

# **ANALYSIS OF BROWNFIELD CLEANUP ALTERNATIVES**

**U.S. EPA Brownfield  
FY24 Single-Site Cleanup Grant CA #4B-00E03874  
Revolving Loan Fund CA #4B-00E03232  
Indiana Brownfields Program Sites 4180207 and 4240109**

**North River South and Calhoun Street Historic Fill  
1610 North Calhoun Street and 1601 North Calhoun Street (Common Addresses)  
Fort Wayne, Indiana  
March 2026**

This Analysis of Brownfield Cleanup Alternatives (ABCA) was cooperatively prepared by the Indiana Brownfields Program (Program), Fort Wayne Redevelopment Authority (Authority), and Industrial Waste Management Consulting Group, LLC (IWM Consulting) as a requirement for utilizing United States Environmental Protection Agency (U.S. EPA) Cleanup Grant and Revolving Loan Fund (RLF) monies to remediate a brownfield. North River South (AKA Former OmniSource South; Indiana Brownfields Site ID: 4180207) and Calhoun Street Historic Fill (Indiana Brownfields Site ID: 4240109), located at the common addresses of 1610 North Calhoun Street and 1601 North Calhoun Street, respectively, in Fort Wayne, Indiana (hereinafter referred to collectively as the "Site") are currently open land, covered with grass, gravel, and/or asphalt paving, and no building structures. Portions of the Site occasionally function as overflow parking.

During various periods in the past, the Site has been occupied by a junk yard, a wood products manufacturer, a railroad roundhouse, a railroad freight station, a locomotive repair facility, an engineering and manufacturing company, a sand and gravel company, a truck equipment and oil company, an auto wrecking yard, an iron and metal company, a pump and air compressor manufacturer, a bus garage, a wholesale liquor distributor, a transformer manufacturer, an auto parts warehouse, warehouse facilities, an automobile paint and body shop, and retail facilities. Former industrial, rail shops and yard, and scrap yard operations at the Site included the storage of petroleum products and potentially hazardous substances, which are believed to be the primary source(s) of heavy metals contamination in soils at the Site. The shallow perched groundwater located approximately five (5) to twenty (20) feet below surface grade (bsg) is minimally impacted. Two (2) underground storage tanks (USTs) associated with historic Site activities were closed through removal from the Site in 2000.

The City of Fort Wayne has worked closely in the past with Indiana Brownfields Program during investigation and remediation activities previously completed at the Site. Targeted excavations occurred on other portions of the former OmniSource Corporation (OmniSource) property under an RLF subgrant in 2019 and 2020. This ABCA presents remedial alternatives considered to mitigate potential exposure to remaining contaminated soil and/or groundwater associated with the historical Site activities.

Site redevelopment anticipates a combination of land use including retail, commercial, attraction, event space, and/or parking. The combined total acreage of the Site is 13.07-acres. The acreage of North River South is approximately 8-acres of State Parcel No. 02-07-35-457-003.000-074 (24.86-acres). The total acreage of the Calhoun Street Historic Fill property is approximately 5.07-acres, which includes approximately 2.95-acres of the above-referenced parcel (Parcel References E1, E2, and E4), along with the following fifteen (15) additional parcels:

State Parcel ID	Parcel Reference	Assigned Address	Acreage
02-12-02-202-011.000-074	C	1531 N. Calhoun St.	0.95
02-12-02-202-012.000-074		1525 N. Calhoun St.	
02-12-02-202-013.000-074		1523 N. Calhoun St.	
02-12-02-202-014.000-074		1519 N. Calhoun St.	
02-12-02-202-015.000-074		1517 N. Calhoun St.	
02-12-02-202-016.000-074		1513 N. Calhoun St.	
02-12-02-202-017.000-074		1509 N. Calhoun St.	
02-12-02-202-018.000-074		1503 N. Calhoun St.	
02-12-02-202-010.000-074		114 W. 4 <sup>th</sup> St.	
02-07-35-456-008.000-074		D1	
02-07-35-456-001.000-074	D2	1636 N. Harrison St.	0.28
02-07-35-456-002.000-074		1632 N. Harrison St.	
02-07-35-456-003.000-074		115 6 <sup>th</sup> St.	
02-07-35-456-004.000-074		1628 N. Harrison St.	
02-07-35-456-005.000-074		1626 N. Harrison St.	

The southern portion of North River South is bound to the north by the northern right-of-way of vacated 6th Street; to the west by North Calhoun Street; to the east by North Clinton Street; and to the south by 4th Street.

North Calhoun Street borders the Calhoun Street Historic Fill Site to the east, except for the northern 740-feet of the Site, which is bound to the east by other former OmniSource property; Headwaters Church property borders the Site to the north; and 4th Street borders the Site to the south. The northern portion of the Calhoun Street Historic Fill Site is bordered by North Harrison Street to the west, with commercial properties beyond; and residential properties are present adjacent to the west of the southern portion of the Site, beyond an alley. The Calhoun Street Historic Fill Site is intersected from east to west by 5th Street and 6th Street.

### **Site Details**

Site: North River South and Calhoun Street Historic Fill  
1610 North Calhoun Street and Addresses Listed in Table Above  
Fort Wayne, Allen County, Indiana 46808

Property Owner: Fort Wayne Redevelopment Authority  
% City Administrator, 200 East Berry Street, Suite 320  
Fort Wayne, Indiana 46802

Site Representative: Ms. Lindsey Maksim  
Brownfields Coordinator  
City of Fort Wayne, Department of Redevelopment  
200 East Berry Street, Suite 320  
Fort Wayne, Indiana 46802

## **Summary of Previous Site Activities**

### **Site History**

The Site has been commercially developed since at least 1902; however, historical records suggest the Fort Wayne, Jackson and Saginaw (New York Central) rail yard and shops were constructed after 1872, when a portion of the Site, formerly a part of Lawton Park, was donated by City Council. During various periods in the past, the Site has been occupied by a junk yard, a wood products manufacturer, a railroad roundhouse, a railroad freight station, a locomotive repair facility, an engineering and manufacturing company, a sand and gravel company, a truck equipment and oil company, an auto wrecking yard, an iron and metal company, a pump and air compressor manufacturer, a bus garage, a wholesale liquor distributor, a transformer manufacturer, an auto parts warehouse, warehouse facilities, an automobile paint and body shop, and retail facilities.

A junk yard was present in the southeast corner of the Site at the turn of the century, which was replaced by a freight station that operated through the 1960s. Historically, the Calhoun Street Historic Fill portion of the Site was primarily utilized for commercial, auto scrap, and industrial purposes and the southern portion of Site was primarily utilized for residential purposes until the 1950s, when a bus garage and parts warehouse were constructed centrally on the Site. A second bus garage had been constructed south of the initial garage by the mid-1960s. Historical industrial operations conducted on the northern portion of the Site from at least 1902 through the mid-1960s included pulley and wood furniture manufacturing, water pump and air compressor manufacturing, and transformer manufacturing. In the 1950s, Superior Iron & Metal began operating on-site after acquiring American Iron & Metal, which had operated on the northern portion of the Site and the adjacent land to the north and east since the 1930s. Superior Companies conducted scrap storage and processing operations primarily on North River South from the mid-1950s through the mid-1980s, when OmniSource, a scrap iron and metals recycling company, acquired the property to continue similar operations. Scrap metal processing was discontinued by the mid-1990s, and the Site was used only for administrative offices until 2006. Historical aerial photographs show most Site buildings were located on the west portion of the Site, while the east portion was vacant land covered with piles of debris.

The Site is approximately 13.07-acres and existing Site conditions include open land, covered with grass, no buildings, and occasionally cars are parked for overflow festival parking. OmniSource, a scrap iron and metal recycler, most recently occupied the Site. The Site has been vacant since 2006 and all buildings were removed by 2012. The Fort Wayne Redevelopment Authority acquired the Site on November 14, 2022 as part of an economic development/revitalization project.

### **Previous Environmental Assessments/Environmental Investigations**

Environmental conditions at North River have been assessed numerous times between 1998 and 2021. The primary historical environmental assessments and investigations of the Site were documented in the following reports, which are described below.

- Triad Engineering, Inc., September 1998, Limited Soil Sampling & Analysis Investigation
- ATC Associates, Inc., April 2000, Phase II Subsurface Investigation
- Triad Engineering, Inc., July 2000, Underground Storage Tank Closure Report
- Triad Engineering, Inc., July 2000, Initial Site Characterization (ISC) Report
- AVANT Group, Inc., August 2002, Further Site Investigation Report

- AVANT Group, Inc., November 2002, Corrective Action Progress Report and Response to IDEM Comments (October 1 - December 31, 2002)
- IDEM, December 2002, Site Characterization Approval
- AVANT Group, Inc., February 2003, Corrective Action Plan
- IDEM, April 2003, CAP Approval
- AVANT Group, Inc., July 2003, Corrective Action Progress Report and CAP Implementation Report (April 1 - June 30, 2003)
- AVANT Group, Inc., September 2003, Corrective Action Progress Report (July 1 - September 30, 2003)
- AVANT Group, Inc., January 2004, Corrective Action Progress Report (October 1 - December 31, 2003)
- AVANT Group, Inc., April 2004, Corrective Action Progress Report (January 1 - March 31, 2004)
- AVANT Group, Inc., July 2004, Corrective Action Progress Report (April 1 - June 30, 2004)
- AVANT Group, Inc., October 2004, Final Corrective Action Progress Report (July 1 - September 30, 2004)
- IDEM, February 2005, Approval of No Further Action Status
- AVANT Group, Inc., April 2005, Monitoring Well Abandonment
- AVANT Group, Inc., June 2007, Report Review
- AVANT Group, Inc., September 2007, Draft Sampling and Analysis Report
- AVANT Group, Inc., November 2007, Test Pit Soil Sampling and Analysis Report
- AVANT Group, Inc., November 2007, Groundwater Investigation Report
- IWM Consulting Group, LLC, February 2013, Phase I Environmental Site Assessment
- IWM Consulting Group, LLC, March 2013, 2012 Groundwater Investigation Report
- IWM Consulting Group, LLC, December 2017, Phase I Environmental Site Assessment
- IWM Consulting Group, LLC, May 2018, Further Site Investigation
- IWM Consulting Group, LLC, June 2018, Soil Fill Pile and Sump Area Sampling and Analysis
- IWM Consulting Group, LLC, June 2018, UST Closure Report
- IWM Consulting Group, LLC, August 2018, Soil Fill Pile Chromium VI Sampling and Analysis
- IWM Consulting Group, LLC, October 2018, UST Closure Report - Gasoline USTs
- IWM Consulting Group, LLC, March 2019, Site Remediation Work Plan
- IWM Consulting Group, LLC, May 2020, Remediation Work Plan Implementation Report
- IWM Consulting Group, LLC, April 2021, Remediation Work Plan Implementation Report Addendum No. 1 - Sump Area
- IWM Consulting Group, LLC, December 2021, Hazardous Substances Site Assessment Report
- IWM Consulting Group, LLC, November 2022, Phase I Environmental Site Assessment
- IWM Consulting Group, LLC, July 2022 (Updated July 2023), Soil Management Plan

Triad Engineering, Inc., Limited Soil Sampling & Analysis Investigation, September 14, 1998

In August 1998, Triad Engineering, Inc. (Triad) advanced ten (10) soil borings on, or adjacent to, the Site, in the vicinity of a vacant railroad spur. Analytical results for soil samples collected from the borings indicated that elevated metals concentrations and isolated used oil and/or hydraulic oil impacts were present.

ATC Associates, Inc., Phase II Subsurface Investigation, April 20, 2000

In January 2000, ATC Associates, Inc. (ATC) advanced four (4) soil borings (GP-7, GP-8, GP-11, and GP-12) on, or adjacent to, the Site. Analytical results for soil samples collected from the borings indicated that elevated metals concentrations, trace polychlorinated biphenyl (PCB), and isolated volatile organic compound (VOC) and semi-VOC (sVOC) impacts.

Triad Engineering, Inc., Underground Storage Tank Closure Report, June 2000, and Initial Site Characterization (ISC) Report, July 2000

In May 2000, Triad oversaw the closure by removal of one (1) 10,000-gallon capacity steel, diesel UST, and one (1) 550-gallon capacity steel, gasoline UST, as well as the removal of approximately 600-gallons of petroleum-impacted soil. Soil and groundwater analytical results revealed limited petroleum contamination in the vicinity of the former USTs. Seven (7) soil borings (GP-1 through GP-7) were advanced and three (3) monitoring wells (MW-1, MW-2, and MW-3) were installed following the UST closure and excavation activities. Soil and groundwater analytical results confirmed impacts were limited in the vicinity of the former USTs.

AVANT Group, Inc., Further Site Investigation Report, August 27, 2002 through Monitoring Well Abandonment, April 21, 2005

In July 2002, AVANT Group, Inc. (AVANT) advanced five (5) soil borings with temporary wells (GP-8 through GP-12) to confirm the extent of the petroleum impacts to the subsurface. In October 2002, an additional boring with temporary well (GP-13) was advanced down-gradient of the subsurface petroleum impacts to delineate groundwater impacts. A Corrective Action Plan (CAP) identifying Monitoring Natural Attenuation (MNA) as the preferred remedial action was developed by AVANT in February 2003, and a fourth monitoring well (MW-4) was installed in June 2003 to monitor petroleum contamination attenuation in the source area (former UST cavity). Groundwater was monitored quarterly by AVANT through the third quarter 2004, unconditional No Further Action (NFA) status was granted by the Indiana Department of Environmental Management (IDEM) to the petroleum release in February 2005, and monitoring wells MW-1 through MW-4 were properly abandoned in March 2005.

AVANT Group, Inc., Report Review, June 21, 2007

In June 2007, AVANT reviewed available historical documentation related to environmental investigations, including Phase I and II environmental site assessments (ESAs) and UST closures, performed at North River. Two (2) "Areas" of concern, Area 1 and 2, were identified on the Site, which included former USTs that were reportedly historically closed or closed by removal in 2000. Area 3 was identified as the UST area assessed by AVANT north of 4th Street and east of Calhoun Street, and Area 4 was identified as the rail spur area assessed by Triad north of 4th Street and west of Clinton Street. A fifth Area (Area 5) was identified as "Site-wide" in the report.

AVANT Group, Inc., Draft Sampling and Analysis Report, September 4, 2007

In August 2007, AVANT performed investigation activities in Areas 1, 4, and 5. Four (4) soil borings (B-1 through B-4) were advanced in the vicinity of a former gasoline UST, five (5) soil borings (B-5 through B-9) were advanced near where isolated used oil and/or hydraulic oil impacts were previously identified, and two (2) soil borings (B-10 and B-14) were advanced randomly on the Site. Elevated metals and PCBs were identified in soil samples collected from B-10 and B-14, and petroleum hydrocarbons were identified in the soil samples collected along the former railroad spurs. The report indicated that Areas 2 and 3 had been appropriately addressed historically, and did not recommend further investigation of these concerns.

AVANT Group, Inc., Test Pit Soil Sampling and Analysis Report, November 16, 2007

In October 2007, AVANT excavated twenty (20) test pits (TP-1 through TP-4, TP-10 through 13, TP-18 through TP-20, TP-26 through TP-31, and TP-34 through TP-36) on the Site. The test pits were completed to identify the thickness of fill material on the Site and to assess if contamination was present. The test pits were excavated at randomly selected locations on the Site. The grid area included areas adjacent to Site buildings, within the former auto salvage yard, and in the location of former railroad spurs. The results of the 2007 test pit soil analyses indicated that a large portion of the Site had concentrations of metals and PCBs in excess of the IDEM regulatory levels at the time.

AVANT Group, Inc., Groundwater Investigation Report, November 14, 2007

In October 2007, AVANT installed two (2) groundwater monitoring wells (MW-1 and MW-5) on the Site and conducted groundwater sampling at the request of the City of Fort Wayne, Division of Community Development. Arsenic and petroleum contaminants were detected in one (1) of the groundwater samples collected from the Site. Surficial fill was observed to a depth of 5.5-feet below grade.

IWM Consulting Group, LLC, Phase I Environmental Site Assessment, February 25, 2013

The following Recognized Environmental Conditions (RECs) were identified in association with North River (including the subject property) by IWM Consulting during a 2013 Phase I ESA.

- Historical subject property occupants have included a railroad yard with locomotive repair, truck and automobile repair facilities, an oil company, a transformer manufacturer, and a metal processing scrap yard. These operations typically utilize hazardous substances and petroleum products in their operations. Details concerning the usage and disposal of hazardous substances and petroleum products by the subject property occupants were not readily available.
- Two 4,000-gallon capacity gasoline USTs located on the west-central portion of the subject property, between 5th and 6th Streets, were manifolded together to form one, 8,000-gallon capacity UST (owner designated UST #8). Notations made by subject property personnel on UST registration forms indicated this manifolded UST was removed from the subject property in the 1980s. No UST closure report or other tank removal documentation was readily available.
- Four spill incidents were reported at the subject property between 1989 and 2002. The spills consisted of 25 gallons of transformer oil in 1989, 2,400 gallons of caustic soda to the municipal sewer in 1994, 60 gallons of chromate cleaning solution to the sanitary sewer in 1996, and an alleged petroleum spill in 2002. No active investigations of these spills are underway; however, documentation of the cleanup of these spills was not readily available.
- Sampling of surface soil along the former railroad spur on the Site indicate total petroleum hydrocarbon (TPH) concentrations in five sample locations exceeded the IDEM regulatory level at that time.
- Laboratory testing results indicate lead, argon, cadmium, PCBs, and mercury were present in the soil samples at concentrations exceeding their respective IDEM regulatory levels at the time.

The ESA also identified a floor drain and sump located near the east end of a building foundation in the northwest portion of the subject property. The sump contained some liquid at the time of the Site inspection, but it was not determined if the sump discharged to the municipal sewer system. No unusual odors were noted in the sump, and no surface staining or etching was observed on the floor around the drain. No other evidence of disposal of petroleum products or hazardous substances to the drain was observed.

Two (2) 4,000-gallon capacity gasoline USTs located on the west-central portion of the subject property, between 5th and 6th Streets, were manifolded together to form one (1) UST (owner designated UST #8). UST #8 was apparently removed from the Site in the 1980s. Two (2) 10,000-gallon gasoline and diesel USTs were removed from an area north of 6th Street and east of Harrison Street in 1994 (designated by the owner as USTs #2 and #3). One (1) 550-gallon gasoline UST and one (1) 10,000-gallon diesel fuel UST (owner designated tanks #4 and #5) were removed from the Site, east of the intersection of Calhoun and 5th Streets, as discussed above, in 2000. The Site received an NFA status letter for the reported release from USTs #4 and #5 in 2005.

*IWM Consulting Group, LLC, 2012 Groundwater Investigation Report, March 4, 2013*

In December 2012, IWM Consulting collected a groundwater sample from well MW-5, and in February 2013, installed two (2) additional groundwater wells (MW-6 and MW-7) on the Site. Vinyl chloride (VC) and elevated metals were detected in the groundwater sample collected from MW-5, and groundwater samples were not collected from wells MW-6 or MW-7.

*IWM Consulting Group, LLC, Phase I Environmental Site Assessment, December 1, 2017*

No additional RECs were identified in association with the Site by IWM Consulting since the 2013 Phase I ESA.

*IWM Consulting Group, LLC, Further Site Investigation, May 1, 2018*

In March 2018, IWM Consulting advanced two (2) soil borings (SB-1 and SB-3), and excavated seven (7) test pits (TPL-8A and TPL-10 through TPL-15) on the Site. A geophysical survey of the Site was also performed.

One (1) historic turntable was identified near the northeast corner of the Site and buried metallic debris encountered in various areas across the Site. Soil samples collected during the investigation contained polynuclear aromatic hydrocarbons (PAHs), arsenic, mercury, lead, cadmium, and/or the PCB Aroclors 1248, 1254, and 1260 in excess of the IDEM regulatory levels at the time. Groundwater samples collected from the temporary wells did not contain analytes at concentrations in excess of the IDEM regulatory levels at the time. The thickness of fill on the Site was measured from soil borings and test pit locations during this investigation and varied from approximately 2 feet to 9 feet.

*IWM Consulting Group, LLC, Soil Fill Pile and Sump Area Sampling and Analysis, June 25, 2018*

In May 2018, one (1) soil boring was advanced in close proximity to a sump observed near the northwest corner of the Site and five (5) individual imported soil piles on the Site containing less than approximately 40 cubic yards each were sampled. Contaminants were not detected the soil samples collected from the fill piles in excess of the IDEM regulatory levels at the time; however, lead was detected in a surface soil sample collected from the sump boring at a concentration exceeding its residential, commercial/industrial, and excavation worker levels at the time.

*IWM Consulting Group, LLC, UST Closure Report, June 27, 2018*

One (1) orphan 20,000-gallon UST suspected to formerly hold heating oil was identified in the northwest portion of the Site and closed by removal. Petroleum compounds were not detected in soil in excess of the IDEM regulatory levels at the time.

*IWM Consulting Group, LLC, Soil Fill Pile Chromium VI Sampling and Analysis, August 10, 2018*

In July 2018, the soil fill piles were sampled again for hexavalent chromium (Cr VI). Cr VI was not detected above the IDEM regulatory levels at the time.

*IWM Consulting Group, LLC, UST Closure Report - Gasoline USTs, October 22, 2018*

In June and July 2018, an additional geophysical investigation of the Site was completed. The geophysical investigation identified several anomalies including buried metallic debris, building footers, and potential historical USTs/UST cavities. Two (2) orphan USTs, 850-gallons and 4,000-gallons and suspected to formerly hold gasoline, were identified in the northwest portion of the Site during the geophysical investigation and closed by removal. Petroleum compounds were detected in excess of the IDEM regulatory levels at the time in soil and groundwater in the vicinity of the former USTs.

*IWM Consulting Group, LLC, Remediation Work Plan Implementation Report, May 29, 2020*

Between November 2019 and January 2020, IWM Consulting oversaw the excavation and off-site disposal of approximately 2,431.24 tons of impacted soil/fill material from the Site and adjacent property to the northeast from 24 targeted excavations where the highest levels of contamination were present. Some of the soils were mixed with a stabilizing compound on-site to pre-treat the soil for leachability, prior to being disposed off-site. Ten (10) of the excavations (B-10, B-11, TP-4, TP-12, TP-13, TP-20, TPL-10, TPL-13, TPL-14, and TPL-15) were on the Site. Some sidewall and bottom confirmation soil samples collected from one (1) foot to 30-inches deep contained lead in excess of 1,000 parts per million (ppm) and/or mercury in excess of its IDEM excavation worker level in eight (8) of the excavations.

*Remediation Work Plan Implementation Report Addendum No. 1 - Sump Area, April 1, 2021*

Between December 2020 and March 2021, IWM Consulting oversaw the excavation and off-site disposal of approximately 56.11 tons of impacted soil/fill material from the Site from beneath a former sump and concrete pad. Prior to being disposed off-site, the soil was mixed with a stabilizing compound to pre-treat the soil for leachability. Seven (7) surrounding surface soil confirmation samples contained lead in excess of 1,000 ppm, exceeding its IDEM excavation worker level following the excavation activities.

*IWM Consulting Group, LLC, Hazardous Substances Site Assessment Report, December 10, 2021*

Between June and July 2021, IWM Consulting advanced 15 soil borings on the southern portion and 102 soil borings on the western portion of the Site to investigate the nature of the fill material and confirm contamination did not impact the native soil. Soil samples were collected from fill material identified as primarily foundry sand/slag and/or reworked soil from the former scrap metal business, possible building demolition debris/fill, and the underlying native soil. The depths of the borings ranged from 4 to 10 feet based on the materials encountered and the depth of the underlying native soil. Soil samples collected during the assessment contained arsenic, lead, n-hexane, and/or PAHs at concentrations exceeding regulatory levels in four (4) of the borings.

*IWM Consulting Group, LLC, Phase I Environmental Site Assessment, November 9, 2022*

No additional RECs were identified in association with the Site by IWM Consulting since the 2013 and 2017 Phase I ESAs.

IWM Consulting Group, LLC, Soil Management Plan, July 6, 2022 (Updated July 28, 2023)

A Soil Management Plan (SMP) was devised based on the cumulative analytical results and lithology of North River. The SMP segregated North River into several areas, with North River South being identified as *Parcels G1, G2, and G3*, and Calhoun Street Historic Fill being identified as *Parcels C, D1, D2, E1, E2, and E4*, based on the extent of impact and anticipated future use. The SMP dictates the handling and disposal requirements in any given area of the Site based on the hazard level. *Parcel C, D1, and D2* soil is identified as Level 4 due to contaminants exceeding residential use regulatory levels, *Parcel G3* soil is identified as Level 3 due to contaminants exceeding commercial use regulatory levels, and *Parcel G1, G2, E1, E2, and E4* soils are identified as Level 2 due to contaminants exceeding commercial use and excavation worker regulatory levels.

**Summary of Site Characterization**

The following summary of results and conclusions is supported by historical and recent Site Investigations:

1. The Site is located in Section 35, Township 31 North, Range 12 East in Allen County as shown on **Figure 1**. The Site consists of approximately 13.07-acres of vacant land and a vacated section of Sixth Street. North Calhoun Street borders the Site to the west of North River South, and to the east of Calhoun Street Historic Fill. Another portion of North River borders the Site to the north and east of each area, respectively, and Headwaters Church is present to the north of Calhoun Street Historic Fill. North Clinton Street borders North River South to the east, with 4th Street comprising its southern boundary. Another portion of North River is located south of Calhoun Street Historic Fill, beyond 4th Street. Harrison Street forms the western boundary of the northern portion of Calhoun Street Historic Fill, and residential properties are present to the west of the southern portion, beyond an alley. Asphalt parking lots are located on the western portion of North River South, and a gravel parking lot is located on the southeast corner of the Site. Asphalt parking lots are also located on the southern portion of Calhoun Street Historic Fill and southeast of the intersection of North Harrison and 6th Streets.
2. The nearest surface water feature to the Site is the St. Marys River, located approximately 200 feet south and down-gradient from the southern portion of the Site. Other surface water features near the Site include Spy Run Creek (approximately ¼-mile east of the Site) and the confluence of the St. Joseph and Maumee Rivers (approximately ½-mile southeast of the Site).
3. The Site is partially (approximately 9.5-acres) located within the federally-designated floodplains of the St. Marys River, with reduced risk of flooding due to a levee.
4. The depth to groundwater at the Site has been gauged periodically over several years and is measured to be between 10 and 18 feet below grade on the southern portion of the Site and between 5 and 20 feet below grade on the western portion of the Site. Isolated impacts of naphthalene, trichloroethylene (TCE), VC, and total/dissolved arsenic have been identified separately in groundwater above, but near, their respective IDEM *Risk-Based Closure Guide* (R2) Groundwater Published Levels (GWPLs). This groundwater is not used as a source of potable water for the Site or surrounding properties. Potable water for the City is obtained mainly from the St. Joseph River approximately ½-mile east of the Site.

5. Generally, the Site is covered with fill varying from approximately 1 to 4 feet thick with limited areas with approximate 9 feet thicknesses. The native soil types encountered beneath the fill during previous Site investigation activities were generally consistent with one another. The northern portion of North River appears to be underlain by glacially derived sediments consisting mainly of sandy, silty, clay with some silty and gravelly sands and the southern portion of North River appears to contain coarser grained sediments at depth, possibly derived from fluvial deposition from the historic path of the St. Marys River.
6. The southeastern portion of the Site (former railroad spur) and locations of previous railroad-related Site features (tracks, buildings, spurs, etc.) exhibited fill material that consisted mainly of foundry slag. Coal, concrete, and treated (creosote) railroad timbers were also prevalent in these locations. The fill on the former salvage and scrap metal recycling yard portion of the Site mainly consisted of re-worked soil with metal scraps, wire, non-metallic automotive parts, with some oil-stained soils. The fill on the northwest portion of the Site, north of 6th Street and west of North Calhoun Street where non-scrap related industrial operations historically occurred, typically contained re-worked soil and construction debris rather than automotive-type materials.
7. Recent and historical Site environmental assessments indicate that the surface fill/soil contamination at the Site consists of metals including arsenic, lead, and mercury, with isolated areas of PCB, VOC, and PAH contamination at concentrations exceeding IDEM R2 Residential Soil Published Levels (RSPLs), Commercial Soil Published Levels (CSPLs), and/or Excavation Worker Soil Published Levels (XSPLs). Due to the non-homogeneous nature of the fill material and the nature of historical operations, the extent of soil contamination in the surface fill material is varied and widespread. Generally, impacted soils do not appear to extend beneath the surface fill into the native soil.

### **Summary of Remedial Alternatives**

1. Alternative 1 – No action; Environmental Restrictive Covenant (ERC).
2. Alternative 2 – Soil capping; ERC.
3. Alternative 3 – Excavation and disposal; ERC.

### **Remedial Action Objectives**

Environmental conditions at the Site and anticipated land use suggest that the following human exposure routes represent potential risks for the indicated media and potentially exposed populations:

1. Direct contact with impacted surface soil, subsurface soil, or groundwater by on-site workers, Site occupants, or future construction workers performing maintenance or excavation; and,
2. Ingestion of groundwater by future users of water wells (potable or industrial use) which might be drilled at the Site or near the Site, within the areas exhibiting VOC or metals impacts above the R2 GWPLs; and,

3. Inhalation of vapors by occupants of future structures built on the Site and potential occupants of nearby structures that are near the Site (within 50-100 feet of the VOC impacts in soil and/or groundwater).

One (1) aspect of the Site is identified as needing corrective action based on the results of previous Site investigations. The IDEM R2 provides numeric remedial action objectives in the form of published levels (PLs) for the relevant exposure routes and land uses. Site media exceeding applicable PLs include, or may include, the following:

1. Surface, and near-surface, soil media to depths of up to two feet below grade that exceed one or more R2 RSPL, CSPL, or XSPL, depending on the Master Developer plan.
2. Subsurface soil media at depths of up to 10 feet below grade that exceed one or more R2 RSPL, CSPL, or XSPL, depending on the Master Developer plan.
3. Groundwater media at depths of approximately 5 to 20 feet below grade that exceed one or more R2 GWPL.
4. Subsurface soil vapor media that exceed one or more R2 Residential or Commercial/Industrial Exterior Soil Gas or Sub-Slab Vapor PLs, or within 50-100 feet of the known VOC impacts in soil and/or groundwater, depending on the Master Developer plan.

Surface soils and surficial fill material require corrective action to achieve contaminant levels below R2 CSPLs and XSPLs, based on the results of previous environmental investigations.

### **Analysis of Remedial Alternatives**

The remedial action alternatives considered were evaluated using the following criteria:

#### (1) Effectiveness

- a. The degree to which the toxicity, mobility, and volume of the contamination is expected to be reduced.
- b. The degree to which a remedial action option, if implemented, will protect public health, safety and welfare and the environment over time.
- c. Taking into account any adverse impacts on public health, safety and welfare and the environment that may be posed during the construction and implementation period until case closure.

#### (2) Implementability

- a. The technical feasibility of constructing and implementing the remedial action option at the Site or facility.
- b. The availability of materials, equipment, technologies and services needed to conduct the remedial action option.
- c. The administrative feasibility of the remedial action option, including activities and time needed to obtain any necessary licenses, permits or approvals; the presence of any federal or state, threatened or endangered species; and the technical feasibility of recycling, treatment, engineering controls, disposal or naturally occurring biodegradation; and the expected time frame needed to achieve the necessary restoration.

(3) Cost

- a. The following types of costs are generally associated with the remedial alternatives:
  - Capital costs, including both direct and indirect costs; Initial costs, including design and testing costs.
  - Annual operation and maintenance costs.

Remedial Alternatives

1. *Alternative 1 – No Action; ERC:* If no action is taken at the Site, the impacted soil will remain on the Site and it 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 Authority. This option is considered the least environmentally protective and the impacts to the environment will continue for years to come. An ERC restricting groundwater use and direct contact with soil will be utilized as an institutional control.
  - a. **Effectiveness** – None: This option does not decrease the toxicity, mobility, or volume of the contamination and does not protect human health, safety, welfare, or the environment.
  - b. **Implementability** – Easy: There are no required actions or technology necessary to implement this option.
  - c. **Cost** – None: This option does not require ongoing operation or maintenance costs. Any deficit incurred would be in the form of loss of potential income from redevelopment.
2. *Alternative 2 – Soil Capping; ERC:* The advantage of soil capping (importing two (2) feet of clean clay 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 (2) feet and future construction or on-site excavation workers at the Site may be exposed to the contaminants left in place when the Site is redeveloped. Since the unstable fill material will remain on-site under this remedial alternative, any future construction activities will be complicated due to geotechnical concerns. Additionally, the elevation of the majority of the Site is already slightly higher than the surrounding properties, further limiting potential redevelopment of the Site if the surface elevation is raised another 2 feet. An ERC restricting groundwater use and requiring adherence to a revised SMP for direct contact with soil will be utilized as an institutional control.
  - a. **Effectiveness** – Medium: This method is effective so long as the top two (2) feet of imported, clean clay soil is not disturbed. There is a risk of exposure once disruption of the imported soil occurs during Site redevelopment.
  - b. **Implementability** – Easy: The Site is currently vacant, so no operations would be interrupted.
  - c. **Cost** – Significant: Costs would include clearing debris from the Site and grading prior to installing a geotextile fabric to serve as a demarcation barrier, sampling and importing up to 2 feet of clean clay soil and compacting, topping the clay soil with an impervious barrier and/or topsoil planted with a maintained grass surface. Long term maintenance and inspections of the Site will also be required to ensure the integrity of the cap remains intact, especially after flooding events.

3. *Alternative 3 – Soil Excavation and Disposal; ERC:* The advantage of the excavation and disposal portion of this option is that it expeditiously addresses the environmental concerns with respect to the hazardous substances adsorbed to the surface and near surface soil and removes the impacted soil from the Site. The excavation alleviates any long-term effects with managing direct contact with the surface and near surface soil.

To dispose of the Site soils at a local soil disposal facility as a non-hazardous solid waste, additional testing will be required to determine if the leachable arsenic, lead, and/or mercury renders the soils characteristically hazardous. Consequently, toxicity characteristic leaching procedure (TCLP) analyses are required to determine the leachability of those specific metals in soils. If the soils are determined to be hazardous based on TCLP analyses, the soils will be conditioned in-situ order to stabilize (change the leachability of) the metals in the soil. The pH of the soil is altered by mixing a calcium silicate-based powder (pH soil amendment) with a pH between 11 and 12 (Blastox<sup>®</sup> 215 or similar product) at a ratio of approximately three (3) to five (5) percent, depending on the TCLP results. Soil samples from the mixed materials will be re-analyzed for TCLP metals and those results will then be used to determine if the soils are still considered characteristically hazardous. If the soil stabilization is successful, the soils can be disposed of as non-hazardous solid waste instead of a hazardous waste.

Specifically, it is anticipated that the soils from 1.0 and up to 9.0 feet bsg impacted with heavy metals, PAHs, PCBs, and/or VOCs, totaling approximately 60,000-tons will be removed from broad (North River South) and targeted (Calhoun Street Historic Fill) areas across the Site. Note, the tonnage was estimated based on analytical data collected from borings advanced across the Site. Since the soil conditions between the borings may vary from what was identified at each boring, additional impacted soil may be encountered during excavation. Therefore, IWM recommends including a contingency allowing for up to approximately 10-20% additional soil to be excavated and disposed. This produces an estimate of 66,000 to 72,000 tons of soil to be excavated across the approximate 13.07-acre Site.

Soil samples collected from specific areas will be submitted for TCLP analysis and mixed with Blastox<sup>®</sup> 215 as necessary to modify soils sufficiently to dispose of them as non-hazardous solid waste. Confirmatory soil samples will be obtained from the base and sidewalls of the excavation to document the soil conditions post-excavation. Once the excavation has been adequately performed to appropriate published levels, the excavation will be backfilled with clean fill and compacted using the excavation equipment. No engineered backfill is being installed at the Site, nor is any compaction testing planned for the backfilled areas.

Since groundwater at the Site has been historically characterized and is limited in extent, groundwater monitoring wells will not be installed and groundwater samples will not be collected. An ERC restricting groundwater use and direct contact with soil in unremediated areas will be utilized as an institutional control.

- a. **Effectiveness** – High: This method eliminates potential future direct contact risks with impacted surface soil.
- b. **Implementability** – Easy to moderate: The Site is currently vacant, so no operations would be interrupted, but a significant number of excavators and tri-axle trucks will be required to complete the work activities.

- c. **Cost** – Moderate to High: Costs would include soil disposal, mixing with Blastox® 215 as necessary, TCLP analyses, imported limestone, and compaction of imported limestone.

### **Remedial Alternatives with Respect to Climate Change Conditions**

An evaluation of several climate change consequences (e.g., rising sea level, increased frequency and intensity of flooding and/or extreme weather events, etc.) indicates that the Site is not likely to be materially affected by such conditions. However, with the Site's proximity to the Saint Marys River and flooding occurring at unprecedented frequency because of climate change, it would be prudent to complete **Alternative 3** (Excavation and Disposal), which eliminates the potential for impacted Site soils to be redistributed by flooding.

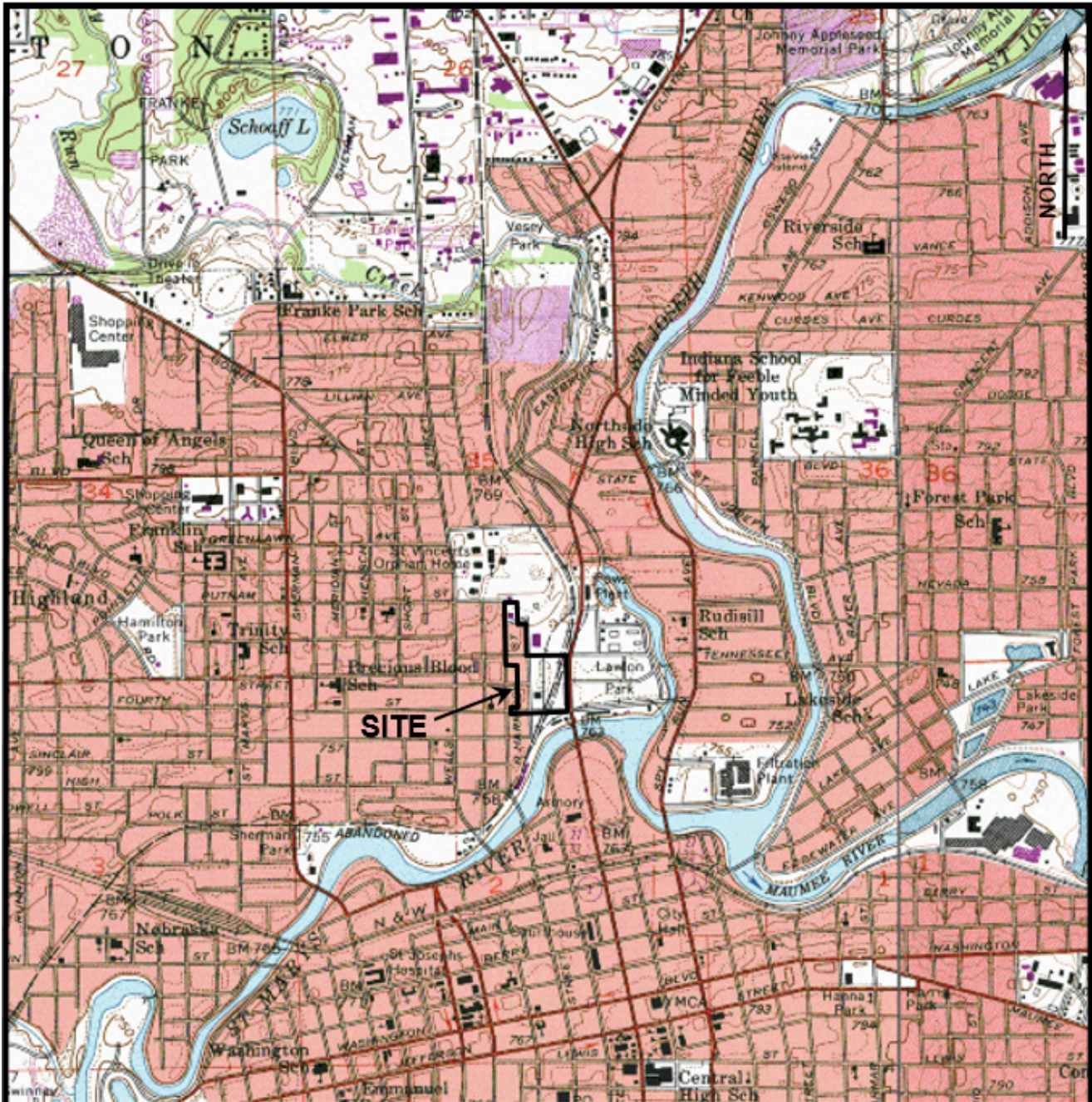
### **Recommendation for Site Remedy**

The most feasible and appropriate cleanup alternative is **Alternative 3** (Excavation and Disposal). This remedial approach immediately remediates and removes areas with the highest contaminant concentrations and expeditiously minimizes potential exposure pathways. The approach quickly promotes redevelopment for commercial, multi-family residential, or recreational use of the varying areas of the Site by cleaning up the Site surface and near-surface soils and it is the most health protective option for future Site occupants and construction workers. Future excavation/construction workers will also be able to work in a safe environment since the excavation work will not extend into and through contaminated soil.

### **Decision Document**

A decision document will be issued at the close of the public comment period with additional details on the selected alternative for Site remedy. The decision document will serve as a notice to proceed with federally funded remediation activities and will be available in the local information repository for public review, along with this Site ABCA and other Site-related documents.

**FIGURE 1**



SCALE: 1 INCH = 2,000 FT; CONTOUR INTERVAL = 10 FT, DOTTED LINES REPRESENT 5 FT CONTOURS

SOURCE: FORT WAYNE WEST, INDIANA, USGS TOPOGRAPHIC QUADRANGLE MAP, 1963, REVISED 1981