.

Cost

The cost to implement Alternative #3 is estimated to be approximately \$31,900. The costs for annual inspections of the cap are not included in this ABCA. Details of the cost estimate, along with the assumptions made, are provided in Attachment 3.

3.6 Recommended Cleanup Alternative

Alternative #1 – No Action does not provide any cleanup of impacted soil and liability for cleanup would remain at the site. The less expensive alternative of the other options is Alternative #3 - MRBCA Risk Assessment and Installation of a Cap. However, Alternative #3 does not remove the contaminated soil and requires management of it indefinitely (or until applicable conditions change). The proposed cap is also an awkward fix and limits the use of the property; a significant portion of the site could be capped with asphalt. If a permanent asphalt cap is not desirable [along with the Activity Use and Limitation (AUL) that accompanies this

alternative], then Alternative #2- MRBCA Risk Assessment and Excavation and Disposal of Contaminated Soil would be a more suitable option with less restrictions.

4.0 REFERENCES

Missouri Department of Natural Resources, 2006, Departmental Missouri Risk-Based Corrective Action (MRBCA) Technical Guidance.

SCI Engineering, Inc., 2016. Limited Phase Two Environmental Site Assessment, Old Saw Shop, Iberia, Missouri.

SCI Engineering, Inc., 2017. Limited Phase Two Environmental Site Assessment, Old Saw Shop, Iberia, Missouri.

Seagull Environmental Technologies, Inc., 2016. Phase I Environmental Site Assessment, Old Saw Shop Site, 835 State Highway 42, Iberia, Missouri.

Tidball, Ronald R., 1984. Geochemical Survey of Missouri, USGS Professional Paper 954-H, I.

Attachment 1
Soil Boring Location Map



PROJECT NAME
 OLD SAW SHOP
 IBERIA, MISSOURI

**BORING LOCATIONS MAP &
 AERIAL PHOTOGRAPH**

| | | | |
|-------------------|-----|-------------|-------------------|
| DRAWN BY | RCV | DATE | JOB NUMBER |
| CHECKED BY | BLL | 06/2017 | 2015-1074.22 |

GENERAL NOTES/LEGEND

- INDICATES APPROXIMATE SOIL BORING LOCATIONS.
- INDICATES PREVIOUS SOIL BORING LOCATIONS, DRILLED 07/2016.

AERIAL PHOTOGRAPH OBTAINED FROM BING MAPS.
 © 2011 MICROSOFT CORPORATION AND ITS DATA SUPPLIERS.



FIGURE
 1

Attachment 2
Tables

Table 1
Soil Analytical Data
Old Saw Shop
Iberia, Missouri

June 11, 2016 Results

| Chemical | Units | MRBCA DTL | MRBCA Tier 1 RBTL Surface Soils (Residential) | B-1 | B-1 | B-2 | B-2 | B-3 | B-3 |
|---------------|-------|--------------|--|---------|---------|----------|---------|---------|----------|
| | | | | 0-1 ft | 4-6 ft | 0-2 ft | 4-6 ft | 0-2 ft | 4-5.5 ft |
| Date | | | | 6/11/16 | 6/11/16 | 06/21/16 | 6/21/16 | 6/21/16 | 6/21/16 |
| Benzene | mg/kg | 0.0561 | 177 | <0.0012 | <0.0235 | <0.0011 | <0.0014 | <0.0017 | <0.038 |
| Ethylbenzene | mg/kg | 39.9 | 7450 | <0.0059 | <0.118 | <0.0054 | <0.0072 | <0.0083 | <0.19 |
| Toluene | mg/kg | 29.8 | 6210 | <0.0059 | <0.118 | <0.0054 | <0.0072 | <0.0083 | <0.19 |
| Total Xylenes | mg/kg | 24.7 | 7830 | <0.0059 | <0.018 | <0.0054 | <0.0072 | <0.0083 | <0.19 |
| TPH GRO | mg/kg | 385 | 35,400 | <0.593 | 68.2 | <0.538 | <0.725 | <0.830 | <19 |
| TPH DRO | mg/kg | 4150 | 140,000 | <3050 | 172 | <0.126 | <205 | <322 | 86.5 |
| TPH ORO | mg/kg | 124,000 | 124,000 | <3050 | 2150 | 260 | <205 | 898 | 901 |
| Lead | mg/kg | 260 | 260 | 1040 | 31.4 | 202 | 132 | 1180 | 26.6 |

June 6, 2017 Results

| Chemical | Units | MRBCA DTL | MRBCA Tier 1 RBTL Surface Soils (Residential) | B-4 | B-4 | B-5 | B-5 | B-6 | B-6 |
|----------------------|-------|--------------|--|--------|--------|--------|--------|--------|--------|
| | | | | 0-3 ft | 6-8 ft | 0-3 ft | 4-6 ft | 0-3 ft | 4-6 ft |
| Date | | | | 6/6/17 | 6/6/17 | 6/6/17 | 6/6/17 | 6/6/17 | 6/6/17 |
| Benzo(a)pyrene | mg/kg | 0.62 | 0.62 | 0.006 | <0.005 | <0.005 | <0.005 | 0.073 | <0.004 |
| Benzo(b)fluoranthene | mg/kg | 6.19 | 6.19 | 0.009 | <0.005 | <0.005 | <0.005 | 0.142 | <0.004 |
| Benzo(k)fluoranthene | mg/kg | 62 | 62 | <0.004 | <0.005 | <0.005 | <0.005 | 0.049 | <0.004 |
| Chrysene | mg/kg | 599 | 599 | 0.005 | <0.005 | <0.005 | <0.005 | <0.04 | <0.004 |
| Fluoranthene | mg/g | 2280 | 2280 | 0.008 | <0.005 | <0.005 | <0.005 | 0.044 | <0.004 |
| Phenanthrene | mg/kg | 158 | 2170 | 0.005 | <0.005 | <0.005 | <0.005 | <0.04 | <0.004 |
| Pyrene | mg/kg | 1500 | 2730 | 0.008 | <0.005 | <0.005 | <0.005 | 0.072 | <0.004 |
| Arsenic | mg/kg | 3.89 | 9 ¹ | 8.56 | 14.7 | 10 | 12.9 | 7.32 | 14.9 |
| Barium | mg/kg | 2040 | 15,000 | 234 | 487 | 241 | 269 | 159 | 401 |
| Cadmium | mg/kg | 9.31 | 16.8 | 0.5 | 0.55 | 0.24 | 0.37 | 0.27 | 0.42 |
| Chromium | mg/kg | 74,600 | 74,600 | 20.9 | 44.7 | 28.1 | 44.3 | 32.5 | 60.1 |
| Lead | mg/kg | 3.74 | 260 | 84.2 | 17.9 | 21.1 | 14.2 | 14.1 | 14.7 |
| Mercury | mg/kg | 2.19 | 46.3 | 0.088 | 0.046 | 0.061 | 0.045 | 0.039 | 0.02 |
| Selenium | mg/kg | 6.27 | 380 | <3.92 | 4.23 | <3.77 | 5.21 | <3.92 | 5.41 |
| Silver | mg/kg | 16.2 | 374 | <0.49 | <0.45 | <0.47 | <0.47 | <0.49 | <0.48 |

Notes:

¹ = Background concentration for arsenic in Miller County (Tidball, 1984)

< = not detected at concentration following "<" sign

ft = feet below grade

mg/kg = milligrams per kilogram

MRBCA DTL = Missouri Risk-Based Corrective Action Default Target Level

MRBCA RBTL = Missouri Risk-Based Corrective Action Risk-Based Target Level

NA = not applicable

Shaded cells indicate concentration exceeds the MRBCA Tier 1 RBTL for residential surface soils

Table 2
Groundwater Analytical Data
Old Saw Shop
Iberia, Missouri

| Chemical | Units | MRBCA DTL | B-1 6/23/16 | B-4 6/6/17 |
|----------------------|-------|--------------|----------------|---------------|
| Benzene | mg/L | 0.005 | <.002 | |
| Ethylbenzene | mg/L | 0.7 | <.005 | |
| Toluene | mg/L | 1 | <0.005 | |
| Total Xylenes | mg/L | 10 | <.005 | |
| TPH GRO | mg/L | 18.1 | <0.500 | |
| TPH DRO | mg/L | 34.3 | 25.3 | |
| TPH ORO | mg/L | 31.8 | <20 | |
| Benzo(a)anthracene | mg/L | 0.000103 | | 0.000109 |
| Benzo(b)fluoranthene | mg/L | 0.0000627 | | 0.000104 |
| Benzo(ghi)perylene | mg/L | 0.0264 | | 0.000108 |
| Chrysene | mg/L | 0.0103 | | 0.000117 |
| Fluoranthene | mg/L | 0.164 | | 0.000191 |
| Naphthalene | mg/L | 0.00109 | | 0.000163 |
| Phenanthrene | mg/L | 0.075 | | 0.000118 |
| Pyrene | mg/L | 0.0961 | | 0.000159 |
| Arsenic | mg/L | 0.01 | | <0.025 |
| Barium | mg/L | 2.0 | | 0.286 |
| Cadmium | mg/L | 0.005 | | <0.002 |
| Chromium | mg/L | 0.1 | | <0.005 |
| Lead | mg/L | 0.015 | 8.95 | <0.015 |
| Mercury | mg/L | 0.0507 | | <0.0002 |
| Selenium | mg/L | 0.05 | | <0.04 |
| Silver | mg/L | 0.0781 | | <0.005 |

Notes:

< = not detected at concentration following "<" sign

ft = feet below grade

mg/L – milligrams per liter

MRBCA DTL = Missouri Risk-Based Corrective Action Default Target Level

Attachment 3
Budget Details

Alternative 2

| | | | | | w 15% |
|-------------------------------------|--------|-----------|---------------------------|------------|-------------|
| MRBCA Tier 1 Risk Assessment | Number | Unit | Unit Cost | Total Cost | markup |
| MRBCA Phase I Risk Assessment | 1 | lump sum | 4000 | 4000 | 4000.00 |
| Excavation | | | | | |
| bobcat | 3 | days | 275.00 | 825.00 | 948.75 |
| back hoe | 3 | days | 700.00 | 2100.00 | 2415.00 |
| dump truck #1 | 2 | days | 1100.00 | 2200.00 | 2530.00 |
| dump truck #2 | 2 | days | 1100.00 | 2200.00 | 2530.00 |
| dump truck #3 | 1 | days | 1100.00 | 1100.00 | 1265.00 |
| labor -excavation and transport | | | | | |
| truck driver #1 | 2 | days | 100.00 | 200.00 | 230.00 |
| truck driver #2 | 2 | days | 100.00 | 200.00 | 230.00 |
| truck driver #3 | 1 | days | 100.00 | 100.00 | 115.00 |
| equipment operator | 3 | days | 100.00 | 300.00 | 345.00 |
| equipment laborer | 3 | days | 100.00 | 300.00 | 345.00 |
| Soil disposal @ Jeff City Landfill | 89 | cy | 40.00 | 3560.00 | 4094.00 |
| Fill material | 89 | cy | 10.00 | 890.00 | 1023.50 |
| temporary fencing | 150 | linear ft | 2.00 | 300.00 | 345.00 |
| fence posts every 10 ft | 11 | each | 4.00 | 44.00 | 50.60 |
| Soil testing | | | | | |
| XRF | 1 | day | 577.5 | 577.5 | 664.13 |
| Geoprobe with mobilization | 1 | day | 2000 | 2000 | 2300 |
| Confirmation Samples | | | | | |
| Lead | 8 | each | 7.00 | 56.00 | 64.40 |
| Arsenic | 8 | each | 7.00 | 56.00 | 64.40 |
| Labor - environmental tech | 3 | day | 480.00 | 1440.00 | 1440.00 |
| Pickup truck | 3 | day | 90.00 | 270.00 | 310.50 |
| Per diem | 3 | day | 140.00 | 420.00 | 483.00 |
| Total Excavation | | | | | 21793.28 |
| Assumptions: | | | | | |
| Area of impacted soil | 800 | sq ft = | 89 | sq yds | |
| Volume of impacted soil | 89 | sq yds | 3 | ft deep | 89 cubic yd |
| Iberia - Jeff City | 1 | hour | | | |
| Load truck (12 cy) | 0.5 | hour | | | |
| Loads | 89 | cy | 12 | 7 | loads |
| Load round trip | 2.5 | hour | 3 loads per day per truck | | |
| 3 dump trucks per day | 3 | days | to complete excavation | | |
| 3 days for excavation | | | | | |
| 1 day for backfill | | | | | |

Alternative 2

1 environmental tech to check soil with XRF tool and collect confirmation samples
 1 confirmation sample on each end of excavation (2 end samples), 1 confirmation sample
 every 20 feet along the long sides of the excavation (2 x 3 or 6 samples).
 7 day turnaround time on metals analysis. The excavation would be fenced until analytical
 results are received.

Plans, Project Management and Reporting

| | | | | | |
|------------------------------|----|------|-----|------|-------|
| Review reports | 40 | hour | 65 | 2600 | 2600 |
| Develop Health & Safety plan | 20 | hour | 80 | 1600 | 1600 |
| Develop Work plan | 40 | hour | 80 | 3200 | 3200 |
| Final report | 40 | hour | 80 | 3200 | 3200 |
| Review | 8 | hour | 100 | 800 | 800 |
| Admin | 4 | hour | 59 | 236 | 236 |
| CAD | 4 | hour | 57 | 228 | 228 |
| Total report and planning | | | | | 11864 |
| Project management | 32 | hour | 100 | 3200 | 3200 |

Estimated costs

| | | | | | |
|--|--|--|--|-------|-------|
| MRBCA Tier I Risk Assessment | | | | | 4000 |
| Excavation, soil disposal and backfill | | | | | 21793 |
| Plans and Reporting | | | | | 11864 |
| Project Management | | | | | 4000 |
| | | | | Total | 41657 |

Alternative 3

| | Number | Unit | Unit Cost | Total Cost | w 15% markup |
|--|--------|----------|-----------|------------|-----------------|
| MRBCA Tier 1 Risk Assessment | 1 | lump sum | 4000.00 | 4000.00 | 4000.00 |
| Capping | | | | | |
| 3" thick asphalt & 3" base rock includes labor, materials and transport | 800 | sq ft | 4.50 | 3600.00 | 4140.00 |
| LTS Fee | 1 | each | 15000.00 | 15000.00 | 15000.00 |
| Plans, Project Management and Reporting | | | | | |
| Review reports | 40 | hour | 65.00 | 2600.00 | 2600.00 |
| Develop Health & Safety plan | 20 | hour | 80.00 | 1600.00 | 1600.00 |
| Develop Work plan | 8 | hour | 80.00 | 640.00 | 640.00 |
| Final report | 16 | hour | 80.00 | 1280.00 | 1280.00 |
| Review | 4 | hour | 100.00 | 400.00 | 400.00 |
| Admin | 2 | hour | 59.00 | 118.00 | 118.00 |
| CAD | 2 | hour | 57.00 | 114.00 | 114.00 |
| Total report and planning | | | | | 6752.00 |
| Project management | 20 | hour | 100.00 | 2000.00 | 2000.00 |

Assumptions:

Maintenance of asphalt cap is not included in this cost estimate

Size of cap is based on arsenic plus lead concentrations above MDNR Tier 1 RBTLs for soil

Estimated costs

| | |
|------------------------------|--------------|
| MRBCA Tier I Risk Assessment | 4000 |
| Asphalt cap | 4140 |
| LTS Fee | 15000 |
| Plans and Reporting | 6752 |
| Project Management | 2000 |
| Total | 31892 |