Draft Analysis of Brownfield Cleanup Alternatives

Former Tabor Property
3540-3600 Southwest Adams Street and S Lydia Street
Peoria, Illinois

November 15, 2019

Prepared for:
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ACRES No: 234841

Stantec Project No.: 193706499
Sign-off Sheet

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Stantec Consulting Services Inc. (Stantec) prepared this draft Analysis of Brownfield Cleanup Alternatives (ABCA) and draft preliminary Remedial Action Plan (RAP) at the request of the City of Peoria for the commercial property located at 3540-3600 SW Adams Street, Peoria, Illinois (herein referred to as the Property, Remediation Site, and Site). The purpose of this draft ABCA/RAP is to satisfy a threshold requirement of USEPA for a brownfield cleanup grant application prepared under solicitation number EPA-OLEM-OBLR-18-07 by including community input during continued evaluation of remedial alternatives to mitigate the risk of exposure to residual environmental impacts following commercial redevelopment of the Site. The following provides a summary of the Site Investigation, a summary of proposed Site reuse, and a summary of evaluated remedial alternatives.

Site Investigation Results. The concentrations of select semi-volatile organic compounds (sVOCs), polychlorinated biphenyl (PCBs) mixtures, pesticides, and metals exceed one or more respective Tier I Soil Remediation Objective (SRO) for direct contact at industrial/commercial properties or by construction workers and/or the Tier I SRO for the soil component of groundwater ingestion pathway. The source(s) of residual soil impacts are likely a reflection of multiple cumulative and indistinguishable releases associated with prior industrial/commercial activities and/or placement of an apparent site-wide heterogeneous anthropogenic fill unit containing cinders and other debris.

Proposed Site Reuse. Based on the location of the Property, the post-remediation use will be commercial/industrial. Initial conceptual reuse plans are illustrated on Figure 5 and include adaptive reuse of the existing 10,000 square foot (ft²) building, construction of a site-wide (206,000 ft²) driveway/parking lot/storage area, and construction of a 14,000 ft² storm water retention pond on the southwestern portion of the Property. A nominal amount of new landscaping surrounding the existing building (estimated 5,300 ft²) is likely.

Remedial Alternative Evaluation. Four remedial alternatives were evaluated to achieve remedial objectives for commercial redevelopment. The most reasonable and economical approach includes limited excavation and offsite disposal of impacted fill/soil, construction of a crushed recycled concrete/brick and clean gravel fill engineered barrier and use of institutional controls to maintain the engineered barrier and prevent consumption of groundwater.
2.0 Background Information

Stantec Consulting Services Inc. (Stantec) prepared this draft Analysis of Brownfield Cleanup Alternatives (ABCA) and draft preliminary Remedial Action Plan (RAP) at the request of the City of Peoria for the commercial property located at 3540-3600 SW Adams Street, Peoria, Illinois (herein referred to as the Property, Remediation Site, and Site). As a continuance of previous activities funded under the United States Environmental Protection Agency (USEPA) Cooperative Agreement Number BF-00E01526-00, accomplishments will continue to be tracked under USEPA Assessment, Cleanup and Redevelopment Exchange System (ACRES) Number: 234841. The purpose of this draft ABCA/RAP is to satisfy a threshold requirement of USEPA for a brownfield cleanup grant application prepared under solicitation number EPA-OLEM-OBLR-18-07 by including community input during continued evaluation of remedial alternatives to mitigate the risk of exposure to residual environmental impacts following commercial redevelopment of the Site.

This draft ABCA/RAP was prepared in accordance with the requirements of the IEPA Site Remediation Program (SRP) under Title 35 of the Illinois Administrative Code (35 IAC), Part 740. Section 2.0 of this report summarizes general Site and project information; a description of the Site and summary of prior Site uses; a summary of previous environmental Site assessments; a summary of the nature and extent of impacts; and outlines the likely reuse scenario.

Section 3.0 of this report summarizes applicable regulations and cleanup objectives for the project. Section 4 summarizes the review of three cleanup alternatives and describes the rationale behind the selected approach. Section 5 provides a preliminary draft RAP based on the selected remedial approach. Section 6.0 presents the references used in this report and report limitation are provided in Section 7.

2.1 GENERAL SITE AND PROJECT INFORMATION

<table>
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<tr>
<th>1. Project Title and Purpose</th>
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<th>2. Key Site Contact Information</th>
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<tr>
<td>Owner</td>
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<td></td>
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<tr>
<td></td>
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<tr>
<td>Contact: Ross Black, Community Development Director</td>
</tr>
<tr>
<td>Email: <a href="mailto:rblack@peoriagov.org">rblack@peoriagov.org</a></td>
</tr>
<tr>
<td>Phone: 309-494-8601</td>
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<th>3. Regulatory Information</th>
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<td>Current SRP Case Number:</td>
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SRP Number = Site Remediation Program Case Number

Remediation Site Boundary. The location of the Property relative to local topography is illustrated on Figure 1. As illustrated on Figure 2, the Remediation Site Boundary consists of five contiguous parcels of land owned by the City of Peoria, Illinois, as summarized on the following table.
Background Information

<table>
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<th>PIN</th>
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<th>Acreage</th>
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<td>1819203023</td>
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<td>0.20</td>
<td>MOFFATT’S SUB NE 1/4 SEC 19-8N-8E COMG INTERSEC SE LN ADAMS ST &amp; W LN LYDIA ST TH SW 666.67’ SE 13’ TO POB: TH SE 59.2’ SW 87.92’ NW 63.84’ NE 17.98’ NE 70.09’ TO POB PT LOT 5; ALSO BEG PT 618’ SW OF INTERSEC OF SE LN ADAMS ST &amp; W LN LYDIA ST: TH SE 74’ SW 48.8’ NW 74’ NE 48.8’ TO POB (EXC ADAMS ST ROW AS DESC PER DOC 79-06408) PT LOT 5</td>
</tr>
<tr>
<td>1819203018</td>
<td>3560 SW ADAMS ST</td>
<td>0.27</td>
<td>MOFFATT’S SUB NE 1/4 SEC 19-8N-8E BEG 618’ SW OF INTERSEC SE LN ADAMS ST &amp; W LN LYDIA ST: TH SE 74’ SW 300’ NW 74’ SE 300’ TO POB (EXC BEG 618’ SW OF INTERSEC SE LN ADAMS ST &amp; W LN LYDIA ST: TH SE 74’ SW 48’8” NW 74’ NE 48’8” TO POB (-007); ALSO EXC ADAMS ST ROW AS DESC PER DOC 79-06411; ALSO EXC COMG INTERSEC SE LN ADAMS ST &amp; W LN LYDIA ST TH SW 666.67’ SE 13’ TO POB: TH SE 59.2’ SW 87.92’ NW 63.84’ NE 17.98’ NE 70.09’ TO POB (-019)) PT LOT 19</td>
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<tr>
<td>1819203014</td>
<td>S LYDIA AVE</td>
<td>2.01</td>
<td>SUB OF PT NE 1/4 SEC 19-8N-8E 1.996 AC TRACT AS DESC PER DOC 92-17848 BEING PT LOTS 4-5-19 (SUB OF PT NE 1/4 SEC 19 AKA MOFFATT’S SUB)</td>
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<td>1819203005</td>
<td>3600 SW ADAMS ST</td>
<td>2.56</td>
<td>NE 1/4 19-8-8E 2.51 AC COMG INTERSEC W LN NE 1/4 &amp; SE LN ADAMS ST: TH NW 34’ SW 1221.4’ SE 34’ NE ALG RR ROW 1954.42’ TO POB: TH NE 560’ SE 74’ SW 1’ SE 170’ SW 575’ NW 155’ TO POB</td>
</tr>
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</table>

Source: https://gis.peoriacounty.org/peoriagis/

2.2 SITE DESCRIPTION AND PREVIOUS SITE USES

2.2.1 Site Description

The Property is located on the east side of Adams Street and corresponds to the address range 3540 to 3600 SW Adams Street and S Lydia Street in Peoria, Illinois. As summarized in Section 2.1, the Remediation Site Boundary consists of five continuous parcels of land owned by the City of Peoria, Illinois. The Site is located at the intersection of South Stanley Street and Southwest Adams Street in a mixed-use (commercial and residential) corridor. The location of the Site relative to nearby topography is provided on Figure 1. A Site basemap is provided on Figure 2. A birds-eye view of the Property obtained from the Peoria County GIS online portal is provided on Figure 3.
Background Information

2.2.2 Previous Site Uses
Stantec conducted a Phase I Environmental Site Assessment (ESA) at 3550 SW Adams Street (PIN 18-19-203-023) and 3540 SW Adams Street (PIN 18-19-203-008) on September 11, 2014 and September 15, 2014, respectively. Prior uses of the Property described in Stantec (2014a and 2014b) and IEPA (2014a and 2014b) are summarized below.

Former Go-Tane Service Station (3540 Southwest Adams Street). The parcel was developed for commercial use prior to 1939 (Stantec, 2014a) and operated as a bulk oil and gasoline filling station until the station closed in 1978 (IEPA, 2014a). Five underground storage tanks (USTs) were removed in 1990, and following active remediation to address residual impacts, a Section 4(y) letter was issued by IEPA confirming no additional remediation was necessary (Stantec, 2014a). IEPA (2014a) suggests that one additional UST may have been removed in 2001 and clarified the former UST contents as: (4) tanks contained gasoline, (1) tank contained used oil, and the contents of (1) tank remains unknown. The Parcel was transferred from Go-Tane Service Stations to the Peoria County Trustee by 2013 and to the City by 2014. The parcel is currently vacant.

3550 Southwest Adams Street. Prior use of the parcel appears to be associated with adjacent industrial/commercial uses. Stantec (2014b) notes the Property was developed for commercial and industrial purposes prior to 1939; however, much remains unknown related to specific operations. The primary occupant in the early-mid 20th Century was the Heller Tin Compressor Company. The Property was redeveloped for commercial use in 1970 and has been occupied by various commercial operations, including TV sales, a real estate office, and used car sales. The parcel was transferred from “Dean M. Penn” to the City of Peoria by 2014. The parcel is currently vacant.

Former Ultimate Recycling (3560 Southwest Adams Street). IEPA (2014b) indicates the parcel was owned by the Chicago and Northwestern Railroad company and utilized as outdoor storage through the 1960s/1970s. Historic aerial photographs provided by Stantec (2014b) suggest 3560 Southwest Adams Street and the two adjacent parcels (PIN 1819203005-3600 Southwest Adams Street and PIN 1819203014-S Lydia Street) were developed as a junk yard/salvage as early as 1967, which is consistent with conclusions by IEPA (2014b). Salvage operations at the parcels appear to have continued through 2013, after which, the parcels were transferred from “EB Tabor” to the City of Peoria. IEPA subsequently facilitated removal of remaining materials (ex. stored tires, etc.). As shown on a birds-eye photograph obtained from the Peoria County Geographic Information System (GIS) online portal (https://gis.peoriacounty.org/peoriagis/) and provided on Figure 3, the parcels are currently occupied by a vacant building, associated driveways, and vegetated/landscaped areas. The City fenced off the properties immediately after taking possession to restrict public access and ensure that no further or additional contamination will occur. The fence is locked, and the properties are only accessed to mow and show potential developers. With the Illinois EPA’s assistance and oversight, the City demolished a Quonset hut and properly disposed of thousands of automotive tires.

2.3 PRIOR ENVIRONMENTAL SITE INVESTIGATIONS

2.3.1 IEPA Investigations
Former Go-Tane Service Station (3540 Southwest Adams Street and 3550 Southwest Adams Street). The IEPA Office of Site Evaluation working in cooperation with USEPA completed an investigation at the former Go-Tane Service Station (3540 Southwest Adams) and the adjacent parcel (3550 Southwest Adams) in 2014. Sample locations and results are illustrated on Figure 4.

In summary, IEPA (2014a) confirms that the known USTs associated with the service station were removed; however, concentrations of polychlorinated biphenyls (PCBs), semi volatile organic compounds (SVOCs), pesticides, and/or heavy metals exceeded one or more Tier I Soil Remediation Objectives (SROs). The concentrations of heavy metals (ex. iron, lead, manganese, boron, cadmium, and chromium) in groundwater were greater than Tier I Groundwater Remediation Objectives (GRO) for Class I groundwater.
Background Information

(IEPA, 2014a). In addition to finishing the CISR, (IEPA, 2014a) suggested further evaluation of an anomaly identified during an electromagnetic survey which appeared consistent with a possible UST on the west side of the former building.

**Former Ultimate Recycling (3560 Southwest Adams Street).** The IEPA Office of Site Evaluation completed an investigation at the former Ultimate Recycling facility in 2014. Sample locations and the results of the investigation are illustrated on Figure 4.

In summary, IEPA (2014b) notes concentrations of PCBs, PAHs, pesticides, and/or heavy metals exceeded one or more Tier I SROs. The concentrations of vinyl chloride and/or heavy metals in groundwater were greater than Tier I GROs for Class I groundwater (IEPA, 2014b).

### 2.3.2 Stantec (2018) CSIR/ROR

The following provides a summary of the Stantec (2018) Comprehensive Site Investigation Report (CSIR) and Remediation Objectives Report (ROR).

**CSIR**

The purpose of the CSI was to characterize residual environmental impacts from previous commercial/industrial operations at the Site. The CSI included the collection of soil and groundwater samples for chemical analysis. Sample locations and results are illustrated on Figure 4.

The following Conceptual Site Model (CSM) provides a summary of the physical site conditions and our present understanding of potential exposure pathways and groundwater flow direction.

- The Site is approximately 5.4 acres in size (5 parcels) and is currently not developed.
- The Site consists of five contiguous parcels of land with historic uses including: bulk fuel storage, automotive fueling, automotive salvage, railroad storage, and various commercial tenants. Five known underground storage tanks (USTs) were removed from the former automotive fueling station and the parcel was issued a Section 4(y) letter from the IEPA.
- The City provides water to the Site; however, a citywide ordinance preventing installation or operation of groundwater supply wells does not exist.
- Soil lithology consists of a sitewide heterogeneous fill unit of anisotropic quality consisting of anthropogenic debris (ex. cinders, plastic, construction debris, reworked native soil units, etc.) underlain by regional sand/gravely sand unit with varying quantities of fine-grained soils. The underlying sand/gravely sand unit serves as the regional groundwater aquifer and is further underlain by Paleozoic bedrock.
- The concentrations of select sVOCs, PCB mixtures, pesticides, and metals exceed one or more respective Tier I SRO for direct contact at industrial/commercial properties or by construction workers and/or the Tier I SRO for the soil component of groundwater ingestion pathway.
- The source(s) of residual soil impacts are likely a reflection of multiple cumulative and indistinguishable releases associated with prior industrial/commercial activities and/or placement of an apparent site-wide heterogeneous anthropogenic fill unit containing cinders and other debris.
- The potentiometric surface of groundwater could not be confirmed with Site-specific measurements; however, prior/nearby work suggest the potentiometric surface of groundwater surface should decrease in an eastward direction, towards the Illinois River.
- Groundwater at the Site is classified as Class I and concentrations of select metals in groundwater from an undetermined source are greater than respective Tier I GRO for ingestion of Class I groundwater.
Background Information

ROR
The ROR summarizes an evaluation of the potential for human exposure to COCs. The remediation Site is currently fenced and capped with concrete building slabs, associated driveways/parking lots, and landscaped (vegetated) areas. Further, the Property is currently vacant; therefore, direct contact with residual soil/fill and groundwater impacts is currently considered a low risk. As noted in Section 2.5, the proposed reuse of the Site will be for commercial purposes. Therefore, potential future receptors include employees, construction workers and/or potential customers/guests. Potential future exposure routes at the Site include soil ingestion, outdoor inhalation, and groundwater ingestion. Indoor inhalation is not considered a pathway of concern.

2.4 NATURE AND EXTENT OF IMPACTS
As summarized in Section 2.3, soil lithology consists of a sitewide heterogeneous fill unit of anisotropic quality consisting of anthropogenic debris (ex. cinders, plastic, construction debris, reworked native soil units, etc.). The concentrations of select sVOCs, PCBs mixtures, pesticides, and metals exceed one or more respective Tier I SROs for direct contact at industrial/commercial properties or by construction workers and/or the Tier I SRO for the soil component of the groundwater ingestion pathway. The source(s) of residual soil impacts are likely a reflection of multiple cumulative and indistinguishable releases associated with prior industrial/commercial activities and/or placement of an apparent site-wide heterogeneous anthropogenic fill unit containing cinders and other debris.

Groundwater at the Site is classified as Class I and concentrations of select metals in groundwater from an undetermined source are greater than respective Tier I GROs for ingestion of Class I groundwater.

2.5 REUSE PLAN
Based on the location of the Property, the post-remediation use will be commercial/industrial. Initial conceptual reuse plans are illustrated on Figure 5 and include adaptive reuse of the existing 10,000 square foot (ft²) building, construction of a site-wide (206,000 ft²) driveway/parking lot/storage area, and construction of a 14,000 ft² storm water retention pond on the southwestern portion of the Property. A nominal amount of new landscaping surrounding the existing building (estimated 5,300 ft²) is likely. The City of Peoria has several interested parties wishing to use the site for storage and recycling, which would include utilization of labor from the adjacent neighborhoods.

As discussed further in Section 3.4, this conceptual redevelopment plan is in agreement with the results of the CISR.
Applicable Regulations and Cleanup Objectives

3.0 APPLICABLE REGULATIONS AND CLEANUP OBJECTIVES

3.1 CLEANUP OVERSIGHT RESPONSIBILITY
The Site is enrolled in the IEPA SRP program. Therefore, a project manager from the IEPA SRP program will be assigned to provide regulatory oversight of the project. The objective of the cleanup is to obtain a No Further Remediation (NFR) letter for commercial reuse.

3.2 SOURCE EVALUATION AND CLEANUP STANDARDS
Data collected during the Stantec (2018) CSI was evaluated to determine the presence of contaminant sources in accordance with the regulatory definition as presented in 35 IAC Part 742 Section 305. The criteria that comprise the regulatory definition that are pertinent to this CSI follow:

- Materials whose sum of concentrations of organic contaminants is greater than the soil attenuation capacity;
- Materials with a concentration of individual organic contaminants with melting points less than 30°C that is greater than the soil saturation limit for these contaminants;
- Materials which exhibit characteristics of reactivity for hazardous wastes;
- Materials which have a pH of less than or equal to 2.0 or greater than or equal to 12.5;
- Materials which exhibit the toxicity criteria for hazardous waste; and
- Materials that have a concentration of PCBs greater than 50 mg/kg.

As noted in Stantec (2018), none of these abovementioned conditions apply at the Site.

3.3 EXPOSURE EVALUATION AND CLEANUP STANDARDS
Exposure routes are defined as transport mechanisms by which a COC reaches a receptor. Receptors are persons that could be exposed to a COC. Exposure routes are identified and reviewed for completeness to evaluate the potential or actual risk to a receptor from a COC. In accordance with 35 IAC Part 742, potential exposure routes at the Remediation Site include soil ingestion, outdoor inhalation, indoor inhalation and groundwater ingestion. Based on the proposed reuse, potential future receptors include employees, construction workers and commercial patrons. Therefore, the following remediation objectives are applicable for the Site:

- Tier I SROs for soil ingestion at commercial/industrial properties
- Tier I SROs for soil ingestion by commercial workers
- Tier I SROs for outdoor inhalation at commercial/industrial properties
- Tier I GROs for consumption of Class I Groundwater

As noted in Stantec (2018) indoor inhalation is not considered a pathway of concern and is not included in the exposure evaluation.

3.4 DEVELOPMENT OF CONTAMINANTS OF CONCERN
The following subsections present the development of COCs for each exposure route identified in Section 3.3. The Tier 1 screening values are from 35 IAC Part 742 unless otherwise noted in Stantec (2018).
DRAFT ANALYSIS OF BROWNFIELD CLEANUP ALTERNATIVES

Applicable Regulations and Cleanup Objectives

3.4.1 Soil
The Remediation Site is currently fenced and capped with concrete building slabs, associated driveways/parking lots, and landscaped (vegetated) areas. Further, the Property is currently vacant; therefore, direct contact with residual soil/fill and groundwater impacts is currently considered a low risk.

The ingestion and outdoor inhalation exposure routes to residual soil/fill impacts at industrial/commercial properties could be complete in the future based on current Site conditions. Concentrations of five SVOCs (benzo(b)fluoranthene, benzo(a)pyrene, indeno(1,2,3-cd)pyrene, dibenzo(a,h)anthracene and benzo(a)anthracene); two PCB mixtures (Aroclor 1254 and Aroclor 1260); and four metals (lead, arsenic, chromium, and mercury) in soil/fill at the Property are greater than the Tier I SROs for direct contact at industrial/commercial properties. Concentrations of two SVOCs (benzo(a)pyrene and naphthalene), two PCB mixtures (Aroclor 1254 and Aroclor 1260), and six metals (copper, lead, manganese, antimony, chromium, and mercury) could pose an additional exposure risk to construction workers during remediation/redevelopment. Concentrations of four SVOCs (benzo(b)fluoranthene, benzo(a)pyrene, carbazole, benzo(a)anthracene, and 3,3-dichlorobenzidine), two pesticides (Dieldrin and alpha-BHC), and several metals (antimony, thallium, zinc, barium, cadmium, lead, nickel and selenium) could pose a risk to groundwater quality. These contaminants will be retained as COCs requiring future action to mitigate the risk of exposure following redevelopment.

Except for the COCs listed above, all other detected constituents at the Site by Stantec (2018) are excluded from further consideration as the greatest detected concentrations are less than Tier 1 SROs for direct contact or the soil component of Class I groundwater.

3.4.2 Groundwater

Ingestion
The Remediation Site is currently vacant, and no potable wells are present at the property; therefore, the groundwater ingestion route is not currently complete. However, the ingestion of groundwater could be complete in the future if a drinking water well is installed at the Remediation Site. The concentrations of aluminum, iron, lead, manganese, and/or arsenic in groundwater were greater than the Tier I GRO for consumption of Class I Groundwater and these metals will be retained as COCs requiring future action to mitigate the risk of exposure following redevelopment.
Evaluation of Cleanup Alternatives

4.0 EVALUATION OF CLEANUP ALTERNATIVES

Commercial occupants (workers/customers) and construction worker populations have been identified as potential receptors to COCs in soil following commercial/industrial redevelopment of the Property. Applicable exposure routes to residual soil/fill impacts are direct contact through ingestion or outdoor inhalation and the soil component of groundwater ingestion. As illustrated on Figure 4, the horizontal extent of residual impacts exceeding one or more Tier I SROs for direct contact (ingestion or outdoor inhalation) at commercial/industrial properties extends across most of the Property. The source(s) of residual soil impacts are likely a reflection of multiple cumulative and indistinguishable releases associated with prior industrial/commercial activities and/or placement of an apparent site-wide heterogeneous anthropogenic fill unit containing cinders and other debris. The concentrations of contaminants from within this fill unit are not uniform and further confirm the anisotropic quality of the fill unit. Based on the thickness depths provided in soil boring logs, the anthropogenic fill unit could be as large as 30,000 cubic yards (45,000 tons) at the Property. As described in Section 2.5 and illustrated on Figure 5, commercial reuse of the Site includes adaptive reuse of the existing 10,000 ft²; construction of a paved driveway/parking lot/exterior material storage area; and construction of a storm water retention pond. Redevelopment will also include extending upgraded utilities to the existing building and construction of limited landscaping around the building.

4.1 PRE-CONSTRUCTION WASTE CHARACTERIZATION

Two remedial alternatives evaluated in Section 4.2 require the excavation and offsite disposal of impacted soil/fill. Therefore, as suggested in the Stantec (2018) CSIR/ROR, prior to initiation of Site work, a waste characterization investigation is warranted to confirm the appropriate handling/transport/disposal options for the material. The investigation should include advancement of soil borings and laboratory analysis of the material to properly characterize the bulk waste. The results of the investigation should be included in the RAP, as recommended in Section 5.1.

4.2 EVALUATION OF REMEDIAL ALTERNATIVES

Unit costs summarized in this section are aggregated estimates based on recent projects completed by Stantec in Illinois. The current property owner (the City of Peoria, Illinois) will likely need to competitively bid the remediation work at the Site, and if the remediation work utilizes a USEPA Brownfield cleanup grant, the work may need to comply with the Davis Bacon Act. Therefore, the unit rates used to estimate the cost of each remedial alternative are provided for budget/comparison purposes only and are subject to change during project implementation.

Four remedial alternatives were evaluated to prevent completion of possible exposure routes following commercial redevelopment of the Site:

1. Natural Attenuation (no action)
2. Excavation and Offsite Disposal of All Soil Exceeding a Tier I SRO with an Institutional Control for Groundwater Consumption
3. Limited Excavation and Offsite Disposal of Soil Exceeding a Tier I SRO; Construction of Engineered Barriers; Maintenance of Engineered Barriers and Restriction of Groundwater Consumption Through Institutional Controls
4. Limited Excavation and Offsite Disposal of Soil Exceeding a Tier I SRO; Construction of Crushed Recycled Concrete/brick and Clean Gravel Fill to Serve as Engineered Barriers; Maintenance of Engineered Barriers and Restriction of Groundwater Consumption Through Institutional Controls
4.2.1 Remedial Alternative 1 – Natural Attenuation (No Action)

Remedial Alternative 1 assumes the Site is reused in its current condition without the use of institutional controls and without construction/maintenance of engineered barriers. Although the cost to implement Remedial Alternative 1 is the least of the three options, constituents of concern in soil are considered recalcitrant to natural attenuation. Overall exposure risk, magnitude, mobility, and toxicity of impacts would not decrease within a reasonable timeframe. Soil impacts would remain in close proximity to sensitive receptors following redevelopment. Residual impacts would be subjected to increased leaching potential if increased precipitation occurs due to potential extreme weather events. The long-term effectiveness of natural attenuation is unreliable and would not result in issuance of an NFR letter by IEPA. Therefore, Remedial Alternative 1 is not a reasonable approach to mitigate exposure risk following commercial redevelopment.

4.2.2 Remedial Alternative 2 - Excavation and Offsite Disposal of All Soil Exceeding a Tier I SRO with an Institutional Control for Groundwater Consumption

Excavation and offsite disposal of impacted soil/fill is a common remediation method used during redevelopment brownfield Sites. This method has been shown to be effective in eliminating the short-term and long-term exposure risk and reducing the mobility, toxicity, and magnitude of existing impacts. Further, no increased in leaching potential is expected if increased precipitation occurs due to potential extreme weather events. However, the labor and transportation/disposal involved in implementing Remedial Alternative 2 and confirming all residual soil impacts were property removed is cost prohibitive as summarized in the table below; please note the cost assumes 30,000 cubic yards (45,000 tons) of impacted fill is present at the Property and can be disposed offsite at a licensed solid waste landfill; the cost for disposal of the fill/soil as hazardous waste could increase the project cost by tenfold. Remedial Alternative 2 assumes the open areas of the Site will be landscaped with grass following redevelopment. The cost estimate for post-construction groundwater monitoring is provided in Section 5.2; confirmation soil sampling is not warranted. An initial construction budget for Remedial Alternative 2 is provided below:

<table>
<thead>
<tr>
<th>Element</th>
<th>Unit Rate</th>
<th>Number of Units</th>
<th>Cost Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-Construction Waste Characterization (3d in field)</td>
<td>$12k Driller; $10k Lab; $8k Consulting</td>
<td>$30,000</td>
<td>$30,000</td>
</tr>
<tr>
<td>Finalize Remedial Action Plan</td>
<td>$30,00</td>
<td></td>
<td>$30,000</td>
</tr>
<tr>
<td>Excavate/Haul/Disposal of Soil at Solid Waste Landfill</td>
<td>$70/Ton</td>
<td>45,000</td>
<td>$3,150,000</td>
</tr>
<tr>
<td>Backfill Site to 6” of Current Grade; Excluding Storm Water Pond</td>
<td>$11/yd³</td>
<td>26,100</td>
<td>$287,100</td>
</tr>
<tr>
<td>Backfill with 6” topsoil, grade, and seed</td>
<td>$5/yd²</td>
<td>23,500</td>
<td>$117,500</td>
</tr>
<tr>
<td>Construction Total</td>
<td></td>
<td></td>
<td>$3,614,600</td>
</tr>
<tr>
<td>Engineering/Design (estimated 12% of construction cost)</td>
<td></td>
<td></td>
<td>$433,752</td>
</tr>
<tr>
<td>IEPA Review Fees</td>
<td></td>
<td></td>
<td>$10,000</td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
<td></td>
<td>$4,058,352</td>
</tr>
</tbody>
</table>
Evaluation of Cleanup Alternatives

4.2.3 Remedial Alternative 3 - Limited Excavation and Offsite Disposal of Soil Exceeding a Tier I SRO; Construction of Engineered Barriers; Maintenance of Engineered Barriers and Restriction of Groundwater Consumption Through an Institutional Controls

Remedial Alternative 3 is similar to Remedial Alternative 2; however, the excavation and offsite disposal of impacted soil will be limited to the portions of the Site not covered by an engineered barrier (ex. the storm water detention pond and a nominal amount of landscaped areas) and material removed for installation of new utilities. As illustrated on Figure 5, the storm water detention pond is targeted for the southwest portion of the Site where the fill is only 3.7 feet thick, on average. Excavation and offsite disposal of contaminated fill/soil under Remedial Alternative 3 is expected to only be 2,010 cubic yards (3,020 Tons), which is only 8% of the fill/soil proposed for removal/disposal under Remedial Alternative 2. This reduction in the amount of material transported offsite will reduce the carbon footprint of the project and preserve landfill space. The remainder of the Site will be compacted as appropriate, graded with gravel underlayment, and finished with asphalt to create a driveway, parking areas, and a large impervious outdoor material storage area. Maintenance of the engineered barrier and restriction of groundwater consumption at the property will occur through an institutional control (i.e. the NFR letter). The draft RAP outlined in Section 5.1 should be finalized and submitted to IEPA for review/comment prior to initiation of remediation.

The cost estimate for post-construction groundwater monitoring is provided in Section 5.2; confirmation soil sampling is not warranted. An initial construction budget for Remedial Alternative 3 is provided below.

<table>
<thead>
<tr>
<th>Element</th>
<th>Unit Rate</th>
<th>Number of Units</th>
<th>Cost Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-Construction Waste Characterization (1d in field) ($5k Driller; $5k Lab; $5k Consulting)</td>
<td>$15,000</td>
<td></td>
<td>$15,000</td>
</tr>
<tr>
<td>Finalize Remedial Action Plan, ABCA, QAPP</td>
<td>$20,000</td>
<td></td>
<td>$20,000</td>
</tr>
<tr>
<td>Excavate/Haul/Disposal of Soil at Solid Waste Landfill (Storm Water Pond)</td>
<td>$70/Ton</td>
<td>2,880</td>
<td>$201,600</td>
</tr>
<tr>
<td>Excavate/Haul/Disposal of Soil at Solid Waste Landfill (Utility Trench; assumes 100’x4’x6’)</td>
<td>$70/Ton</td>
<td>140</td>
<td>$9,800</td>
</tr>
<tr>
<td>Construction of Asphalt Engineered Barrier</td>
<td>$7/ft²</td>
<td>211,000</td>
<td>$1,477,000</td>
</tr>
<tr>
<td>Backfill Landscaped Areas to 6” of Current Grade (Excluding Storm Water Pond)</td>
<td>$11/yd³</td>
<td>1,275</td>
<td>$14,025</td>
</tr>
<tr>
<td>Backfill Landscaped Areas with 6” Topsoil, Grade, and Seed</td>
<td>$5/yd²</td>
<td>590</td>
<td>$2,950</td>
</tr>
<tr>
<td>Construction Total</td>
<td></td>
<td></td>
<td>$1,740,375</td>
</tr>
<tr>
<td>Engineering/Design (estimated 12% of construction cost)</td>
<td></td>
<td></td>
<td>$208,845</td>
</tr>
<tr>
<td>IEPA Review Fees</td>
<td></td>
<td></td>
<td>$10,000</td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
<td></td>
<td>$1,959,220</td>
</tr>
</tbody>
</table>

Please note that Remedial Alternative 3 includes only a nominal amount of greenspace as the fill/soil located outside of the proposed storm water pond area is generally greater than 5-feet thick (sometimes >> 12 feet thick). For budgeting purposes, if the area if greenspace is increased during development of final design, the cost to excavate/dispose of contaminated material and construct new landscaping is approximately $24/ft². Also, it is assumed that paving will be completed in a phased manner as the site is redeveloped. Initially the west acre will be developed as the stormwater pond and surrounding pavement. Additional paving may be the responsibility of the developer.

The approach proposed under Remedial Alternative 3 has been shown to be effective in eliminating the short-term and long-term exposure risk and reducing the mobility, toxicity, and magnitude of all constituents...
of concern. However, the long-term effectiveness of this approach requires continued monitoring of the engineered barrier and restoration/repairs of the engineered barrier to be completed in a timely manner. Although Remedial Alternative 3 increases the amount of impervious area at the Property, the size of the storm water pond can be increased prior to construction to mitigate additional runoff that might be generated due to a possible increase in precipitation due to potential extreme weather events.

Similar to Remedial Option 2, if groundwater impacts are confirmed to extend offsite following redevelopment, a groundwater ordinance may be required to prevent consumption of groundwater. The extent of the ordinance would be documented in the Remedial Action Completion Report (RACR), as appropriate.

4.2.4 Remedial Alternative 4 - Limited Excavation and Offsite Disposal of Soil Exceeding a Tier I SRO; Construction of Crushed Recycled Concrete/brick and Clean Gravel Fill to Serve as Engineered Barriers; Maintenance of Engineered Barriers and Restriction of Groundwater Consumption Through Institutional Controls

Remedial Alternative 4 is similar to Remedial Alternative 3; the excavation and offsite disposal of impacted soil will be limited to the portions of the Site not covered by an engineered barrier (ex. the storm water detention pond and a nominal amount of landscaped areas) and material removed for installation of new utilities. See Section 4.2.3 for details regarding the limited excavation plan. This reduction in the amount of material transported offsite will reduce the carbon footprint of the project and preserve landfill space. Similarly, the beneficial reuse of crushed recycled concrete/brick will also reduce the amount of landfill space utilized.

The remainder of the Site will be compacted as appropriate graded with a 1-foot crushed recycled concrete/brick and clean gravel fill graded layer to create an engineered barrier for a future driveway, parking area, and a large outdoor material storage area. The beneficially reused crushed concrete/brick and clean gravel fill engineered barrier will also be reinforced by fencing along all sides of the Property, inhibiting Site access from unauthorized civilians on the future commercial/industrial facility. Maintenance of the engineered barrier and restriction of groundwater consumption at the property will occur through an institutional control (i.e. the NFR letter).

The crushed recycled concrete/brick would be from a nearby school that is scheduled to be demolished, according to the City of Peoria, located at 2702 W. Krause Avenue, Peoria, IL (approximately 0.5-miles from the Property). According to available records, the school to be demolished is approximately 32,669 ft² in area and has one to three approximate 7.5 ft stories of concrete/brick walls and floors estimated to be 9-inches thick, equating to approximately 1,604 cubic yards of crushed material. To accommodate for the 1-foot of crushed concrete/brick engineered barrier, approximately 7,815 yd³ of crushed concrete/brick or clean gravel fill is needed to be graded on the Property. The crushed concrete/brick from the school is able to accommodate for approximately 21% of this remedial action alternative with approximately 6,211 yd³ needing to be supplemented from a clean gravel fill source. Given that the material will need to be sampled for lead-based paint and asbestos-containing materials (ACM) alongside being crushed at the school prior to mobilization for demolition, the cost of these actions would be financed by the demolition project, resulting in a material cost savings for this alternative and landfilling savings for the demolition project. Additionally, the hauling and grading costs are significantly more cost effective than the asphalt engineering barrier proposed in Remedial Alternative 3. A geotextile will be placed in between the existing soils and beneficially reused crushed concrete/brick and clean gravel fill to prevent piercing and interaction with the contaminated fill material.

Additionally, an approximately 9,000 ft² portion of the Property, primarily at the entrance and egress, will be an asphalt engineered barrier to protect these frequently used areas from deterioration and reduce the likelihood of barrier breakthrough. The cap will still need to be monitored and maintained similar to the crushed concrete/brick and clean fill barrier.
DRAFT ANALYSIS OF BROWNFIELD CLEANUP ALTERNATIVES

Evaluation of Cleanup Alternatives

The draft RAP outlined in Section 5.1 should be finalized and submitted to IEPA for review/comment prior to initiation of remediation.

The cost estimate for post-construction groundwater monitoring is provided in Section 5.2; confirmation soil sampling is not warranted. An initial construction budget for Remedial Alternative 4 is provided below.

<table>
<thead>
<tr>
<th>Element</th>
<th>Unit Rate</th>
<th>Number of Units</th>
<th>Cost Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-Construction Waste Characterization (1d in field) ($5k Driller; $5k Lab; $5k Consulting)</td>
<td>$15,000</td>
<td></td>
<td>$15,000</td>
</tr>
<tr>
<td>Finalize Remedial Action Plan, ABCA, QAPP</td>
<td>$20,000</td>
<td></td>
<td>$20,000</td>
</tr>
<tr>
<td>Excavate/Haul/Disposal of Soil at Solid Waste Landfill (Storm Water Pond)</td>
<td>$70/Ton</td>
<td>2,880</td>
<td>$201,600</td>
</tr>
<tr>
<td>Excavate/Haul/Disposal of Soil at Solid Waste Landfill (Utility Trench; assumes 100’x4’x6’)</td>
<td>$70/Ton</td>
<td>140</td>
<td>$9,800</td>
</tr>
<tr>
<td>Mobilization of Crushed Concrete/Brick (2,599 tons)</td>
<td>$8.50/ yd³</td>
<td>1,604</td>
<td>$13,634</td>
</tr>
<tr>
<td>Mobilization of Clean gravel fill (8 days)</td>
<td>$126.50/hr</td>
<td>64</td>
<td>$8,096</td>
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<tr>
<td>Construction of Crushed Engineered Barrier</td>
<td>$5.50/yd³</td>
<td>7,815</td>
<td>$42,982.50</td>
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<tr>
<td>Construction of Asphalt Engineered Barrier</td>
<td>$7/ft²</td>
<td>9,000</td>
<td>$63,000</td>
</tr>
<tr>
<td>Geotextile Between Engineered Barrier and Contaminated Soil</td>
<td>$40,000</td>
<td></td>
<td>$40,000</td>
</tr>
<tr>
<td>Equipment/personnel/mobilization/demobilization</td>
<td>$12,500</td>
<td></td>
<td>$12,500</td>
</tr>
<tr>
<td>Backfill Landscaped Areas to 6” of Current Grade (Excluding Storm Water Pond)</td>
<td>$11/yd³</td>
<td>1,275</td>
<td>$14,025</td>
</tr>
<tr>
<td>Backfill Landscaped Areas with 6” Topsoil, Grade, and Seed</td>
<td>$5/ yd²</td>
<td>590</td>
<td>$2,950</td>
</tr>
<tr>
<td>Construction Total</td>
<td></td>
<td></td>
<td>$443,587.50</td>
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<td>Engineering/Design (estimated 12% of construction cost)</td>
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<td>$53,230.50</td>
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<td>IEPA Review Fees</td>
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<td>$10,000</td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
<td></td>
<td>$506,818</td>
</tr>
</tbody>
</table>

Please note that Remedial Alternative 4 includes only a nominal amount of greenspace. This will include removal of all impacted fill/soil in these areas. The fill/soil located in these areas is generally greater than 5-feet thick (sometimes >> 12 feet thick). For budgeting purposes, if the area if greenspace is increased during development of final design, the cost to excavate/dispose of contaminated material and construct new landscaping is approximately $24/ft².

This alternative assumes no lead-based paint or ACMs are detected in the recycled concrete/brick. If these constituents are detected in the concrete/brick to be crushed for utilization on the Property, then additional costs may be incurred to repurpose this material, or the concrete/brick source may change impacting mobilization costs.

The approach proposed under Remedial Alternative 4 has been shown to be effective in eliminating the short-term and long-term exposure risk and reducing the inhalation and ingestion mobility, toxicity, and magnitude of all constituents of concern. However, the long-term effectiveness of this approach requires continued monitoring of the crushed concrete/brick and fenced engineered barrier and restoration/repairs of the engineered barrier to be completed in a timely manner. According to the State of Illinois Department of Natural Resources (IDNR), crushed stone used as roadways or parking lots are considered impervious area (IDNR, 2015). Although Remedial Alternative 4 increases the amount of impervious area at the
Evaluation of Cleanup Alternatives

Property, the size of the storm water pond can be increased prior to construction to mitigate additional runoff that might be generated due to a possible increase in precipitation due to potential extreme weather events.

Although IDNR identifies crushed stone parking lots and roadways as impervious surface, there is still a greater chance of infiltration in the crushed concrete/brick and clean gravel fill grading plan compared to the asphalt proposed in Remedial Option 3. To prevent exposure to any groundwater impacts extending offsite following redevelopment, a groundwater ordinance will be pursued to prevent consumption of groundwater. The extent of the ordinance would be documented in the Remedial Action Completion Report (RACR), as appropriate.

### 4.3 RECOMMENDED CLEANUP ALTERNATIVE

Remedial Alternative 4 is selected as the recommended cleanup alternative and is the most economical and is considered effective in eliminating the short-term and long-term exposure risk and reducing the inhalation and ingestion mobility, toxicity, and magnitude of all constituents of concern.
5.0 REMEDIAL ACTION PLAN

This draft RAP provides additional detail to the cleanup alternative selected in Section 4. As redevelopment plans are finalized, this RAP should be further revised prior to submittal to IEPA for review and comment.

5.1 SELECTED REMEDIATION TECHNOLOGY

Active remediation of the Site will include excavation and offsite disposal of contaminated fill/soil to facilitate construction of a storm water pond, a nominal amount of landscaping, and installation of new utilities to the existing building. Based on work completed to date, the fill/soil is likely to be accepted by a local solid waste landfill. However, as reuse plans are finalized, as recommended in section 4.1, impacted soil/fill targeted for excavation and offsite disposal should be characterized for disposal purposes to confirm handling/disposal options. A soil management plan should be developed and included in the final RAP to transmit the results of the waste characterization sampling and landfill waste profiles to IEPA for review/comment. The final RAP will also document measures to be in place to maintain a controlled environment for the remediation. These control measures will be implemented throughout the remedial action and include health and safety, security, ambient air monitoring, remedial action related emissions control, control and management of storm water and wastewater, traffic maintenance and control and decontamination procedures. The RAP will include a plan for excavating impacted soil, including excavation, transportation, and offsite and a restoration (backfilling/grading/finishing) plan for the areas not covered with an engineered barrier.

A site-wide engineered barrier will be constructed to prevent direct contact with remaining impacted fill/soil. Construction of the engineered barrier with crushed recycled concrete/brick and clean gravel fill will increase the amount of outdoor storage, which will be critical to support the proposed commercial redevelopment of the Site. Final engineering/construction documents should be included in the final RAP to allow for IEPA review/comment.

Maintenance of the engineered barrier and restriction of groundwater consumption at the Site and extending offsite will be accomplished through an institutional control (i.e. NFR letter) and a groundwater ordinance, respectively.

This approach is considered reliable and feasible to implement. The approach is expected to perform satisfactorily and reliably; however, the long-term effectiveness requires continued monitoring of the engineered barrier and restoration/repairs of the engineered barrier to be completed in a timely manner.

5.2 CONFIRMATION SAMPLING PLAN

Confirmation soil samples will not be collected during implementation of the selected remedial alternative. As an alternative, record drawings and photographic documentation will be provided in the RACR documenting the anthropogenic fill was completely removed from the storm water pond area and landscaped area.

Although the investigation is considered substantially complete, further evaluation of physical and chemical hydrogeology is warranted to confirm the potentiometric surface of groundwater and further evaluate the magnitude/extent and attempt to identify a source of metals in groundwater. Confirmation groundwater samples will be collected following redevelopment to determine if consumption of groundwater currently poses a risk to offsite receptors or if continued infiltration may also pose a risk to offsite receptors. As redevelopment plans are finalized, a workplan for confirmation groundwater sampling will be developed and submitted to IEPA for review/comment in the final RAP. The following is provided for budgeting purposes:
### Remedial Action Plan

<table>
<thead>
<tr>
<th>Task</th>
<th>Cost Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Installation of (15) 2-Inch Diameter Groundwater Monitoring Wells</td>
<td>$28,000</td>
</tr>
<tr>
<td>($18k Driller; $3k Lab; $4k Consulting)</td>
<td></td>
</tr>
<tr>
<td>Quarterly Groundwater Quality Monitoring for Dissolved Metals</td>
<td>$40,000</td>
</tr>
<tr>
<td>($10k/Quarter)</td>
<td></td>
</tr>
<tr>
<td>Remedial Action Completion Report</td>
<td>$20,000</td>
</tr>
<tr>
<td>Groundwater Ordinance</td>
<td>$5,000</td>
</tr>
<tr>
<td>IEPA Oversight Fees (RACR and NFR)</td>
<td>$10,000</td>
</tr>
<tr>
<td>TOTAL</td>
<td>$103,000</td>
</tr>
</tbody>
</table>

A groundwater ordinance would serve as an institutional control for the consumption of groundwater offsite, if warranted. The results of the supplemental groundwater investigation and extent of the ordinance would be documented in the RACR.
References

6.0 REFERENCES

IDNR, 2015, Model Stormwater Management Ordinance, Version 1, September 2015.
IEPA, 2014a, Redevelopment Assessment for Go-Tane Service Station, LPC#1430655178, November 26, 2014.
Stantec, 2014, 3540 SW Adams Street Phase I Environmental Site Assessment, September 15, 2014.
Stantec, 2014b, 3550 SW Adams Street Phase I Environmental Site Assessment, September 11, 2014.
7.0 LIMITATIONS

This draft ABCA/RAP was prepared in accordance with generally accepted practices for the environmental consulting profession, undertaking similar studies at the same time and in the same geographical area as the work conducted by Stantec. Stantec observed the degree of care and skill that are generally exercised by the profession under similar circumstances and conditions. No other warranty is expressed or implied.

Stantec’s observations, findings and opinions should not be considered as scientific certainties, but only as opinion based upon our professional judgment concerning the significance of the data gathered during this investigation. Specifically, Stantec cannot represent that the Property does not contain any hazardous or toxic materials or other latent conditions beyond that observed by Stantec during the investigation. Additionally, due to limitations of the investigation process and the necessary use of data furnished by others, Stantec and its subcontractors cannot assume liability if actual conditions differ from the information presented in this report.
Property Location & Local Topography

3540-3600 SW ADAMS ST.
CITY OF PEORIA
PEORIA, ILLINOIS
2. Data Sources Include: Stantec, Peoria County GIS
3. Orthophotography: 1:1200 (At original document size of 11x17)

Notes
2. Data Sources Include: Stantec, Peoria County GIS
3. Orthophotography: 1:1200 (At original document size of 11x17)
Figure 3
Approximate Remediation Site Boundary and Birds-Eye View of Property

Source: https://gis.peoriacounty.org/peoriagis/More/WebMapLinks.html
Concentration of one or more constituent is greater than the Tier I SRO for direct contact by ingestion at industrial/commercial properties.

Concentration of one or more constituent is greater than the Tier I SRO for inhalation at industrial/commercial properties.

PCB concentrations greater than Tier I SRO for direct contact by ingestion into industrial/commercial properties.

Concentration of one or more constituent is greater than the Tier I SRO for the soil component of Class I Groundwater Ingestion.