February 25, 2020

Project No.: 3896-303

# ANALYSIS OF BROWNFIELDS CLEANUP ALTERNATIVES

# **VILLAGE OF BELLWOOD**

4901 St. Charles Road Bellwood, Illinois









# TABLE OF CONTENTS

1	INTR	RODUCTION1			
2	BACKGROUND3				
	2.1	Prop	erty Description3		
	2.2	Prop	erty History3		
	2.3	Prop	osed Redevelopment4		
3	SUM	MARY	OF PROPERTY CHARACTERIZATION5		
	3.1	Prio	r Investigations and Remedial Activities5		
		3.1.1	August 15, 1997 Phase II Subsurface Investigation by Noble & Associ	ates	
		3.1.2	November 30, 1999 Phase II Subsurface Investigation by K-Plus 6		
		3.1.3	July 27, 2001 Subsurface Investigation by K-Plus 6		
		3.1.4	April 6, 2004 Subsurface Investigation by K-Plus 7		
		3.1.5	March 9, 2006 Subsurface Investigation by Shaw 8		
		3.1.6	November 25, 2009 Subsurface Investigation by Shaw 9		
		3.1.7	September 23, 2010 Subsurface Investigation by Shaw 10		
		3.1.8	Remedial Activities		
	3.2	Property Geology and Hydrogeology10			
		3.2.1	Water Well Survey 11		
4	CLEA	NUP A	ALTERNATIVES ANALYSIS12		
	4.1	Soil Cleanup Alternatives Analysis12			
		4.1.1	Alternative 1 – No Action		
		4.1.2	Alternative 2 – Risk-Based Approach with Hot Spot Removal 13		
		4.1.3	Alternative 3 – Remediation and Risk-Based Approach 14		
		4.1.4	Cleanup Alternatives Cost Analysis		
	4.2	Proposed Remedial Action14			
	4.3 Cleanup Schedule15				





## **LIST OF FIGURES**

Figure 1 – Property Location Map

Figure 2 – Property Layout Map





#### 1 INTRODUCTION

On behalf of the Cook County Department of Environment and Sustainability Coalition (CCDESC) and the Village of Bellwood, **Weaver Consultants Group North Central, LLC** (WCG) has prepared this Analysis of Brownfields Cleanup Alternatives (ABCA) report for the property located at 4901 St. Charles Road in Bellwood, Illinois, as shown on **Figure 1 – Property Location Map** (the Property). This ABCA report was prepared in support of ongoing Brownfields activities to identify and evaluate cleanup alternatives to mitigate potential risks to human health and the environment from identified subsurface environmental impacts at the Property.

The previous assessment activities at the Property were funded from an Illinois Environmental Protection Agency (IEPA) Municipal Brownfields Redevelopment Grant, under an initiative related to the American Recovery and Reinvestment Act (ARRA), or privately funded. Assessment and investigation work at the Property was conducted between 1997 and 2010. The Property was previously enrolled in the Illinois Environmental Protection Agency (IEPA) Site Remediation Program (SRP) and received a Focused No Further Remediation (NFR) Letter with an industrial/commercial land use restriction, a construction worker caution, a Highway Authority Agreement, an engineered barrier in the southwestern portion, and a groundwater use restriction. The NFR Letter was issued by IEPA on November 16, 2011.

The proposed cleanup activities described herein would be funded under a Brownfields Revolving Loan Fund (RLF) Loan Agreement (#BF00E02368) between the Village of Bellwood and the CCDESC, who manages the RLF, executed April 2018. The remediation area, addressed under this ABCA report, is for the cleanup of impacted soil across the Property (refer to Figure 2 – Property Layout Map). The purpose of this proposed cleanup is to meet environmental regulatory requirements for the Property to be redeveloped for residential property uses without an engineered barrier requirement.

This ABCA report has been prepared in support of the Property's Community Involvement Plan and submitted to the USEPA for review and approval. As part of the Community Involvement Plan, the existing Administrative Records (AR) file and the Information Repository (IR) for the Property will be updated to be made available for public review and comment. The AR/IR will be available at CCDESC and the Village of Bellwood's offices and through a website hosted by CCDESC and the Village of Bellwood. Reasonable public notice will be provided that the required USEPA documents are being prepared and will be available for public review and





comment. CCDESC and the Village of Bellwood will also conduct public meetings to gather input regarding the cleanup process.

The Village of Bellwood and their environmental consultant shall consider all comments received and provide responses to those comments at the end of the public comment period. Comments that may change or supplement the Remedial Action Plan that will be provided to the IEPA SRP Project Manager for review. All public comments will be summarized and documented and included in the AR, as well as any responses to public comments.

Pending USEPA and public approval, WCG and the Village of Bellwood tentatively plan on conducting the remediation in spring of 2020. After the USEPA 30-day public review process, the Village of Bellwood will issue the Decision Memorandum. The Village of Bellwood will then obtain Request for Proposals/Qualifications and Bids from multiple remediation contractors, including local MBE/WBE/DBE qualified companies. Once selected, contract negotiations will commence and a contract will be finalized by May 1, 2020. The USEPA Brownfields Grant Project Officer will be contacted once a remediation contractor has been selected.





#### 2 BACKGROUND

## 2.1 Property Description

The Property consists of 0.36 acres of land and is generally bounded by Railroad Avenue to the north, 49<sup>th</sup> Avenue to the east, St. Charles Road to the south, and 50<sup>th</sup> Avenue to the west in Bellwood, Illinois (refer to **Figure 1**). The Property is currently vacant, undeveloped, and primarily grass covered, with the exception of an asphalt-paved engineered barrier in the southwestern portion of the Property (refer to **Figure 2 – Property Layout Map**).

#### 2.2 Property History

According to our review of historical reports, the Property consisted of undeveloped land from at least 1939 to 1951 and the Property was first developed in 1960 for use as an automobile filling station. Operations at the Property included the installation of eight underground storage tanks (USTs), associated underground piping, and pump islands. According to historical reports, by 1999, the USTs and aboveground filling station facilities were removed from the Property and the Property has remained as vacant land through the present day.

Leaking UST (LUST) incident 971779 was identified for the Property on September 22, 1997 associated with the discovery of gasoline and used oil impacts. According to a Remedial Action Completion Report (RACR) dated July 2011, the LUST incident was identified "based on the results of a subsurface soil investigation that was completed by others in 1997." Furthermore, this report indicates that according to a field log obtained from the Office of the State Fire Marshal (OSFM) and prepared by an OSFM inspector at the time of the UST removals in 1999, "there was obvious soil contamination in each of the UST excavation zones and associated piping trenches." A Corrective Action Completion Report (CACR) was prepared for the LUST incident in May 2004, but was rejected by the IEPA on September 8, 2004 for multiple reasons including the absence of an appropriate engineered barrier, the absence of sufficient quality assurance/quality control documentation for the soil and groundwater sample laboratory analyses, and for insufficient analyses of soil samples collected form the former used oil UST excavation zone.

The Property was enrolled in the IEPA SRP in June 2006 to address impacts associated with the LUST incident. On November 16, 2011, the IEPA issued a Focused NFR Letter for the Property with an industrial/commercial land use restriction, a construction worker caution, a Highway Authority Agreement, an engineered barrier in the southwestern portion, and a groundwater





use restriction. The contaminants of concern (COCs) identified in the Focused NFR Letter include the Target Compound List (TCL) parameters, with the exception of arsenic, iron, lead, and manganese.

## 2.3 Proposed Redevelopment

The future use of the Property is intended to be for residential purposes. Specific redevelopment plans depict two single-family residences and associated residential garages on the Property. The CCDESC and the Village of Bellwood are interested in promoting redevelopment of the Property.





#### 3 SUMMARY OF PROPERTY CHARACTERIZATION

### 3.1 Prior Investigations and Remedial Activities

As discussed in **Section 1** and **Section 2.2**, multiple assessments have been conducted on the Property between 1997 and 2010. Furthermore, remedial activities were completed in support of obtaining the Focused NFR Letter for the Property. The primary documents reviewed in support of this ABCA include the following:

- 1. Corrective Action Completion Report: Incident Number 971779 dated May 28, 2004, prepared by K-Plus Environmental (K-Plus) and prepared for the Village of Bellwood;
- 2. *Phase I Environmental Site Assessment* dated February 2006, prepared by Shaw and prepared for the Village of Bellwood;
- 3. Comprehensive Site Investigation Report dated May 2006, prepared by Shaw Environmental, Inc. (Shaw) and prepared for the Village of Bellwood;
- 4. *Comprehensive Site Investigation Report* dated January 2010, prepared by Shaw and prepared for the Village of Bellwood;
- 5. Addendum to the Revised Comprehensive Site Investigation Report dated October 4, 2010, prepared by Shaw and prepared for IEPA;
- 6. Remedial Objectives Report/Remedial Action Plan dated October 2010, prepared by Shaw and prepared for IEPA;
- 7. Remedial Action Completion Report dated July 2011, prepared by Shaw and prepared for IEPA; and
- 8. *NFR Letter* dated November 16, 2011 prepared by IEPA and prepared for the Village of Bellwood.

According to our review of these documents, the following investigations and remedial activities were conducted on the Property:

3.1.1 August 15, 1997 Phase II Subsurface Investigation by Noble & Associates Inc.

This investigation was conducted prior to the removal of the eight USTs from the Property and included the advancement of six soil borings (B1 through B6) to depths up to ten (10) feet below ground surface (bgs) across the eastern two-thirds of the Property and the installation of





three monitoring wells at three of the soil boring locations. Soil samples were analyzed for benzene, toluene, ethylbenzene, and xylenes (BTEX) and groundwater samples were analyzed for BTEX and/or polynuclear aromatic hydrocarbons (PNAs). According to the analytical results, benzene was detected above the Tier 1 Soil Remediation Objectives (SRO) for the Soil Component of the Groundwater Ingestion Exposure Route in four soil locations and above the Tier 1 Groundwater Remediation Objective (GRO) for the Groundwater Ingestion Exposure Route in two groundwater locations.

#### 3.1.2 November 30, 1999 Phase II Subsurface Investigation by K-Plus

This investigation was conducted after the removal of the eight USTs and included the advancement of six soil borings (A1 through A6) on the eastern two-thirds of the Property to depths up to twelve (12) feet bgs and the installation of one monitoring well at one of the soil boring locations. Soil and groundwater samples were analyzed for BTEX. According to the analytical results, the following impacts were identified:

- Benzene was detected above the Tier 1 SROs for the Soil Inhalation Exposure Route for Residential Properties and the Construction Worker Scenario in one soil location (A4) and above the Tier 1 SRO for the Soil Component of the Groundwater Ingestion Exposure Route in three soil locations. Benzene was also detected above the Tier 1 GRO for the Groundwater Ingestion Exposure Route at one groundwater location;
- Ethylbenzene was detected above the Tier 1 SRO for the Soil Inhalation Exposure Route for the Construction Worker Scenario in one soil location and above the Tier 1 SRO for the Soil Component of the Groundwater Ingestion Exposure Route in two soil locations; and
- Xylene was detected above the Tier 1 SRO for the Soil Inhalation Exposure Route for the Construction Worker Scenario in one soil location.

#### 3.1.3 July 27, 2001 Subsurface Investigation by K-Plus

As part of this investigation, K-Plus advanced twelve (12) soil borings (K1 though K12) across the Property to depths up to sixteen (16) feet bgs. The soil samples were analyzed for BTEX and/or PNAs. According to the analytical results, the following impacts were identified:





- Benzo(a)pyrene was detected above the Tier 1 SRO for the Soil Ingestion Exposure Route for Residential Properties in one soil location (K1);
- Benzene was detected above the Tier 1 SROs for the Soil Inhalation Exposure Route for Residential Properties and the Construction Worker Scenario in four soil locations (K5, K6, K8, and K9), above the Tier 1 SRO for the Soil Ingestion Exposure Route for Residential Properties in one soil location (K8), and above the Tier 1 SRO for the Soil Component of the Groundwater Ingestion Exposure Route in seven soil locations;
- Ethylbenzene was detected above the Tier 1 SRO for the Soil Inhalation Exposure Route for the Construction Worker Scenario in one soil location and above the Tier 1 SRO for the Soil Component of the Groundwater Ingestion Exposure Route in two soil locations; and
- Xylenes were detected above the Tier 1 SRO for the Soil Inhalation Exposure Route for the Construction Worker Scenario in two samples.

#### 3.1.4 April 6, 2004 Subsurface Investigation by K-Plus

As part of this investigation, K-Plus advanced twelve (12) soil borings (K13 to K24) to depths up to twenty (20) feet bgs. Eleven (11) of these borings were advanced on the southern and western adjoining properties and one of the borings (K13) was advanced on the Property. In addition, three of the off-site borings were converted to monitoring wells. The on-site soil sample was analyzed for BTEX and RCRA metals and the off-site soil and groundwater samples were analyzed for BTEX. According to the analytical results, the following impacts were identified on the Property:

- Benzene was detected above the Tier 1 SROs for the Soil Ingestion and Soil Inhalation
  Exposure Routes for Residential Properties, the Soil Inhalation Exposure Route for the
  Construction Worker Scenario, and the Soil Component of the Groundwater Ingestion
  Exposure Route in soil location K13;
- Ethylbenzene was detected above the Tier 1 SRO for the Soil Component of the Groundwater Ingestion Exposure Route in soil location K13; and





• Xylenes were detected above the Tier 1 SRO for the Soil Inhalation Exposure Route for the Construction Worker Scenario in soil location K13.

Furthermore, benzene soil impacts were also identified off-site.

#### 3.1.5 March 9, 2006 Subsurface Investigation by Shaw

As part of this investigation, Shaw advanced nine soil borings (GP-1 though GP-9) on the Property to depths up to twenty-four (24) feet bgs and installed five monitoring wells at five of the soil boring locations. The soil samples were analyzed for volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), target analyte list (TAL) metals (including cyanide), Resource Conservation and Recovery Act (RCRA) metals, total petroleum hydrocarbons (TPH), pesticides, polychlorinated biphenyls (PCBs), pH, fraction of organic carbon (foc), and/or synthetic precipitation leaching procedure (SPLP) metals and the groundwater samples were analyzed for VOCs, SVOCs, TAL metals, pesticides, and PCBs. According to the analytical results, the following impacts were identified:

- Benzo(a)pyrene was detected above the Tier 1 SRO for the Soil Ingestion Exposure Route for Residential Properties in two soil locations (GP-1 and GP-3). In addition, benzene was detected above the Tier 1 GRO for the Groundwater Ingestion Exposure Route in two groundwater locations;
- Arsenic was detected above the Tier 1 SRO for the Soil Ingestion Exposure Route for Residential Properties in two soil locations (GP-4 and GP-7);
- Benzene was detected above the Tier 1 SRO for the Soil Inhalation Exposure Route for Residential Properties in two soil locations (GP-5 and GP-6) and above the Tier 1 SRO for the Soil Component of the Groundwater Ingestion Exposure Route in five soil locations;
- Xylenes were detected above the Tier 1 SRO for the Soil Inhalation Exposure Route for the Construction Worker Scenario in one soil location;
- Naphthalene was detected above the Tier 1 SRO for the Soil Inhalation Exposure Route for the Construction Worker Scenario in two soil locations; and
- Methyl-tert-butyl ether (MTBE) was detected above the Tier 1 GRO for the Groundwater Ingestion Exposure Route in one groundwater location.





#### 3.1.6 November 25, 2009 Subsurface Investigation by Shaw

As part of this investigation, Shaw advanced nine soil borings (GP-10 through GP-18) to depths up to twenty (20) feet bgs and installed seven monitoring wells: five on the Property and two off-site. The soil samples were analyzed for VOCs, SVOCs, TAL metals, RCRA metals, TPH, pesticides, PCBs, pH, foc and/or SPLP metals and the groundwater samples were analyzed for BTEX, MTBE, PNAs, and RCRA metals. According to the analytical results, the following impacts were identified on the Property:

- Arsenic was detected above the Tier 1 SRO for the Soil Ingestion Exposure Route for Residential Properties in nine soil locations (GP-10, GP-11, GP-12, GP-13, GP-14, GP-15, GP-16, GP-17, and GP-18). In addition, arsenic was detected above the Tier 1 GRO for the Groundwater Ingestion Exposure Route in one groundwater location;
- Benzene was detected above the Tier 1 SRs for the Soil Ingestion Exposure Route for Residential Properties in one soil location (GP-12), above the Tier 1 SROs for the Soil Inhalation Exposure Route for Residential Properties and the Construction Worker Scenario in three soil locations (GP-12, GP-14, and GP-15), and above the Tier 1 SRO for the Soil Component of the Groundwater Ingestion Exposure Route in four soil locations. In addition, benzene was detected above the Tier 1 GRO for the Groundwater Ingestion Exposure Route in one groundwater location;
- Ethylbenzene was detected above the Tier 1 SRO for the Soil Component of the Groundwater Ingestion Exposure Route in three soil locations;
- Xylenes were detected above the Tier 1 SRO for the Soil Inhalation Exposure Route for the Construction Worker Scenario in one soil location;
- MTBE was detected above the Tier 1 GRO for the Groundwater Ingestion Exposure Route in one groundwater location;
- Manganese was detected above the Tier 1 GRO for the Groundwater Ingestion Exposure Route in four groundwater locations; and
- Lead was detected above the Tier 1 GRO for the Groundwater Ingestion Exposure Route in one groundwater location.





Furthermore, benzene, MTBE, manganese, and lead groundwater impacts were also identified off-site.

#### 3.1.7 September 23, 2010 Subsurface Investigation by Shaw

As part of this investigation, Shaw advanced four soil borings (GP-19 through GP-22) on the western adjoining property for BTEX and naphthalene analyses. According to the analytical results, benzene and naphthalene soil impacts were identified.

#### 3.1.8 Remedial Activities

In support of obtaining the Focused NFR Letter for the Property, an engineered barrier consisting of approximately 4,000 square feet of 3-inches of hot mix asphalt pavement was placed over nine inches of sub base CA-6 stone in the southwestern portion of the Property. In addition, approximately 620 tons of fuel-impacted soil was excavated and disposed off-site from the western adjoining property. The excavation was backfilled and the asphalt pavement was replaced.

As discussed in **Section 2.2**, on November 16, 2011, the IEPA issued a Focused NFR Letter for the Property with an industrial/commercial land use restriction, a construction worker caution, a Highway Authority Agreement, an engineered barrier in the southwestern portion, and a groundwater use restriction. The COCs identified in the Focused NFR Letter include the TCL parameters, with the exception of arsenic, iron, lead, and manganese.

## 3.2 Property Geology and Hydrogeology

The following interpretation of the subsurface conditions is based upon the previous reports presented in **Section 3.1** above. The following includes a summary of soils that were encountered during investigation activities:

- Fill materials consisting of topsoil and gravel, or mulch and gavel, and gravel fill materials were encountered from approximately 0 to four feet bgs;
- Native soil consisting of silty clay was encountered at depths ranging from one to twelve
   (12) feet bgs and was underlain with gray silty clay to approximately twenty-four (24)
   feet bgs, the maximum depth explored.

Groundwater was encountered in the soil borings at depths ranging from eleven (11) to fifteen (15) feet bgs. The depth to groundwater was measured in the monitoring wells between four

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and six feet bgs. In-situ permeability tests identified the average hydraulic conductivity of the shallow groundwater bearing unit to be 4.05 X 10<sup>-4</sup> centimeters per second. Based on the depth to groundwater measurements and average hydraulic conductivity, the groundwater classification was determined to be Class I. Flow direction was determined to be to the southeast with a hydraulic gradient of 0.0297 feet/feet.

#### 3.2.1 Water Well Survey

Based on Shaw's review of information from the Illinois State Geological Survey, the Illinois State Water Survey, the Cook County Health Department, and the Village of Bellwood, there is one potable water supply well located within a radius of 1,000 feet of the Property. The water well, identified as Bellwood Public Water Well #21086 (IEPA designation) and Village of Bellwood Water Well #120310037900 (USGS designation), is no longer in service. According to the Village of Bellwood, the water well, which was dug in the year 1964, has not been used since the year 1992, when the Village of Bellwood began to purchase Lake Michigan water for its residents.





#### 4 CLEANUP ALTERNATIVES ANALYSIS

The Property is currently vacant and unused. Future land use at the Property and remediation area is planned to be residential. The cleanup goals reflect the objective of minimizing the environmental considerations that respective end-users may need to consider during development and construction, and subsequent operation and maintenance of facilities.

The cleanup is proposed to remove soil impacts on the Property in support of subsequent redevelopment of the Property and issuance of a Comprehensive NFR Letter from the IEPA SRP under a residential land use scenario. According to the results of the previous investigation activities, multiple soil samples throughout the Property exhibited concentrations of COCs above Tier 1 SROs for Residential Properties.

Based on the identified concentrations and the proposed development plans for the Property, re-enrollment into the SRP and soil excavation is proposed. As part of SRP enrollment, additional remedial investigation activities may be performed to further refine the area and volume of soil requiring excavation prior to making final decisions on the timing of remedial activities. The final extent of the cleanup will depend on the results of the investigation activities and/or confirmation samples.

The cleanup activities will be conducted under the oversight and review of the IEPA. The intent of the cleanup is to mitigate exposure to humans and the environment, including the end users or construction workers during redevelopment. Any remaining Tier 1 SRO exposure route exceedances may be addressed through engineering and institutional controls (e.g. engineered barriers, construction worker notification, and deed restrictions).

## **4.1 Soil Cleanup Alternatives Analysis**

The cleanup alternatives considered for mitigating the risks associated with the impacted soil are discussed below.

#### 4.1.1 Alternative 1 – No Action

A no-action alternative was considered as part of the ABCA process and would be the least expensive alternative. Under this scenario, the subsurface conditions would remain as-is. A no-action alternative does not include a cost that would be incurred.

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Although no action is the least costly, it also does not address the soil impacts detected above Tier 1 SROs for Residential Properties or the IEPA SRP requirements (35 IAC 742.305(e)) in support of obtaining a NFR Letter for the Property under a residential land use scenario. Additionally, the no action alternative does not achieve the Village of Bellwood's plan to redevelop the Property. Therefore, the soil must be remediated to protect human health and the environment, and thus the no-action alternative has been eliminated from further consideration.

#### 4.1.2 Alternative 2 – Risk-Based Approach with Hot Spot Removal

Alternative 2 assumes that the Property will be enrolled into the IEPA SRP to obtain a Comprehensive NFR Letter under a residential land use scenario. Alternative 2 also assumes that limited Hot Spot removal will be conducted to excavate soil impacts above the Tier 1 SRO for the Soil Inhalation Exposure Route for Residential Properties. In addition, soil will be excavated as part of basement construction. Excavated soil will be transported and disposed of at a Subtitle D facility and clean backfill will be imported to backfill the excavations.

The identified soil impacts above Tier 1 SROs for the Soil Ingestion Exposure Route and Soil Component of the Groundwater Ingestion Exposure Route and groundwater impacts above Tier 1 GROs for the Groundwater Ingestion Exposure Route will be addressed using a risk-based approach (e.g., institutional controls and engineered barriers) including alternate soil cap engineered barriers, building, driveway, and sidewalk engineered barriers, averaging, a Highway Authority Agreement, a Construction Worker Caution, and/or reliance on the Village of Bellwood's groundwater ordinance along with the aforementioned Hot Spot removal. For purposes of this ABCA, it is assumed that the proposed residences and associated driveways and sidewalks will serve as an engineered barrier and an alternate soil cap will be installed over the proposed landscaped areas which would require the importation of clean soil. On-going maintenance of the engineered barriers will be required to maintain their integrity.

The excavation of soil from the proposed basement footprints and Hot Spot locations, backfill of the Hot Spot locations, installation of the alternate soil cap, and on-going maintenance of the engineered barriers cost would be between \$125,000 and \$150,000. This alternative assumes that approximately 1,700 tons of soil will be excavated from the building footprints and Hot Spot locations and approximately 2,100 square feet will be covered by the alternate soil cap. This cost does not include grading; building, sidewalk, and driveway engineered barrier construction; or SRP costs.





#### 4.1.3 Alternative 3 – Remediation and Risk-Based Approach

Alternative 3 assumes that the Property will be enrolled into the IEPA SRP to obtain a Comprehensive NFR Letter under a residential land use scenario. Alternative 3 also assumes that soil excavation will be conducted throughout the Property to address soil impacts above Tier 1 SROs for the Soil Ingestion and Soil Inhalation Exposure Routes for Residential Properties; therefore, no engineered barriers will be required. Soil excavated will be transported and disposed of at a Subtitle D facility and imported clean backfill will be imported to backfill the excavations. Soil and groundwater impacts remaining after completion of soil excavation activities will be addressed using a risk-based approach (e.g., institutional controls) including a Highway Authority Agreement, a Construction Worker Caution, and reliance on the Village of Bellwood's groundwater ordinance.

The soil excavation and backfill costs would be between \$225,000 and \$250,000. This alternative assumes that approximately 3,750 tons of soil will be excavated from the Property. This volume will be further refined during additional investigation activities and/or confirmation sampling.

#### 4.1.4 Cleanup Alternatives Cost Analysis

Alternative	Cost
Alternative 1: No Action	\$0
Alternative 2: Risk-Based Approach without Remediation	\$125,000 - \$150,000
Alternative 3: Remediation and Risk-Based Approach	\$225,000 - \$250,000

## 4.2 Proposed Remedial Action

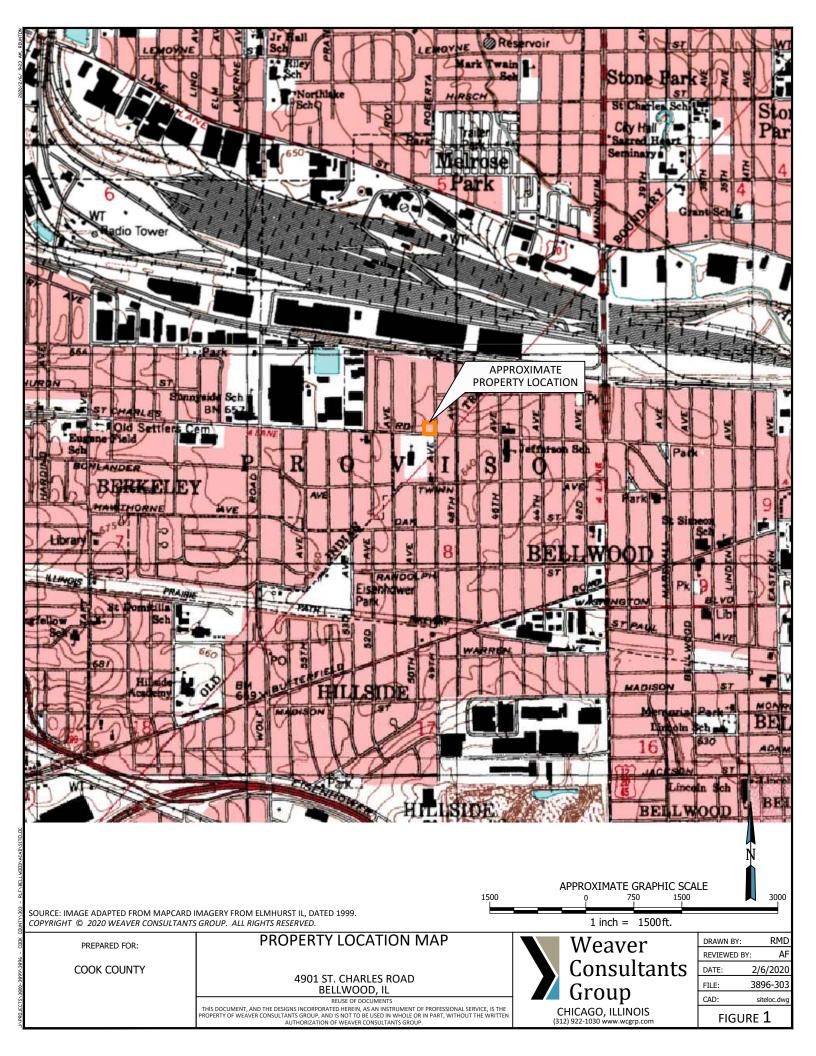
On the basis of effectiveness, costs, time constraints, future land use goals and site plans, regulatory criteria and technical feasibility, WCG recommends Alternative 3 – Remediation and Risk-Based Approach as the most appropriate alternative to remediate impacted soils. Under WCG's direction, the remediation contractor will excavate the impacted soil and collect confirmation samples to assess the efficacy of the excavation activities.





## 4.3 Cleanup Schedule

Pending USEPA and public approval, WCG, CCDESC, and the Village of Bellwood tentatively plan on conducting the remediation in spring of 2020. After the USEPA 30-day public review process and issuance of the Decision Memorandum, the Village of Bellwood will obtain Request for Proposals/Qualifications and Bids from multiple remediation contractors, including local MBE/WBE/DBE qualified companies. Once selected, contract negotiations will commence and a contract will be finalized by May 1, 2020. The USEPA Brownfields Grant Project Officer will be contacted once a remediation contractor has been selected. It is anticipated that remediation will begin within two to three weeks following the finalized contract and all approvals are received.





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FIGURE 2

CAD:

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