Analysis of Brownfield Cleanup Alternatives (ABCA)

Property Bound by Depot St., Main St., and Orchard St.
Antioch, Lake County, IL 60002

November 8, 2021

The Village of Antioch
874 Main Street
Antioch, IL 60002

Prepared by: the deigan group
environmental managers/consultants

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1.0 INTRODUCTION AND BACKGROUND

1.1 Site Location

The former Pittman Property is being analyzed for brownfield alternatives and is herein referred to as the Site. The Site is identified by Property Index Numbers (PIN) 02-08-306-001, 02-08-306-002, 02-08-306-003, 02-08-306-004, 02-08-306-005, 02-08-306-012, and 02-08-306-078. and consists of approximately 3-acres. The property is bounded bound by Depot St. to the north, Main St. to the west, and Orchard St. to the south and east. The former auto sales and repair facility and above-grade structures have been demolished and removed from the property. The Site is currently an undeveloped vacant lot owned by the Village of Antioch and in conceptual planning stages for redevelopment.

1.2 Previous Uses of the Site

The Site is environmentally-impacted from the former site use as an auto sales and repair facility as well as a gasoline filling station dating back to the early 1900s. Review of available historical records and previous site assessments indicates that in approximately 1915 the subject property was developed on its eastern portion with residential structures and associated storage sheds, and on its north-central and western portions with various commercial structures, including a printing facility present at its southwest corner and a garage. Additionally, the site was formerly divided by Sequoit Creek, which was diverted beneath the site's surface via a closed culvert pipe in approximately 1924. By 1924, a paint shop and a large capacity automobile garage occupied the site. Also, an automobile service station and gasoline filling station equipped with four gasoline underground storage tanks (USTs), was located on the northwestern portion of the site by 1934. Between 1934 and the early 1960s, various commercial structures were demolished and replaced by other commercial structures, including the printing facility that was demolished by 1939 and replaced by a Chevrolet dealership facility sometime in the 1950's. Additionally, the previously described on-site gasoline filling station appeared to have been expanded or replaced by another structure by 1953. This structure was listed as Jim's Service Station/Sinclair and Hudson Sales & Service on a 1956 Antioch Telephone Directory. By the early 1960s, the central and northwestern portions of the site included a total four on-site buildings that were reportedly utilized by Pittman Pontiac, as an automobile dealership, until early 2002. Prior to 1993, the southwesterly-located automobile dealership structure and the easternmost dwelling were demolished, and by 1999, Orchard Street was constructed along the site's southern border. The remaining four commercial buildings were reportedly demolished in August 2003, resulting in the general present day site configuration.

Site investigations were conducted in 2009, 2019 and 2020, all prior to the Village acquiring the property in 2020 in "as-is" condition. These investigations included an All-Appropriate Inquiry (AAI) Phase I Environmental Site Assessment (ESA), completed on September 30, 2019, and a Phase II ESA meeting the standards of ASTM E1903-19, completed on January 20, 2020.

Following acquisition of the site, the village retained an environmental consultant to further define the contaminants of concern and the extent of contamination from the former site use activities. The current Phase II activities comply with the ASTM E1903-19 standards and define site environmental conditions for remediation. The Village has achieved all the important milestones for eligibility and readiness for use of USEPA BF Grant funds. This funding in FY 2022 will help this project continue to move forward.

1.3 Past Site Assessment Findings

Phase I and Phase II ESAs were completed for the Village in 2009 by Pioneer Engineering & Environmental Services, Inc. and Stateline Environmental in 2019 & 2020. The Pioneer reports were investigating environmental conditions on the east adjoining property (formerly residential now used for community gardening) and the Stateline reports were investigating environmental conditions on the former Pittman site.

Results of the Pioneer investigation found a slight exceedance of total lead (Pb) in groundwater that they attributed to observed sediment in the sample. Thus, they concluded this was a false positive result and not a concern.

Results of the Stateline reports identified a lead exceedance (3,800 mg/kg) on the east end of the property, exceedances of polyaromatic hydrocarbons (PAHs) on the west side of the property surrounding the creek bed, and mercury levels above inhalation levels for construction workers throughout the central and northwest area of the site.

A Phase II Environmental Site Assessment (ESA) was conducted by **the deigan group** of Lake Bluff, Illinois, for the property bound by Depot St., Main St., and Orchard St., Antioch, Lake County, Illinois 60002 to evaluate the potential for the presence of contaminants related to past property uses and to plan for soil and groundwater management during site redevelopment.

Based on the observed field evidence and laboratory analytical data collected during this Phase II ESA, **deigan** has confirmed a recognized environmental condition (REC)* at the site. The presence of residual petroleum hydrocarbon compounds and lead above IEPA's soil remediation objectives for residential properties were identified in the southwest corner underneath the concrete pad. SB-800, SB-900 and SB-UST1 had elevated levels of SVOCs and SB-700, SB-800 and SB-UST1 had elevated levels of lead consistent with previous knowledge of USTs and auto repair at the site. SB-700 had leachable levels of lead above hazardous waste levels and should be treated using a heavy metals treatment reagent then properly excavated and disposed at a licensed landfill.

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* ***REC*** – defined by the ASTM Standard Practice E1527-13 as "*the presence or likely presence of hazardous substances or petroleum products in, on, or at a property: (1) due to release to the environment; (2) under conditions indicative of a release to the environment; or (3) under conditions that pose a material threat of a future release to the environment*."

Based on the concentrations of mercury above construction worker inhalation standards at multiple locations and lead above construction worker ingestion standards, a site-wide health and safety plan will need to be prepared and implemented whenever excavation, grading, or underground work is conducted.

The soil piles in the northeast portion of the site met the required MAC limits to be classified as Clean Construction or Demolition Debris (CCDD). **Deigan** completed the LPC-663 Uncontaminated Soil Certification forms for this soil, so it can be used on-site as clean backfill or managed off-site as clean fill.

Although underground storage tanks (USTs) have not been located on the site during Phase II ESA activities, it is possible that during remediation/redevelopment efforts USTs maybe uncovered due to historical site uses. If USTs are discovered they will be removed by a licensed tank removal contractor and all applicable OSFM/IEPA notifications, permits, and confirmation sampling will be completed.

Recommendations

The findings of our Phase II investigation provide an opportunity to address environmental conditions on the property using the following approaches for an open space public use recreational redevelopment.

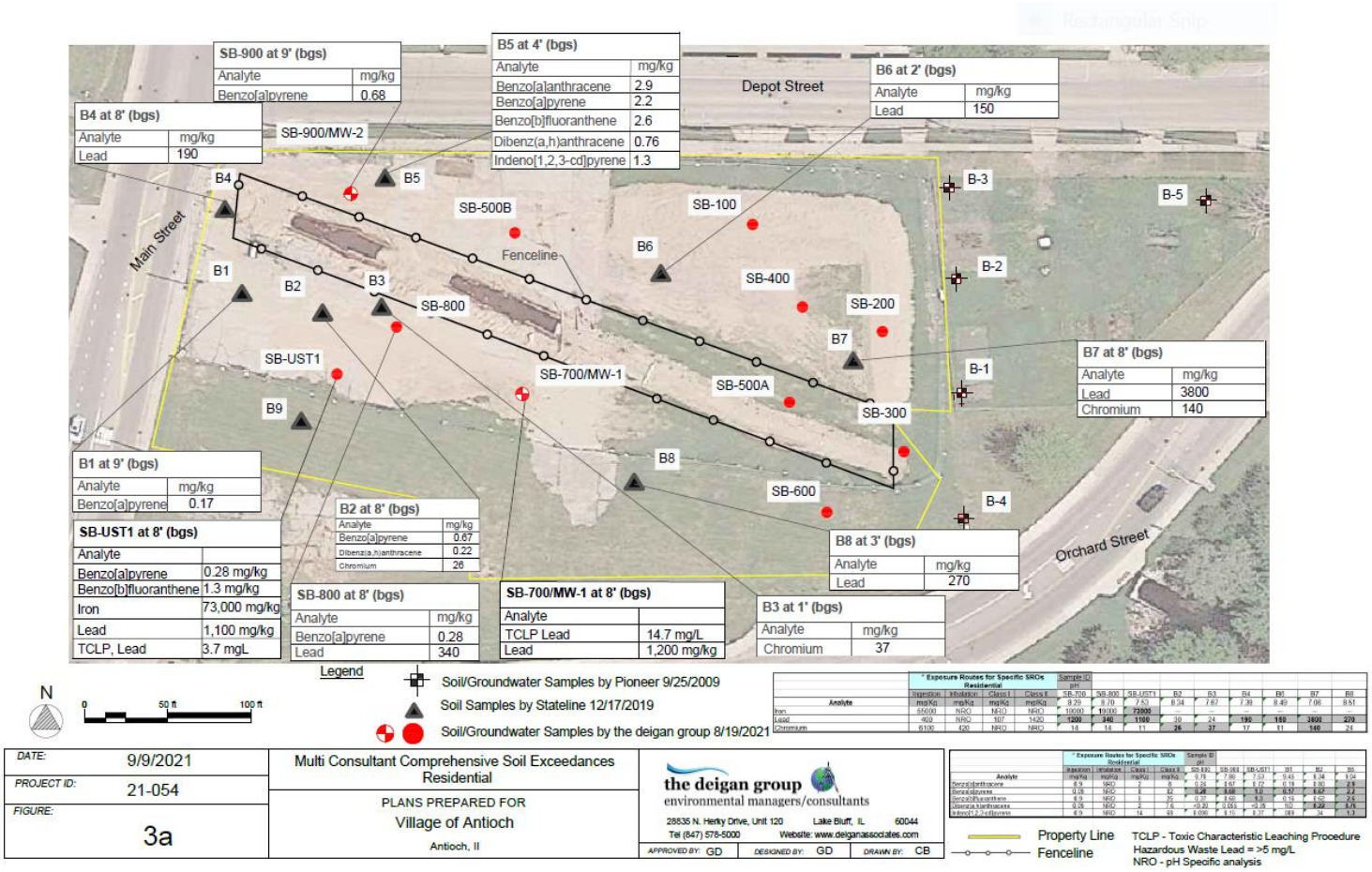
The impacted soils, which after laboratory analysis of soil samples show numerical exceedances of IEPA Tier 1 residential and construction worker soil remediation objectives, can be addressed in the following manner:

1. Develop a soil management plan (SMP) for the site that defines contractor soil management specifications. When implemented, the SMP will utilize proper management and disposal practices to ensure that open space area soils meet IEPA Tier 1 residential standards throughout the development at completion of the project. Conduct removal and off-site disposal of visibly stained and petroleum impacted soils with elevated PID readings and lab data levels that would exceed residential/recreational exposure risk levels. Treat and dispose of soil having characteristic hazardous waste lead levels (SB-700).

2. Develop and engineered barrier plan for the site that provides exposure pathway exclusion to soils that exceed residential standards. This plan can be developed to be consistent with the desired site landscape and hardscape features using clean soil, vegetation, and various paving surfaces.

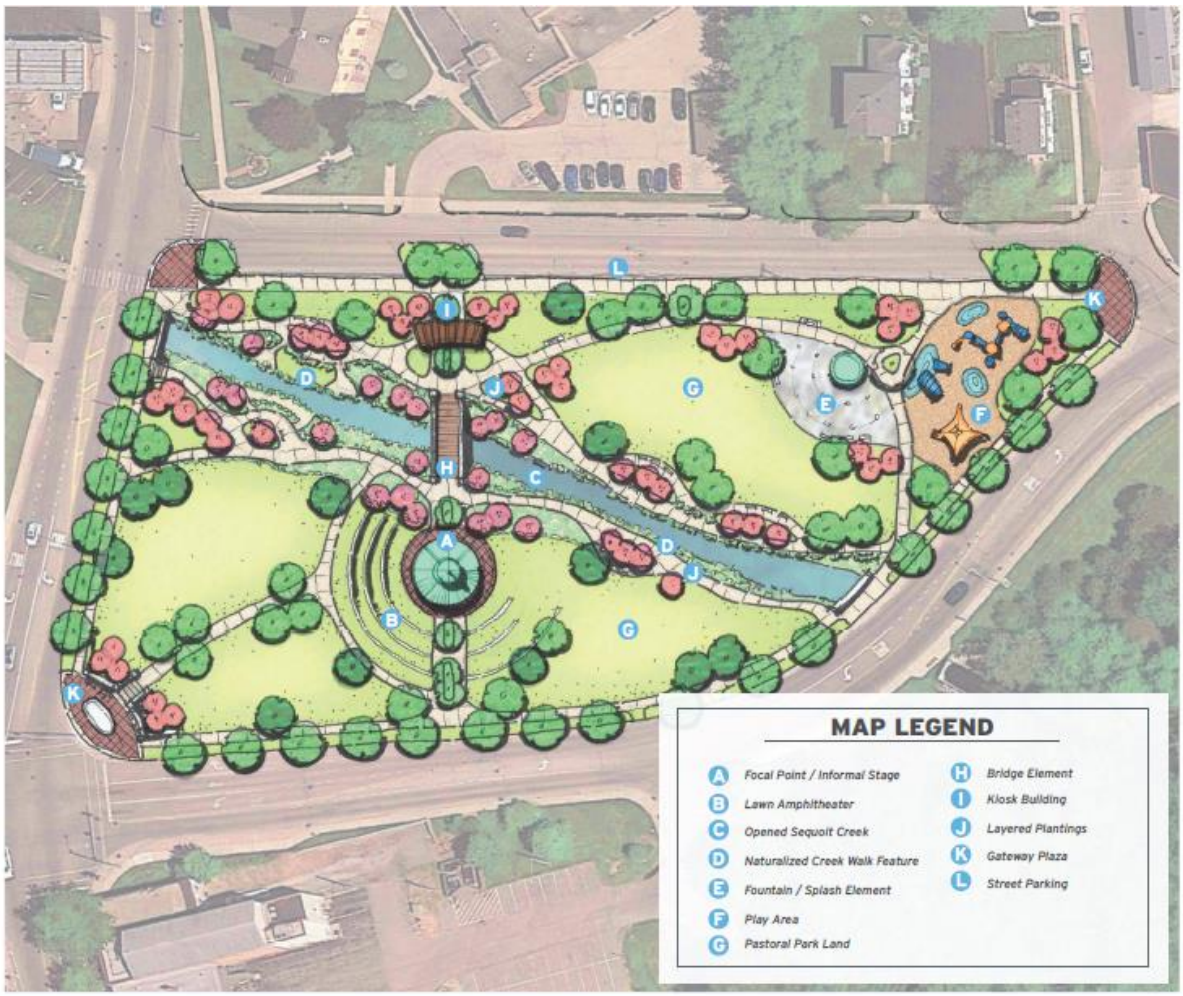
3. Remove or relocate soils and buried debris that have concentrations of compounds that may impact surface water quality in the reconstructed Sequoit Creek alignment.

4. Develop a site wide a site-wide health and safety plan to address the construction worker exceedances of mercury and lead. This plan will need to be implemented whenever excavation, grading or underground work is conducted at the site.



1.4 Project Goal (Reuse Plan)

The intended Reuse Plan for the Site is a Village led redevelopment project for open space and recreational public use. The Village has engaged a planning and landscape architecture firm to provide conceptual site plans for the site to ensure maximum use and benefit to the community. These concepts include daylighting and providing flood control improvements to Sequoit Creek, potentially creating an amphitheater, adding a playground, incorporating open green space and shade tree groves as well as bridge and creek overlooks. Reviving the subject property for open space and public recreational use will provide a focal point for the Village's downtown area and a space for the community to gather and enjoy nature. One of the illustrative concepts is shown below:



DEVELOPMENT SITE | CONCEPT C

2.0 APPLICABLE REGULATIONS AND CLEANUP STANDARDS

2.1 Cleanup Oversight Responsibility

As the owner of the orphan Site, the Village of Antioch will be responsible for the cleanup activities. The Village is now leading completion of environmental investigation, planning, engineering, permitting, and remedial work for the 3-acre site. The Village of Antioch will procure a qualified environmental consulting company to oversee the site cleanup activities through the appropriate procurement process. The remedial cleanup work will also be completed in accordance with the IEPA's regulatory framework under 35 IAC Part 740 and 742 standards.

2.2 Cleanup Standards for Major Contaminants

The overall objective of cleanup work is to reduce concentrations of contaminants of concern (COCs) in soil and groundwater to below Tiered Approach to Corrective Action Objectives (TACO) Tier 1 Soil Remediation Objectives for Residential Properties. Illinois does not have recreational land use cleanup standards, so it is appropriate to utilize residential cleanup standards when considering the planned use of this property as public open space recreational use. All confirmation sampling and analysis will be in compliance with IEPA Residential Tier 1 Remediation Objectives for the contaminants of concern at the Site, and/or will consider the use of exposure pathway exclusions for contaminants that may safely remain on the property but will not allow for a pathway of exposure to such contaminants.

2.3 Applicable Laws & Regulations

Laws and regulations that are applicable to this cleanup include Tiered Approach to Corrective Action Objectives (TACO) rules (35 Ill. Adm. Code 742), federal, state, and local laws regarding procurement of contractors to conduct the cleanup will be followed. In addition, all appropriate permits (*e.g.*, notify before you dig, soil transport/disposal manifests) will be obtained prior to the work commencing.

3.0 EVALUATION OF CLEANUP ALTERNATIVES

3.1 Cleanup Alternatives

To address contamination from the former auto sales, repair, and gasoline filling station at the Site, the following remedial alternatives were considered:

- ***Alternative 1*** - No Action
- ***Alternative 2*** – Complete contaminated soil excavation and off-site disposal of impacted soils.
- ***Alternative 3*** – Combination of contaminated soil excavation and disposal of impacted soil as well as completing an engineered barrier plan for the site that provides exposure pathway exclusion to soils that exceed residential standards in accordance with Illinois EPA standards.

3.2 Impact of Potential Climate Change

The following observed and potential changing climate conditions have been identified for the Midwest United States via the website http://scenarios.globalchange.gov/:

Observed Climate Change Trends

Category	Observed Trends
Temperature	Annual temperatures in the Midwest have generally been well above the 1901-1960 average since the late 1990s, beginning in 2000 being the warmest on decade record. Seasonal temperature trends denote warmer winters and springs, with no overall trend in summer and fall. Annual temperature increases, as well as those for the spring season, are statistically significant (at the 95% confidence level).
Precipitation	The 20th century annual and summer precipitation trends are upward and statistically significant for the Midwest region.
Extremes	The frequency of cold waves in the Midwest has been very low since the mid-1990s. The frequency of heat waves has not been particularly high in recent decades, with the 1930s "Dust Bowl" remaining as the period with the most intense heat in history. The frequency and intensity of extreme precipitation in the region has increased, as indicated by multiple metrics.
Additional Climate Features	Great Lakes water levels have fluctuated over a range of 3 to 6 feet since the late 19th century. Trends on the lakes have been relatively small with the exception of the combined Lake Michigan-Huron system, which has shown a statistically significant downward trend over the past 150 years. Measurements of ice cover on regional lakes indicate a negative trend in both duration of ice cover and percentage of total ice cover.

Future Regional Climate Scenarios

Category	Future Regional Climate Scenarios
Temperature	CMIP3 models show small spatial variations in simulated annual mean temperature change for both scenarios, though there is a slight tendency for greater warming toward the northwestern part of the region. The models indicate that temperature increases across the Midwest are statistically significant (at the 95% confidence level) for all future time periods and both emissions scenarios. Seasonal temperature increases are simulated by the NARCCAP models to be largest in winter and summer, with the two seasons having near-opposite spatial patterns. There is uncertainty within the range of model-simulated temperature changes, but for each model simulation, the warming is unequivocal and large compared to historical temperature variations. NARCCAP simulations indicate increases in the number of hot days (maximum temperature of more than 95°F) throughout the region, with the largest increases in southern areas. The freeze-free season is simulated by the NARCCAP models to lengthen by 20 to 30 days across most of the Midwest region.
Precipitation	CMIP3 models simulate the greatest increases in annual mean precipitation for the far north, while indicating a decrease for the southwestern corner of the region. Seasonally, NARCCAP models generally simulate increases in precipitation in winter, spring, and fall, but decreases in summer. The range of model-simulated precipitation changes is considerably larger than the multi-model mean change for both the high and low emissions scenarios, meaning that there is greater uncertainty associated with precipitation changes in these scenarios. NARCCAP simulations indicate increases in the number of wet days (precipitation exceeding 1 inch) for the entire Midwest region, with increases of up to 60%. The largest changes are seen in the states bordering Canada. These increases are statistically significant in northern parts of the region (see figure). Statistically significant decreases in the number of consecutive dry days (precipitation of less than 0.1 inches) are also simulated for northern areas. However, simulations indicate an increased number of dry days for southern portions of the region.

Given the above-noted climate change concerns, the following site-specific risk factors have been identified:

- The engineered barrier that will be utilized as part of the remediation may contribute to stormwater runoff. The dense clay or non-permeable surface can pose issues for increased stormwater runoff. The increased precipitation in this area could pose as a concern and contribute to flooding. The site has a natural waterway (Sequoit Creek) which can carry water downstream, away from the site and will be further engineered to improve flood mitigation.

Due to the site contours (from spot elevation survey) and the proposed expansion of the creek width, the surface water feature will inhibit climate change precipitation concerns.

The following table summarizes how well each alternative is expected to accommodate the identified climate change risk factors. All stages of the cleanup process have been considered as well as the long-term reuse of the Site:

Remedial Alternative	**Ability of Alternative to Accommodate Identified Climate Change Risk Factors** Low, Moderate, High
Alternative 1 No Action	Low
Alternative 2 Complete contaminated soil excavation and disposal of impacted soil at the Site	Moderate
Alternative 3 Combination of contaminated soil excavation and disposal of impacted soil as well as completing the engineered barrier plan in accordance with Illinois EPA standards	Moderate

3.3 Effectiveness, Implement ability and Preliminary Cost Estimates

Remedial Alternative	**Risk Management**	**Technical Feasibility**	**Compliance with State/Local Laws or Other Public Concerns**	**Financial Feasibility**
Alternative 1 No Action	***Will not comply***--soil concentrations of contaminants of concern at the Site exceed Applicable ROs.	Yes	No - Site would not be in compliance with Remediation Regulations.	Yes $0
Alternative 2 Complete excavation and disposal of impacted soil at the Site	***Will comply***--by removing the potential for site users to come into contact with contaminated soil & groundwater.	Yes	Yes- Site would not be in compliance with Remediation Regulations.	Yes to No $ 1M

<u>Alternative 3</u> Combination of site excavation of impacted soil as well as capping and other engineered barriers	***Will comply***-- by reducing the potential for site users to contact with contaminated soil & groundwater and current and future users of the Site will maintain the capping and manage it accordingly.	Yes	Yes	Yes ~$500,000

3.4 Recommended Cleanup Alternative

Based on the technical feasibility and cost efficiency evaluation, **Alternative 3** is a cost-effective remedial alternative that is in compliance with the intent of the Clean-up Remediation Regulations (as well as other applicable federal, state, and local laws or public concerns). This alternative is technically feasible and is consistent and compatible with current and future planned land use. The following tasks will propel this alternative and successfully mitigate actual and potential risks to human health and the environment.

- Perform confirmation sampling and analysis at specific previously excavated source areas and the soil stockpiles proposed to be removed as part of remedial activities.
- Conduct groundwater monitoring to confirm groundwater at the subject property is free of contaminates of concern by installing groundwater monitoring wells to perform sampling/analysis to demonstrate no migration of contaminants to the Sequoit Creek surface water pathway.
- Perform confirmation sampling and analysis of engineered barriers that will be installed as part of future development activities to demonstrate they meet IEPA residential Tier 1 TACO objectives.

The preferred remedial ***Alternative 3*** is proposed to be implemented at the Site in conjunction with redevelopment of the Site.

Property Line

N

400' 0 300'

DATE:	9/9/2021
PROJECT ID:	21-054
FIGURE:	1

Site Location Map

PLANS PREPARED FOR
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