

# **ANALYSIS OF BROWNFIELD CLEANUP ALTERNATIVES**

**Small Business Liability Relief and Brownfields Revitalization Act  
U.S. EPA CERCLA Section 128(a)  
State Response Program Cooperative Agreement # RP-00E14605-0**

**Indiana Brownfields Program  
Former Muncie Paper Processing Property  
701 West 23<sup>rd</sup> Street  
Muncie, Delaware County, Indiana  
Brownfield Site ID: 4010016  
May 2012**

This Analysis of Brownfield Cleanup Alternatives (ABCA) was prepared in cooperation among the Indiana Brownfields Program (Program), the City of Muncie (City), the Delaware County Commissioners, the Delaware County Redevelopment Commission, and the Muncie-Delaware County Economic Development Alliance (County), and IWM Consulting Group, LLC as a requirement for 128(a) funding for the cleanup of the Former Muncie Paper Processing Property located at 701 West 23rd Street in Muncie, Delaware County, Indiana (Site). The Program and the United States Environmental Protection Agency (U.S. EPA) deemed the Site eligible for the expenditure of approximately \$56,000. Phase II Environmental Site Assessment (ESA) activities that were conducted determined soil contamination at the Site. Environmental remediation activities utilizing this federal funding are anticipated to be completed in 2012. Site reuse is planned for commercial/industrial purposes.

The ABCA outlines the following three (3) alternative cleanup and environmental management activities considered for the Site:

1. Alternative 1: No Action
2. Alternative 2: Soil Capping
3. Alternative 3: Targeted Excavation & Disposal & Institutional Controls

Adsorbed metals (arsenic and lead) have been detected in the surface and subsurface soil at the above referenced Site at concentrations exceeding the default regulatory action levels. The impacted soil requires environmental cleanup activities prior to redevelopment; consequently, this Analysis of Brownfields Cleanup Alternatives (ABCA) has been developed. The ABCA generally follows the outline developed by the U.S. EPA and summarizes the pertinent Site information (including a brief summary of the historical environmental investigation results),

identifies the applicable regulations and cleanup standards, and provides an evaluation of the available cleanup alternatives.

It should be noted that even though historical investigations indicate that additional contaminants of concern (chlorinated volatile organic compounds (cVOCs)) are present in other areas of the Site, this ABCA only provides recommendations regarding cleanup of the adsorbed metals. The cVOCs will be addressed during a separate phase of the cleanup process.

## **I. Site Background Information**

### *a. Site Name and Location:*

Former Muncie Paper Processing Property  
701 West 23<sup>rd</sup> Street  
Muncie, Delaware County, Indiana

### *b. Previous Site Uses & Cleanup Activities:*

Based on a review of previous environmental reports, the Site was historically identified as the Muncie Paper & Pulp and Hinde & Dauch Paper Company during the time period of 1892 through 1950. The Site was later listed as the Goodyear Tire and Rubber Metal Parts facility from approximately 1950 through 1967. More recently, the Site was identified as Jordan Paper Products, Inc. in 1987 and Muncie Paper Process, Inc. (paper recycling) in 1992. Records from previously researched Indiana Department of Environmental (IDEM) records indicated that Muncie Paper Process, Inc. received a permit for a solid waste facility at the Site in 1990.

The Muncie Paper Process, Inc. facility reportedly ceased operations in approximately 1992. The Delaware County Commissioners acquired the Site in January 2000 due to tax delinquency. The Delaware County Commissioners razed the former buildings in 2000; however, the building foundations and below grade structures are still present. Currently the Site is an unoccupied, vacant, over-grown lot which is enclosed by a fence. *See* Figures at the end of this document.

Although several environmental investigations have been completed at the Site since 2009, no environmental cleanup activities have been completed at the Site. Additionally, no information has been discovered to indicate that any historical environmental cleanup activities have been completed at the Site.

### *c. Site Assessment Findings & Potential Exposure Pathways:*

The Site is a former metal parts and paper processing facility and currently consists of a fenced in, vacant, overgrown 13.32-acre property located in a mixed residential, commercial, and industrial corridor on the south side of Muncie, Indiana. Commercial

and industrial properties are located north, west and east (beyond Buck Creek) of the Site. Residential and agricultural properties are located south of the Site.

A Phase I Environmental Site Assessment (ESA) was completed at the Site in August 2009 and an initial Phase II ESA was completed in September 2009. The Phase I ESA identified numerous recognized environmental conditions (RECs) and the September 2009 Phase II ESA investigated three (3) of the RECs. The Phase II ESA confirmed the presence of metals (arsenic and lead), poly-aromatic hydrocarbons (PAHs), and cVOCs in the soil and/or groundwater at concentrations exceeding the corresponding IDEM Risk Integrated System of Closure (RISC) residential default closure level (RDCL) and/or the commercial/industrial default closure level (IDCL). *See* Figures at the end of this document and refer to the Groundwater Maps.

Two (2) additional Phase II ESAs were completed in 2011 and further evaluated areas the RECs identified in 2009. The initial Phase II ESA, completed in August 2011, attempted to further define the lateral and vertical soil impacts (arsenic and lead) in three key areas (in the vicinity of historical soil borings SB-4, SB-24, and SB-31) of the Site and attempted to define the lateral and vertical extent of the adsorbed and dissolved cVOCs in the vicinity of the Former Wood Pulp Bleaching Area. Based upon the results of the August 2011 sampling event, it was determined the adsorbed metal concentrations were adequately defined the vicinity of historical soil boring SB-4, but the adsorbed arsenic and lead were not adequately defined in the vicinity of historical soil borings SB-24 and SB-31, respectively. The cVOCs also were not adequately defined during the August 2011 investigation.

A subsequent Phase II ESA was complete in September 2011 and attempted to further define the adsorbed metal impacts in the vicinity of historical soil borings SB-24 and SB-31 and to further define the extent of cVOC impacts in the vicinity of the Former Wood Pulp Bleaching Area. The September 2011 investigation did not adequately define the lateral or vertical extent of the adsorbed arsenic in the vicinity of historical soil boring SB-24 and did not define the southern and eastern lateral extents of adsorbed lead in the vicinity of historical soil boring SB-31. However, the adsorbed arsenic impacts appear to extend to a depth of approximately 8-9 feet below land surface (BLS) and the adsorbed lead appears to extend to a depth of approximately 5-6 feet BLS. Additionally, the vertical and lateral extents of the cVOCs were not defined during the September 2011 Phase II ESA. *See* Figures at the end of this document and refer to the Groundwater Maps.

Based on analytical data obtained from historical Site investigations, the primary adsorbed metal constituents of concern (COCs) detected in the surface (0-0.5 feet BLS) and subsurface (0.5 – ~9.0 feet BLS) at the Site are: Arsenic and Lead. As previously noted, the cVOCs detected at the Site are generally detected in other areas of the Site and will be addressed under a separate phase of the cleanup activities. Consequently, the cVOCs are not discussed further throughout the remaining portion of this ABCA.

The Site is not located within the City of Muncie wellhead protection area. The adsorbed COCs (arsenic and lead) being addressed under this ABCA are not volatile and thus do not pose a threat for vapor intrusion.

Since the majority of the Site does not have engineered barriers (i.e., asphalt or concrete) and the adsorbed metal COCs have predominantly been detected in soil samples obtained from the surface (0-0.5 feet BLS) or shallow subsurface (0.5 – ~9.0 feet BLS), soil exposure through direct contact or ingestion by occupants of the Site or future construction workers is the primary potential exposure pathway which may be viable. At this time, the future redevelopment plans indicate that the Site will be developed for commercial/industrial purposes. Therefore, the most applicable cleanup standards are Industrial/Commercial Direct Contact Screening Levels for Soil Exposure, as outlined in Table A-6, Appendix A, of the *Remediation Closure Guide* dated March 22, 2012.

*d. Project Goals:*

Currently the Site is vacant and has remained vacant since the onsite structures were razed in 2000. The objective of the cleanup activities is to expeditiously minimize and/or eliminate the risk of exposure to the general public and future occupants or construction workers at the Site. The redevelopment objective is to transform the Site from a vacant, contaminated property into a productive commercial/industrial facility that will stimulate the economy by creating jobs for citizens of the greater Muncie area, increasing the local tax base, and reducing blight in the neighborhood, thus increasing the chances that additional redevelopment activities will occur.

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## **II. Applicable Regulations and Cleanup Standards**

### *a. Cleanup Oversight Responsibility:*

The Muncie-Delaware County Redevelopment Commission (MDC) has worked and will continue to work closely with representatives from the Indiana Finance Authority - Indiana Brownfield Program (IFA-IBP) for developing and implementing the remedial activities for this Site. The MDC has also engaged the services of a qualified environmental contractor (IWM Consulting Group, LLC) to develop and implement an appropriate remediation work plan to address the metal-impacted soil. IWM Consulting employs licensed professional geologists (LPG), a licensed professional engineer (PE), a Certified Hazardous Materials Manager (CHMM), and qualified All-Appropriate Inquiry (AAI) Environmental Professionals. IWM Consulting is experienced with respect to remediating these types of properties and understands the requirements of the IFA-IBP. IWM Consulting submitted the proposed remediation work plan to the IFA-IBP for review and preliminary approval (pending any public comments) prior to implementing the remediation activities. The IFA-IBP submitted a copy of the remediation work plan to U.S. EPA for review. The final remediation work plan will take into account any substantial comments provided by the public, if they affect the final cleanup. The MDC and the IFA-IBP will also provide oversight with respect to ensuring that all of the tasks are completed on time and the IFA-IBP staff will oversee the field activities during the implementation stage of the remediation project.

### *b. Cleanup Standards:*

Adsorbed arsenic and lead have been detected in the surface and subsurface of the Site at concentrations that exceed the corresponding RISC Residential and Industrial Direct Contact Levels. Since the Site will be redeveloped for commercial/industrial purposes, the cleanup standards for the soil will be the IDEM Office of Land Quality Commercial/Industrial Direct Contact Screening Levels for Soil Exposure for lead (800 mg/kg) and arsenic (16 mg/kg), as documented in Table A-6, Appendix A, of *Remediation Closure Guide* dated March 22, 2012.

### *c. Laws and Regulations Applicable to the Cleanup:*

The cleanup will comply with the U.S. EPA Brownfields Program requirements (e.g., for information repository, public comment, ABCA, cleanup oversight, etc.). The cleanup project will generally follow the guidelines outlined in House Enrolled Act (HEA) 1162, which amended Indiana Code 13-25-5-8.5. HEA 1162 states that IDEM must consider risk-based remediation objectives for hazardous substances and petroleum products that (A) manage risk and (B) control completed or potential exposure pathways. The cleanup project will also incorporate guidelines set forth in IDEM's Non-Rule Policy Document titled *Remediation Closure Guide (Waste-0046-R1)*.

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### **III. Evaluation of Cleanup Alternatives**

*a. Cleanup Alternatives Considered:*

1. No Action
2. Soil Capping
3. Targeted Excavation & Disposal & Institutional Controls

*b. Feasibility and Cost Estimate of Cleanup Alternatives:*

The following information briefly summarizes the feasibility/effectiveness of implementing the proposed cleanup alternatives and provides an estimated cost to implement these activities.

**Alternative 1 - No Action:** If no action is taken at the Site, the impacted soil will remain on the Site for decades and will not be a developable property. Additionally, if the Site is not secured, it is possible that the general public could come into direct contact with the impacted surface soils, thus creating a potential environmental, health, and welfare liability for the MDC. This option is considered the least environmentally protective and the impacts to the environment will continue for many years to come. The no action alternative does not have an associated cost, is easy to implement and does not require ongoing operation or maintenance costs. There are no required actions or technology necessary to implement this option. The time frame needed for the no action alternative to result in improved environmental conditions at the Site is unknown; however, given the fact that the historical activities that adversely impacted the Site ceased operations decades ago, the amount of time required to significantly reduce concentrations to acceptable levels is expected to be greater than 25 years. This approach would prohibit redevelopment of this Site and the Site will continue to pose an environmental and health risk to the residents of the surrounding neighborhood.

**Alternative 2 - Soil Capping:** The advantage of soil capping (importing 2 feet of clean soil) is that it quickly addresses the environmental and health risks associated with direct contact with contaminated surface soil located throughout portions of the Site. However, the contaminants are left in-situ at depths below two feet and future construction or onsite excavation workers at the Site may be exposed to the contaminants left in place when the Site is redeveloped. Although soil capping is easy to implement and quickly addresses the direct contact issue related to impacted surface soil, this option is not the best option for the Site since the contaminants are left in-situ and future construction workers would be exposed to the contaminants remaining below the soil cap during site development activities. The imported soil will also raise the elevation of the Site by 2 feet, potentially creating drainage issues and impeding future development of the Site into commercial/industrial purposes. The estimated cost associated with this work is approximately \$10,000 - \$20,000.

**Alternative 3 - Targeted Excavation & Disposal & Institutional Controls:** The advantage of the targeted excavation (~1,000 tons) and disposal portion of this option is that it is easy to implement and expeditiously addresses the environmental concerns with respect to the hazardous substances adsorbed to the surface and subsurface soil and immediately removes the impacted soil from the Site. The excavation areas can focus on source areas or only areas with the highest contaminant concentrations and alleviates any long term effects with managing direct contact with the surface and subsurface soil. The risks associated with the remaining soil can be managed through the use of institutional controls. The disadvantage of soil excavation is that it does not necessarily remediate the impacted soil since the impacted soil is simply removed from the Site and transported and disposed, untreated, at an offsite landfill.

**SB-24:** Based upon available data, IWM Consulting estimates excavating a minimum area approximating 40' x 40' x 8' deep. Historical soil borings SB-24, GP-13 through GP-18, and GP-200 through GP-207 will be over-excavated during the remediation activities. Since shallow groundwater monitoring well SW-9 is located in the center of proposed excavation area and corresponds to historical soil boring SB-24, shallow monitoring well SW-9 will be abandoned by a licensed well driller prior to initiating the excavation activities. The total volume of soil to be removed from this area is approximately 650 tons. *See Figures at the end of this document and refer to the Proposed Excavation Map.*

**SB-31:** Based upon available data, IWM Consulting estimates excavating a minimum area approximating 35' x 35' x 6' deep. Historical soil borings SB-31, SB-31A, GP-19 through GP-24, GP-208, and GP-210 through GP-214 will be over-excavated during the remediation activities. The total volume of soil to be removed from this area is approximately 350 tons. *See Figures at the end of this document and refer to the Proposed Excavation Map.*

The over-excavation area(s) will be backfilled and brought to grade with imported soil. In order to document the condition of the imported soil, confirmatory soil samples will be obtained from each source of the fill material at a rate of three (3) soil samples per source and then one (1) additional soil sample will be obtained if the total imported amount of soil exceeds 500 tons. In this case, all of the fill material (soil) is anticipated to come from one (1) common source area and the total amount of imported material is anticipated to be 1,000 tons. Consequently, IWM Consulting will obtain a total of four (4) confirmatory soil samples (3 from the source and 1 additional sample since >500 tons) from the imported backfill material, and the soil samples will be submitted to Pace and analyzed for the following analytical parameters: volatile organic compounds (VOCs) using SW-846 Method 8260B, poly-aromatic hydrocarbons (PAHs) using SW-846 Method 8270, RCRA-8 Metals using the appropriate SW-846 Method, and percent moisture. The soil samples will be analyzed on a normal turnaround time and Level II QA/QC documentation will be provided by the laboratory.

The institutional controls can consist of restricting the zoning of the property to non-residential purposes, prohibiting the installation of a garden (unless it is located in a raised garden bed) in the remaining affected areas, and require that any soil excavated from the affected areas be properly characterized prior to leaving the Site or being stockpiled on the Site. The advantages of using the institutional control is that it is quick and easy to implement yet very effective at controlling the environmental risks of human exposure to the contaminants that remain in-situ.

The total estimated cost to implement these activities range between \$55,000 and \$65,000.

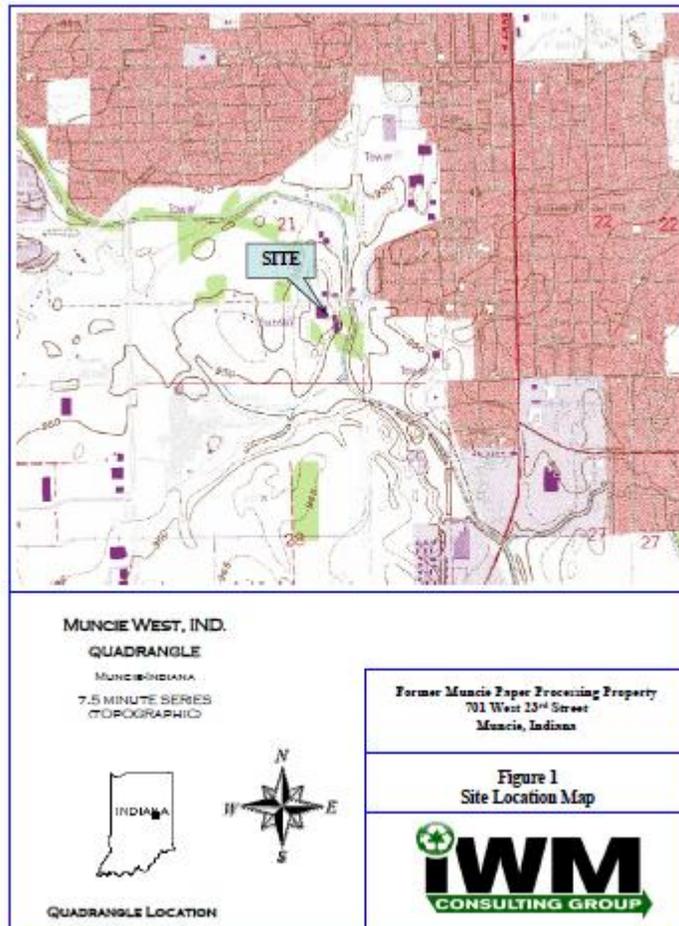
*c. Recommended Cleanup Alternative:*

The most feasible and appropriate cleanup alternative option is **Alternative #3: Targeted Excavation & Disposal, & Institutional Controls**. This remedial approach immediately remediates and removes areas with the highest contaminant concentrations and expeditiously minimizes potential exposure pathways. This approach promotes redevelopment of the 13.32-acre Site by cleaning up to levels at or below the Commercial/Industrial Direct Contact Screening Levels, and it is the most health protective option for future site occupants and construction workers.

#### **IV. Decision Document**

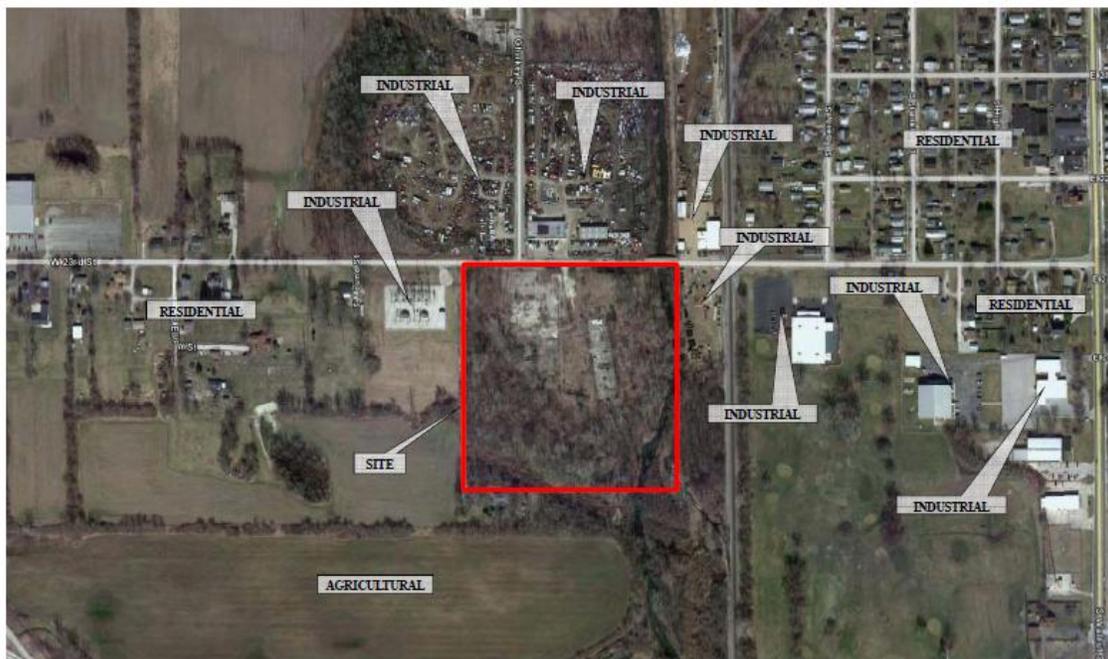
A decision document will be issued at the close of the 30-day public comment period with additional details on the selected alternative. This document will serve as a notice to proceed with 128(a)-funded remediation activities and will be available in the local information repositories for public view, along with this Site ABCA and other Site-related documents for public view.

### FIGURES



**FIGURES (cont.)**

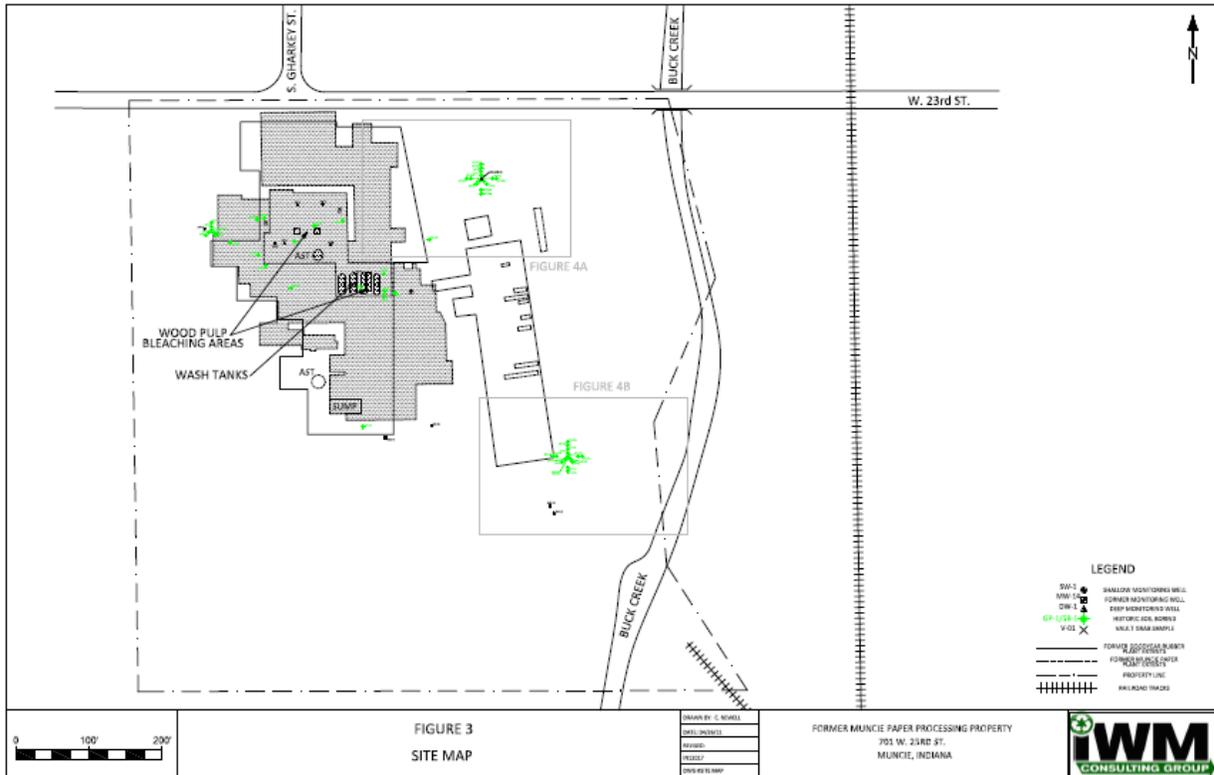
Figure 2 – Site Vicinity Map



Former Muncie Paper Processing Property  
701 W. 23<sup>rd</sup> St.  
Muncie, Indiana  
Image ©2012 from Google Earth.

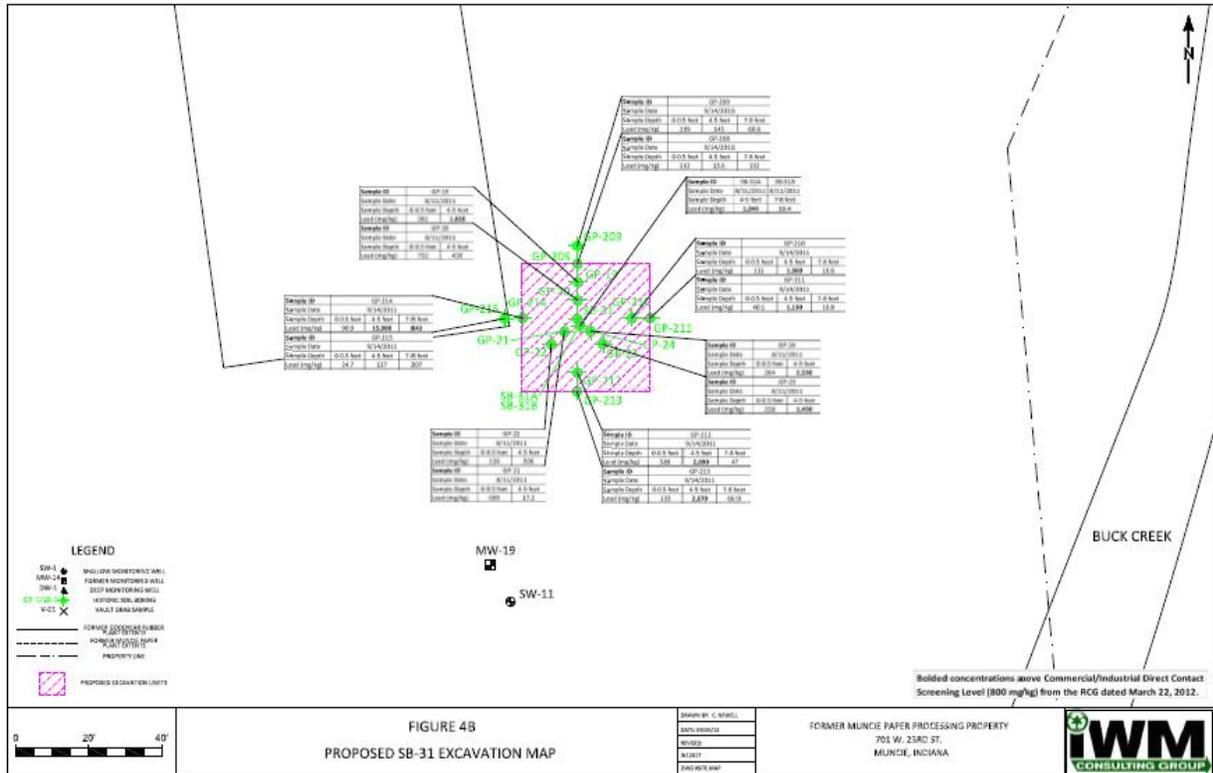


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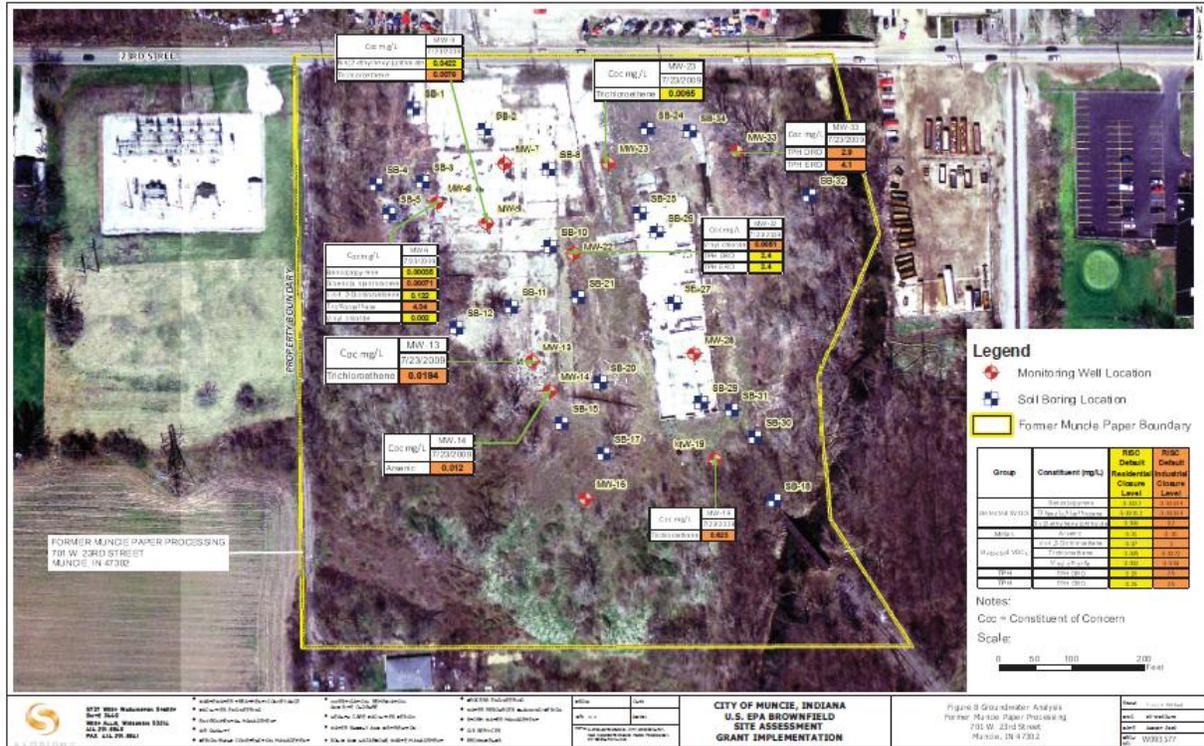




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