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# ANALYSIS OF BROWNFIELD CLEANUP ALTERNATIVES

**Former Tapco Properties  
502 South Main Street  
Rockford, Illinois 61101**

Prepared For:

**City of Rockford  
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- Commercial knitting and manufacturing (Burson Knitting Co. / Burson Mfg Co.) occurred at the Remediation Site with machine shop operations from the early 1900s to the mid 1970s. The current building was constructed in 1907 with additions in 1915.
- The Remediation site was used for warehouse storage by several commercial and private entities and/or vacant from the mid 1970s to the 2000s.

### 3.0 CONTAMINANTS AND EXPOSURE ROUTES

As summarized in the Illinois Environmental Protection Agency's (IEPA) approved Comprehensive Site investigation Report (CSIR):

- Soil located at the central and eastern areas of the Remediation Site was found to contain concentrations of Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Indeno(1,2,3-cd)pyrene, Arsenic, Iron, and Lead that exceed their respective IEPA Tiered Approach at Corrective Action Objectives (TACO) - Tier 1 Residential ROs for the Soil Ingestion Exposure Route.
- Trichloroethylene was found to exceed the Residential Tier 1 RO for the Soil Inhalation Exposure Route.
- The unconfined water-bearing unit at the Remediation Site most accurately reflects Class I Potable Groundwater, as set forth per 35 IAC, Part 620.220. The constituents in soil that exceed Tier 1 Residential ROs for the Soil Component of the Groundwater Ingestion Exposure Route for Class I Groundwater include: Tetrachloroethylene, Trichloroethylene, 2-Methylnaphthalene, Carbazole, and Lead.
- Detected contaminants that exceed Tier 1 Groundwater Remediation Objectives for Class I groundwater of the Groundwater Ingestion Exposure Pathway included: Aluminum, Antimony, Iron, Lead, Manganese, Vanadium, Tetrachloroethene, Trichloroethene, and Vinyl Chloride.

The Rock River borders the Remediation Site to the east and is the most limiting receptor. Tier 2 or Tier 3 modeling, or both, will be conducted with respect to the upper unconfined aquifer and bedrock aquifer to predict the extent of impacts in soil and groundwater and whether surface water can be expected to be impacted at concentrations greater than Derived Water Quality Criteria, for areas not affected by Derived Water Quality Criteria, the maximum distance from the site to Tier 1 Remediation Objectives.

#### **4.0 CLEANUP ALTERNATIVES**

There are four (4) cleanup alternatives applicable to the Remediation Site that could be implemented to address the soil and groundwater contamination. These alternatives include:

##### **4.1 Alternative 1 – No Action**

The City does not address the contamination in any way at the site.

1. Effectiveness – this alternative does not address the contamination in any manner and, therefore, is not effective.
2. Implementability – implementing this alternative takes no effort on the part of the City, but considering the fact groundwater at the site has been affected at concentrations exceeding those established in 35 IAC, Part 620, an investigation into the source and extent, along with any required corrective action would be necessary.
3. Cost – there is no cost for inactivity.

#### **4.2 Alternative 2 –Excavation for Engineered Barrier Placement and completion of Tier 2 or 3 Groundwater Modeling**

Demolish and remove existing structure. Excavate impacted soil areas to a maximum depth of five (5) feet below ground surface. Conduct waste profiling on impacted soil and transport to a licensed and permitted disposal facility/landfill. Conduct Tier 2 or Tier 3 modeling, or both, with respect to the upper unconfined aquifer and bedrock aquifer to predict the extent of remaining groundwater contamination and whether surface water can be expected to be impacted.

1. Effectiveness – This alternative can be very effective at removing contaminants and soil exposure pathways. The engineered barrier is an effective corrective action used to exclude the Soil Ingestion Exposure Route and Soil Inhalation Exposure Route.
2. Implementability – The implementability of this alternative is logical in concept and can be accomplished with conventional equipment and can effectively remove any source areas that may be impacting groundwater. The engineered barrier would be completed once the soil excavation has occurred and would consist of a minimum of three feet of clean material.
3. Cost – The cost to excavate, profile, transport, and dispose of contaminated soil is approximately \$50.00 per cubic yard. Additional costs would include the engineered barrier and Tier 2/3 modeling.

#### 4.3 **Alternative 3 – Chemical Oxidation of Contaminants with Excavation for Engineered Barrier Placement and completion of Tier 2 or 3 Groundwater Modeling**

Chemically oxidize volatile organic compounds in place while addressing ingestion exposure pathways of polynuclear aromatic hydrocarbons and inorganics with excavation and engineered barrier. Conduct Tier 2 or Tier 3 modeling, or both, with respect to the upper unconfined aquifer and bedrock aquifer to predict the extent of remaining groundwater contamination and whether surface water can be expected to be impacted

1. Effectiveness – All identified volatile organic compound contamination occurs in the upper three (3) feet of the Remediation Site. By chemically oxidizing soil in this area with expected low oxidant mass requirements, the groundwater will correspondingly also be oxidized as well. The excavation and engineered barrier would remove the remaining exposure routes of impacted soil by the use of three (3) feet of clean material. Groundwater treatment by chemical oxidation is a well known method to address VOC contamination in groundwater. In addition, an engineered barrier is an effective corrective action used to exclude the Soil Ingestion Exposure Route and Soil Inhalation Exposure Route.
2. Implementability – Injection of the chemical oxidant is expected as straightforward, however, the introduction of oxidants allows for a change in the pH of impacted soils has the ability to cause inorganics/metals to mobilize and further impact groundwater. The soil excavation and installation of the engineered barrier can be accomplished with conventional equipment and can effectively remove any source areas that may be impacting groundwater.
3. Cost – Costs of excavation, transportation, and disposal would remain consistent with Alternative 2 with the added costs of materials and labor for chemical oxidation. Additional costs would also include the engineered barrier and Tier 2/3 modeling.

## **5.0 RECOMMENDATION**

Based on the analysis presented in the previous section, the second alternative addresses all soil exposure pathways without risking further contaminant impact to groundwater. It is also compatible with the end use and is less costly. Therefore, Alternative 2 is recommended.

## **6.0 DECISION DOCUMENT**

A decision document will be issued at the close of the 30-day public comment period with additional details on the selected alternative.

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## **1.0 INTRODUCTION**

The Tapco property, which shall be referred to as the “Remediation Site”, is located at 502 South Main Street, south of downtown Rockford, Illinois. The project is located adjacent to the west bank of the Rock River. The City of Rockford is located in Winnebago County, Illinois with major routes of transportation including Interstates 39 and 90, along with Route 20. Rockford has a population of approximately 152,000 residents, according to the most recent Census, and is the largest community in Winnebago County.

This Analysis of Brownfield Cleanup Alternatives (ABCA) is provided to outline the three (3) alternatives evaluated during the cleanup planning process for the Remediation Site. The cleanup activities are planned to be completed from the Spring of 2012 through the Summer of 2013. Since the proposed end use of the property is recreational in nature, commercial/industrial Remediation Objectives (ROs) for contaminant exposer pathways are no longer applicable. Conservative residential-based ROs have been adopted for the site to account for the diversity of end users.

## **2.0 SITE BACKGROUND**

The Remediation Site was developed within the City of Rockford’s downtown commercial sewing district in the mid-nineteenth century. Review of historical information sources identify the following commercial activities at the Remediation Site dating back to 1890s:

- The Remediation Site was occupied by private dwellings in the 1880s.
- A power generation facility occupied the Remediation Site in the 1890s (Forest City Electric).