



AN ENVIRONMENTAL, ENGINEERING & SURVEYING FIRM

**ANALYSIS OF BROWNFIELDS CLEANUP ALTERNATIVES (ABCA) AMENDMENT
HENNINGER LANDFILL, 4103 PEARL ROAD
CLEVELAND, OHIO**

Introduction & Background

The Property occupies approximately 25 acres and is located northeast of the intersection of Pearl and Henninger Roads, in Cleveland, Ohio. The Property consists of vacant land that is primarily vegetated. The north portion of the Property is wooded and slopes steeply down to the north toward the Big Creek valley. Big Creek crosses the northeastern portion of the Property. The planned reuse for the Property is for recreational use as a hike and bike trail.

This Analysis of Brownfields Cleanup Alternatives (ABCA) Amendment has been prepared for use by the Western Reserve Land Conservancy (WRLC). This ABCA Amendment amends the ABCA completed in June 2016 (Attachment 1). The 2016 ABCA stated that two (2) soil sample locations would require remedy when in fact only one (1) area was identified in the Property Specific Risk Assessment completed for the Property in 2015. Additionally, confirmation sampling has been conducted, as part of Ohio Environmental Protection Agency (EPA) Voluntary Action Program (VAP) activities which are currently in progress. The additional sampling has found that the area requiring remedy is smaller than originally expected. The ABCA Amendment was completed to include the revisions and to recommend removal as the remedy instead of capping, as it would be more protective.

The public notice posted for the 2016 ABCA received one (1) comment regarding the planned timing of the project. Consequently, a shortened notification period of two (2) weeks was deemed acceptable for the ABCA Amendment.

Forecasted Climate Conditions

According to the US Global Change Research Program (USGCRP), climate trends for this region of the United States include increased temperatures, increased precipitation with greater variability, and increased extreme precipitation events. The increased precipitation is the most applicable to the cleanup of the site. According to FEMA Flood Zone Map 39035C0179E, the Property is located within Zone X which is defined as areas outside of the 0.2% annual chance flood plain. Therefore soils are not expected to wash out and potentially impact downstream receptors over the next 20 years in the cleanup area under any of the alternatives presented in this ABCA Amendment.

Previous Site Use

Based on historical information, the Property was used for commercial/industrial purposes since about 1900. This included the Hunt Manufacturing Company, the Brooklyn Station Municipal Electric Light Plant with a cooling pond, a gasoline filling station, the Brooklyn Auto Wrecking Co. The Cuyahoga Scrap Iron & Metal Co., former rail spurs, and Rockport Construction. Some of these operations were located in the former valley that existed before filling occurred.

Undocumented and documented dumping has occurred at the Property since at least 1948. The Property was used for the disposal of fill from the construction of Interstate I-71 in the mid-1960s and was used for disposing foundry sand cores from the Ford Motor Foundry since at least 1975. From 1976 to 1987, the Property operated as a construction and demolition waste landfill. Big Creek was relocated due to the filling activities.

Previous borings conducted on the Property indicate that the fill material is up to 94 feet thick. Fill materials observed in test pits and soil borings include wood cinders, tar paper, foundry sand, coal, office paper, rolled carpet, appliances, metal, slag, concrete, oily material, brick, ash, and metal tubing.

The 2014 Phase I completed by others referred to the past use as including "demolition and industrial waste". Based on Partners research no industrial wastes were approved to be placed at the Property. It is expected that their use of the term industrial waste refers to the foundry sand.

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Previous Assessments

The WRLC provided Partners with several reports associated with the Property including a Phase II Environmental Site Assessment, a 2014 VAP Phase I Property Assessment, and a Limited Phase II Property Assessment. Additionally, Partners is in the process of completing a VAP Phase II Property Assessment to support the issuance of a No Further Action (NFA) Letter and Request for Covenant Not to Sue (CNS) from the Ohio EPA.

Based on Partners review of the previous assessments, impacts to groundwater, surface water, and sediment with chemicals of concern (COC) appear to be limited. The primary COCs found in the soil/fill that are the focus of the cleanup activities are polynuclear aromatic hydrocarbons (PAHs), primarily benzo(a)pyrene.

The recreational use Property Specific Risk Assessment (PSRA) was completed using the results of previous work to determine if COCs detected in soil in the upper four (4) feet at the Property were likely to pose an unacceptable human health risk. The PSRA included development of risk-based standards for recreational land use for the PAHs, metals, and polychlorinated biphenyls (PCBs) which exceeded or added significant risk to the cumulative risk ratio calculated using the Generic Direct Contact Standards (GDSCS) for the Residential Land Use Category for carcinogenic and non-carcinogenic endpoints. Statistical evaluation was conducted to determine representative exposure point concentrations for benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, dibenz(a,h)anthracene, indeno(1,2,3-cd)pyrene, chromium and TPH (10-C20) in soil. The 95% upper confidence limits (UCL95) were calculated for these compounds utilizing the USEPA ProUCL statistical software in a manner consistent with Ohio VAP guidance. Calculations were completed following the guidance presented in *Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites* (USEPA, 2002a). The UCL95 values were below the applicable standards with the exception of benzo(a)pyrene.

Concentrations of benzo(a)pyrene in the zero (0) to four (4) foot point of compliance ranged from non-detect to 51 milligram/kilogram (mg/kg). The UCL95 concentration of the full data set was 10.24 mg/kg. This value was above the recreational use standard. Further evaluation of benzo(a)pyrene was completed for the purpose of determining the impact of soil removal. The UCL95 was recalculated by removing the highest concentration (51 mg/kg at TT-SB-09 [0-2]). The UCL95 concentration following soil removal is 2.94 mg/kg. This value is below the recreational use standard and was used in the multiple chemical adjustment conducted as part of the PSRA.

Risk characterization found that applicable standards are met for the recreational receptor by removing the potential for exposure at one (1) location, TT-SB09 (0-2 feet) due to the concentration of benzo(a)pyrene (51 mg/kg). Delineation sampling found that the impacted area surrounding TT-SB09 (0-2 feet) is very limited in extent, measuring approximately 30 feet by 30 feet by two (2) feet deep.

Evaluation of Cleanup Alternatives and Costs

To address contamination at the Property, three (3) different alternatives were considered, including Alternative #1: No Action, Alternative #2: VAP Process with Soil Excavation with Offsite Disposal and Replacement, and Alternate #3: VAP Process with Soil Capping and no removal. Cost estimated for Alternatives #2 and #3 include access, permitting, surveying, and reporting.

Alternative #1 – No Action

With this alternative, the WRLC would take no action to remediate the Property.

1. Effectiveness – The No Action alternative is not effective in controlling or preventing the exposure of receptors to contamination at the site and would not facilitate re-use of the Property for recreational purposes.
2. Implementability – This alternative can be implemented since no action will be conducted.
3. Cost – There would be no cost for the No Action alternative.

Alternative #2 – Soil Excavation, Disposal and Replacement

This alternative requires the removal and replacement of soil from an area measuring approximately 30 feet by 30 feet by two (2) feet deep (approximately 1,800 cubic feet of soil) to address shallow soil contamination from zero (0) to two (2) feet. Soil in the two (2) to four (4) foot depth interval was found to meet applicable standards. The

soil removal limits were estimated by drawing lines between “clean” sampling points that meet applicable VAP standards. This alternative would render the Property safe for its intended future use. Under the NFA and CNS, remediation will also include the implementation of institutional controls (land use and groundwater use limitations).

1. Effectiveness – Soil excavation with off-site disposal and replacement is an effective way to reduce and manage risk at the Property, contaminated soil will be removed and the Property can safely be developed for its intended future use without continuing obligations. No impacted soils would remain should increases in precipitation and washouts occur.
2. Implementability – This alternative is implementable.
3. Cost – Targeted soil excavation, disposal and replacement of up to 120 tons of soil would cost approximately \$54,000.

Alternative #3 –Capping

This alternative involves the placement of a four (4) foot thick soil cap over and beyond the impacted area (approximately 760 tons of soil). In this way, the four (4) foot point of compliance established under the recreational land use scenario is met and maintained. This alternative would render the Property safe for its intended future use. Under the NFA and CNS, remediation would also require implementation of institutional controls (land use and groundwater use limitations), implementation of an Operation and Maintenance (O&M) Plan, and Ohio EPA annual O&M reporting requirements.

1. Effectiveness –Capping is an effective way to prevent recreational receptors from coming into direct contact with contaminated soils. However, impacted soils would remain on the Property. Predicted increases in precipitation and storm events could result in the cap being compromised and impacted soils being washed down stream.
2. Implementability – This alternative is implementable.
3. Cost –Soil capping would cost approximately \$62,000.

Cleanup Alternatives Cost

1. There will be no costs under Alternative #1: No Action.
2. It is estimated that Alternative #2: Soil excavation, disposal and replacement will cost approximately \$54,000 (Attachment 2).
3. It is estimated that Alternative #3: Soil capping will cost approximately \$62,000 (Attachment 2).

Applicable Regulations and Cleanup Standards

All work will be conducted in accordance with the Ohio Environmental Protection Agency (EPA) Voluntary Action Program (VAP) Rules set forth in Ohio Administrative Code (OAC) 3745-300. The Ohio EPA Division of Environmental Response and Revitalization (DERR) is providing technical assistance to this project. The WRLC will obtain concurrence from the Ohio EPA to implement the clean-up work. Remediation work will be directed by an environmental consulting firm, contracted by the WRLC, which is fully qualified in all aspects of assessment and remediation. The environmental consulting firm will utilize a Certified Professional (CP) licensed by Ohio EPA to oversee remediation activities, and is qualified to submit a VAP No NFA for the Property.

Recommendation

Based on project size, time, cost, intended future Property use and end use requirements, Alternative #1 - No Action was deemed inappropriate because it would thwart the intended re-use of the Property.

Alternative #2 –Soil Excavation, Disposal and Replacement is the most cost effective approach that would facilitate the planned use of the Property without continuing obligations under the VAP.

Alternative #3 – Soil Capping was deemed inappropriate as the costs of capping are higher and future costs would be incurred for maintaining and managing the continuing obligations required under the VAP.

ATTACHMENT 1
2016 ABCA



AN ENVIRONMENTAL, ENGINEERING & SURVEYING FIRM

Introduction & Background

The Property occupies approximately 25 acres and is located northeast of the intersection of Pearl and Henninger Roads, in Cleveland, Ohio. The Property consists of vacant land that is primarily vegetated. The north portion of the Property consists of a wooded ravine which slopes down to a portion of Big Creek which crosses the northeastern portion of the Property.

The planned reuse for the Property is a recreational park.

This Analysis of Brownfields Cleanup Alternatives (ABCA) has been prepared for use by the Western Reserve Land Conservancy (WRLC).

Previous Site Use

Based on historical information, the Property was used for commercial/industrial purposes since about 1900. This included the Hunt Manufacturing Company, the Brooklyn Station Municipal Electric Light Plant with a cooling pond, a gasoline filling station, the Brooklyn Auto Wrecking Co. The Cuyahoga Scrap Iron & Metal Co., former rail spurs, and Rockport Construction. Some of these operations were located in the former valley that existed before filling occurred.

Undocumented and documented dumping has occurred at the Property since at least 1948. The Property was used for the disposal of fill from the construction of Interstate I-71 in the mid-1960s and was used for disposing foundry sand cores from the Ford Motor Foundry since at least 1975. From 1976 to 1987, the Property operated as a demolition and industrial waste landfill. Big Creek was relocated due to the filling activities.

Previous borings conducted on the Property indicate that the fill material is up to 94 feet thick. Fill materials observed in test pits and soil borings include wood cinders, tar paper, foundry sand, coal, office paper, rolled carpet, tires, appliances, metal, slag, concrete, oily material, brick, ash, and metal tubing.

Previous Assessments

The WRLC provided Partners with several reports associated with the Property including a Phase II Environmental Site Assessment, a Voluntary Action Program (VAP) Phase I Property Assessment, and a Limited Phase II Property Assessment.

Based on Partners review of the previous assessments, impacts to groundwater, surface water, and sediment with chemicals of concern (COC) appear to be limited. The primary COCs found in the soil/fill that are the focus of the cleanup activities are polynuclear aromatic hydrocarbons (PAHs), primarily benzo(a)pyrene (BaP).

Using existing data, Partners completed a Property Specific Risk Assessment (PSRA) assuming recreational land use. The PSRA determined a single chemical recreational use standard of 4.8 mg/kg for BaP. That PSRA identified two (2) locations where shallow soil (upper four [4] feet) would require remediation in order to meet applicable standards. Two (2) locations approximately 15,000 square feet each are being evaluated for cleanup alternatives. Future limited supplemental testing will help refine the limits of area requiring cleanup to meet applicable standards and will be incorporated into a final Remedial Action Plan and Project Specifications.

Evaluation of Cleanup Alternatives and Costs

To address contamination at the Property, three (3) different alternatives were considered, including Alternative #1: no Action, Alternative #2: VAP Process with Soil Excavation with Offsite Disposal and Replacement, and Alternate #3: VAP Process with Soil Capping.

Alternative #1 – No Action

With this alternative, the WRLC would take no action to remediate the Property.

1. Effectiveness –The No Action alternative is not effective in controlling or preventing the exposure of receptors to contamination at the site and would not facilitate re-use of the Property for recreational purposes.
2. Implementability – This alternative can be implemented since no action will be conducted.
3. Cost – There would be no cost for the No Action alternative.

Alternative #2 – Soil Excavation, Disposal and Replacement

With this alternative, WRLC would seek issuance of a No Further Action letter from a Ohio EPA VAP Certified Professional (CP) for a Covenant Not to Sue (CNS) for the Property. In order to obtain an NFA letter through the VAP for the Property, several steps under the VAP process would be required. With this alternative, removal and replacement of up to 8,000 tons of soil would be conducted to address shallow soil contamination from zero (0) to four (4) feet. The four (4) foot point of compliance is generally required under the VAP. Additional VAP activities including modifying the existing Property Specific Risk Assessment (PSRA) to include confirmation testing and account for clean up, soil and groundwater confirmation testing, institutional and engineering controls (i.e. property and groundwater use limitations), an Operations and Maintenance (O&M) Plan, a Risk Mitigation Plan to protect future trench workers, and meeting the VAP reporting requirements to demonstrate that applicable standards are achieved. Although this alternative would assist the WRLC with its plan to position the Property for recreational use, the associated cost may be prohibitive.

1. Effectiveness – Soil excavation with off-site disposal and replacement is an effective way to reduce and manage risk at the Property, contaminated soil will be removed and the Property can safely be developed for its intended future use.
2. Implementability – This alternative is implementable.
3. Cost – Targeted soil excavation, disposal and replacement of up to 8,000 tons of soil would cost approximately \$490,000.

Alternative #3 –Capping

With this alternative, WRLC would seek issuance of a No Further Action letter from a Ohio EPA VAP Certified Professional (CP) for a Covenant Not to Sue (CNS) for the Property. In order to obtain an NFA letter through the VAP for the Property, several steps under the VAP process would be required. With this alternative, a four (4) foot thick soil cap would be placed over impacted areas to establish a zero (0) to four (4) foot recreational point of compliance (POC). Additional VAP activities including modifying the existing Property Specific Risk Assessment (PSRA) to include confirmation testing and account for clean up, soil and groundwater confirmation testing, institutional and engineering controls (i.e. property and groundwater use limitations), an Operations and Maintenance (O&M) Plan, a Risk Mitigation Plan to protect future trench workers, and meeting the VAP reporting requirements to demonstrate that applicable standards are achieved. This alternative assists WRLC with its plan to position the Property for recreational use at a significantly lower cost.

1. Effectiveness – This alternative would render the Property safe for its intended future use and would be as effective as Alternative 2.
2. Implementability – This alternative is implementable.
3. Cost –Soil capping would cost approximately \$100,000.

Cleanup Alternatives Cost

1. There will be no costs under Alternative #1: No Action.
2. It is estimated that Alternative #2: Soil excavation, disposal and replacement will cost approximately \$490,000.
3. It is estimated that Alternative #3: Soil capping will cost approximately \$100,000.

Applicable Regulations and Cleanup Standards

All work will be conducted in accordance with the Ohio Environmental Protection Agency (EPA) Voluntary Action Program (VAP) Rules set forth in Ohio Administrative Code (OAC) 3745-300 and under the oversight of the Ohio

EPA Division of Environmental Response and Revitalization (DERR). WRLC will obtain concurrence from the Ohio EPA to implement the clean-up work. Remediation work will be directed by an environmental consulting firm, contracted by the WRLC, which is fully qualified in all aspects of assessment and remediation. The environmental consulting firm will utilize a Certified Professional (CP) licensed by Ohio EPA to oversee remediation activities, and is qualified to submit a VAP No Further Action Letter (NFA) for the Property.

Recommendation

Based on project size, time, cost, intended future Property use and end use requirements, Alternative #1 - No Action method was deemed inappropriate because it would thwart the intended re-use of the Property.

Alternative #2 –Soil Excavation, Disposal and Replacement was deemed inappropriate because of cost.

Based on the evaluation criteria, Alternative #3 – Soil Capping is the most cost effective approach that would facilitate the planned use of the Property.

ATTACHMENT 2

Planned Remedial Action Budgetary Costs

**Planned Remedial Action Budgetary Costs
Henninger Landfill Property
Cleveland, Ohio**

Task	Unit Cost	Alternative 2		Alternative 3	
		# of Units Remove & Replace	Estimated Cost Remove & Replace	# of Units Capping	Estimated Cost Capping
Mobilization	\$1,800/event	1	\$1,800	1	\$1,800
Excavate & Place Backfill	\$3,560/day	5	\$17,800	0	0
PCS (load, transport & dispose)	\$38/ton	120 tons	\$4,560	0	0
Certified Clean Backfill (delivered)	\$25/yd ³	70 yd ³	\$1,750	432 yd ³	\$10,800
Placement of Capping Material	\$3,560/day	0	0	5	\$17,800
Re-Seeding	\$5/yd ²	100 yd ²	\$500	545 yd ²	\$2,725
20% Contingency	-	-	\$5,282	-	\$6,625
Permitting, Access and Design	-	1	\$10,000	1	\$10,000
Remediation Oversight and Surveying	-	1	\$12,000	1	\$12,000
Total Cost Estimate	-	-	\$53,692	-	\$61,750

20% Contingency was only added to field activities

Calculations:

PCS (load, transport & dispose) = 30 ft x 30 ft x 2 ft = 1,800 ft³ = 118 tons (rounded to 120)

Certified Clean Backfill (delivered) = 30 ft x 30 ft x 2 ft = 1,800 ft³ = 70 yd³

Place Capping Material = (30 ft x 30 ft x 2 ft) + (70 ft x 70 ft x 2 ft) = 11,600 ft³ = 430 yd³

Re-seeding Area Alt #2 = 30 ft x 30 ft = 900 ft² = 100 yd²

Re-seeding Area Alt #3 = 70 ft x 70 ft = 4,900 ft² = 545 yd²