HAZARD RANKING SYSTEM (HRS) DOCUMENTATION RECORD COVER SHEET

Name of Site: Federated Metals Corp Whiting

EPA ID No.: IND005444104

Contact Persons

Documentation Record:

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Pathways, Components, or Threats Not Scored

The ground water and air migration pathways, as well as the subsurface intrusion component and nearby population threat of the soil exposure and subsurfaceintrusion pathway were not scored in this Hazard Ranking System (HRS) documentation record because the resident population threat of the soil exposure component of the soil exposure pathway and the surface water migration pathway are sufficient to qualify the Site for the National Priorities List (NPL). The ground water, and air migration pathways, and the nearby population threat of the soil exposure component of the soil exposure and subsurface intrusion pathway, are of concern to the U.S. Environmental Protection Agency (EPA) and may be considered during a future evaluation. At the time of the listing, the Site score is sufficient without, and the listing of the Site would not be changed by the addition of the threats, components, and pathways mentioned above.

Ground Water Migration Pathway: The listing of the Site would not be changed by evaluating this pathway.

Nearby Population Threat and Subsurface Intrusion Component of the Soil Exposure and Subsurface Intrusion Pathway: The resident population threat of the soil exposure component is adequate to qualify the Federated Metals Corp Whiting Site for the NPL; therefore, the nearby population threat was not scored. Lead is the contaminant of concern at the Federated Metals Corp Whiting Site; therefore, the subsurface intrusion component is not a concern.

Air Migration Pathway: The listing of the Site would not be changed by evaluating this pathway.

HAZARD RANKING SYSTEM (HRS) DOCUMENTATION RECORD

Name of Site:	Federated Metals Corp Whiting
EPA Region:	5
Date Prepared:	March 2023
Street Address of Site*:	2230 Indianapolis Blvd.
City, County, State, Zip:	Hammond, Lake, Indiana 46394 (Figure 1, Ref. 4, pg. 13)
General Location in the State:	Northwestern portion of state (Refs. 3; 53)
Topographic Maps:	Whiting, Indiana (Ref. 3) Lake Calumet, Il-In (Ref. 53)
Latitude:	41.672435 North (Figure 1)
Longitude:	-87.496064 West (Figure 1)

The coordinates above for the Federated Metals Corp Whiting site were measured from within the area of observed contamination (AOC B/Source #2) at the Federated Metals/Whiting Metals property, Whiting, Indiana (Figures 1, 2, 3).

* The street address, coordinates, and contaminant locations presented in this HRS Documentation Record identify the general area where the site is located. They represent one or more locations the U.S. EPA considers to be part of the site based on the screening information the U.S. EPA used to evaluate the site for NPL listing. The U.S. EPA lists national priorities among the known "releases or threatened releases" of hazardous substances; thus, the focus is on the release, and not precisely delineated boundaries. A site is defined as where a hazardous substance has been "deposited, stored, disposed or placed, or has otherwise come to belocated." Generally, HRS scoring and the subsequent listing of a release merely represent the initial determination that a certain area may need to be addressed under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). Accordingly, the U.S. EPA contemplates that the preliminary description of facility boundaries at the time of scoring will be refined as more information is developed as to where the contamination has come to be located.

Pathway	**Pathway Score**
Ground Water[1] Migration	Not Scored
Surface Water Migration	60.00
Soil Exposure and Subsurface Intrusion	82.84
Air Migration	Not Scored
HRS SITE SCORE	**51.14**

[1] "Ground water" and "groundwater" are synonymous; the spelling is different due to "ground water" being codified as part of the HRS, while "groundwater" is the modern spelling.

WORKSHEET FOR COMPUTING HRS SITE SCORE

	S Pathway	S^2 Pathway
1. Ground Water Migration Pathway Score (S_{gw})(from Table 3-1, line 13)	NS	NS
2a. Surface Water Overland/Flood Migration Component Score(from Table 4-1, line 30)	60	
2b. Ground Water to Surface Water Migration Component Score(from Table 4-25, line 28)	NS	NS
2c. Surface Water Migration Pathway Score (S_{sw}) Enter the larger of lines 2a and 2b as the pathway score.	60	3,600
3a. Soil Exposure Component Score (S_{se}) (from Table 5-1, line 22)	82.84	6,862.46
3b. Subsurface Intrusion Component Score (S_{ssi}) (from Table 5-11, line 12)	NS	NS
3c. Soil Exposure and Subsurface Intrusion Pathway Score (S_{sessi})(from Table 5-11, line 13)	82.84	6,862.46
4. Air Migration Pathway Score (S_a)(from Table 6-1, line 12)	NS	NS
5. Total of $S_{gw}^2 + S_{sw}^2 + S_{sessi}^2 + S_a^2$		10,462.46
6. HRS Site Score Divide the value on line 5 by 4 and take the square root		**51.14**

Note:
NS = Not scored

Table 4-1

Surface Water Overland/Flood Migration Component Scoresheet

Factor Categories and Factors	Maximum Value	Value Assigned
DRINKING WATER THREAT		
Likelihood of Release		
1. Observed Release	550	550
2. Potential to Release by Overland Flow		
2a. Containment	10	
2b. Runoff	25	
2c. Distance to Surface Water	25	
2d. Potential to Release by Overland Flow (lines 2a x (2b + 2c))	500	
3. Potential to Release by Flood		
3a. Containment (Flood)	10	
3b. Flood Frequency	50	
3c. Potential to Release by Flood (lines 3a x 3b)	500	
4. Potential to Release (lines 2d + 3c, subject to a maximum of 500)	500	
5. Likelihood of Release (higher of lines 1 and 4)	550	550
Waste Characteristics		
6. Toxicity/Persistence	a	NS
7. Hazardous Waste Quantity	a	NS
8. Waste Characteristics	100	NS
TargetsF		
9. Nearest Intake	50	NS
10. Population		
10a. Level I Concentrations	b	NS
10b. Level II Concentrations	b	NS
10c. Potential Contamination	b	NS
10d. Population (lines 10a + 10b + 10c)	b	NS
11. Resources	5	NS
12. Targets (lines 9 + 10d + 11)	b	NS

Factor Categories and Factors	Maximum Value	
DRINKING WATER THREAT (Concluded)		
Drinking Water Threat Score		
13. Drinking Water Threat Score ((lines 5 x 8 x 12)/82,500, subject to a maximum of 100)	100	NS
HUMAN FOOD CHAIN THREAT		
Likelihood of Release		
14. Likelihood of Release (same value as line 5)	550	550
Waste Characteristics		
15. Toxicity/Persistence/Bioaccumulation	a	NS
16. Hazardous Waste Quantity	a	NS
17. Waste Characteristics	1,000	NS
Targets		
18. Food Chain Individual	50	NS
19. Population		
19a. Level I Concentrations	b	NS
19b. Level II Concentrations	b	NS
19c. Potential Human Food Chain Contamination	b	NS
19d. Population (lines 19a + 19b + 19c)	b	NS
20. Targets (lines 18 + 19d)	b	NS
Human Food Chain Threat Score		
21. Human Food Chain Threat Score ((lines 14 x 17 x 20)/82,500, subject to a maximum of 100)	100	NS
Factor Categories and Factors	Maximum Value	Value Assigned
ENVIRONMENTAL THREAT		
Likelihood of Release		
22. Likelihood of Release (same value as line 5)	550	550
Waste Characteristics		
23. Ecosystem Toxicity/Persistence/ Bioaccumulation	a	50,000,000
24. Hazardous Waste Quantity	a	10,000
25. Waste Characteristics	1,000	560
Targets		
26. Sensitive Environments		
26a. Level I Concentrations	b	NS
26b. Level II Concentrations	b	100
26c. Potential Contamination	b	NS

26d. Sensitive Environments (lines 26a + 26b + 26c)	b	100
27. Targets (value from 26d)	b	100
Environmental Threat Score		
28. Environmental Threat Score ((lines 22 x 25 x 27)/82,500, subject to a maximum of 60)	60	60
SURFACE WATER OVERLAND/FLOOD MIGRATION COMPONENT SCORE FOR A WATERSHED		
29. Watershed Score[c] (lines 13 + 21 + 28, subject to a maximum of 100)	100	60
SURFACE WATER OVERLAND/FLOOD MIGRATION COMPONENT SCORE		
30. Component Score (S_{of})[c] (highest score from line 29 for all watersheds evaluated, subject to a maximum of 100)	100	60

Table 5-1

Soil Exposure Component Scoresheet

Factor categories and factors	Maximum Value	Value Assigned	
Resident Population Threat			
Likelihood of Exposure:			
1. Likelihood of Exposure	550		550
Waste Characteristics:			
2. Toxicity	(a)	10000	
3. Hazardous Waste Quantity	(a)	10	
4. Waste Characteristics	100		18
Targets:			
5. Resident Individual	50	50	
6. Resident Population:			
6a. Level I Concentrations	(b)	229.5	
6b. Level II Concentrations	(b)	405.9	
6c. Population (lines 6a + 6b)	(b)	635.4	
7. Workers	15	5	
8. Resources	5	NS	
9. Terrestrial Sensitive Environments	(c)	NS	
10. Targets (lines 5 + 6c + 7 + 8 + 9)	(b)	690.4	
Resident Population Threat Score			
11. Resident Population Threat Score (lines 1 x 4 x 10)	(b)		6,834,960
Nearby Population Threat			
Likelihood of Exposure:			NS
12. Attractiveness/Accessibility	100		
13. Area of Contamination	100		
14. Likelihood of Exposure	500		
Waste Characteristics:			
15. Toxicity	(a)		
16. Hazardous Waste Quantity	(a)		
17. Waste Characteristics	100		
Targets:			
18. Nearby Individual	1		
19. Population Within 1 Mile	(b)		
20. Targets (lines 18 + 19)	(b)		
Nearby Population Threat Score:			
21. Nearby Population Threat (lines 14 x 17 x 20)	(b)		
Soil Exposure Component Score:			
22. Soil Exposure Component Score [d] (S_{se}), (lines [11+21]/82,500,subject to a maximum of 100)	100.00		82.84

Notes:

[a] Maximum value applies to waste characteristics category.

[b] Maximum value not applicable.

[c] No specific maximum value applies to factor. However, pathway score based solely on terrestrial sensitive environments is limited to maximum of 60.

[d] Do not round to nearest integer.

NS Not scored.

Figure 1:
Federated Metals Corp Whiting
Site Location Topographic Map
EPA ID # IND005444104
2230 Indianapolis Blvd, Hammond
Lake County, Indiana

Former Federated Metals Corporation

Site Coordinates:
Latitude: 41.672435
Longitude: -87.496064

Site located in PLSS:
T37N, R9W, S7

Site Coordinates
Former Federated Metals Corp Boundary
Public Land Survey System (PLSS) Section

Site Coordinates:
Latitude: 41.672435
Longitude: -87.496064

Township 37 North
Range 9 West
Section 7

IDEM

This map is intended to serve as an aid in graphic representation only. This information is not warranted for accuracy or other purposes.

Mapped By: Cyndi Jones
Office of Land Quality
Date: December 5, 2022

Sources:
Non-Orthophotography Data
- Obtained from the State of Indiana (SOI) Geographic Information Office (GIO) ArcSDE Library
- Basemap USGS 1:24,000 Topographic maps for Indiana (https://imagery.gis.in.gov /arcgis/services/Imagery/Quad_24K/ ImageServer); USGS, Indiana GIO
- Site Coordinates based on Sample Location FMWS2230-IND-SB07-3672; obtained from Office of Land Quality's SampDB Sampling Database
- For additional detailed source information, see Reference 48 - Figure Reference Sheet

Map Projection: UTM Zone 16 N
Map Datum: NAD83

USGS, Indiana GIO

0 300 600 1,200 Feet
0 100 200 400 Meters

Figure 2:
Federated Metals Corp Whiting
Map Showing Source Areas

EPA ID # IND005444104
2230 Indianapolis Blvd, Hammond
Lake County, Indiana

- Sample Location Within Area of Concern - Lead and/ or Arsenic Exceed 3 Times Background Within AOC
- Remediated Property
- Site Center
- Source 1
- Source 2
- Source 3
- Former Federated Metals Property
- Administrative Boundaries of Indiana 2022

-All units are in mg/Kg.
-Background for Arsenic (Total) is 11 mg/Kg.
-Background for Lead (Total) is 120 mg/Kg.
-Refer to References 54 and 57 for all sample locations and names. Polygons shown on Reference 54 indicate properties that have been inferred to be contaminated.
-Sample Locations delineating the AOCs are labelled.
-Landfill Samples were taken at a depth greater than two feet.

Sources:

Orthophotography Data
- Obtained from the State of Indiana Best Available Orthophotography, various years 2017-2022

Non-Orthophotography Data
- Obtained from the State of Indiana GIO Library
- AOC Polygons created by OLQ Staff
- State of Indiana Geographic Information Office's Spatial Database Engine (ArcSDE) data library.
- GIO.County_Parcel Layer - Property Boundary comprised of former Federated Metals parcels
- Site Coordinates based on Source # 1 Sample Location 886731; obtained from Office of Land Quality's SampDB Sampling Database; See References 75 and 3
- For references to the related laboratory reports for results on this map, see Tables 3, 6, and 10 of the Federated Metals Corp Hazard Ranking System (HRS) Documentation Record
- See Reference 48, Figure Reference Sheet for additional source citations
- See Reference 76 for Sample IDs and Sample Addresses

0 160 320 640 Feet
0 45 90 180 Meters

This map is intended to serve as an aid in graphic representation only. This information is not warranted for accuracy or other purposes.

Mapped By: Cyndi Jones
Office of Land Quality
Indiana Department of Environmental Management
Date: December 19, 2022;
Revised March 8, 2023

Map Projection: UTM Zone 16 N
Map Datum: NAD83

Figure 3:
Federated Metals Corp Whiting

Map Showing Areas of Observed Contamination and Background Samples

EPA ID # IND005444104
2230 Indianapolis Blvd, Hammond
Lake County, Indiana

- **Background Sample Location**
- **Observed Lead Result within AOC**
- **Remediated Property**
- **Area of Observed Contamination (AOC) A**
- **Area of Observed Contamination (AOC) B**
- **City Boundary**
- **Former Federated Metals Property**

-All units are in mg/Kg.
-Background for Arsenic (Total) is 11 mg/Kg.
-Background for Lead (Total) is 120 mg/Kg.
-Refer to References 54 and 57 for all sample locations and names. Polygons shown on Reference 54 indicate properties that have been inferred to be contaminated.
-Refer to Reference 76 for a table identifying the full Sample Location ID numbers and Lab ID number for the Sample IDs.
-Background Sample Locations and Sample Locations delineating the AOCs are labelled.
-Eastlake Metals LLC aka Alex Gross & Eastlake Metals LLC aka Jeff Condon - Sidwell's Portico.

Sources:

Orthophotography Data
- Obtained from the State of Indiana Best Available Orthophotography, various years 2017-2022.

Non-Orthophotography Data
- Obtained from the State of Indiana GIO Library.
- AOC Polygons created by OLQ Staff.
- State of Indiana Geographic Information Office's Spatial Database Engine (ArcSDE) data library.
- GIO.County_Parcel Layer - Property Boundary comprised of former Federated Metals parcels.
- Site Coordinates based on Sample Location FMWS2230-IND-SB07-3672; obtained from Office of Land Quality's SampDB Sampling Database.
- Sample location and concentration references are in Tables 2, 3, 6, and 10 of the Federated Metals Corp HRS Documentation Record.
- See Reference 48, Figure Reference Sheet for additional source citations.

0 250 500 1,000 Feet
0 75 150 300 Meters

This map is intended to serve as an aid in graphic representation only. This information is not warranted for accuracy or other purposes.

Mapped By: Cyndi Jones
Office of Land Quality
Indiana Department of Environmental Management
Date: December 19, 2022
Revised: January 11, 2023
Map Projection: UTM Zone 16 N
Map Datum: NAD83

Figure 4:
Federated Metals Corp Whiting
Potential Off-Site Sources

EPA ID # IND005444104
2230 Indianapolis Blvd, Hammond
Lake County, Indiana

Historical Potential Off-Site Source*

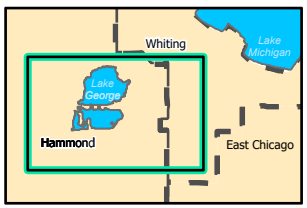
Former Federated Metals Corp Boundary

*These facilities may no longer be present at this location.

This map is intended to serve as an aid in graphic representation only. This information is not warranted for accuracy or other purposes.

Mapped By: C Jones, Office of Land Quality
Indiana Department of Environmental Management
Date: December 6, 2022

Map Projection: UTM Zone 16 N
Map Datum: NAD83



Sources:
Non-Orthophotography Data
- Obtained from the State of Indiana Geographic Information Office Library
-For Additional Detailed Source Information, See Reference 48, Figure Reference Sheet
- Potential Off-Site Source Locations - IDEM's Virtual File Cabinet VFC #s 45135806, 55863162, 47799495, 57840771 and 43404518.

Orthophotography Data
- Obtained from the State of Indiana Best Available Orthophotography, various years 2017-2021 (https://imagery.gis.in.gov/arcgis/services/Imagery/BestAvailable/ImageServer)

0 200 400 800 Feet
0 50 100 200 Meters

Figure 5:
Federated Metals Corp Whiting Surface Water Pathway Map Showing Background Sample Locations and Target Distance Limit

EPA ID # IND 005444104
2230 Indianapolis Blvd, Hammond
Lake County, Indiana

- Background Sediment Sample
- Background Wetland Sample
- 15-Mile Target Distance Limit
- Former Federated Metals Corp. Property Boundary
- Wetland
- Indiana State Line

Wetland Designation - Sample Location
PEM1F - ET1B1 and ET1C5
PEM1C - ET1G7

For additional wetland designations, see Figure 8, Wetland Sediment Sample Location Map Showing Probable Point of Entry, Background Concentrations, and Observed Release Concentrations in the Lake George Area.

Sources:

Non-Orthophotography Data
- Obtained from the State of Indiana Geographic Information Office Library
- For additional detailed source information, see Reference 48, Figure Reference Sheet
- Property Boundary composed of joined parcels which compose the former site
- Target Distance Limit calculated by OLQ Engineering & GIS Services Section.
- Obtained from the IDEM Office of Land Quality Sampling Database (SampDB)
- Sample concentrations exceeding 3x background within the area of concern from Table 14 and 18 the Federated Metals Corp. Hazard Ranking System Document Record.
- Quad250K https://imagery.gis.in.gov/ArcGIS/services/Imagery/Quad250K/ImageServer

Map Projection: UTM Zone 16 N
Map Datum: NAD83

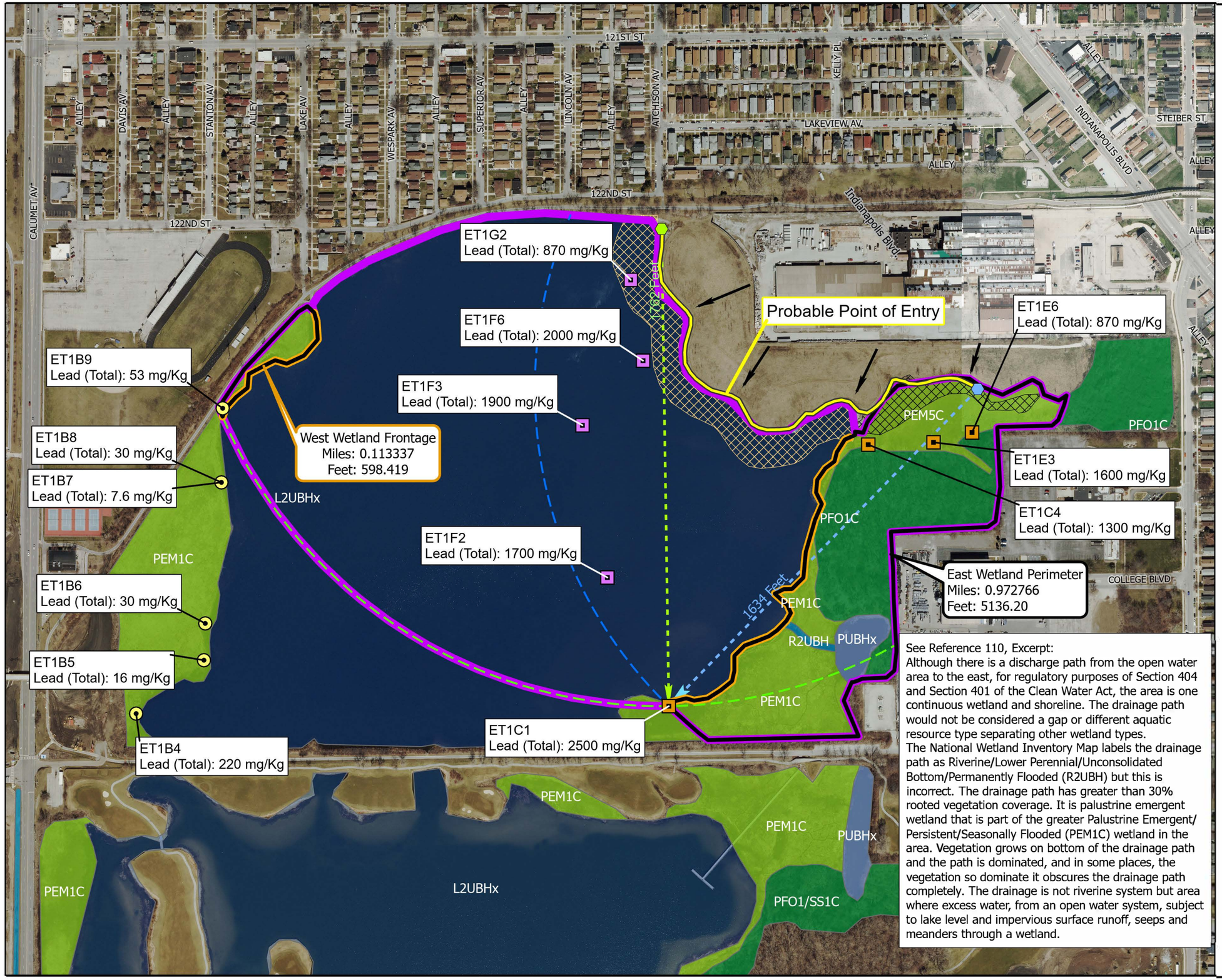
0 0.25 0.5 1 Mile
0 500 1,000 2,000 Meters

This map is intended to serve as an aid in graphic representation only. This information is not warranted for accuracy or other purposes.

Mapped By: Cyndi Jones
Office of Land Quality
Date: December 8, 2022

Figure 6:
Federated Metals Corp Whiting Wetland and Sediment Sample Location Map Showing Probable Point of Entry, Wetland Frontage and Perimeter, Background Concentrations, and Observed Release Concentrations in the Lake George Area

EPA ID # IND005444104
2230 Indianapolis Blvd, Hammond
Lake County, Indiana



See Reference 110, Excerpt:
Although there is a discharge path from the open water area to the east, for regulatory purposes of Section 404 and Section 401 of the Clean Water Act, the area is one continuous wetland and shoreline. The drainage path would not be considered a gap or different aquatic resource type separating other wetland types.
The National Wetland Inventory Map labels the drainage path as Riverine/Lower Perennial/Unconsolidated Bottom/Permanently Flooded (R2UBH) but this is incorrect. The drainage path has greater than 30% rooted vegetation coverage. It is palustrine emergent wetland that is part of the greater Palustrine Emergent/ Persistent/Seasonally Flooded (PEM1C) wetland in the area. Vegetation grows on bottom of the drainage path and the path is dominated, and in some places, the vegetation so dominate it obscures the drainage path completely. The drainage is not riverine system but area where excess water, from an open water system, subject to lake level and impervious surface runoff, seeps and meanders through a wetland.

- Background Wetland Sample
- Wetland Sample that meets Observed Release Criteria
- Sediment Sample that meets Observed Release Criteria
- Probable Point of Entry (PPE) End Point 1
- Probable Point of Entry (PPE) End Point 2
- Radius of Arc 1
- Radius of Arc 2
- Arc 1
- Arc 2
- OverlandFlow
- Probable Point of Entry
- Wetland Frontage
- Zone of Level II Contamination
- Wetland Perimeter
- Approximate Dredged Lake Area
- Approximate Sedge Meadow Dredged Area
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

Sources:
Non-Orthophotography Data
- Obtained from the State of Indiana Geographic Information Office Library
- Indiana Wetland obtained from https://www.fws.gov/wetlandsmapservice/rest/services/Wetlands/MapServer
- Property Boundary composed of joined parcels which compose the former site.
-Wetland Frontage and Perimeter include R2UBH and PUBHx per Reference 110, Page 4 Excerpt and Reference 127.
- Refer to Reference 87 for the Wetland Frontage and Perimeter Measurements.
-Dredged Areas - Reference 27 Page 38
-Concentrations obtained from the IDEM Office of Land Quality Sampling Database (SampDB)
- Laboratory Reports for Sample Concentrations are available through the references in Tables 16, 18, and 20 of the HRS Documentation Record.
-For additional detailed source information, see Reference 48, Figure Reference Sheet
Orthophotography Data
- Obtained from the State of Indiana Best Available Orthophotography, various years 2017-2021
Map Projection: UTM Zone 16 N
Map Datum: NAD83

This map is intended to serve as an aid in graphic representation only. This information is not warranted for accuracy or other purposes.

Mapped By: Cyndi Jones
Office of Land Quality
Date: February 14, 2023; Revised March 7, 2023

0 100 200 400 Feet
0 30 60 120 Meters

REFERENCES

1. U.S. Environmental Protection Agency (EPA). Hazard Ranking System, Title 40 Code of Federal Regulations (CFR) Part 300, Appendix A (55 Federal Register [FR] 51583, Dec. 14, 1990, as amended at 82 FR 2779, Jan. 9, 2017; 83 FR 38037, Aug. 3, 2018), as published in CFR on July 1, 2019, with two attachments. Attachment A: FR Vol. 55, No. 241. December 14, 1990. Hazard Ranking System Preamble. Attachment B: FR Vol. 82, No. 5, January 9, 2017. Addition of a Subsurface Intrusion Component to the Hazard Ranking System Preamble. https://semspub.epa.gov/src/document/HQ/100002489. 197 pages.

2. U.S. EPA. Superfund Chemical Data Matrix (SCDM) Query. Available on-line at: https://www.epa.gov/superfund/superfund-chemical-data-matrix-scdm-query, accessed November 15, 2022. 25 pages.

3. U.S. Geological Survey, Whiting, Indiana Quadrangle Indiana-Lake Co., 7.5 Minute Series (Topographic) Map, Revised 1998. 1 page.

4. Indiana Department of Environmental Management, Site Investigation Report, Federated Metals with Memorandum of Decision, EPA ID# IND005444104, May 5, 2021. 28,299 pages.

5. Indiana Department of Environmental Management, Expanded Site Investigation Report, Federated Metals with Memorandum of Decision, EPA ID# IND005444104, March 29, 2022. 4,562 pages.

6. MicroVision Laboratories, Inc., Tetra Tech, Inc., Federated Metals Project #10739, June 5, 2017. 117 pages.

7. Indiana Department of Environmental Management, Email Correspondence with attachment from Cyndi Jones (IDEM) to Mark Jaworski (IDEM) regarding Lake County GIS Portal, Lake County Surveyor GIS Website, Desktop, Attachment: Whiting Metals Parcel, accessed on December 8, 2022. 2 pages. https://portico.mygisonline.com/html5/?viewer=lakeinsurveyor.

8. Indiana Department of Environmental Management, Email Correspondence with attachment from Barry Steward (IDEM GIS Services) to Mark Jaworski (IDEM) regarding Lake County GIS Portal, Lake County Surveyor GIS Website, Desktop, Attachment: Monaghan, LLC (occupied by Village Discount) Parcel, https://portico.mygisonline.com/html5/?viewer=lakeinsurveyor, January, 31, 2023. 2 pages.

9. Indiana Department of Environmental Management, Email Correspondence with attachment from Barry Steward (IDEM GIS Services) to Mark Jaworski (IDEM) regarding Lake County GIS Portal, Lake County Surveyor GIS Website, Desktop, Attachment: ASARCO (CAMU) Parcel, https://portico.mygisonline.com/html5/?viewer=lakeinsurveyor, January 31, 2023. 2 pages.

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11. CT Laboratories, Federated Metals, Whiting, In., Project# 103X90260001S051610003, SDGs 135353 and 135854, May 4, 2018. 1,341 pages.

12. CT Laboratories, Federated Metals, Whiting, IN, Project# 103X90260001S051610003, SDGs 136168, 136335, and 136370, May 29, 2018. 1,181 pages.

13. CT Laboratories, Federated Metals, Whiting, In., Project# 103X90260001S051610003, SDGs 136856, 137066, and 137408, June 22, 2018. 2,975 pages.

14. CT Laboratories, Federated Metals, Whiting, In., Project# 103X90260001S051610003, SDGs 137901, 137949 and138147, August 8, 2018. 1,817 pages.

15. CT Laboratories, Federated Metals, Whiting, In., Project# 103X90260001S051610003, SDGs 138501 and 138898, August 28, 2018. 1,080 pages.

16. CT Laboratories, Federated Metals, Whiting, In., Project# 103X90260001S051610003, SDGs 139099, 139742, and 139744, September 24, 2018. 1,507 pages.

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20. ALS Environmental and US EPA Region V Level 3 Data Validation, SDG MET0J9, May 10, 2018 (IDEM Sampling April 2018). 322 pages.

21. MicroVision Laboratories, Inc., Tetra Tech, Inc, Federated Metals Project #10739, SDG 124357 and 125224, Report Analysis, June 5, 2017. 2,106 pages.

22. MicroVision Laboratories, Inc., Tetra Tech, Inc, Federated Metals Project #10739, SDG 126148, Report Analysis, June 5, 2017, Project 10739. 1,212 pages.

23. Indiana Department of Environmental Management, Office Memorandum from Philip N. Ward, LPG (IDEM Geological Services Section) to Mark Jaworski (IDEM), Background Sample for Former Federated Metals and Whiting Metals, January 25, 2022. 2 pages.

24. U.S. EPA, Using Qualified Data to Document an Observed Release and Observed Contamination, Directive 9285.7-89FS, https://semspub.epa.gov/src/document/HQ/100003071, November 2022. 20 pages.

25. MH Environmental, Inc., Phase I Site Assessment, Current Whiting Metals Facility, July 26, 2010. 544 pages.

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27. ENTACT, Corrective Measures Completion Report, Former Federated Metals Site, May 26, 2006. 102 pages.

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SITE DESCRIPTION

The Federated Metals Corp Whiting site is composed of lead and arsenic-contaminated soil on residential (single- and multi-family) and non-residential (businesses, churches, parks, play areas, and vacant lots) properties where emissions from the former Federated Metals and Whiting Metals facilities contaminated the impacted properties in addition to a covered waste pile containing lead and arsenic that is located the facility property (Figures 2 and 3 of this HRS documentation record; Ref. 76, pg. 2). The contaminated soil affects approximately 400-plus neighboring residents and 29 workers at the for former facility property (section 5.1.1.3 of this HRS documentation record). The sediments within Lake George, which lies adjacent to the former Federated Metals facility, have also been contaminated with lead released from the waste pile and contaminated soil sources that are located at the facility property (see Figure 6 and section 4.1.2.1.1 of this HRS documentation record). A habitat known to be used by the state endangered Trumpeter swan and HRS-eligible wetlands are affected by the contaminated sediment within Lake George (Figure 6 and sections 4.1.2.1.1 and 4.1.4.3 of this HRS documentation record). Therefore, the Resident Population Threat in the Soil Exposure Component of the Soil Exposure and Subsurface Intrusion Pathway and the Environmental Threat in the Surface Water Migration Pathway are the two (2) pathway routes that are being scored as part of this HRS documentation record.

The U.S. EPA identification number for the Federated Metals Corp Whiting (Federated) site in the Superfund Enterprise Management System (SEMS) is IND005444104 (Refs. 114, pg. 1). The coordinates for the Site are 41.672435 Latitude and -87.496064 Longitude (Figure 1 of this documentation record; Ref. 3). The facility is located in Hammond, Indiana, with an address of 2230 Indianapolis Boulevard in Whiting, Indiana (Ref. 25, pg. 13; 27, pg. 6; 28, pg. 3; 39, pg. 2; 115, pg. 1). Note that this Site is located in Hammond, Indiana, but has a Whiting, Indiana address (Ref. 98, pgs. 1, 2). The facility can be found in Section 7 of Township 37 North, Range 9 West (Figure 3 of this HRS documentation record). The Site can be found on the U.S. Geological Survey (USGS), Whiting Quadrangle, Indiana (Ref. 3).

The former Federated facility covers approximately 36 acres in Whiting and Hammond, Indiana. From 1937 until 1983, the Federated facility operated as a smelting, refining, recovery, and recycling facility for non-ferrous metals including copper, zinc and lead (Ref. 39, pg. 2; 35, pg. 5; 33, pg. 5). The property is located in a residential and commercial area. The parcel is bounded to the north by the Lake George Trail, vacant land and residences; to the east by a commercial building and New York Avenue; to the south by a Resource Conservation and Recovery Act (RCRA) Corrective Action Management Unit (CAMU) and Calumet College of St. Joseph; to the west by vacant land; and to the southwest by Lake George. Lake Michigan is located approximately 0.7 miles northeast of the parcel (Ref. 43, pg. 1; 3, pg. 1; Figure 1 of this HRS documentation record). Note the above-mentioned CAMU is a landfill that contains waste materials that were removed from Federated Metals Solid Waste Management Units (SWMU) #2, #3, #4, #5, #7, and # 9 (Ref. 27, pg. 7; 71, pg. 3). This CAMU is Source #1 in this HRS documentation record.

The lead-contaminated soil is present at Level II concentrations on residential and non-residential properties located along Birch Avenue, Center Street, Central Avenue, Clark Street, Davidson Place, Euclid Avenue, Fischrupp Avenue, Fred Street, Indianapolis Boulevard, John Street, Lakeview Avenue, Laporte Avenue, Lincoln Avenue, New York Avenue, Ohio Avenue, Oliver Street, Schrage Avenue, Sheridan Avenue, Steiber Street,

Wespark Avenue, White Oak Avenue, and 120th and 121st Streets in Hammond and Whiting, Indiana, Lake County (Ref. 54, pgs. 2-35; 76, pg. 2; 78, pgs. 2-30; and Figures 2 and 3 and Table 10 of this HRS documentation record). Within this area are over 700 properties that have yet to be sampled. In addition, arsenic-contaminated soil is present at Level I on some of the residential properties where Level II concentrations of lead is also present (section 5.1.1.3.2.1 and Table 27 of this HRS documentation record). Elevated levels of lead and arsenic are also present in the soils of the former Federated Metals/Whiting Metals facility (Ref. 57, pgs. 1-9; 76, pg. 2; Figure 3, Figure 2, and Table 6 of this HRS documentation record). The former Federated Metals/Whiting Metals property where elevated levels of lead and arsenic are still present on the surface comprises the area of Source #2 and is the Area of Observed Contamination B (AOC B) (Figures 2 and 3 of this documentation record; Ref. 57, pgs. 1-9; 76, pg. 2). Aerial deposition from this area and from the smelter operations when the facilities were active, is the activity that contributed to the contamination in the residential area. The Level I and Level II residential and non-residential properties north of the former facility property comprise Source #3 and AOC A (Figures 2 and 3 of this HRS documentation record; Ref. 76, pg. 2).

The primary mode of deposition of the contamination in residential yards is believed to be air deposition of lead particles via a smelting process. It is believed that over time, lead particles and other heavy metal particles associated with the smelters' operations became airborne and settled onto area properties (Ref. 6, pg. 4; 52, pg. 1). As stated in the **"**Previous Investigations Conducted by the U.S. EPA and IDEM**"** Section below, Whiting Metals had exceeded their lead particulate levels and received a notice of violation in September 2018 (Ref. 30, pgs. 3, 7). Pollutants emitted in fugitive dust generated by traffic flow is also believed to be a possible mode for spreading lead and arsenic contamination (Ref. 4, pgs. 24, 25, 22, 468). Historically, the mode of deposition for the contamination for contamination in Lake George was likely through dumping of facility waste (Ref. 37, p. 12). Encroachment of Source #1 in the recent past and the current capacity for overland migration from Sources #1 and #2 reflect the current ability for releasing to the surface water migration pathway (Tables 4 and 7 of this HRS documentation record).

Analysis of residential soil particles reveal that while the particles contained a mixture of metals consistent with slag, they also contained much higher concentrations of carbon, oxygen aluminum and/or silicon than would be expected in a slag produced from a metal foundry (Ref. 6, pg. 4). In general, some of the samples appeared more likely to have been impacted by foundry metals than others (Ref. 6, pg. 4).

For HRS scoring purposes, the scoring of the soil exposure component focuses on arsenic- and lead-contaminated soil significantly above background levels on properties located in Hammond, Indiana, and properties located in Whiting, Indiana, where a removal action by the U.S. EPA has not occurred (Tables 10, 27, 28, and 29 of this HRS documentation record). Residential targets associated with 39 Hammond properties are evaluated in the scoring: 38 at Level II lead concentrations and 1 at Level I arsenic concentration. Residential targets associated with 129 Whiting properties are evaluate in the scoring: 121 at Level II lead concentrations and 8 at Level I arsenic concentrations (Tables 10, 27, 28, and 29 of this HRS documentation record). Further, the scoring also focuses on 29 people who currently work on the former Federated Metals facility property (section 5.1.1.2 of this HRS documentation record).

Properties within AOC A where U.S. EPA removal actions have occurred at Tier 1 properties (defined as residential properties where children are present and with lead in soils at or greater than 1,200 parts per million [ppm]) are not being scored, nor are properties that are currently not occupied or that are non-residential. Additionally, the city of Hammond remediated 12 residential properties (Ref. 62, pg. 1). The remediation of these properties has not been verified by IDEM. These residences are not included in the assigned resident population target factor value.

Contamination on some residential properties at the Site is being inferred in the absence of sampling results due to the suspected mode of windblown air deposition of the contamination. Most of these areas where residential properties have inferred contamination lie between residential yards of contaminated properties and have been grouped to form polygons (Ref. 54, pgs. 1-35; Figure 3 of this HRS documentation record).

As mentioned above, the sediments of Lake George and some adjacent wetlands have also been impacted with lead. Lead levels in the Lake George sediments were found to be as high as 2,000 mg/kg (Ref. 5, pg. 49; Table 15 and 16 of this documentation record). Lead in the wetland sediments adjacent to Lake George were found to be as high as 2,500 mg/kg (Ref. 5, pg. 49; Table 19 and 20 of this HRS documentation record).

FACILITY HISTORY AND CORRECTIVE ACTIONS

The property was originally developed sometime prior to 1930 as a Federated Metals Corporation plant. In 1938 the facility was expanded as the Federated Metals Division of the American Smelting and Refining Company (ASARCO) (Ref. 37, pg. 12).

Federated Metals conducted smelting (extractive metallurgy) and refining (purification) operations on approximately 36 acres of land (Ref. 37, pg. 12). According to the Lake County GIS Surveyor, the original 36-acre facility property is currently owned by three (3) entities: Whiting Metals to the east (Ref. 7, pgs. 1, 2), Monaghan, LLC (Discount Village Warehouse) to the west (Ref. 8, pgs. 1, 2), and the ASARCO trust to the far west and south sectors (Ref. 9, pg. 1, 2; Figure 6).

Operations at the former Federated Metals facility included storage of raw materials, offices, lead dross (impurities that floated on refined lead) reclamation, foundry operations, white metal (alloying), a large baghouse (dust collector), oil storage, and a charcoal briquetting operation. The charcoal was used as a reducing agent for the smelting of certain ores. During smelting, a flux chemical cleaning agent was used to remove impurities that lead to the formation of a molten slag. The slag associated with the smelting of lead is high in iron and silica and once hardened can have a glasslike appearance. Federated Metals was disposing of various wastes generated during operations, such as the slag, by discharging to the land and/or nearby waterways, in particular Lake George. Arsenic is a common by product of the smelting and refining of lead ores such as galena. In addition, some of the dross processed at the former Federated Metals facility was known to contain high concentrations of arsenic, which in 1949 lead to the accidental arsenic poisoning and death of four Federated Metals employees (Ref. 37, pgs. 12, 13, 16; 84, pgs. 2, 3, 4). Metals including lead and arsenic are the primary hazardous materials associated with this site (Table 3, 6, 10 of this HRS documentation record).

As a result of the operations and disposal activities (including emissions from the lead solder Alloying Process which are vented to an American Bag Filter Dust Collector System) (Ref. 30, pg. 8) and from dust from vehicular traffic along access road (Ref. 4, pgs. 24, 25, 28,240 – 28,245), lead and arsenic were found in source samples and observed contamination samples. Lead is a common air contaminant near lead smelters (Ref. 52, pg. 1). As discussed in PREVIOUS INVESTIGATIONS CONDUCTED BY THE U.S. EPA AND IDEM section of this HRS documentation record, IDEM issued a Notice of Violation (NOV) to Whiting Metals (a company that conducted operations after Federated Metals) on November 8, 2018 (Ref. 30, pg. 3). An ambient air monitoring station is located approximately 100 feet north of the former Federated Metals/Whiting Metals facility (Ref. 109, pg. 1). The facility was believed to have emitted lead from the Site in a manner that caused ambient air quality to exceed 0.15 microgram per cubic meter (mg/m^3) of air averaged from August 3, 2018, through November 4, 2018, in violation of IC 13-30-2-1 and 326 IAC 1-3-4 (Ref. 30, pg. 3). Also, on November 8, 2018, the U.S. EPA issued a NOV under Section 113(a)(l) of the Clean Air Act, 42 U.S.C. § 7413(a)(l) for violating the Indiana State Implementation Plan (SIP) (Ref. 30, pg. 7, 10). Since lead emissions are associated with lead smelter and were documented, as noted above, air deposition of lead particles and other heavy metal particles associated with the smelters' operations likely occurred overtime and settled onto area properties.

Federated Metals conducted operations until approximately 1983. In August of 1985 the portions of the facility that contained manufacturing operations were sold to HBR Partners (HBR). These areas included all existing structures but excluded major areas located south and west of the manufacturing portions. HBR subsidiaries conducted various metals related operations on the purchased portions of the Site. These subsidiaries included Saxon Metals (smelting/refining), Accurate Metals De-tinning (metal recycling), and American Solder Corporation. In addition, HBR rented a section near the southwest corner of the facility to Globe Building Materials that manufactured asphalt/felt roofing materials (Ref. 37, pg. 12).

The United States District Court for the Northern District of Indiana filed a Consent Decree on November 17, 1992. The objectives of the Consent Decree were to conduct corrective action at the facility, including the development and implementation of corrective measures necessary to remediate the release or threat of release of hazardous constituents from the facility into the environment. To comply with the requirements of the Consent Decree, the corrective action documents, including the RCRA Facility Investigation (RFI) dated January 1998, the Corrective Measures Study (CMS) Workplan dated July 1998, and the CMS Report dated May 2000, were submitted to the U.S. EPA for review and approval. The U.S. EPA then issued its Statement of Basis on October 17, 2000, proposing a remedy for the Site and providing the public opportunity to comment. The U.S. EPA issued its Final Decision and Response to Comments (FDRTC) on February 6, 2001 (Ref. 27, pg. 6).

In July 2001, the Final Corrective Measures Implementation (CMI) Plan was submitted to the U.S. EPA. The Final CMI Design Report was developed based on this plan and submitted to the U.S. EPA in November 2002. The remedial work described in the Final CMI Design Report was implemented by ENTACT in November 2003 and completed in December 2005. The remedial work included removal of waste materials placed in SWMUs #7 and #9, backfilling of SWMU areas, dredging back to the original shoreline all landfill slag/waste materials that had encroached in Lake George, etc. Refer to the CMI which discusses the remedial activities completed by ENTACT during that time period (Ref. 27, pgs. 7, 9).

While Federated Metals was in the process of implementing the U.S. EPA-selected remedy for the Site in 2005, Federated Metals' parent company, ASARCO, filed for bankruptcy. In spite of the bankruptcy process, the Federated Metals remedial contractor was able to complete the construction of an approximate 10-acre cap over the landfill in December 2005 (Ref. 33, pg. 5). According to U.S. EPA documents, a phytocover consisting of appropriate soil cover, trees and grasses was constructed over the CAMU (Refs. 27, pg. 7; 71, pg. 3). ASARCO had been responsible for the facility/property during its operation as a smelter and following the cessation of operations until December 9, 2009. On December 9, 2009, the United States Bankruptcy Court for the Southern District of Texas entered an order associated with ASARCO's bankruptcy, Case No. 05-21207, that approved a Settlement Agreement establishing a Trust for certain ASARCO-owned facilities, including the Site, and conveyed the Site to the Trust (Ref. 33, pg. 5).

On July 28, 2005, Saxon Metal, Inc. submitted applications to IDEM's Office of Air Quality (OAQ) requesting to renew its operating air permit. Saxon Metal, Inc. was issued a Minor Source Operating Permit (MSOP) on November 8, 2000. On February 20, 2007, Saxon Metal, Inc. was taken over by Northern Indiana Metals, LLC (Northern)and became Northern Indiana Metals, LLC dba Saxon Metals, Inc. (Ref. 31, pg. 92).

In February of 2007 Northern took over the operation formerly owned by HBR on approximately 9.02 acres of the facility that included the majority of the manufacturing buildings but excluded western and southern sections including the former bag house building, the building formerly used by Globe Building Materials, oil storage areas, the charcoal briquetting operations, and areas now containing the CAMU (Source #1). Northern conducted metals re-melting/recycling operations at the Site until October of 2008. In April of 2009 a majority of the former Northern assets were purchased at auction, and in July of 2009 Whiting Metals, LLC (current owner) began operations (Ref. 37, pgs. 12, 13).

Northern Indiana Metals, LLC dba Saxon Metals, Inc. was issued a MSOP Renewal (No. 089-21474-00262) on August 10, 2007, for a stationary secondary nonferrous metal plant located at 2230 Indianapolis Boulevard, Hammond, Indiana 46394. On June 10, 2009, and June 15, 2009, the OAQ received an application and additional information from the source requesting that the permit be updated to indicate a change in company name to Whiting Metals, LLC, and to remove local agency requirements (Ref. 31, pg. 152).

On June 19, 2009, the IDEM OAQ received another application from Whiting Metals, LLC, requesting that a registration 089-16715-00445, issued on January 24, 2003, for metal detinning process, be updated to indicate a change of the company name from Northern Indiana Metals dba Accurate Metals Detinning to Whiting Metals, LLC, and to remove five (5) units of mixers and burners from the source (Ref. 31, pg. 152).

On December 17, 2010, Whiting Metals, LLC applied to enter into IDEM's Voluntary Remediation Program (VRP) (Ref. 44, pg. 5). The property is an approximate 9.02-acre portion of 36 acres formerly operated by the Federated Metals Division (Federated) of the American Smelting and Refining Company (ASARCO) (Ref. 26, pg. 13). On July 30, 2011, MH Environmental, Inc. on behalf of Whiting Metals, LLC, submitted a Site Investigation Report to the VRP as required (Ref. 26, pg. 1). On December 6, 2013, MH Environmental, Inc. submitted a Remediation Completion report for the Whiting Metals, LLC facility stating that site remediation as proposed in the Site Investigation report has been completed (Ref. 37, pg. 1). According to the Remediation Completion Report, lead in soils ranged from 7.1 ppm to 140,000

ppm and arsenic ranged from 1.7 ppm to 5,600 ppm (Ref. 37, pg. 47). On March 27, 2014, an Environmental Restrictive Covenant was recorded in the Lake County Recorder's Miscellaneous book (Ref. 28, pg. 1). On July 11, 2014, Whiting Metals, LLC received a Certificate of Completion (COC) from the VRP (Ref. 36, pg. 6). The COC stated that the remediation cleanup goals were achieved for IDEM Risk-Integrated System of Closure (RISC) Industrial Default Closure Levels and Remediation Closure Guide Industrial Screening Criteria. The COC pertains only to surface soils (Ref. 36, pg. 6). On October 10, 2014, IDEM's VRP issued a Covenant-Not-to-Sue letter (Ref. 34, pg. 1). On February 16, 2021, the IDEM OAQ received a letter from the source requesting that the MSOP be revoked, since the source has ceased operations (Ref. 29, p. 1).

Although remedial activities were conducted under EPA RCRA Corrective Action and IDEM Voluntary Remediation programs, elevated levels of lead and arsenic are still present in residential soils and within Lake George (Tables 6, 10, 16, 20 of this HRS documentation record). Currently, the western plant building of the former Federated Metals property is owned by Monaghan, LLC and is occupied by Discount Village. The eastern plant building, that was occupied by Whiting Metals is now owned and operated by Eastlake Metals, LLC, aka Alex Gross & Eastlake metals, LLC. Aka Jeff Condon (Ref. 59, pg. 1; 86, pg. 1).

PREVIOUS INVESTIGATIONS CONDUCTED BY THE U.S. EPA AND IDEM

On April 6, 1978, an inspection was made by the State Board of Health at Federated Metals as a result of a complaint. The inspector for the State Board of Health, had been contacted by the Hammond Air Pollution Control Department who told him of a dump on the Federated Metals property and an incident which had occurred in which a boy playing on the dump got some waste material in his shoe and suffered second- and third-degree burns (Ref. 88, pg.1). According to the inspection, the area appeared to have been created over a long period of time by dumping incinerator ash and coal klinkers into Lake George. There were several piles of different sludges on-site and there were also several boys riding their bicycles around on the piles of waste material. Mr. Palin stated that he intended to contact Federated Metals and initiate procedures to get the site under some type of control (Ref. 88, pg. 1).

In November/December 2016, the U.S. EPA Region 5 Superfund Removal Program implemented a broad sampling approach at publicly owned rights-of-way and unoccupied residential properties in order to determine the initial scope of the removal investigation. This initial investigation identified lead contamination to the north and northeast of the former Federated Metals facility. In March 2017, additional publicly owned properties were sampled (Ref. 39, pg. 34). Based on the November/December 2016 and March 2017 sampling results, the U.S. EPA conducted sampling at an additional number of occupied residential properties in 2017. Of the 30 occupied residential properties sampled in 2017, 25 of the properties had surficial concentrations that exceeded the U.S. EPA Removal Management Level (RML) of 400 ppm for lead. Of these properties, nine (9) had surficial concentrations above 1,200 ppm (parts per million) for lead. Five (5) of the properties that had surficial lead above 1,200 ppm had sensitive populations (children up to 7 years old or pregnant women) residing there at the time. The highest lead concentration found at the surface of a residential property was 2,760 ppm (Ref. 39, pg. 34).

According to a September 2018 U.S. EPA Action Memorandum, occupied residential properties were sampled by the U.S. EPA in October and November 2017 and March through July 2018. Of the 201 occupied residential properties, 125 sampled properties had surficial concentrations that exceeded the U.S. EPA RML of 400 ppm for lead but below the 1,200 ppm level with no sensitive populations (children up to 7 years old or pregnant women) residing there at the time. These properties are identified as Tier 3 properties in accordance with the "Superfund Lead-Contaminated Residential Sites Handbook" (Lead Handbook). Of the 201 properties, 60 have either sensitive populations and soil lead concentrations in surface soils between 400 ppm and 1,200 ppm, or no sensitive populations and surface soil lead concentrations above 1,200 ppm, but not both. These properties are identified as Tier 2 properties in accordance with the Lead Handbook. Of the 201 properties, 22 have both sensitive populations and surficial lead concentrations above 1,200 ppm and are identified as Tier I properties in accordance with the Lead Handbook. The highest lead concentration found at the surface of one of the Tier 1 residential properties was 3,540 ppm (Ref. 39, pg. 4). The highest surficial concentration of lead observed during the occupied residential sample through July 2018 was 3,540 ppm (Ref. 39, pg. 6).

An integrated assessment with IDEM was conducted in April 2018 to further investigate the scope of contamination at the Site (Ref. 4, pg. 16; 39, pg. 34). On April 2, 2018, IDEM staff met with U.S. EPA Superfund Removal Program staff. U.S. EPA staff obtained signed access agreements allowing U.S. EPA staff to enter properties prior to sampling. The U.S. EPA also asked the property owners if they would grant access to IDEM to collect samples from their property; as a result, all property owners granted access to IDEM staff as well. The U.S. EPA collected several samples from the front and backyard of each selected residential property. IDEM staff then screened the top six (6) inches of soil for lead at each sample location utilizing an X-ray fluorescence (XRF) instrument. IDEM staff also split soil material from the one (1) soil sample collected by the U.S. EPA which had the highest lead concentration as determined by the XRF screening. All samples that were collected from the residential yards were obtained from the top six (6) inches (Ref. 4, pgs. 16, 17). The sampling was conducted utilizing IDEM's Site Investigation Program Quality Assurance Project Plan (QAPP) (Ref. 41).

In addition to the residential soil samples that were split with the U.S. EPA, IDEM staff also collected five (5) soil samples from municipal right-of-way areas located just north of the former Federated Metals facility. These samples were collected from the top six (6) inches and were not split with U.S. EPA staff. In all, IDEM staff collected twenty-seven (27) soil samples for the integrated assessment (Ref. 4, pg. 17). According to the analytical results, elevated levels of metals, specifically lead and some arsenic, were detected in some soil samples. Lead concentrations ranged from 77.6 ppm to as high as 2,960 ppm. Arsenic concentrations were found to range from 6.1 ppm to as high as 206 ppm (Ref. 4, pg. 22).

IDEM issued a Notice of Violation (NOV) to Whiting Metals on November 8, 2018 (Ref. 30, pg. 3). The facility was believed to have emitted lead from the Site in a manner that caused ambient air quality to exceed 0.15 microgram per cubic meter (mg/m^3) of air averaged from August 3, 2018, through November 4, 2018, in violation of IC 13-30-2-1 and 326 IAC 1-3-4 (Ref. 30, pg. 3). Also, On November 8, 2018, the U.S. EPA issued a NOV under Section 113(a)(l) of the Clean Air Act, 42 U.S.C. § 7413(a)(l) for violating the Indiana State Implementation Plan (SIP) (Ref. 30, pg. 7). The air monitoring station is approximately 100 feet from the former Federated Metals/Whiting Metals facility (Ref. 109, pg. 1). IDEM works annually with U.S. EPA in reviewing the latest emissions inventories to determine if additional sources warrant monitoring (Ref. 73, pg. 1).

The U.S. EPA continued to sample residential yards through 2019. According to an August 12, 2019, U.S. EPA Pollution Report (POLREP), 242 properties were sampled, and 33 properties were targeted for removal action (Tier 1) (Ref. 39., pg. 214).

As previously stated, the IDEM and U.S. EPA issued NOVs respectively for violating ambient air requirements and for the Indiana SIP (Ref. 30, pgs. 3, 7). To better understand the impact of Whiting Metals operations on the lead and cadmium concentrations measured by the air monitors, on December 14, 2018, the U.S. EPA issued an information request under Section 114 of the Clean Air Act to Whiting Metals (Ref. 4, pgs. 38, 28,196).

According to statements made by Whiting Metals representatives during a meeting on December 3, 2018, another possible contributor to the lead (and cadmium) ambient air concentrations is an access road (Road) which runs along the north side of the property shared by Whiting Metals. This Road is frequently used by a neighboring business called Village Discount Outlet, Inc. (Village Discount) to send and receive deliveries by truck (Ref. 4, pg. 28,196). The property which Village Discount is on is owned by Monaghan, LLC (Refs. 7, pgs. 1, 2; 8, pgs. 1,2; 59, pg. 1).

Segments of the Road on the Monaghan, LLC (Village Discount business) is paved, but portions of the Road on the north, northwest, and south areas of the property remain unpaved. Because the Road is situated on the former Federated Metals property, it is possible that the surface soil of the unpaved Road contains historical lead and cadmium pollutants. These pollutants could be emitted in fugitive dust generated by traffic flow. As a result, the U.S. EPA collected 12 soil samples from the unpaved Road (Ref. 4, pgs. 28,240 – 28,245). In addition, the U.S. EPA collected five (5) background soil samples (Ref. 4, pgs. 28,197, 28, 211).

The U.S. EPA observed areas of disturbed surface soil on Whiting Metals property; specifically, an unpaved section of the Road along the north side of the Whiting Metals facility and an unpaved lot near the southwest corner of the Whiting Metals property. The U.S. EPA observed tire tracks in these areas, indicating recent traffic usage.

Lead concentrations from the Whiting unpaved Road area varied between 41 mg/kg to as high as 6,900 mg/kg (Ref. 4, pgs. 24, 25, 28,280 – 28,291). This is this the same unpaved access road mentioned above in relation to Village Discount. Lead concentrations from the Village Discount unpaved road area (owned by Monaghan, LLC) were found to be as high as 4,500 mg/kg (Refs. 4, pgs. 24, 25, 28,246 – 28,257; 8, pgs. 1,2).

On July 14, 2021, IDEM staff conducted an Expanded Site Inspection (ESI). As part of the ESI, staff collected 13 surface soil background samples from residential properties located approximately 1 (one) mile to the northwest of the former Federated Metals facility and two (2) additional samples from an athletic field and a golf course located upwind due west and due south, respectively, of the former Federated Metals property (Ref. 5, pgs. 13, 43, 45, 49, 51).

Staff also collected sediment samples from Lake George and surrounding wetlands to determine the extent of lead contamination in the surface water pathway (Ref. 5, pg. 49). Sediments of Lake George were also found to be impacted with lead. Some wetland samples of

the surrounding Lake George were found to be impacted with lead and/or arsenic at levels greater than three (3) times background (Ref. 5, pgs. 23, 49).

In 2021, the city of Hammond took the initiative to remediate lead contamination from residential yards located in Hammond. The initial remediation started on September 20, 2021. On November 22, 2021, Hammond Mayor Thomas M. McDermott Jr. announced that the city of Hammond had completed the initial phase of the lead remediation project. The city of Hammond utilized the 400 ppm as an action level for lead, and 68 ppm as an action standard for arsenic (Ref. 83, pg. 1). The city remediated 12 properties designated for this initial remediation activity (Ref. 58, pgs. 1, 2). To actually remediate the soil, the city worked with the environmental consulting firm EnviroForensics and contractors to remove and replace the top two (2) feet of soil in all 12 properties (Ref. 72, pg. 2).

REMEDIATION BY THE CITY OF HAMMOND

On November 22, 2021, the city of Hammond completed the first Phase of lead remediation in residential yards (Ref. 58, pg. 1). The city had decided to be proactive on this issue and give immediate relief to residents whose home values may have been impacted by the lead in the soil. This remediation was conducted with no oversight by the State of Indiana. In 2021 the city remediated 12 residential properties. In 2022, the city proposed to remediate an additional 30 properties (Ref. 92, pg. 1). According to an email correspondence from the City of Hammond representative, the remediation at Robertsdale ended in Mid-November. The properties remediated were listed in the email (Ref. 100, pgs. 1, 2).

2.2 SOURCE CHARACTERIZATION

2.2.1 SOURCE IDENTIFICATION

Number of Source: Source #1

Name of Source: Pile (RCRA Solid Waste Management Unit #1)

Source Type: Pile

Description and Location of Source (Figure 2 of this HRS documentation record, Ref. 75; 76, pg. 2):

Source #1 is buried piles of waste material located around the western and southern portions of the former Federated Metals property. It should be noted that the RCRA Solid Waste Management Unit #1 (SWMU #1) area is referred to as a landfill in Corrective Measure reports (Refs. 27, pg. 8; 38, pg. 13; 84, pgs. 13, 34). Throughout Section 2.2.1 for Source #1, the SWMU #1, the landfill/CAMU, is Source #1.

Two feet of soil material and a phytoremediation cap was constructed for SWMU #1 in December 2005. There is no liner with functioning leachate collection and removal system immediately above a liner. In addition, SWMU #1 (Source #1) does not have a functioning and maintained run-on control system and runoff management system. Currently a vegetative cover is being maintained over SWMU #1 (Source #1) (Ref. 108, pgs. 1, 2). RCRA SWMU #1 (Source #1) accepted much of the wastes generated at the facility. The following solid wastes were deposited in the landfill: blast furnace slag from cupola operations; zinc oxide fume from the brass and cupola operation; tin/lead fume; low tin slag; zinc hopper dust; zinc sludge; used firebrick; and lead base alloys, as well as material dredged from Lake George (Refs. 38, pgs. 13, 21; 89, pgs. 56, 57; 101, pg. 20). The primary hazardous substances associated with this generated waste is lead and arsenic (see Table 3 of this HRS documentation record).

This area is owned by Le Petomane XXV Inc Tr of ASARCO Multi-State Custodial Tr (ASARCO) (Ref. 9, pgs. 1, 2; 59, pg. 1; 86, pg. 1).

Sediment sampling in Lake George conducted for the RCRA Facility Investigation (RFI) suggested elevated levels of contaminants (Ref. 38, pg. 21). Historically, overland flow from SWMU #1 (Source #1) had discharge directly into Lake George as evidenced by materials at SWMU #1 (Source #1) that had encroached into the lake and sedge meadow. Corrective Action Objectives for Lake George included bringing visible waste materials that encroached into the lake and sedge meadow back to SWMU #1where they could be confined under an engineered barrier (Ref. 38, pg. 21; 101, pg. 20). The sedge meadow is a wetland located on the south side of SWMU #1 (Source #1) (Ref. 27, pg. 38). Only a 100-foot area of Lake George was dredged and deposited into SWMU #1 (Source #1). Approximately 7,403 cubic yards of impacted material was removed from Lake George (Refs. 27, pgs. 17, 38; 38, pg. 61 shows

area that was dredged). Approximately 4,188 cubic yards of impacted material was removed from the sedge meadow (Ref. 27, pg.17). The sedge meadow area (a wetland) was located on the south side of the property (Ref. 27, pg. 38).

Although, RCRA Corrective Action activities were conducted for Source #1 (SWMU #1), additional sediment sampling of Lake George by IDEM during the ESI, revealed that high levels of lead are still present in Lake George and within surrounding wetlands (Ref. 5, pg. 49; Tables 15, 16, 19, and 20 of this HRS documentation record).

Since a cover material has been placed over the buried piles and no liner is present, the historic probable points of entry (PPE) for contamination of the surface water pathway occurred along the entire southern perimeter of the former Federated Metals property where contaminated dredged material from Lake George was deposited in SWMU #1 (Source #1) (Ref. 108, pg. 1, 2; Table 4 and Figures 2 and 6 of this HRS documentation record).

SWMU #1 is currently vegetated. Any development of rills and/or gullies in the cover material could expose the underlying hazardous materials. Since there is no functioning and maintained run-on control system and runoff management system as previously stated, hazardous materials could enter into Lake George via overland flow (Ref. 108, pg. 1).

2.2.2 HAZARDOUS SUBSTANCES ASSOCIATED WITH THE SOURCE

BACKGROUND SAMPLES

Background Soil Descriptions:

Lead and arsenic, metals that are related to the lead smelter, are the only contaminants discussed in this HRS documentation record.

The National Oceanic and Atmospheric Administration (NOAA) Wind Rose chart for Hammond, Indiana, accessed on January 3, 2022, was reviewed to determine what direction is upwind of the site sources based on historical prevailing wind direction and thus an appropriate location to collect background soil samples. The Wind Rose chart shows the historical average prevailing wind percentages as from the west (18.2%), south (17.5%), southwest (15.1%), north (12.8%), northeast (12.4%), east (11.8%), northwest (8%), and southeast (4.3%). An evaluation of the historical prevailing wind direction shows that the area to the northwest of the former Federated Metals would be the best location for collection of surface soil to identify background lead concentrations (Ref. 23, pg. 1).

Based on the NOAA findings, surface soil samples collected primarily from residential yards located approximately ¾ to 1 mile northwest of the former Federated Metals site were used to represent background levels for lead for comparison to contaminated surface soil samples. Samples collected from a local park (northwest of the site), a golf course (located south of the former Federated Metals), and from residential properties located northwest of the former Federated Metals/Whiting Metals were also evaluated to establish background levels for lead and arsenic (Ref. 5, pgs. 49, 51, 55, 56, 59; Figure 3, Table 1 and Table 2 of this HRS documentation record).

Background surface soil samples EPA Air S13, EPA Air S16, EPA Air S14, and EPA Air S17 were collected by the U.S. EPA's Air Program on May 2, 2019 (Ref. 4, pg. 24, 25). Surface soil samples collected by U.S. EPA Removal Program staff (including their contractors) were composite samples collected from the residential yards. Background samples MET0K2, MET0K5, and MET0L9 were collected by IDEM on April 2, 2018, April 3, 2018, and April 4, 2018, respectively, during the Site Inspection (Integrated Assessment). Soil samples collected by IDEM for the Site Inspection were composite samples that were collected by U.S. EPA Removal Program staff and split with IDEM for the Site Inspection (Ref. 4, pg. 17, 21, 22).

Background samples ET1D2, ET1D3, ET1D4, ET1D5, ET1D6, ET1D7, ET1D8, ET1D9, ET1E0, and ET1G6 were collected on July 14, 2021, by IDEM during for the Expanded Site Inspection. The surface soil samples that were collected by IDEM staff for the Expanded Site Inspection were single grab samples from residential properties. The background surface soil samples were collected from residential areas located ¾ to 1 mile northwest of the former Federated Metals facility and from and athletic field and a golf course located upwind to the west and southwest of the former Federated Metals facility (Figure 3 of this HRS documentation record; Refs. 5, pgs.25, 55, 56, 59, 69, 73, 74, 75; 67; 76, pg. 2). All background samples were collected at a depth of 0 to 6 inches bgs with either dedicated plastic scoops or stainless steel soil trowels (Refs. 4, pgs. 20, 21; 5, pg. 15).

Background and contaminated surface soil samples were collected in accordance with IDEM- and U.S. EPA-approved sampling and analysis plan and quality assurance project plans (SAP/QAPP) (Refs. 46; 47; and 50). The composition of all soil samples evaluated to establish background levels and the contaminated surface soil samples collected from residential samples consisted of similar samples (Ref. 23, pgs. 1, 2). The locations of the background soil samples are depicted in the SI and ESI reports (Ref. 4, pgs. 33, 71; and Ref. 5, pgs. 49, 51, 55, 56, 59; See also Figure 3 of this HRS documentation record). Sample field sheets are provided in Reference 40 and pictures of where soil samples were collected by IDEM are contained in Reference 4, pgs. 19349 through 19,409.

To obtain a better understanding of the background lead levels, information from the U.S. Geological Survey (USGS) was reviewed. The USGS conducted a Background Soil-Lead Survey from 2007 to 2010 and collected 57 surface soil samples for lead analysis from Indiana (Ref. 45, pgs. 2, 6). The lead concentration mean result was 30.7 mg/kg with a minimum result of 8.2 mg/kg and a maximum result of 423.0 mg/kg. The 423.0 mg/kg result was considered an outlier and the outlier was excluded. Refer to Ref. 45 for additional information. The mean for lead using 56 surface soil samples was calculated at 23.7 mg/kg with a maximum result of 83.9 mg/kg. The outlier-excluded mean results for the neighboring states of Illinois and Michigan were 25.6 mg/kg (87 surface soil samples) and 16.4 mg/kg (93 surface soil samples), respectively (Ref. 23, pg. 1). Note that the USGS Background Soil-Lead Survey stated the values represented geogenic background soil lead concentrations with some impact from widespread anthropogenic sources (Refs. 45, pgs. 2, 6). The USGS background lead concentrations compared well with the background concentrations detected in the IDEM background samples presented below.

Table 1 below depicts the background soil descriptions along with other related information. Surface soils between the Federated Metals facility Source 1 and Source 2, contaminated residential soils, and the background residential soils can be considered similar (Refs. 102, pg. 1; 107). See Figure 3 of this HRS documentation record for sample locations. The background samples in Table 1 are used for comparison to Source #1, Source #2/AOC B, and Source #3/AOCA.

TABLE 1

Background Surface Soil Sample Description

Sample ID/Lab ID	Date Sampled	Physical Characteristics	Depth (inches bgs)	References
Hammond S13/1905008-13	5/2/19	Not Recorded	0 to 1	Ref. 4, pgs. 65, 28,203, 28,205, 28,211; 46, pg. 30; Figure 3
Hammond S14/1905008-14	5/2/19	Not Recorded	0 to 1	Ref. 4, pgs. 65, 141, 28,203, 28,205, 28,211; 46, pg. 46; Figure 3
Hammond S16/1905008-16	5/2/19	Not Recorded	0 to 1	Ref. 4, pgs. 65, 131, 28,203, 28,205, 28,211; 46, pg. 48; Figure 3
Hammond S17/1905008-17	5/2/19	Not Recorded	0 to 1	Ref. 4, pgs. 65, 140, 28,203, 29,205, 28,211; 46, pg. 49; Figure 3
MET0K2	4/2/18	Dark soil, black	0 to 6	Ref. 40, pg. 12, 14; Figure 3
MET0K5	4/3/18	Dark, moist	0 to 6	Ref. 40, pg. 21; Figure 3
MET0L9	4/4/18	Black, moist	0 to 6	Ref. 4, pg. 133; 40, pg. 62; Figure 3
ET1D2	7/14/21	Sand, brown, some root material	0 to 6	Ref. 5, pgs. 13, 15, 17, 43, 55, 4,307, 4,368; Figure 3
ET1D3	7/14/21	Black to dark gray, slightly sandy loam, roots, moist	0 to 6	Ref. 5, pgs. 13, 15, 17, 43, 55, 4,308, 4,370; Figure 3

Sample ID/Lab ID	Date Sampled	Physical Characteristics	Depth (inches bgs)	References
ET1D4	7/14/21	Same as ET1D3	0 to 6	Ref. 5, pgs. 13, 15, 17, 55, 4,309, 4,372; Figure 3
ET1D5	7/14/21	Black to dark gray, sandy loam, roots	0 to 6	Ref. 5, pgs. 13, 15, 17, 45, 56, 4,310, 4,374; Figure 3
ET1D6	7/14/21	Same as ET1D5	0 to 6	Ref. 5, pgs. 13, 15, 17, 56, 45, 56, 4,311, 4,376; Figure 3
ET1D7	7/14/21	Black to dark gray, sandy loam, roots	0 to 6	Ref. 5, pgs. 13, 15, 17, 45, 56, 4,312, 4,377, 4,378; Figure 3
ET1D8	7/14/21	Black to dark gray sandy loam, moist	0 to 6	Ref. 5, pgs. 13, 15, 17, 45, 56, 4,313, 4,379, 4,380; Figure 3
ET1D9	7/14/21	Black to dark gray sandy loam,	0 to 6	Ref. 5, pgs. 13, 15, 17, 45, 56, 4,314, 4,382, 4,383; Figure 3
ET1E0	7/14/21	Black to dark gray, fine grain sand	0 to 6	Ref. 5, pgs. 13, 15, 17, 45, 56, 4,315, 4384, 4,385; Figure 3
ET1G6	7/14/21	Black to dark gray sandy loam, roots	0 to 6	Ref. 5, pgs. 13, 15, 17, 45, 59, 4,322, 4,416, 4,417; Figure 3

Notes: bgs - below ground surface

Background Soil Concentrations:

Table 2 below lists background surface soil concentrations.

TABLE 2

Background Surface Soil Sample Results

Sample ID/Lab ID	Hazardous Substance	Concentration (mg/kg)	MRL/ CRQL/Adj MDL (mg/kg)	References
Hammond S13/190500 8-13	Lead Arsenic	36 8.8	3.4 4.5	Ref. 4, pgs. 33, 28,258
Hammond/ S14/190500 8-14	Lead Arsenic	74 8.1	3.4 4.5	Ref. 4, pgs. 33, 28,259
Hammond/ S16/190500 8-16	Lead Arsenic	58 5.7	3.2 4.3	Ref. 4, pgs. 33, 28,261
Hammond/ S17/190500 8-17	Lead Arsenic	100 6.6	3.0 4.0	Ref. 4, pgs. 33, 28,262
MET0K2	Lead Arsenic	77.6 6.1	0.22 0.24	Refs. 4, pg. 298; 19, pgs. 16, 42, 54, 148-149, 302
MET0K5	Lead Arsenic	110 8.6	0.20 0.23	Ref. 20, pgs. 13, 39, 50, 140-141, 170-171, 251
MET0L9	Lead Arsenic	112 6.4	0.23 0.26	Ref. 19, pgs. 23, 43, 61, 161-162, 306
ET1D2	Lead Arsenic	12 3.1	1.3 1.3	Ref. 51, pgs. 16, 78, 518, 947, 959
ET1D3	Lead Arsenic	61 5.8	1.4 1.4	Ref. 51, pgs. 17, 79, 519, 947, 960
ET1D4	Lead Arsenic	59 5.8	1.4 1.4	Ref. 51, pgs. 22, 80, 520, 947, 961
ET1D5	Lead Arsenic	56 5.8	1.2 1.2	Ref. 51, pgs. 27, 81, 521, 947, 962
ET1D6	Lead Arsenic	57 5.9	1.3 1.3	Ref. 51, pgs. 28, 82, 522, 947, 963
ET1D7	Lead Arsenic	57 6.3	1.2 1.2	Ref. 51, pgs. 33, 83, 523, 947, 964
ET1D8	Lead Arsenic	120 8.8	1.8 1.8	Ref. 51, pgs. 37, 84, 524, 948, 965
ET1D9	Lead Arsenic	68 7.7	1.2 1.2	Ref. 51, pgs. 38, 85, 525, 948, 966

Sample ID/Lab ID	Hazardous Substance	Concentration (mg/kg)	MRL/ CRQL/Adj MDL (mg/kg)	References
ET1E0	Lead Arsenic	62 8.6	1.2 1.2	Ref. 51, pgs. 39, 86, 526, 948, 967
ET1G6	Lead Arsenic	110 11	0.52 0.49	Ref. 49, pgs. 19, 47, 63, 504, 522, 569

Quantitation Limits were adjusted using the % solids results per the CLP SOW SFAM01.0, Exhibit G - Equations, for samples ET1D2 to ET1G6 (Ref. 125).

120 mg/kg was found to be the highest concentration of background lead and 11 mg/kg was found to be the highest level of arsenic. These values will be used as the soil background levels of lead and arsenic, respectively, for the HRS evaluation of Source #1, Source #2/AOC B, and Source #3/AOC A at this Site.

Source Samples:

No descriptions of soil samples are available of the original soils prior to RCRA cover over Source #1. As stated in an IDEM Office Memorandum, the USDA NRCS Web Viewer classified soil in Whiting, Indiana for the northern portion of Forsythe Park as Oakville-Adrian complex (OkB), 0 to 6 percent slopes, while the southern portion of Forsythe Park and the residential neighborhood to the east classified as undescribed Urban Land. The OkB soil consists of drained eolian dune sands. While a detailed description of the Urban Land soils was not listed in the Web Viewer, the General Soil Map from the Soil Survey for Lake County, Indiana illustrated Forsythe Park and the residential area to the east as Oakville-Tawas associated, indicating the surface soil in the two areas would be considered similar. This will also include the Source Area 1 soils and Source Area 2 soils on the Federated Metals facility (Ref. 102, pg. 1).

Urban land (Ur) in the northern part of Lake County, Indiana consists of areas that have been filled with earth, cinders, basic slag, trash, or any combination of these, and that then have been smoothed over. Urban land in northern lake county also includes those areas where sand dunes have been removed and the areas leveled. Thus, surface soils between the Federated Metals original Source Area 1 and Source Area 2 soils and off-site contaminated residential soils and the background residential soils samples can be considered similar (Ref. 102, pg. 1).

No soil samples were collected from Source #1 prior to the RCRA cover. In order to evaluate potential sources for lead found in residential yards, soil borings were collected at the former Federated Metals landfill/SWMU #1 in June 2017. EPA collected soil samples at depth below the cover to determine metal concentrations in the original soils. Analytical results from samples taken at the SWMU #1 were between 6,990 ppm and 26,700 ppm for lead. Eleven soil samples from the SWMU #1 and ten soil samples from residential properties were sent to a lab to assess whether the material in the SWMU #1 from the former Federated Metals facility is the same material that is present in the residential yards. The lab documented the presence of coal, coal ash, fly ash, slag, lead bearing particles or other metal particles in the samples. In a report provided by the lab, a comparison of the trends from these analyses suggests a likely connection between the lead-bearing particles detected in both sets of samples (SWMU #1 and residential) (Ref. 39, pg. 4).

Table 3 lists the ten (10) source surface soil samples that the U.S. EPA collected. The table depicts the lead and arsenic concentrations of the samples along with other related information.

TABLE 3

Source #1 Soil Sample Results

Laboratory ID	Date Sampled	Sample Depth (inches bgs)	Hazardous Substance	Hazardous Substance Concentration (mg/kg)	Sample Quantitation Limit (mg/kg)	Reference
886723	6/29/17	36-42	Arsenic Lead	60.0 J* (34.48) 11,700	4.6 1.4	Ref. 55, pg. 15, 320, 354, 382; 75, pg. 1; 111, pg. 1; 120, pgs. 1, 3
886725	6/29/17	36-72	Arsenic Lead	104 26,700	5.1 32	Ref. 55, pg. 17, 19, 326, 355, 382; 75, pg. 1; 111, pg. 1; 120, pgs. 1, 3
886726	6/29/17	36-72	Arsenic Lead	42.6 7,740	5.0 1.6	Ref. 55, pg. 23, 327, 356, 382; 75, pg. 1; 111, pg. 1; 120, pgs. 1, 3
886727	6/29/17	36-72	Arsenic Lead	182 21,600	4.7 29	Ref. 55, pg. 30, 32, 328, 357, 382; 75, pg. 1111, pg. 1; 120, pgs. 1, 3
886728	6/29/17	108-144	Arsenic Lead	59.4 6,990	4.0 1.3	Ref. 55, pg. 27, 335, 358, 382; 75, pg. 1; 120, pg. 3
886729	6/29/17	36-72	Arsenic Lead	431 J** [247.70] 12,400	4.4 1.4	Ref.55, pg. 36, 336, 359, 382; 75, pg. 1; 111, pg. 1; 120, pg. 3
886734	6/29/17	36-72	Arsenic Lead	3,080 J** [1,770.11] 23,500	85 27	Ref. 55, pg. 39, 341, 370, 382; 75, pg. 1; 111, pg. 1;

Laboratory ID	Date Sampled	Sample Depth (inches bgs)	Hazardous Substance	Hazardous Substance Concentration (mg/kg)	Sample Quantitation Limit (mg/kg)	Reference
						120, pg. 3
886730	6/29/17	36-72	Arsenic Lead	162 13,400	4.4 28	Ref. 55, pg. 43, 46, 337, 366, 382; 75, pg. 1; 111, pg. 1; 120, pg. 3
886731	6/29/17	36-72	Arsenic Lead	873 23,800	4.6 29	Ref. 55, pg. 48, 51, 338, 367, 382; 75, pg. 1; 111, pg. 1; 120, pg. 3
886733	6/29/17	36-72	Arsenic Lead	140 13,100	4.7 1.5	Ref. 55, pg. 61, 340, 369, 382; 75, pg. 1; 111, pg. 1; 120, pg. 3

J* = The MS/MSD was performed on FMWS-2230IND-SB01-3642. The percent recoveries were high, outside the laboratory established control limits, in the FMWS-2230IND-SB01-3642 MS/MSD for Arsenic. A serial dilution (SD) was performed on FMWS-2230IND-SB01-3642 for Arsenic and passed. A postdigestion spike (PDS) was performed on FMWS-2230IND-SB01-3642 for Arsenic and the recovery failed low. Therefore, the detected result for Arsenic in this sample is estimated, bias unknown and was adjusted using the appropriate factor per EPA factsheet, Using Qualified Data to Document an Observed Release and Observed Contamination (Ref. 24 pages 8, A-6; Ref. 95, page 2).

J** = The field duplicate sample results for these two samples qualified as estimated with an unknown bias, and have been adjusted using the appropriate factor per EPA factsheet, Using Qualified Data to Document an Observed Release and Observed Contamination (Ref. 24; Ref. 95, pages 3, 4)

List of Hazardous Substances Associated with Source

Lead
Arsenic

2.2.3 HAZARDOUS SUBSTANCES AVAILABLE TO A PATHWAY

Lead and arsenic are hazardous substances available to the surface water pathway. As stated in 2.2.2 above, the RCRA SWMU #1 (Source #1), accepted much of the wastes generated at the facility, including the following solid wastes: blast furnace slag from cupola operations; zinc oxide fume from the brass and cupola operation; tin/lead fume; low tin slag; zinc hopper dust; zinc sludge; and used firebrick, as well as waste material dredged from Lake George (Refs. 38, pgs. 13, 21; 89, pgs. 56, 57; 101, pg. 20).

Because materials at SWMU #1 (Source #1) encroached into the lake, Corrective Action Objectives for Lake George included bringing visible waste materials that encroached into the lake and sedge meadow back to the landfill where they were confined under an engineered barrier (Ref. 38, pg. 21; 101, pg. 20). Only a 100-foot area of Lake George was dredged and deposited into SWMU #1 (Source #1) (Refs. 27, pgs. 17, 38; 38, pg. 61).

Table 4 below depicts the containment description and containment value with references.

TABLE 4

Containment Description

Containment Description	Containment Factor Value	References
Gas release to air:	NS	
Particulate release to air:	NS	

Containment Description	Containment Factor Value	References
Release to ground water:	NS	
Release via overland migration and/or flood: SWMU #1 (Source #1) does not have a functioning and maintained run-on control system and runoff management system or a liner with functioning leachate collection and removal system immediately above liner. A value of 9 is assigned (Ref. 1, Table 4-2; 108, pgs. 1, 2). It should be noted that materials at the RCRA SWMU #1 (Source #1) encroached into Lake George and a sedge meadow (Ref. 38, pg. 21; 101, pg. 20). Corrective Action Objectives for Lake George included bringing visible waste materials that encroached into the lake and sedge meadow back to the SWMU #1 (Source #1) where they were confined under an engineered barrier (Ref. 38, pg. 21; 101, pg. 20). Only a 100-foot area of Lake George directly adjacent to SWMU #1 (Source #1) was dredged and deposited into SWMU #1(Source #1) (Refs. 27, pgs. 17, 38; 38, pg. 61). However, lake sediments and wetlands are still contaminated beyond the 100-foot dredged area as indicated by Lake George sediment samples (Table 16 of this documentation record, Refs. 27, pg. 17; 38, pg. 61).	9	Refs. 1, Table 4-2; 108, pgs. 1, 2

Notes:
NS – Not Scored

2.4.2.1 Source Hazardous Waste Quantity

2.4.2.1.1 Tier A - Hazardous Constituent Quantity:

The hazardous constituent quantity for Source #1 could not be adequately determined according to the HRS requirements; that is, the total mass of all CERCLA hazardous substances in the source and releases from the source is not known and cannot be estimated with reasonable confidence [Ref. 1, Section 2.4.2.1.1]. There are insufficient historical and current data [manifests, potentially responsible party (PRP) records, State records, permits, waste concentration data, etc.] available to adequately calculate the total or partial mass of all CERCLA hazardous substances in the source and the associated releases from the source. Therefore, there is insufficient information to evaluate the associated releases from the source to calculate the hazardous constituent quantity for Source #1 with reasonable confidence. As a result, the evaluation of hazardous waste quantity proceeds to the evaluation of Tier B, Hazardous Wastestream Quantity [Ref 1, Section 2.4.2.1.1].

Sufficient information is not available to document a hazardous constituent quantity (Ref. 1, Section 2.4.2.1.1, p. 51590).

Hazardous Constituent Quantity Assigned Value: NS
Hazardous Constituent Quantity Complete? No

2.4.2.1.2 Tier B - Hazardous Wastestream Quantity:

The hazardous wastestream quantity for Source #1 could not be adequately determined according to the HRS requirements; that is, the total mass of all hazardous wastestreams plus the mass of any additional CERCLA pollutants and contaminants in the source and releases from the source is not known and cannot be estimated with reasonable confidence [Ref. 1, Section 2.4.2.1.2]. There are insufficient historical and current data (manifests, PRP records, State records, permits, waste concentration data, etc.) available to adequately calculate the total mass or partial mass of the hazardous wastestreams plus the mass of all CERCLA pollutants and contaminants in the source and the associated releases from the source. Therefore, there is insufficient information to evaluate the associated releases from the source to calculate the hazardous wastestream quantity for Source #1 with reasonable confidence. Scoring proceeds to the evaluation of Tier C, Volume [Ref. 1, Section 2.4.2.1.2].

Hazardous Wastestream Quantity Assigned Value: NS

2.4.2.1.3 Tier C - Volume

Description

The exact volume of wastes and type of wastes deposited in the landfill is not known. There is no documentation in IDEM's virtual file cabinet to address the volume of wastes. Sufficient information is not available to document a hazardous constituent volume quantity (Ref. 1, Section 2.4.2.1.3).

As discussed in Table 4 of this documentation record, materials at the RCRA SWMU #1 (Source #1) encroached into Lake George and a sedge meadow (Ref. 38, pg. 21; 101, pg. 20). Only a 100-foot area of Lake George was dredged leaving additional elevated levels of lead in Lake George sediments beyond the 100-foot dredged area (Table 16 of this documentation record; Ref. 27, pg. 17; 38, pg. 61). The exact volume of Source #1 wastes still present in the lake is not known. Therefore, the volume assigned value cannot be determined.

Volume Assigned Value: 0
(Ref. 1, Section 2.4.2.1.3)

2.4.2.1.4. Tier D - Area

Description

As discussed in Table 4 of this documentation record, materials at the RCRA SWMU #1 (Source #1) encroached into Lake George and a sedge meadow (Ref. 38, pg. 21; 101, pg. 20). Only a 100-foot area of Lake George was dredged leaving additional elevated levels of lead in Lake George sediments beyond the 100-foot dredged area (Table 16 of this documentation record; Ref. 27, pg. 17; 38, pg. 61). The source area for the landfill was traced in ArcGIS Pro from IDEM's Landfill boundary layer. The measurement includes the area within Federated Metals Landfill SWMU #1 boundary area (Refs. 75, pg. 1; 126, pg. 1).

TABLE 5

(Source #1) Area

Source Type	Units (ft^2)	References
Pile	442,263.6	Refs. 75, pg. 1; 126, pg. 1

Sum (ft^2): 442,263.6
Equation for Assigning Value (Ref. 1, Section 2.4.2.1.4, Table 2-5): 442,263.6/13 = 34,020

Area Assigned Value: 34,020

(Ref. 1, Section 2.4.2.1.4, Table 2-5)

2.4.2.1.5. Source Hazardous Waste Quantity Value

Per the HRS, the highest of the values assigned to the source for hazardous constituent quantity (Tier A), hazardous wastestream quantity (Tier B), Volume (Tier C), and Area (Tier D) should be assigned as the source hazardous waste quantity value [Ref. 1, Section 2.4.2.1.5].

Source #1 – Hazardous Waste Quantity Value

Tier	Source #1
A	NS
B	NS
C	0
D	34,020

Source #1 Hazardous Waste Quantity Value: 34,020

2.2.1 SOURCE IDENTIFICATION

Number of Source: Source #2

Name of Source: Contaminated Soil at the Former Federated Metals Facility

Source Type: Contaminated Soil

Description and Location of Source: (Figure 2 of this HRS documentation record; Ref. 57, pgs. 1-7; 76, pg. 2)

Source #2 is an area of arsenic and lead contaminated soil on the former Federated Metals facility property. The levels of these hazardous materials exceed three (3) times background concentrations (Tables 2 and 6 of this HRS documentation record). This source located along an access road beginning along the northern perimeter of the former Federated Metals property and the soils around the former Whiting Metals plant building (Figures 2 and 3). The soils along the immediate west and southern portions of the plant buildings (of the Federated Metals facility) west and southern portions had contained visible slag (Ref. 38, pg. 60). According to a SWMU Locations Site Map, the access road along the northern perimeter is adjacent to an old main baghouse, small baghouse, and barrels of baghouse dust (Refs. 38, pg. 60; 37 pg., 42, 43). Source #2 also represents area of observed contamination (AOC) B (Section 5.1 of this HRS documentation record).

A Remediation Completion Report by MH Environmental was submitted to the IDEM Voluntary Remediation Program on December 6, 2013, for the former Whiting Metals facility (Ref. 37, pg. 5). Soil sampling was confined to areas that had not been previously addressed during the Federated Metals RFI (Ref. 37, pg. 26).

Sampling of soils around the former Whiting Metals Plant building was conducted by MH Environmental in October of 2010 at areas external to the buildings (Ref. 37, pg. 16). The upper 6-12 inches below surface cover were sampled (Ref. 37, pg. 27). The sampling identified areas impacted with primarily lead with some excess arsenic and antimony. Refer to Table 6 of this documentation record for the results of that soil sampling. The location, consistency, and composition of the contaminants are consistent with smelting/refining activities conducted at the Site (Ref. 37, pg. 16).

Soil sampling by U.S. EPA staff along the northern perimeter of the former Federated Metals facility also confirmed the presence of elevated levels of lead and/or arsenic (Refs. 4, pgs. 67, 68; 57, pgs. 1-4; Table 6 and Figure 3 of this HRS documentation record.

The results demonstrated that contamination exists in areas outside of SWMU #1 (Source #1) that is consistent with the level and type of contaminants and materials identified during the Federated Metals activities. Areas extraneous to former lead/lead dross processing areas, and the former bag house demonstrated impacts within particular lead and arsenic (Ref. 37, pg. 7, 16).

There is no functioning and maintained run-on control system and runoff management system for the contaminated on-facility soils and no liner with functioning leachate collection and removal system immediately above liner (Ref. 69, pg. 1); therefore, hazardous materials can be released into Lake George and surrounding wetlands via overland flow from Source #2 (Figure 6 of this HRS documentation record). Currently, only a minimum six (6) inches of stone cover exists over contaminated soil. (Refs, 28, pg. 13; 37, pg. 48). The overall site is restricted to industrial use (Ref. 37, pg. 31).

In addition to the above information, on September 14, 2018, the IDEM Office of Air Quality conducted an inspection at the Whiting Metal facility. Emissions to the air were observed to be coming from the northern access road (northern portion of Source #2) as vehicular traffic drove by (Refs. 4, pg. 22,468; 32, pg. 29). Samples of soil collected by the U.S. EPA and MH Environmental in this area were found have lead concentrations greater than three (3) times background (Refs. 37, pgs. 50 through 57; 57, pgs. 1-5; Table 6 of this documentation record). Depending upon wind direction at the time of vehicular traffic, deposition of lead/arsenic emissions can occur into Lake George, the adjacent wetlands, to the workers in the plant building, and to the residential areas located to the north and east of the for Federated Metals property (Figure 2 and 6 of the HRS documentation record).

Soil contamination on the former Federated Metals property is further characterized in Section 5.0.1 of this documentation record as an area of parcels containing observed contamination (i.e., AOC B) (Figures 2 and 3 of this documentation record; Ref. 76, pg. 2).

2.2.2 HAZARDOUS SUBSTANCES ASSOCIATED WITH THE SOURCE

Background Samples

Refer to Section 2.2.2 for Source #1 regarding a discussion for background samples. Background samples shown in Table 2 of this documentation record lists background residential soil concentrations for lead and arsenic. The highest background level for lead and arsenic was found to by 120 mg/kg and 11 mg/kg respectively (Table 2 of this HRS documentation record).

No sample descriptions for background samples that were provided by the U.S. EPA. Also discussed 2.2.2 for Source #1, the USDA NRCS Web Viewer classified soil in Whiting, Indiana for the northern portion of Forsythe Park as Oakville-Adrian complex (OkB), 0 to 6 percent slopes, while the southern portion of Forsythe Park and the residential neighborhood to the east classified as undescribed Urban Land. The OkB soil consists of drained eolian dune sands. While a detailed description of the Urban Land soils was not listed in the Web Viewer, the General Soil Map from the Soil Survey for Lake County, Indiana illustrated Forsythe Park and the residential area to the east as Oakville-Tawas associated, indicating the surface soil in the two areas would be considered similar. This will also include the Source #1 soils and Source #2 soils on the Federated Metals facility (Ref. 102, pg. 1).

Urban land (Ur) in the northern part of Lake County, Indiana consists of areas that have been filled with earth, cinders, basic slag, trash, or any combination of these, and that then have been smoothed over. Urban land in northern lake county also includes those areas where sand dunes have been removed and the areas leveled. Thus, surface soils between the Federated Metals Source #1 and Source #2 soils and off-site contaminated residential soils and the background residential soils samples can be considered similar (Ref. 102, pg. 1). All samples are Urban land (Ur).

Source Samples

The contaminated soils located on the former Federated Metals property is Source #2. Table 6 below depicts the sample ID, date, and other related information regarding the samples. These samples were collected by MH Environmental to document the completion of activities identified in the remediation work plan for the Federated Metals facility (Ref. 37, pg. 2). In addition, samples were collected from the northern access road by U.S. EPA staff during May and June 2019 at a depth of 1 inch (see Ref. 4, pg. 28,203 which discusses how the sample was collected). All other samples were collected from the top two (2) feet (Ref. 37, pg. 27). Only six (6) inches of stone gravel covers the soils (Refs, 28, pg. 13; 37, pg. 48). No maintained engineered cover or functioning and maintained run-off management system is present (Ref. 69, pg. 1).

The samples shown on Table 6 below were collected on the former Federated Metals property. The samples were collected by MH Environmental and by U. S. EPA on May 2, 2019, and on June 5, 2019, and October 2010. The samples represent elevated levels of arsenic and lead on the Former Federated Metals Facility (57, pgs. 1-5; Tables 2 and 6 of this HRS documentation record).

TABLE 6
Source #2 (AOC B) Soil Samples Collected from Federated Metals Property
October 19-29, 2010, May 2, 2019, and June 5, 2019

Sample ID/Lab ID if applicable (Only Alpha Numeric Sample IDs are listed in place of Laboratory IDs)	Location	Date Sampled	Depth of sample (inches)	Hazardous Substance	Hazardous Substance Concentration (mg/kg)	Laboratory Reporting Limit (mg/kg)	Reference
Aa1	Southwest sector of the former Whiting Metals facility	10/19/10	6-12	Lead Arsenic	4,200 39	0.60 1.2	Ref. 37, pgs. 24, 27, 47, 50, 61, 73, 75, 111; 57, pg. 6
Aa3	Southwest sector of the former Whiting Metals facility	10/19/10	6-12	Lead	1,000	0.51	Ref. 37, pgs. 24, 27,47, 50, 62, 73, 77, 111; 57, pg. 6

Sample ID/Lab ID if applicable (Only Alpha Numeric Sample IDs are listed in place of Laboratory IDs)	Location	Date Sampled	Depth of sample (inches)	Hazardous Substance	Hazardous Substance Concentration (mg/kg)	Laboratory Reporting Limit (mg/kg)	Reference
Ab1	Southwest sector of the former Whiting Metals facility	10/19/10	6-12	Lead Arsenic	6,700 42	11 1.1	Ref. 37, pgs. 24, 27, 47, 50, 62, 73, 78, 111; 57, pg. 6
Ab2	Southwest sector of the former Whiting Metals facility	10/19/10	6-12	Lead Arsenic	9,500 81	9.7 0.97	Ref. 37, pgs. 24, 27, 47, 50, 63, 73, 79, 111; 57, pg. 6
Ab3	Southwest sector of the former Whiting Metals	10/19/10	6-12	Lead Arsenic	3,200 48	0.46 0.93	Ref. 37, pgs. 24, 27, 47, 50, 63, 73, 80, 111; 57, pg. 7
Ac2	Southwest sector of the former Whiting Metals facility	10/19/10	6-12	Lead	11,000	10	Ref. 37, pgs. 24, 27, 47, 64, 73, 82, 111; 57, pg. 7
Ad1	Southwest sector of the former Whiting Metals facility	10/19/10	6-12	Lead	1,200	0.62	Ref. 37, pgs. 24, 27, 47, 50, 65, 73, 84, 111; 57, pg. 7
Ad2	Southwest sector of Whiting Metals facility	10/19/10	6-12	Lead	440	0.51	Ref. 37, pgs. 24, 27, 47, 50, 66, 73, 85, 112; 57, pg. 7
Ad3	Southwest sector of the former Whiting Metals facility	10/19/10	6-12	Lead	630	0.49	Ref. 37, pgs. 24, 27, 47, 50, 66, 73, 86, 112; 57, pg. 7

Sample ID/Lab ID if applicable (Only Alpha Numeric Sample IDs are listed in place of Laboratory IDs)	Location	Date Sampled	Depth of sample (inches)	Hazardous Substance	Hazardous Substance Concentration (mg/kg)	Laboratory Reporting Limit (mg/kg)	Reference
Ba1	South sector of the former Whiting Metals facility	10/19/10	6-12	Lead	6,200	10	Ref. 37, pgs. 24, 27, 47, 51, 67, 73, 87, 112; 57, pg. 4
Ba2	South sector of the former Whiting Metals facility	10/19/10	6-12	Lead	550	0.47	Ref. 37, pgs. 24, 27, 47, 51, 67, 73, 88, 112; 57, pg. 4
Ba3	South sector of the former Whiting Metals facility	10/19/10	6-12	Lead Arsenic	7,500 33	10 1.0	Ref. 37, pgs. 24, 27, 47, 51, 68, 73, 89, 112; 57, pg. 7
Bb1	South sector of the former Whiting Metals facility	10/19/10	6-12	Lead	9,000	9.5	Ref. 37, pgs. 24, 27, 47, 51, 68, 73, 90, 112; 57, pg. 7
Bb2	South sector of the former Whiting Metals facility	10/19/10	6-12	Lead Arsenic	4,100 180	0.57 1.1	Ref. 37, pgs. 24, 27, 47, 51, 69, 73, 91, 112; 57, pg. 7
Bb3	South sector of the former Whiting Metals facility	10/19/10	6-12	Lead Arsenic	14,000 33	9.8 0.98	Ref. 37, pgs. 24, 27, 47, 51, 69, 73, 92, 112; 57, pg. 7
Bc1	South sector of the former Whiting Metals facility	10/19/10	6-12	Lead Arsenic	1,600 40	0.54 1.1	Ref. 37, pgs. 24, 27, 47, 51, 70, 73, 93, 112; 57, pg. 7
Bc3	South sector of the former Whiting Metals facility	10/19/10	6-12	Lead	8,900	10	Ref. 37, pgs. 24, 27, 47, 51, 116, 125, 155; 57, pg. 7

Sample ID/Lab ID if applicable (Only Alpha Numeric Sample IDs are listed in place of Laboratory IDs)	Location	Date Sampled	Depth of sample (inches)	Hazardous Substance	Hazardous Substance Concentration (mg/kg)	Laboratory Reporting Limit (mg/kg)	Reference
Bd1	South sector of the former Whiting Metals facility	10/19/10	6-12	Lead	650	0.51	Ref. 37, pgs. 24, 47, 51, 121, 125, 156, 373; 57, pg. 7
Bd2	South sector of the former Whiting Metals facility	10/19/10	6-12	Lead	12,000	11	Ref. 37, pgs. 24, 27, 47, 51, 122, 125, 156, 373; 57, pg. 7
Bd3	South sector of the former Whiting Metals facility	10/19/10	6-12	Lead Arsenic	14,000 64	10 1.0	Ref. 37, pgs. 24, 27, 47, 51, 122, 125, 156, 373; 57, pg. 7
Ca1	Southeast sector of the former Whiting Metals facility	10/19/10	6-12	Lead Arsenic	7,300 45	10 1.0	Ref. 37, pgs. 24, 27, 47, 52, 116, 125, 155; 57, pg. 7
Ca3	Southeast sector of the former Whiting Metals facility	10/19/10	6-12	Lead Arsenic	6,400 43	0.67 1.3	Ref. 37, pgs. 24, 27, 47, 52, 117, 123, 125, 155; 57, pg. 7
Cb1	Southeast sector of the former Whiting Metals facility	10/20/10	6-12	Lead Arsenic	6,700 35	12 1.2	Ref. 37, pgs. 24, 27, 47, 52, 118, 125, 155; 57, pg. 7
Cb3	Southeast sector of the former Whiting Metals facility	10/20/10	6-12	Lead	3,800	0.48	Ref. 37, pgs. 24, 27, 47, 52, 119, 125, 155; 57, pg. 4
Cc1	Southeast sector of the former Whiting Metals facility	10/20/10	6-12	Lead	880	0.51	Ref. 37, pgs. 24, 27, 47, 52, 119, 125, 155; 57, pg. 4

Sample ID/Lab ID if applicable (Only Alpha Numeric Sample IDs are listed in place of Laboratory IDs)	Location	Date Sampled	Depth of sample (inches)	Hazardous Substance	Hazardous Substance Concentration (mg/kg)	Laboratory Reporting Limit (mg/kg)	Reference
Cc3	Southeast sector of the former Whiting Metals facility	10/20/10	6-12	Lead	2,100	0.55	Ref. 37, pgs. 24, 27, 47, 52, 120, 125, 155; 57, pg. 5
Da2	East sector of the former Whiting Metals facility	10/22/10	6-12	Lead Arsenic	770 B (534.72) 69	0.49 0.99	Ref. 37, pgs. 24, 47, 53, 161, 175, 180, 223; 57, pg. 4
Db3	East sector of the former Whiting Metals facility	10/22/10	6-12	Lead	1,200 B (833.33)	0.53	Ref. 37, pgs. 24, 27, 53, 163, 175, 184, 223; 57, pg. 4
Dc2	East sector of the former Whiting Metals facility	10/22/10	6-12	Lead	1,700 B (1,180.55)	0.51	Ref. 37, pgs. 24, 27, 47, 53, 164, 175, 186, 223; 57, pg. 5
Eb1	East-northeast sector of the former Whiting Metals facility	10/25/10	6-12	Lead	720 B (500)	0.52	Ref. 37, pgs. 24, 27, 47, 54, 168, 175, 194, 224; 57, pg. 4
Eb2	East-northeast sector of the former Whiting Metals facility	10/25/10	6-12	Lead	940 B (652.77)	0.53	Ref. 37, pgs. 24, 27, 47, 54, 169, 175, 195, 224; 57, pg. 4
Fa2	Northeast sector of the former Whiting Metals facility	10/27/10	6-12	Lead	700 B^ (486.11)	0.53	Ref. 37, pgs. 24, 27, 47, 55, 229, 241, 244, 279; 57, pg. 4
Fc1	Northeast sector of the former Whiting	10/27/10	6-12	Lead	670 B^ (465.27)	0.55	Ref. 37, pgs. 24, 27, 47, 55, 232, 241, 249, 279; 57,

Sample ID/Lab ID if applicable (Only Alpha Numeric Sample IDs are listed in place of Laboratory IDs)	Location	Date Sampled	Depth of sample (inches)	Hazardous Substance	Hazardous Substance Concentration (mg/kg)	Laboratory Reporting Limit (mg/kg)	Reference
	Metals facility						pg. 5
Fc2	Northeast sector of the former Whiting Metals facility;	10/27/10	6-12	Lead	1,300 B^ (902.77)	0.49	Ref. 37, pgs. 24, 27, 47, 55, 232, 241, 250, 279; 57, pg. 5
Fd1	Northeast sector of the former Whiting Metals facility	10/25/10	6-12	Lead	2,600 B^ (1,805.55)	0.57	Ref. 37, pgs. 24, 27, 47, 55, 233, 241, 252, 279; 57, pg. 5
Ga1	North-northwest sector of the former Whiting Metals facility	10/29/10	6-12	Lead	1,700 B^ (1,180.55)	0.53	Ref. 37, pgs. 24, 27, 47, 56, 235, 241, 255, 280; 57, pg. 3
Ga2	North-northwest sector of the former Whiting Metals facility	10/29/10	6-12	Lead Arsenic	24,000 ^B (16,666.66) 130	11 1.1	Ref. 37, pgs. 24, 47, 56, 235, 241, 256, 280; 57, pg. 3
Ga3	North-northwest sector of the former Whiting Metals facility	10/29/10	6-12	Lead	620 B^ (430.55)	0.51	Ref. 37, pgs. 24, 27, 47, 56, 236, 241, 257, 280; 57, pg. 3
Gb2	North-northwest sector of the former Whiting Metals facility	10/29/10	6-12	Lead Arsenic	140,000 ^B (97,222.22) 5,600	28 55	Ref. 37, pgs. 24, 27, 47, 56, 237, 241, 259, 280; 57, pg. 3

Sample ID/Lab ID if applicable (Only Alpha Numeric Sample IDs are listed in place of Laboratory IDs)	Location	Date Sampled	Depth of sample (inches)	Hazardous Substance	Hazardous Substance Concentration (mg/kg)	Laboratory Reporting Limit (mg/kg)	Reference
Gc1	North-northwest sector of the former Whiting Metals facility	10/29/10	6-12	Lead	1,000 B^ (694.44)	0.48	Ref. 37, pgs. 24, 27, 47, 56, 238, 241, 261, 280; 57, pg. 4
Gc2	North-northwest sector of Whiting Metals facility	10/29/10	6-12	Lead Arsenic	4,800 B^ (3,333.33) 36	0.54 1.1	Ref. 37, pgs. 24, 27, 47, 56, 238, 241, 262, 280; 57, pg. 4
Ha1	Northwest sector of the former Whiting Metals facility	10/29/10	6-12	Lead Arsenic	27,000 83	11 1.1	Ref. 37, pgs. 24, 27, 47, 57, 286, 300, 333; 57, pg. 3
Ha2	Northwest sector of the former Whiting Metals facility	10/29/10	6-12	Lead Arsenic	15,000 38	10 1.0	Ref. 37, pgs. 24, 27, 47, 57, 286, 301, 333; 57, pg. 3
Ha3	Northwest sector of the former Whiting Metals facility	10/29/10	6-12	Lead	5,400	0.61	Ref. 37, pgs. 24, 27, 47, 57, 287, 302, 333; 57, pg. 3
Hb1	Northwest sector of the former Whiting Metals facility	10/29/10	6-12	Lead Arsenic	12,000 33	9.2 0.92	Ref. 37, pgs. 24, 27, 47, 57, 287, 303, 333; 57, pg. 3
Hb2	Northwest sector of the former Whiting Metals facility)	10/29/10	6-12	Lead	2,500	0.65	Ref. 37, pgs. 24, 27, 47, 57, 288, 304, 333; 57, pg. 3
Hb3	Northwest sector of the former Whiting	10/29/10	6-12	Lead Arsenic	64,000 220	11 1.1	Ref. 37, pgs. 24, 27, 47, 57, 288, 305, 333; 57, pg.

Sample ID/Lab ID if applicable (Only Alpha Numeric Sample IDs are listed in place of Laboratory IDs)	Location	Date Sampled	Depth of sample (inches)	Hazardous Substance	Hazardous Substance Concentration (mg/kg)	Laboratory Reporting Limit (mg/kg)	Reference
	Metals facility						3
Hc1	Northwest sector of the former Whiting Metals facility	10/29/10	6-12	Lead	12,000	11	Ref. 37, pgs. 24, 27, 47, 57, 289, 306, 334; 57, pg. 3
Hc2	Northwest sector of the former Whiting Metals facility;	10/29/10	6-12	Lead	4,600 ^ (3,194.44)	0.59	Ref. 37, pgs. 24, 27, 47, 57, 289, 307, 334; 57, pg. 3
Hc3	Northwest sector of the former Whiting Metals facility	10/29/10	6-12	Lead Arsenic	9,400 65	10 1.0	Ref. 37, pgs. 24, 27, 47, 57, 290, 309, 334; 57, pg. 3
Hd1	Northwest sector of the former Whiting Metals facility	10/29/10	6-12	Lead Arsenic	10,000 33	11 1.1	Ref. 37, pgs. 24, 27, 47, 57, 290, 310, 334; 57, pg. 3
Hd2	Northwest sector of the former Whiting Metals facility	10/29/10	6-12	Lead Arsenic	20,000 60	12 1.2	Ref. 37, pgs. 24, 27, 47, 57, 291, 311, 334; 57, pg. 3
Hd3	Northwest sector of the former Whiting Metals facility	10/29/10	6-12	Lead	2,200 ^ (1,527.77)	0.46	Ref. 37, pgs. 24, 27, 47, 57, 291, 312, 334; 57, pg. 3

Sample ID/Lab ID if applicable (Only Alpha Numeric Sample IDs are listed in place of Laboratory IDs)	Location	Date Sampled	Depth of sample (inches)	Hazardous Substance	Hazardous Substance Concentration (mg/kg)	Laboratory Reporting Limit (mg/kg)	Reference
1905008-03	Village Discount Property	5/2/19	0-1	Lead	850	2.8	Ref. 4, pgs. 28,248; 46, pgs. 3, 12, 19; 57, pg. 2
1905008-05	Village Discount Property	5/2/19	0-1	Lead Arsenic	4,800 79	3.5 4.7	Ref. 4, pgs. 28,250; 46, pgs. 3, 12, 19; 57, pg. 2
1905008-06	Village Discount Property	5/2/19	0-1	Lead	1,200	3.2	Ref. 4, pgs. 28,251; 46, pgs. 3, 12, 19; 57, pg. 2
1905008-07	Village Discount Property	5/2/19	0-1	Lead	750	2.7	Ref. 4, pgs. 28,252; 46, pgs. 3, 12, 19; 57, pg. 2
1905008-09	Village Discount	5/2/19	0-1	Lead	560	2.9	Ref. 4, pgs. 28,254; 46, pgs. 3, 12, 19; 57, pgs. 3
1905008-10	Village Discount Property	5/2/19	0-1	Lead	860	2.8	Ref. 4, pgs. 28,255; 46, pgs. 3, 12, 19; 57, pg. 3
1905008-11	Village Discount	5/2/19	0-1	Lead	2,900	3.2	Ref. 4, pgs. 28,256; 46, pgs. 3, 12, 19; 57, pg. 3
1905008-12	Village Discount Property	5/2/19	0-1	Lead	3,600	3.1	Ref. 4, pgs. 28,257; 46, pg. 3, 19; 57, pg. 3

Sample ID/Lab ID if applicable (Only Alpha Numeric Sample IDs are listed in place of Laboratory IDs)	Location	Date Sampled	Depth of sample (inches)	Hazardous Substance	Hazardous Substance Concentration (mg/kg)	Laboratory Reporting Limit (mg/kg)	Reference
1906001-01	Whiting Metals Property	6/5/19	0-1	Lead	2,500	13	Ref. 4, pgs. 28,228, 28,280; 47, pgs. 2, 6, 7, 11; 57, pg. 3
1906001-02	Whiting Metals Property	6/5/19	0-1	Lead	2,400	14	Ref. 4, pgs., 28, 281; 47, pg. 2, 6, 7, 11; 57, pg. 3
1906001-03	Whiting Metals Property	6/5/19	0-1	Lead	1,300	13	Ref. 4, pgs. 28,282; 47, pgs. 2, 6, 7, 11; 57, pg. 3
1906001-04	Whiting Metals Property	6/5/19	0-1	Lead Arsenic	6,900 34	47 7.3	Ref. 4, pgs. 28,283; 47, pgs. 2, 6, 7, 11; 57, pg. 2
1906001-05	Whiting Metals Property	6/5/19	0-1	Lead	3,600	15	Ref. 4, pgs. 28,284; 47, pgs. 2, 6, 7, 11; 57, pg. 2
1906001-06	Whiting Metals Property	6/5/19	0-1	Lead	2,700	15	Ref. 4, pgs., 28,285; 47, pgs. 2, 6, 11; 57, pg. 2
1906001-07	Whiting Metals Property	6/5/19	0-1	Lead	1,800	14	Ref. 4, pgs. 28,286; 47, pgs. 2, 6, 7, 11; 57, pg. 4
1906001-08	Whiting Metals Property	6/5/19	0-1	Lead	2,000	16	Ref. 4, pgs. 28,287; 47, pgs. 2, 6, 7, 11; 57, pg. 4

B Compound was found in the blank and sample (Ref. 37, pg. 141). This qualified data was not validated. EPA took a conservative approach to reviewing the data; therefore, assuming a high bias, the result was adjusted according to the EPA factsheet, Using Qualified Data to Document and Observed Release and Observed Contamination, and adjusted result is shown in parenthesis (Ref. 24, pgs. 8 and A-6).

^ ICV, CCV, ICB, CCB, ISA, ISB, CRL, DLCK, or MRL standard: Instrument related QC exceeds the control limits (Ref. 37, pg. 141). This qualified data was not validated. EPA took a conservative approach to reviewing the data; therefore, assuming a high bias, the result was adjusted according to the EPA factsheet, Using Qualified Data to Document and Observed Release and Observed Contamination, and adjusted result is shown in parenthesis (Ref. 24, pgs. 8 and A-6).

List of Hazardous Substances Associated with Source

Lead
Arsenic

Table 7 below depicts the containment description and containment value with references.

TABLE 7

Containment Description and Value

Containment Description	Containment Factor Value	References
Gas release to air:	NS	
Particulate release to air:	NS	
Release to ground water:	NS	

Containment Description	Containment Factor Value	References
Release via overland migration and/or flood: A review of IDEM files indicates that there is no functioning and maintained run-on control system and runoff management system for the contaminated on-site soils, no liner with functioning leachate collection and removal system immediately above liner, thus enabling hazardous substances to potentially migrate from the contaminated soils by overland flow into Lake George and the adjacent wetlands located at the southeast corner of the landfill. Only six (6) inches of stone gravel covers the contaminated on-site soils. All samples collected are within the top 6 inches (Table 6 of this HRS documentation record).	10	Ref. 1, Table 4-2; 37, pg. 531; 85, pg. 13; 69, pg. 1

Notes:
NS - Not Scored

2.4.2.1 Source Hazardous Waste Quantity

The hazardous substances associated with each waste type are shown in Section 2.2.2 of this HRS documentation record.

2.4.2.1.1 Tier A - Hazardous Constituent Quantity

Description

The hazardous constituent quantity for Source #2 could not be adequately determined according to the HRS requirements; that is, the total mass of all CERCLA hazardous substances in the source and releases from the source is not known and cannot be estimated with reasonable confidence [Ref. 1, Section 2.4.2.1.1]. There are insufficient historical and current data [manifests, potentially responsible party (PRP) records, State records, permits, waste concentration data, etc.] available to adequately calculate the total or partial mass of all CERCLA hazardous substances in the source and the associated releases from the source. Therefore, there is insufficient information to evaluate the associated releases from the source to calculate the hazardous constituent quantity for Source 1 with reasonable confidence. As a result, the evaluation of hazardous waste quantity proceeds to the evaluation of Tier B, Hazardous Wastestream Quantity [Ref 1, Section 2.4.2.1.1].

Hazardous Constituent Quantity Assigned Value: NS
Hazardous Constituent Quantity Complete? No

2.4.2.1.2 Tier B - Hazardous Wastestream Quantity:

The hazardous wastestream quantity for Source #2 could not be adequately determined according to the HRS requirements; that is, the total mass of all hazardous wastestreams plus the mass of any additional CERCLA pollutants and contaminants in the source and releases from the source is not known and cannot be estimated with reasonable confidence [Ref. 1, Section 2.4.2.1.2]. There are insufficient historical and current data (manifests, PRP records, State records, permits, waste concentration data, etc.) available to adequately calculate the total mass or partial mass of the hazardous wastestreams plus the mass of all CERCLA pollutants and contaminants in the source and the associated releases from the source. Therefore, there is insufficient information to evaluate the associated releases from the source to calculate the hazardous wastestream quantity for Source #1 with reasonable confidence. Scoring proceeds to the evaluation of Tier C, Volume [Ref. 1, Section 2.4.2.1.2].

Hazardous Wastestream Quantity Assigned Value: NS

2.4.2.1.3. Tier C - Volume

Description

The exact volume of wastes and type of wastes deposited in the on-site contaminated soils is not known. There is no documentation in IDEM's virtual file cabinet to address the volume of wastes. Sufficient information is not available to document a volume quantity (Ref. 1, Section 2.4.2.1.). The volume is not scored.

Volume Assigned Value: 0
(Ref. 1, Section 2.4.2.1.3)

2.4.2.1.4. Tier D - Area

Description

The contaminated soil consisting of lead and arsenic concentrations greater than three (3) times background for Source #2 has been found to exist throughout areas surrounding the plant buildings and on the western portion of the property which is now being operated by Village Discount (Ref. 57; 76, pg. 2; Table 6 of this HRS documentation record; Figure 2 of this HRS documentation record shows the outline of Source #2).

The exact area of the contaminated soils is not known. Therefore, the area assigned value is unknown but greater than 0.

TABLE 8

Area Assigned Value

Source Type	Units (ft^2)	References
Contaminated soil	Unknown but >0	NA

Equation for Assigning Value (Ref. 1, Section 2.4.2.1.4, Table 2-5): Unknown but >0/34,000 = Unknown but >0.

Area Assigned Value: Unknown but greater than 0
(Ref. 1, Section 2.4.2.1.4)

2.4.2.1.5. Source Hazardous Waste Quantity Value

Per the HRS, the highest of the values assigned to the source for hazardous constituent quantity (Tier A), hazardous wastestream quantity (Tier B), Volume (Tier C), and Area (Tier D) should be assigned as the source hazardous waste quantity value for Source #2 [Ref. 1, Section 2.4.2.1.5].

Based on Tier D-Area as presented above, the highest assigned value is: Unknown but >0

2.2.1 SOURCE IDENTIFICATION

Number of Source: Source #3

Name of Source: Contaminated Soil

Source Type: Contaminated Residential Soil

Description and Location of Source (see Figure 2 of this HRS documentation record; Ref. 76, pg. 2):

Source #3 is contaminated residential soils found north and east of the former Federated Metals facility (Figure 2 of this HRS documentation record). The hazardous substances found in this source are lead and/or arsenic at concentrations greater than three (3) times background (Tables 2 and 10 of this HRS documentation record). Source #3 also represents area of AOC A (Section 5.1 of this HRS documentation record). The primary mode of deposition of the contamination in the Source #3 soils is believed to be air deposition of lead particles in residential yard via a smelting process. Over time, lead particles and other heavy metal particles associated with the smelters' operations became airborne and settled onto area properties (Refs. 6, p. 4; 39, p. 4; 52, pg. 1). Pollutants emitted in fugitive dust generated by traffic flow is also believed to be a possible mode for spreading lead and arsenic contamination (Ref. 4, pgs. 24, 25, 22, 468). As stated in the "Previous Investigations Conducted by the U.S. EPA and IDEM" Section, Whiting Metals had exceeded their lead particulate levels and received a notice of violation in September 2018 from the U.S. EPA and IDEM (Ref. 30, pgs. 3, 7). Thus, the deposition of these lead particulate levels in the air to the nearby residential soils has led to the contaminated soils of Source #3.

In November/December 2016, the U.S. EPA Region 5 Superfund Removal Program implemented broad sampling approach at publicly owned right of ways and unoccupied residential properties in order to determine the initial scope of the removal investigation. This initial investigation identified lead contamination to the north and northeast of the former FMC facility. In March 2017, more publicly owned properties were sampled, and narrowed the area of concern to much smaller area to the north of the former smelter. Lead as high as 2,200 parts per million (ppm) was found in the surface soils in the neighborhood. Based on the results of this sampling, it was determined that the sampling needed to be expanded to occupied residential properties (Ref. 39, pg. 3).

Occupied residential properties were sampled in October and November 2017 and March through July 2018. Of the 201 occupied residential properties, 125 had surficial concentrations that exceeded the U.S. EPA Removal Management Level (RML) of 400 ppm for lead but below the 1,200 ppm level with no sensitive populations (children up to 7 years old or pregnant women) residing there at the time. These properties are identified as Tier 3 properties in accordance with the "Superfund Lead-Contaminated Residential Sites Handbook" (Lead Handbook). Of the 201 properties, 60 have either sensitive populations and soil lead concentrations in surface soils between 400 ppm and 1,200 ppm, or no sensitive populations and surface soil lead concentrations above 1,200 ppm, but not both. These properties are identified as Tier 2 properties in accordance with the Lead Handbook. Of the 201 properties, 22

have both sensitive populations and surficial lead concentrations above 1,200 ppm and are identified as Tier I properties in accordance with the Lead Handbook. The highest lead concentration found at the surface of one of the Tier 1 residential properties was 3,540 ppm (Ref. 39, pg. 4).

On April 2, 2018, IDEM staff met with U.S. EPA Superfund Removal Program staff. The U.S. EPA staff obtained signed access agreements allowing EPA staff to enter properties prior to sampling yards. The U.S. EPA also asked the property owners if they would grant access to IDEM to collect samples from their property too; as a result, all property owners granted access to IDEM staff as well. The U.S. EPA collected several samples from the front and backyard of each selected residential property. IDEM staff then screened the top six (6) inches of soil for lead at each sample location utilizing an X-ray fluorescence (XRF) instrument (Ref. 4, pgs. 19, 20).

IDEM staff collected a total of 27 soil samples for this sampling event (Ref. 4, pg. 20). Twenty-one (21) of the soil samples were split samples from the U.S. EPA's April 2018 sampling event. Six (6) of the samples were collected from five (5) residential properties where the U.S. EPA did not sample (Ref. 4, pg. 20). According to the analytical results of the samples collected by IDEM, elevated levels of metals, specifically lead and some arsenic, were detected in some soil samples. Lead concentrations range from 77.6 mg/kg to as high as 2,960 mg/kg. Arsenic concentrations were found to range from 6.1 mg/kg to as high as 206 mg/kg (Ref. 4, pg. 22).

2.2.2 HAZARDOUS SUBSTANCES ASSOCIATED WITH THE SOURCE

Background Samples

Refer to Section 2.2.2 for Source #1 regarding a discussion for background samples. Background samples shown in Tables 1 and 2 of this documentation record lists background residential soil concentrations along with other related information.

In addition, the USDA NRCS Web Viewer classified soil in Whiting, Indiana, for the northern portion of Forsythe Park as Oakville-Adrian complex (OkB), 0 to 6 percent slopes, while the southern portion of Forsythe Park and the residential neighborhood to the east classified as undescribed Urban Land. The OkB soil consists of drained eolian dune sands. While a detailed description of the Urban Land soils was not listed in the Web Viewer, the General Soil Map from the Soil Survey for Lake County, Indiana illustrated Forsythe Park and the residential area to the east as Oakville-Tawas associated, indicating the surface soil in the two areas would be considered similar. This will also include the original Source #1 soils and Source #2 soils on the Federated Metals facility (Ref. 102, pg. 1).

Urban land (Ur) in the northern part of Lake County, Indiana, consists of areas that have been filled with earth, cinders, basic slag, trash, or any combination of these, and that then have been smoothed over. Urban land in northern lake county also includes those areas where sand dunes have been removed and the areas leveled. Thus, surface soils between the Federated Metals original Source #1 and Source #2 soils and off-site contaminated residential soils and the background residential soils samples can be considered similar (Ref. 102, pg. 1).

Soil Contamination Concentrations

The surface soil samples listed in Tables 9 and 10 of this HRS documentation record were collected from 2016 through 2018 by U.S. EPA Removal Program and by IDEM during the Site Inspection (Ref. 4, pgs.16-20). Additional surface soil samples were collected during a Site Inspection (Integrated Assessment) that was conducted by IDEM in April 2018 (Ref. 4, pg. 20, 48).

Sample descriptions were recorded during the Integrated Assessment that IDEM had conducted and are listed in the Table 9 below. The U.S. EPA's contractor did not record the physical description of the soils that they collected. Refer to Ref. 77 for the sample locations.

TABLE 9

Surface Soil Sample Descriptions

Sample ID	Physical Description	Depth (inches bgs)	Date Sampled	References
MET0J8	Black to dark gray, sandy	0 to 6	4/2/18	Ref. 40, pg. 1
MET0J9	Dark to black sandy loam	0 to 6	4/2/18	Ref. 40, pg. 4
MET0K0	Black soil, med. Grain, moist	0 to 6	4/2/18	Ref. 40, pg. 7
MET0K1	Black soil, med. Grain, moist	0 to 6	4/2/18	Ref. 40, pg. 10
MET0K2	Dark soil, black	0 to 6	4/2/18	Ref. 40, pg. 12
MET0K3	Dark, moist	0 to 6	4/3/18	Ref. 40, pg. 15
MET0K4	Dark, moist	0 to 6	4/3/18	Ref. 40, pg. 18
MET0K5	Dark, moist	0 to 6	4/3/18	Ref. 40, pg. 21
MET0K6	Dark, moist	0 to 6	4/3/18	Ref. 40, pg. 24
MET0K7	Dark, moist	0 to 6	4/3/18	Ref. 40, pg. 27
MET0K8	Dark, moist	0 to 6	4/3/18	Ref. 40, pg. 30
MET0K9	Dark, moist	0 to 6	4/3/18	Ref. 40, pg. 33
MET0L0	Dark, moist	0 to 6	4/3/18	Ref. 40, pg. 36
MET0L1	Dark, moist	0 to 6	4/3/18	Ref. 40, pg. 39
MET0L2	Dark, moist	0 to 6	4/3/18	Ref. 40, pg. 41
MET0L3	Dark, moist, roots	0 to 6	4/3/18	Ref. 40, pg. 43
MET0L4	Dark, moist, roots	0 to 6	4/3/18	Ref. 40, pg. 45
MET0L5	Dark, moist	0 to 6	4/4/18	Ref. 40, pg. 47
MET0L6	Dark, moist	0 to 6	4/4/18	Ref. 40, pg. 51
MET0L7	Dark, moist	0 to 6	4/4/18	Ref. 40, pg. 55
MET0L8	Dark, moist	0 to 6	4/4/18	Ref. 40, pg. 59
MET0L9	Black, moist	0 to 6	4/4/18	Ref. 40, pg. 62
MET0M0	Dark, moist	0 to 6	4/4/18	Ref. 40, pg. 65

Sample ID	Physical Description	Depth (inches bgs)	Date Sampled	References
MET0M1	Dark, moist	0 to 6	4/4/18	Ref. 40, pg. 67
MET0M2	Dark, moist	0 to 6	4/4/18	Ref. 40, pg. 69
MET0M3	Dark, moist	0 to 6	4/4/18	Ref. 40, pg. 71
MET0M4	Dark, moist	0 to 6	4/5/18	Ref. 40, pg. 73

Contaminated Samples – Source #3/Observed Contamination Locations, Residential Soils

The residential surface soil samples listed in Table 10 below of this HRS documentation record were collected by the U.S. EPA Removals Program and by IDEM during the Site Inspection (see references in the Table 10). Occupied residential properties were sampled by the U.S. EPA in October and November 2017 and March through July 2018. Additional surface soil samples were collected during an integrated assessment with IDEM conducted in April 2018 to further investigate the scope of contamination at the Site (Ref. 4, pg. 16, 20;).

The samples were collected in accordance with the U.S. EPA-approved final SAP/QAPP (Refs. 59). No deviation from the SAP and QAPP had to be made during sampling. The surface soil samples listed below were collected from various residential yards located on Atchison Avenue, Birch Avenue, Center Street, Central Avenue, Clark Street, Davidson Place, Euclid Avenue, Fischrupp Avenue, Fred Street, Indianapolis Boulevard, John Street, Lakeview Avenue, Laporte Avenue, Lincoln Avenue, New York Avenue, Ohio Avenue, Oliver Street, Schrage Avenue, Sheridan Avenue, Steiber Street, Wespark Avenue, White Oak Avenue, and 120th and 121st Streets in Hammond and Whiting, Indiana, Lake County within the AOC (Figure 2, Figure 3, Table 10 of this HRS documentation record).

As previously discussed, contamination on some residential properties at the Federated Metals/Whiting Site are being inferred in the absence of sampling results because of the suspected mode via air deposition of the windblown contamination. Therefore, contamination is inferred between residential yards that have not been sampled that lie between at least two (2) properties where elevated levels of lead have been detected. In addition, those residential properties where elevated levels of lead have been found in multiple areas (including the inferred properties) have been grouped together to form polygon shapes. As a result, twenty-seven (27) polygon areas have been identified (Ref. 54).

Along with the polygon areas, Source #3 is also comprised of single individual residential properties that contain lead and/or arsenic three (3) times above background levels located on the streets mentioned above as well as inferred residential properties (that were not sampled) that are located between known properties that have the elevated levels of lead and/or arsenic (Ref. 54).

Table 10 below lists those residential samples that are in Source #3. The table lists the Lab ID for each sample, date collected, hazardous substance that was detected

three times background and other pertinent information. Refer to Table 2 of this documentation record for the concentrations of lead and arsenic in background soil samples. The surface soil samples that the U.S. EPA's consultant collected consisted of composite samples from each individual property, collected less than two (2) feet bgs (Ref. 40, pgs. 1-531). Reference 56 describes how the depth of the sample was recorded in the sample ID. The contaminated surface soil samples were collected from similar soil types as the background surface soil samples (Ref. 23, pgs. 1, 2; 102, pg. 1).

Note for samples with FMWS prefix (as listed in Reference 78): after sample collection from the yards, EPA's contractor XRF'd all of the samples, then sent all the 0-6" interval, and a subset of the deeper depths, to the lab for analysis/correlation with the XRF. EPA's contractor noted the date of collection on the Chain of Custody (COC) as the date the soil was put into the sample jar and sent to the lab after the XRF screening, not when it was collected from the yard (Ref. 50, pg. 1). The actual date the sample was collected is found in the logbook sheets in Reference 40. Refer to Reference 78 for the sample ID with the associated laboratory IDs and residential address for each sample number. Reference 78 also includes addresses for those properties that are inferred.

TABLE 10

Source #3/AOC Letter A – Residential Soils

Lab # (Refer to Ref. 78 for the corresponding sample ID)	Date Sampled	Depth of Sample (inches bgs)	Hazardous Substance	Hazardous Substance Concentration (mg/kg) [Adjusted Concentration]	Laboratory Reporting Limit/Adjusted Method Detection Limit (mg/kg)	Reference (Refer to Tables 28 and 29 for references regarding inferred locations)
151954	7/18/18	6	Arsenic Lead	41.2 396	0.99 0.31	Ref. 4, pg. 62, 197; 14, pgs. 56, 585, 878; 40, pgs. 152, 153; 56, pg. 1; 94, pg. 2; 96, pg. 3; 97, pg. 2
845994	3/22/17	6	Lead	591	0.32	Ref. 4, pg. 139; 22, pgs. 139, 1164; 40, pgs. 154, 155; 56, pg. 1; 94, pg. 4; 96, pg. 3; 97, pg. 4
845980	3/23/17	6	Lead	498	0.34	Ref. 4, pg. 139; 22, pgs. 154, 1150; 56, pg. 1; 94, pg. 4; 96, pg. 3; 97, pg. 4
845981	3/23/17	6	Lead	513	0.32	Ref. 4, pg. 139; 22, pgs. 157, 1151; 40, pgs. 156, 157; 56,

Lab # (Refer to Ref. 78 for the corresponding sample ID)	Date Sampled	Depth of Sample (inches bgs)	Hazardous Substance	Hazardous Substance Concentration (mg/kg) [Adjusted Concentration]	Laboratory Reporting Limit/Adjusted Method Detection Limit (mg/kg)	Reference (Refer to Tables 28 and 29 for references regarding inferred locations)
						pg. 1; 94, pg. 4; 96, pg. 3; 97, pg. 4
136505	6/11/18	6	Lead	405	0.32	Ref. 4, pg. 136; 13. pgs. 851, 1458; 40, pgs. 158, 159; 56, pg. 1; 94, pg. 3; 96, pg. 2; 97, pg. 3
151963	7/11/18	6	Lead	1,000 J [694.44]	0.30	Ref. 4, pg. 136; 14, pgs. 40, 262, 879; 40, pgs. 160, 161; 56, pg. 1; 94, pg. 3; 95, pgs. 179, 182, 184, 185; 96, pg. 2; 97, pg. 3
151912	7/11/18	6	Lead	467	0.32	Ref. 4, pg. 136; 14, pgs. 41, 564, 877; 40, pgs. 160, 161 162, 163; 94, pg. 3; 96, pg. 2; 97, pg. 3
136499	6/11/18	6	Lead	822	0.31	Ref. 4, pg. 136; 13, pgs. 853, 1455; 40, pgs. 158, 159; 56, pg. 1; 94, pg. 3; 96, pg. 2; 97, pg. 3
845982	3/22/17	6	Lead	854	0.34	Ref. 4, pg. 144; 22, pgs. 166, 1152; 40, pgs. 166, 167; 56, pg. 1; 94, pg. 3; 96, pg. 3; 97, pg. 3
105036	4/2/18	6	Lead	1,200	0.30	Ref. 4, pg. 148; 11, pgs. 37; 40, pgs. 176, 177; 56, pg. 1; 94, pg. 2; 96, pg. 3; 97, pg. 2
845992	3/23/17	6	Lead	847	0.33	Ref. 4, pg. 148; 22, pgs. 169, 1162; 40, pgs. 178-181; 56, pg. 1; 94, pg. 2; 96, pg. 3; 97, pg. 2

Lab # (Refer to Ref. 78 for the corresponding sample ID)	Date Sampled	Depth of Sample (inches bgs)	Hazardous Substance	Hazardous Substance Concentration (mg/kg) [Adjusted Concentration]	Laboratory Reporting Limit/Adjusted Method Detection Limit (mg/kg)	Reference (Refer to Tables 28 and 29 for references regarding inferred locations)
105035	4/12/18	6	Lead	1,160	0.30	Ref. 4, pg. 148; 11, pgs. 36, 224; 40, pgs. 176, 177; 56, pg. 1; 94, pg. 2; 96, pg. 3; 97, pg. 2
955583	10/31/17	6	Lead	1,470	0.31	Ref. 4, pg. 148; 10, pgs. 38, 359; 40, pgs. 190, 191; 56, pg. 1; 94, pg. 2; 96, pg. 3; 97, pg. 2
184404	9/20/18	6	Lead	548	0.30	Ref. 4, pg. 148; 16, pgs. 438, 517; 40, pgs. 182, 183; 56, pg. 1; 94, pg. 2; 96, pg. 3; 97, pg. 2
845992	3/23/17	6	Lead	847	0.33	Ref. 4, pg. 148; 22, pgs. 169, 1162; 40, pgs. 178, 179, 180, 181; 56, pg. 1; 94, pg. 2; 96, pg. 3; 97, pg. 2
211527	11/15/18	6	Lead	1,590	0.34	Ref. 4, pg. 148; 18, pgs. 45, 225; 56, pg. 1; 94, pg. 2; 96, pg. 3; 97, pg. 2
211528	11/15/18	6	Lead	569	0.34	Ref. 4, pg. 148; 18, p. 46, 226; 56, pg. 1; 94, pg. 2; 96, pg. 3; 97, pg. 2
123836	5/16/18	6	Lead	914	1.7	Ref. 4, pg. 143; 12, pgs. 354, 809; 40, pgs. 196, 197; 56, pg. 1; 94, pg. 2; 96, pg. 3; 97, pg. 3
153914	7/19/18	6	Lead	733	0.34	Ref. 4, pg. 144; 14, pgs. 962, 1117; 40, pgs. 198. 199; 56, pg. 1; 94, pg.4; 96, pg. 3; 97, pg. 4

Lab # (Refer to Ref. 78 for the corresponding sample ID)	Date Sampled	Depth of Sample (inches bgs)	Hazardous Substance	Hazardous Substance Concentration (mg/kg) [Adjusted Concentration]	Laboratory Reporting Limit/Adjusted Method Detection Limit (mg/kg)	Reference (Refer to Tables 28 and 29 for references regarding inferred locations)
153918	7/19/18	6	Lead	534	0.31	Ref. 4, pg. 144; 14, pgs. 963, 1132; 40, pgs. 198, 199; 56, pg. 1; 94, pg. 4; 96, pg. 3; 97, pg. 4
Inferred						
136530	6/5/18		Arsenic Lead	37.2 580	1.2 0.36	Ref. 4, pg. 144, 180; 13, pgs. 843, 1460; 40, pgs. 200, 201; 56, pg. 1; 94, pg. 3; 96, pg. 3; 97, pg. 4
136531	6/5/18	6	Lead	419	0.37	Ref. 4, pg. 144; 13, pgs. 844, 1460, 1461; 40, pgs. 200, 201; 56, pg. 1; 94, pg. 4; 96, pg. 3; 97, pg. 4
198274	10/19/18	6	Arsenic Lead	50.0 914	1.1 0.35	Ref. 4, pgs. 144, 180; 17, pgs. 754, 900; 56, pg. 1; 94, pg. 4; 96, pg. 3; 97, pg. 4
198273	10/19/18	6	Lead	1,510	0.33	Ref. 4, pg. 144; 17, pgs. 755, 896; 56, pg. 1; 94, pg. 4; 95, pgs. 506, 507; 96, pg. 3; 97, pg. 4
Inferred						
143714	6/27/18	6	Lead	773	0.33	Ref. 4, pg. 144; 13, pgs. 1554, 2442; 40, pgs. 202, 203; 56, pg. 1; 94, pg. 4; 96, pg. 3; 97, pg. 4
143732	6/27/18	6	Arsenic Lead	40.2 544	1.1 0.34	Ref. 4, pg. 144, 180; 13, pgs. 1555, 2449; 40, pgs. 202, 203; 56, pg. 1; 94, pg. 4; 96, pg. 3; 97, pg. 4
Inferred						
136543	6/7/18	6	Lead	577	0.34	Ref. 4, pg. 144; 13, pgs. 846, 1465; 40,

Lab # (Refer to Ref. 78 for the corresponding sample ID)	Date Sampled	Depth of Sample (inches bgs)	Hazardous Substance	Hazardous Substance Concentration (mg/kg) [Adjusted Concentration]	Laboratory Reporting Limit/Adjusted Method Detection Limit (mg/kg)	Reference (Refer to Tables 28 and 29 for references regarding inferred locations)
						pgs. 204, 205; 56, pg. 1; 94, pg. 4; 96, pg. 3; 97, pg. 4
Inferred						
Inferred						
153915	7/19/18	6	Lead	571	0.36	Ref. 4, pg. 144; 14, pgs. 964, 1129; 40, pgs. 206, 207; 56, pg. 1; 94, pg. 4; 96, pg. 3; 97, pg. 4
153916	7/19/18	6	Lead	665	0.37	Ref. 4, pg. 144; 14, pgs. 965, 1130; 40, pgs. 206, 207; 56, pg. 1; 94, pg. 4; 96, pg. 3; 97, pg. 4
153917	7/19/18	6	Lead	367	0.36	Ref. 4, pg. 144; 14, pgs. 966, 1131; 40, pgs. 206, 207; 56, pg. 1; 94, pg. 4; 96, pg. 3; 97, pg. 4
151910	7/16/18	6	Lead	1,300	0.31	Ref. 4, pg. 144; 14, pgs. 31, 556, 877; 40, pgs. 210, 211; 56, pg. 1; 94, pg. 4; 96, pg. 3; 97, pg. 4
151889	7/16/18	6	Lead	982	0.31	Ref. 4, pg. 144; 14, pgs. 32, 405, 876; 40, pgs. 210, 211; 56, pg. 1; 94, pg. 4; 96, pg. 3; 97, pg. 4
151896	7/13/18	6	Lead	425	0.30	Ref. 4, pg. 144; 14, pgs. 34, 423, 876; 40, pgs. 212, 213; 56, pg. 1; 94, pg. 4; 96, pg. 3; 97, pg. 4
153912	7/19/18	6	Lead	476	0.42	Ref. 4, pg. 144; 14, pgs. 1115; 40, pgs. 214, 215; 56, pg. 1; 94, pg. 4; 96, pg. 3; 97, pg. 4

Lab # (Refer to Ref. 78 for the corresponding sample ID)	Date Sampled	Depth of Sample (inches bgs)	Hazardous Substance	Hazardous Substance Concentration (mg/kg) [Adjusted Concentration]	Laboratory Reporting Limit/Adjusted Method Detection Limit (mg/kg)	Reference (Refer to Tables 28 and 29 for references regarding inferred locations)
153913	7/19/18	6	Lead	539	0.40	Ref. 4, pg. 144; 14, pgs. 968, 1116; 40, pgs. 214, 215; 56, pg. 1; 94, pg. 4; 96, pg. 3; 97, pg. 4
153920	7/19/18	6	Lead	684	0.31	Ref. 4, pg. 144; 14, pgs. 970, 1134; 40, pgs. 208, 209; 56, pg. 1; 94, pg. 4; 96, pg. 3; 97, pg. 4
153919	7/19/18	6	Lead	365	0.39	Ref. 4, pg. 144; 14, pgs. 969, 1133; 40, pgs. 208, 209; 56, pg. 1; 94, pg. 4; 96, pg. 3; 97, pg. 4
169976	8/17/18	6	Lead	1,010	0.36	Ref. 4, pg. 145; 15, pg. 460, 643; 40, pgs. 218, 219; 56, pg. 1; 94, pg. 4; 95, pgs. 54, 55, 57; 96, pg. 3; 97, pg. 4
169977	8/17/18	6	Lead	595	0.38	Ref. 4, pg. 145; 15, pgs. 461, 653; 40, pgs. 220, 221; 56, pg. 1; 94, pg. 4; 96, pg. 3; 97, pg. 4
132475	6/4/18	6	Lead	705	0.31	Ref. 4, pg. 147; 13, pgs. 19, 276; 40, pgs. 224, 225; 56, pg. 1; 94, pg. 1; 96, pg. 2; 97, pg. 1
Inferred						
143720	6/20/18	6	Lead	738	0.34	Ref. 4, pg. 147; 13, pgs. 1521, 2444, 2445; 40, pgs. 226, 227; 56, pg. 1; 94, pg. 1; 96, pg. 2; 97, pg. 1
143729	6/20/18	6	Lead	410	0.32	Ref. 4, pg. 147; 13, pgs. 1520, 2448; 40, pgs. 226, 227; 56,

Lab # (Refer to Ref. 78 for the corresponding sample ID)	Date Sampled	Depth of Sample (inches bgs)	Hazardous Substance	Hazardous Substance Concentration (mg/kg) [Adjusted Concentration]	Laboratory Reporting Limit/Adjusted Method Detection Limit (mg/kg)	Reference (Refer to Tables 28 and 29 for references regarding inferred locations)
						pg. 1; 94, pg. 1; 96, pg. 2; 97, pg. 1
Inferred						
151887	7/16/18	6	Lead	443	0.33	Ref. 4, pg. 147; 14, pgs. 18, 403, 876; 40, pgs. 228, 229; 56, pg. 1; 94, pg. 1; 96, pg. 2; 97, pg. 1
151897	7/16/18	6	Lead	549	0.32	Ref. 4, pg. 147; 14, pgs. 19, 424, 876; 40, pgs. 228, 229; 56, pg. 1; 94, pg. 1; 96, pg. 2; 97, pg. 1
132497	6/7/18	6	Lead	669 J [465.58]	0.34	Ref. 4, pg. 147; 13, pgs. 28, 347; 40, pgs. 230, 231; 56, pg. 1; 94, pg. 1; 95, pgs. 161, 164, 166, 167; 96, pg. 2; 97, pg. 1
132498	6/7/18	6	Lead	557	0.31	Ref. 4, pg. 147; 13, pgs. 26, 353; 40, pgs. 230, 231; 56, pg. 1; 94, pg. 1; 96, pg. 2; 97, pg. 1
132499	6/7/18	6	Lead	645	0.29	Ref. 4, pg. 147; 13, pgs. 8, 27, 354; 40, pgs. 230, 231; 56, pg. 1; 94, pg. 1; 96, pg. 2; 97, pg. 1
143693	6/15/18	6	Lead	436	0.35	Ref. 4, pg. 147; 13, pgs. 1522, 2434; 40, pgs. 232, 233; 56, pg. 1; 94, pg. 3; 96, pg. 2; 97, pg. 3
Inferred						
Inferred						

Lab # (Refer to Ref. 78 for the corresponding sample ID)	Date Sampled	Depth of Sample (inches bgs)	Hazardous Substance	Hazardous Substance Concentration (mg/kg) [Adjusted Concentration]	Laboratory Reporting Limit/Adjusted Method Detection Limit (mg/kg)	Reference (Refer to Tables 28 and 29 for references regarding inferred locations)
1809673 006	4/3/18	6	Lead	1,920	1.28	Ref. 4, pg. 147; 19, pgs. 18, 56, 151-152; 40, pg. 24; 94, pg. 3; 96, pg. 2; 97, pg. 3
105042	4/3/18	6	Lead	732	0.34	Ref. 4, pg. 147; 11, pgs. 14, 345; 40, pgs. 234, 235; 56, pg. 3; 94, pg. 1; 96, pg. 2; 97, pg. 3
105037	4/4/18	6	Lead	501	0.35	Ref. 11, pgs. 16, 226; 40, pgs. 238, 239; 56, pg. 1; 94, pg. 3; 96, pg. 2; 97, pg. 3
105039	4/4/18	6	Lead	587	0.35	Ref. 4, pg. 147; 11, pgs. 15, 228; 40, pgs. 238, 239; 56, pg. 1; 94, pg. 3; 96, pg. 2; 97, pg. 3
1809674 009	4/4/18	6	Lead	1,400	1.46	Ref. 4, pg. 147; 20, pgs. 19, 56, 152-153; 40, pg. 51; 94, pg. 3; 96, pg. 2; 97, pg. 3
151895	7/13/18	6	Lead	610	0.32	Ref. 4, pg. 147; 14, pgs. 24, 422, 876; 40, pgs. 240, 241; 56, pg. 1; 94, pg. 3; 96, pg. 2; 97, pg. 3
955588	11/3/17	6	Lead	732	0.29	Ref. 4, pg. 111, 147; 10, p. 11, 365; 40, pgs. 242, 243; 56, pg. 1; 94, pg. 1; 96, pg. 2; 97, pg. 1
955603	11/3/17	6	Arsenic Lead	52.2 519	1.1 0.35	Ref. 4, pg. 111, 147, 183; 10, pgs.12, 216; 40, pgs. 242, 243; 56, pg. 1; 94, pg. 1; 96, pg. 2; 97, pg. 1
211530	11/15/18	6	Lead	651 J [452.08]	0.31	Ref. 4, pg. 113, 149; 18, pgs. 36, 228; 56,

Lab # (Refer to Ref. 78 for the corresponding sample ID)	Date Sampled	Depth of Sample (inches bgs)	Hazardous Substance	Hazardous Substance Concentration (mg/kg) [Adjusted Concentration]	Laboratory Reporting Limit/Adjusted Method Detection Limit (mg/kg)	Reference (Refer to Tables 28 and 29 for references regarding inferred locations)
						pg. 1; 94, pg. 2; 95, pgs. 526, 528, 529, 530; 96, pg. 3; 97, pg. 2
Inferred						
Inferred						
955605	11/2/17	6	Lead	556	0.28	Ref. 4, pg. 147; 10, pgs. 17, 218; 40, pgs. 244, 245; 56, pg. 1; 94, pg. 1; 96, pg. 3; 97, pg. 1
211521	11/14/18	6	Lead	699	0.33	Ref. 4, pg. 148; 18, pgs.16, 177; 56, pg. 1; 94, pg. 3; 96, pg. 3; 97, pg. 3
211523	11/14/18	6	Lead	434	0.34	Ref. 4, pg. 148; 18, pgs. 18, 221; 56, pg. 1; 94, pg. 3; 96, pg. 3; 97, pg. 3
955622	11/2/17	6	Lead	766	0.29	Ref. 10, pgs. 21, 244: 40, pgs. 246, 247; 56, pg. 1; 94, pg. 1; 96, pg. 3; 97, pg. 1
955620	11/2/177	6	Lead	620	0.33	Ref. 4, pg. 148; 10, pgs. 22, 242; 40, pgs. 246, 247; 56, pg. 1; 94, pg. 1; 96, pg. 3; 97, pg. 1
Inferred						
Inferred						
157115	7/25/18	6	Lead	625	0.39	Ref. 4, pg. 148; 14, pgs. 1390, 1553; 40, pgs. 248, 249; 56, pg. 1; 94, pg. 1; 96, pg. 3; 97, pg. 1
Inferred						

Lab # (Refer to Ref. 78 for the corresponding sample ID)	Date Sampled	Depth of Sample (inches bgs)	Hazardous Substance	Hazardous Substance Concentration (mg/kg) [Adjusted Concentration]	Laboratory Reporting Limit/Adjusted Method Detection Limit (mg/kg)	Reference (Refer to Tables 28 and 29 for references regarding inferred locations)
Inferred						
1809674 002	4/3/18	6	Arsenic	206	0.27	Ref. 4, pg. 148, 184; 20, pgs. 12, 49, 138-139, 250; 40, pgs. 15; 94, pg. 2; 96, pg. 3; 97, pg. 2
105043	4/12/18	6	Arsenic Lead	66.1 502	1.1 0.35	Ref. 4, pg. 148; 11, pgs. 20, 346; 56, pg. 1; 94, pg. 2; 96, pg. 3; 97, pg. 2
114793	5/1/18	12-18	Arsenic	50.1	0.95	Ref. 4, pg. 148; 11, pgs. 631, 1076; 56, pg. 1; 94, pg. 2; 96, pg. 3; 97, pg. 2
114795	5/1/18	6-12	Arsenic Lead	128 592	1.0 0.31	Ref. 4, pg. 147; 11, pgs. 629, 1078; 94, pg. 2; 96, pg. 3; 97, pg. 2
Inferred						
Inferred						
211504	11/14/18	6	Lead	688	0.32	Ref. 4, pg. 148; 18, pgs. 29, 149; 56, pg. 1; 94, pg. 2; 96, pg. 3; 97, pg. 2
211503	11/14/18	6	Lead	681	0.32	Ref. 4, pg. 148; 18, pgs. 28, 148; 56, pg. 1; 94, pg. 2; 96, pg. 3; 97, pg. 2
Inferred						
132479	6/6/18	6	Lead	653	0.3	Ref. 4, pg. 148; 13, pgs. 41, 283; 40, pgs. 252, 253; 56, pg. 1; 94, pg. 2; 96, pg. 3; 97, pg. 2
955581	6/6/17	6	Lead	993	0.32	Ref. 4, pg. 148; 10, pgs. 31, 354; 40, pgs. 254, 255; 56,

Lab # (Refer to Ref. 78 for the corresponding sample ID)	Date Sampled	Depth of Sample (inches bgs)	Hazardous Substance	Hazardous Substance Concentration (mg/kg) [Adjusted Concentration]	Laboratory Reporting Limit/Adjusted Method Detection Limit (mg/kg)	Reference (Refer to Tables 28 and 29 for references regarding inferred locations)
						pg. 1; 94, pg. 2; 96, pg. 3; 97, pg. 2
132483	6/04/18	6	Lead	718	0.31	Ref. 4, pg. 148; 13, pgs. 42, 327; 40, pgs. 256, 257; 56, pg. 1; 94, pg. 2; 96, pg. 3; 97, pg. 2
132487	6/4/18		Lead	627	0.30	Ref. 4, pg. 148; 13, pgs. 43, 334; 40, pgs. 256, 257; 56, pg. 1; 94, pg. 2; 96, pg. 3; 97, pg. 2
Inferred						
845987	3/22/17	6	Lead	388	0.31	Ref. 4, pg. 149; 22, pgs. 148, 1157; 40, pgs. 258, 259; 56, pg. 1; 94, pg. 2; 96, pg. 3; 97, pg. 2
Inferred						
Inferred						
143695	6/15/18	6	Lead	904	0.33	Ref. 4, pg. 149; 13, pgs. 1558, 2434, 2435; 40, pgs. 260, 261; 56, pg. 1; 94, pg. 2; 96, pg. 3; 97, pg. 2
143683	6/5/18	6	Lead	650	0.33	Ref. 13, pgs. 1559, 2430; 40, pgs. 260, 261; 56, pg. 1; 94, pg. 2; 96, pg. 3; 97, pg. 2
Inferred						
132463	6/5/18	6	Lead	395	0.32	Ref. 4, pg. 149; 13, pgs. 45, 256; 40, pgs. 266, 267; 56, pg. 1; 94, pg. 2; 96, pg. 3; 97, pg. 2

Lab # (Refer to Ref. 78 for the corresponding sample ID)	Date Sampled	Depth of Sample (inches bgs)	Hazardous Substance	Hazardous Substance Concentration (mg/kg) [Adjusted Concentration]	Laboratory Reporting Limit/Adjusted Method Detection Limit (mg/kg)	Reference (Refer to Tables 28 and 29 for references regarding inferred locations)
132464	6/5/18	6	Lead	434	0.31	Ref. 4, pg. 149; 13, pgs. 46, 257; 40, pgs. 266, 267; 56, pg. 1; 94, pg. 2; 96, pg. 3; 97, pg. 2
132474	6/5/18	6	Lead	381	0.30	Ref. 4, pg. 149; 13, pgs. 47, 275; 40, pgs. 266, 267; 56, pg. 1; 94, pg. 2; 96, pg. 3; 97, pg. 2
211530	11/15/18	6	Lead	651 J [452.08]	0.31	Ref. 4, pg. 149; 18, pgs. 36, 228; 56, pg. 1; 94, pg. 2; 95, pgs. 526, 528, 529, 530; 96, pg. 3; 97, pg. 2
1809673 012	4/4/18	6	Lead	741	0.20	Ref. 4, pg. 149; 19, pgs. 24, 62, 163-164, 306; 40, pgs. 65; 94, pg. 2; 96, pg. 3; 97, pg. 2
1809674 014	4/5/18	6	Lead	525	0.20	Ref. 4, pg. 130; 20, p. 24, 61, 162-163, 256; 40, pgs. 73; 94, pg. 3; 96, pg. 2; 97, pg. 3
105024	4/5/18	6	Lead	512	0.31	Ref. 4, pg. 130; 11, pgs. 26, 200; 40, 270, 271; 56, pg. 1; 94, pg. 3; 96, pg. 2; 97, pg. 3
821153	11/28/16	12-18	Lead	692	1.2	Ref. 4, pg. 136; 21, pgs. 205, 1061; 40, pgs. 272, 273; 56, pg. 1; 94, pg. 3; 96, pg. 2; 97, pg. 3
Inferred						
Inferred						
Inferred						
143680	6/27/18	6	Lead	612	0.32	Ref. 4, pg. 143; 13. pgs. 1570, 2428,

Lab # (Refer to Ref. 78 for the corresponding sample ID)	Date Sampled	Depth of Sample (inches bgs)	Hazardous Substance	Hazardous Substance Concentration (mg/kg) [Adjusted Concentration]	Laboratory Reporting Limit/Adjusted Method Detection Limit (mg/kg)	Reference (Refer to Tables 28 and 29 for references regarding inferred locations)
						2429; 40, pgs. 274, 275; 56, pg. 1; 94, pg. 3; 96, pg. 2; 97, pg. 3
151905	7/12/18	6	Lead	472	0.31	Ref. 14, pgs. 46, 434, 877; 40, pgs. 280, 281; 56, pg. 1; 94, pg. 3; 96, pg. 3; 97, pg. 3
151906	7/12/18	6	Lead	472	0.30	Ref. 4, pg. 148; 14, pgs. 47, 435, 877; 40, pgs. 280, 281; 56, pg. 1; 94, pg. 3; 96, pg. 3; 97, pg. 3
Inferred						
211506	11/14/18	6	Lead	690	0.33	Ref. 4, pg. 148; 18, pgs. 40, 151; 94, pg. 3; 96, pg. 3; 97, pg. 3
211514	11/14/18	6	Lead	386	0.32	Ref. 4, pg. 148; 18, p. 41, 170; 56, pg. 1; 94, pg. 3; 96, pg. 3; 97, pg. 3
211505	11/14/18	6	Lead	555	0.33	Ref. 4, pg. 148; 18, pgs. 42, 150; 94, pg. 3; 96, pg. 3; 97, pg. 3
Inferred						
820333	11/28/16	6	Lead	674	1.1	Ref. 4, pg. 148; 21, pgs. 223, 764; 40, pgs. 282, 283; 56, pg. 1; 94, pg. 3; 96, pg. 3; 97, pg. 3
955599	10/31/17	6	Lead	709	0.30	Ref. 4, pg. 148; 10, pgs. 36, 399; 40, pgs. 286, 287; 56, pg. 1; 94, pg. 3; 96, pg. 3; 97, pg. 3

Lab # (Refer to Ref. 78 for the corresponding sample ID)	Date Sampled	Depth of Sample (inches bgs)	Hazardous Substance	Hazardous Substance Concentration (mg/kg) [Adjusted Concentration]	Laboratory Reporting Limit/Adjusted Method Detection Limit (mg/kg)	Reference (Refer to Tables 28 and 29 for references regarding inferred locations)
820326	11/28/166	6	Lead	2,040 J** [1416.66]	1.3	Ref. 21, pgs. 231, 750; 40, pgs. 288, 289; 56, pg. 1; 94, pg. 3; 95, pgs. 555, 558, 561, 563, 564, 565; 96, pg. 3; 97, pg. 3
820331	11/28/16	6	Lead	548 J [380.55]	0.76	Ref. 4, pg. 148; 21, pgs. 235, 752; 40, pgs. 288, 289; 94, pg. 3; 95, pgs. 555, 558, 561, 563, 564, 565; 96, pg. 3; 97, pg. 3
136493	6/13/18	6	Lead	809	0.34	Ref. 4, pg. 148; 13, Pgs. 859, 1453; 40, pgs. 290, 291; 56, pg. 1; 94, pg. 1; 96, pg. 3; 97, pg. 1
136491	6/13/18	6	Lead	680	0.30	Ref. 4, pg. 148; 13, pgs. 858, 1452; 40, pgs. 290, 291; 56, pg. 1; 94, pg. 1; 96, pg. 3; 97, pg. 1
157112	7/25/18	6	Lead	1,860	0.46	Ref. 4, pg. 148; 14, pgs. 1392, 1544; 40, pgs. 292, 293; 56, pg. 1; 94, pg. 1; 96, pg. 3; 97, pg. 1
157116	7/25/18	6	Lead	1,270	0.30	Ref. 4, pg. 148; 14, pgs. 1391, 1559; 40, pgs. 292, 293; 56, pg. 1; 94, pg. 1; 96, pg. 3; 97, pg. 1
157114	7/27/18	6	Lead	776	0.32	Ref. 4, pg. 148; 14, pgs. 1393, 1552; 56, pg. 1; 94, pg. 1; 96, pg. 3; 97, pg. 1
157117	7/25/18	6	Lead	1,250	0.33	Ref. 4, pg. 148; 14, pgs. 1396, 1560; 40, pgs. 296, 297; 56,

Lab # (Refer to Ref. 78 for the corresponding sample ID)	Date Sampled	Depth of Sample (inches bgs)	Hazardous Substance	Hazardous Substance Concentration (mg/kg) [Adjusted Concentration]	Laboratory Reporting Limit/Adjusted Method Detection Limit (mg/kg)	Reference (Refer to Tables 28 and 29 for references regarding inferred locations)
						pg. 1; 94, pg. 1; 96, pg. 3; 97, pg. 1
151967	6/29/18	6	Lead	598	0.28	Ref. 14, pgs. 51, 879; 40, pgs. 302, 303; 56, pg. 1; 4, pg. 11401,11,358, 11360; 68, pg. 1; 80, pg. 1; 94, pg. 1; 96, pg. 5; 97, pg. 2
955598	11/1/17	6	Lead	637	0.28	Ref. 4, pg. 156; 10, pgs. 46, 389; 40, pgs. 316, 317; 56, pg. 1; 94, pg. 2; 96, pg. 5; 97, pg. 2
Inferred						
157113	7/25/18	6	Lead	1,200	0.38	Ref, 14, pgs. 1397, 1551; 40, pgs. 322, 323; 56, pg. 1; 94, pg. 2; 96, pg. 5; 97, pg. 2
Inferred						
184407	9/20/18	6	Lead	637	0.28	Ref. 16, pgs. 440, 520; 40, pgs. 324, 325; 56, pg. 1; 94, pg. 2; 96, pg. 5; 97, pg. 2
820351	11/28/166	6	Lead	797	0.69	Ref. 4, pg. 157; 21, pgs. 253, 899; 40, pgs. 326, 327; 56, pg. 1; 94, pg. 2; 96, pg. 5; 97, pg. 2
820350	11/28/16	6	Lead	526	0.80	Ref. 4, pg. 156; 21, pgs. 251, 898; 40, pgs. 326, 327; 56, pg. 1; 94, pg. 2; 96, pg. 5; 97, pg. 2
169990	8/24/18	6	Lead	948	0.28	Ref. 4, pg. 157; 15, pgs. 472, 670; 40, pgs. 330, 331; 94,

Lab # (Refer to Ref. 78 for the corresponding sample ID)	Date Sampled	Depth of Sample (inches bgs)	Hazardous Substance	Hazardous Substance Concentration (mg/kg) [Adjusted Concentration]	Laboratory Reporting Limit/Adjusted Method Detection Limit (mg/kg)	Reference (Refer to Tables 28 and 29 for references regarding inferred locations)
						pg. 2; 96, pg. 5; 97, pg. 2
151968	7/10/18	6	Lead	475	0.28	Ref. 4, pg. 160; 14, pgs. 55, 278, 879; 40, pgs. 332, 333; 56, pg. 1; 94, pg. 2; 96, pg. 5; 97, pg. 2
132489	6/8/18	6	Lead	870	0.39	Ref. 4, pg. 148; 13, pgs. 36, 336; 40, pgs. 336, 337; 56, pg. 1; 94, pg. 2; 96, pg. 5; 97, pg. 4
132495	6/8/18	6	Lead	553	0.32	Ref. 4, pg. 144; 13, pgs. 37, 345; 40, pgs. 336, 337; 56, pg. 1; 94, pg. 4; 96, pg. 5; 97, pg. 4
197012	10/18/18	6	Lead	523	0.31	Ref. 4, pg. 148; 17, pgs. 354, 431; 94, pg. 4; 96, pg. 3; 97, pg. 4
136528	6/5/18	6	Lead	395	0.39	Ref. 4, pg. 149; 13, pgs. 850, 1459; 40, pgs. 338, 339; 56, pg. 1; 94, pg. 4; 96, pg. 3; 97, pg. 4
132480	6/5/18	6	Lead	371	0.29	Ref. 4, pg. 149; 13, pgs. 44, 284; 40, pgs. 338, 339; 56, pg. 1; 94, pg. 4; 96, pg. 3; 97, pg. 4
184413	9/6/18	6	Lead	589 J-	0.32	Ref. 4, pg. 145; 16, pgs. 789, 861; 40, pgs. 340, 341; 56, pg. 1; 94, pg. 4; 96, pg. 3; 97, pg. 4
132493	6/8/18	6	Lead	447	0.29	Ref. 4, pg. 152; 13, pg. 22; 40, pgs. 346, 347; 56, pg. 1; 94, pg. 1; 96, pg. 4; 97, pg. 1

Lab # (Refer to Ref. 78 for the corresponding sample ID)	Date Sampled	Depth of Sample (inches bgs)	Hazardous Substance	Hazardous Substance Concentration (mg/kg) [Adjusted Concentration]	Laboratory Reporting Limit/Adjusted Method Detection Limit (mg/kg)	Reference (Refer to Tables 28 and 29 for references regarding inferred locations)
132490	6/6/18	6	Lead	387	0.34	Ref. 4, pg. 152; 13, pgs. 23, 337; 40, pgs. 350, 351; 56, pg. 1; 94, pg. 1; 96, pg. 4; 97, pg. 1
Inferred						
197023	10/18/18	6	Lead	416	0.35	Ref. 4, pg. 152; 15, pgs. 343, 448, 712; 56, pg. 1; 96, pg. 4
Inferred						
151892	7/13/18	6	Lead	484	0.28	Ref. 4, pg. 152; 14, pgs. 23, 408, 876; 40, pgs. 366, 367; 56, pg. 1; 96, pg. 4
Inferred						
Inferred						
Inferred						
Inferred						
Inferred						
1809674001	4/2/18	6	Arsenic	73.4	1.22	Ref. 4, pg. 137, 173; 20, pgs. 7, 48, 130-131, 164-165; 40, pgs. 4; 94, pg. 3; 96, pg. 3; 97, pg. 3
105028	4/2/18	6	Arsenic	44	1.1	Ref. 4, pg. 173; 11, pgs. 33, 208; 40, pgs. 444, 445; 56, pg. 1; 94, pg. 3; 96, pg. 3; 97, pg. 3
114777	5/01/18	12-18	Arsenic	45.2	0.96	Ref. 4, pg. 137, 173; 11, pgs. 641, 950; 40, pgs. 444, 445; 56, pg. 1; 94, pg. 3; 96, pg. 3; 97, pg. 3
114781	5/01/18	6-12	Arsenic	66.9	0.99	Ref. 4, pg. 173; 11, pgs. 640, 954; 40, pgs. 444, 445; 56,

Lab # (Refer to Ref. 78 for the corresponding sample ID)	Date Sampled	Depth of Sample (inches bgs)	Hazardous Substance	Hazardous Substance Concentration (mg/kg) [Adjusted Concentration]	Laboratory Reporting Limit/Adjusted Method Detection Limit (mg/kg)	Reference (Refer to Tables 28 and 29 for references regarding inferred locations)
						pg. 1; 94, pg. 3; 96, pg. 3; 97, pg. 3
151894	7/12/18	6	Lead	659	0.32	Ref. 4, pg. 152; 14, pgs. 50, 421, 876; 40, pgs. 450, 451; 56, pg. 1; 94, pg. 1; 96, pg. 4; 97, pg. 1
1809673 003	4/2/18	6	Lead	2,540	0.35	Ref. 4, pg. 138; 19, pgs. 15, 53, 146-147, 302; 40, pg. 10; 94, pg. 4; 96, pg. 3; 97, pg. 4
105030	4/12/18	6	Lead	964	0.31	Ref. 4, pg. 138; 11, pgs. 30, 210; 40, pgs. 452, 453; 56, pg. 1; 94, pg. 4; 96, pg. 3; 97, pg. 4
105031	4/2/18	6	Lead	645	0.41	Ref. 4, pg. 138; 11, pgs. 31, 211; 40, pgs. 452, 453; 56, pg. 1; 94, pg.4; 96, pg. 3; 97, pg. 4
1809673 002	4/2/18	6	Lead	1,190	0.25	Ref. 4, pg. 138; 19, pgs. 14, 52, 144-145, 301; 40, pgs. 7; 94, pg. 4; 96, pg. 3; 97, pg. 4
132469	6/05/18	6	Lead	929	0.29	Ref. 4, pg. 149; 13, pgs. 51, 270; 40, pgs. 460, 461; 56, pg. 1; 96, pg. 3
Inferred						
820336	11/29/16	6	Lead	574	0.84	Ref. 4, pg. 154; 21, pgs. 243, 767; 40, pgs. 462, 463; 94, pg. 2; 96, pg. 2; 97, pg. 2

Lab # (Refer to Ref. 78 for the corresponding sample ID)	Date Sampled	Depth of Sample (inches bgs)	Hazardous Substance	Hazardous Substance Concentration (mg/kg) [Adjusted Concentration]	Laboratory Reporting Limit/Adjusted Method Detection Limit (mg/kg)	Reference (Refer to Tables 28 and 29 for references regarding inferred locations)
821148	11/28/16	18-24	Lead	569	1.1	Ref. 4, pg. 157; 21, pgs. 249, 1051; 40, pgs. 464, 465; 56, pg. 1; 94, pg. 2; 96, pg. 5; 97, pg. 2
845979	3/23/17	6	Lead	559	0.30	Ref. 4, pg. 157; 22, pgs. 179, 1148,1149; 40, pgs. 470, 471; 56, pg. 1; 94, pg. 2; 96, pg. 5; 97, pg. 2
845978	3/23/17	6	Lead	473	0.29	Ref. 4, pg. 157; 22, pgs. 176, 1147, 1148; 40, pgs. 470, 471; 56, pg. 1; 94, pg. 2; 96, pg. 5; 97, pg. 2
1809673 001	4/2/18	6	Lead	579	0.29	Ref. 4, pg. 138; 19, pgs. 9, 51, 136-137, 299; 40, pgs. 1; 94, pg. 4; 96, pg. 3; 97, pg. 4
151946	7/10/18	6	Lead	759	0.38	Ref. 4, pg. 134; 14, pgs. 38, 566, 878; 40, pgs. 478,479; 56, pg. 1; 94, pg. 4; 96, pg. 3; 97, pg. 4
151947	7/10/18	6	Lead	1,230	0.31	Ref. 4, pg. 134; 14, pgs. 39, 567, 878; 40, pgs. 478, 479; 56, pg. 1; 94, pg. 4; 96, pg. 3; 97, pg. 4
151953	7/10/18	6	Lead	490	0.31	Ref. 4, pg. 134; 14, pgs. 37, 584, 878; 40, pgs.478, 479; 56, pg. 1; 94, pg. 4; 96, pg. 3; 97, pg. 4
169978	8/17/18	6	Lead	488	0.32	Ref. 4, pg. 134; 15, pgs. 463, 654; 40, pgs. 476, 477; 56, pg. 1; 94, pg. 4; 96, pg. 3; 97, pg. 4

Lab # (Refer to Ref. 78 for the corresponding sample ID)	Date Sampled	Depth of Sample (inches bgs)	Hazardous Substance	Hazardous Substance Concentration (mg/kg) [Adjusted Concentration]	Laboratory Reporting Limit/Adjusted Method Detection Limit (mg/kg)	Reference (Refer to Tables 28 and 29 for references regarding inferred locations)
1809673 007	4/3/18	6	Lead	502	0.29	Ref. 4, pg. 137; 19, pgs. 19, 57, 153-154, 299; 40, pgs. 27; 94, pg. 4; 96, pg. 3; 97, pg. 4
Inferred						
820358	11/28/16	6	Arsenic Lead	45.0 402	3.2 1.0	Ref. 4, pg. 149; 21, pgs. 216, 916; 40, pgs. 490, 491; 56, pg. 1; 94, pg.4; 96, pg. 4; 97, pg. 4
820357	12/16/16	6	Arsenic	57.1	2.4	Ref. 4, pg. 149, 185; 21, pgs. 214, 915; 40, pgs. 490, 491; 56, pg. 1; 94, pg. 4; 96, pg. 4; 97, pg. 4
820359	12/16/16	6	Lead	391	0.94	Ref. 4, pg. 149; 21, pgs. 218, 917; 40, pgs. 490, 491; 56, pg. 1; 94, pg. 4; 96, pg. 4; 97, pg. 4
1809674 004	4/3/18	6	Lead	403	0.25	Ref. 4, pg. 137; 20, pgs. 14, 51, 142-143, 251; 40, pgs. 30; 94, pg. 2; 96, pg. 3; 97, pg. 3
Inferred						
151909	7/10/18	6	Lead	510	0.30	Ref. 4, pg. 137; 14, pgs. 42, 438, 877; 40, pgs. 502, 503; 56, pg. 1; 94, pg. 4; 96, pg. 3; 97, pg. 3
151959	7/1018	6	Lead	455	0.29	Ref. 4, pg. 137; 14, pgs. 43, 589, 879; 40, pgs. 502, 503; 56, pg. 1; 94, pg. 4; 96, pg. 3; 97, pg. 3

Lab # (Refer to Ref. 78 for the corresponding sample ID)	Date Sampled	Depth of Sample (inches bgs)	Hazardous Substance	Hazardous Substance Concentration (mg/kg) [Adjusted Concentration]	Laboratory Reporting Limit/Adjusted Method Detection Limit (mg/kg)	Reference (Refer to Tables 28 and 29 for references regarding inferred locations)
132470	6/06/18	6	Lead	856	0.35	Ref. 4, pg. 154; 13, pgs. 38, 271; 40, pgs. 508, 509; 56, pg. 1; 94, pg. 2; 96, pg. 5; 97, pg. 2
136537	6/15/18	6	Lead	626	0.36	Ref. 4, pg. 153; 13, pgs. 848, 1463; 56, pg. 1; 94, pg. 2; 96, pg. 5; 97, pg. 2
136540	6/15/18	6	Lead	663	0.30	Ref. 4, pg. 154; 13, pgs. 849, 1464; 94, pg. 2; 96, pg. 5; 97, pg. 2
Inferred						
143689	6/29/18	6	Lead	1,440	0.35	Ref. 4, pg. 154; 13, pgs. 1561, 2432; 56, pg. 1; 94, pg. 2; 96, pg. 5; 97, pg. 2
143690	6/14/18	6	Lead	588	0.31	Ref. 4, pg. 154; 13, pgs. 1560, 2432, 2433: 40, pgs. 510, 511; 56, pg. 1; 94, pg. 2; 96, pg. 5; 97, pg. 2
143691	6/26/18	6	Lead	471	0.31	Ref. 4, pg. 154; 13, pgs. 1564, 2433; 40, pgs. 512, 513; 56, pg. 1; 94, pg. 2; 96, pg. 5; 97, pg. 2
143705	6/18/18	6	Lead	701	0.30	Ref. 4, pg. 154; 13, pgs. 1566, 2438, 2439; 40, pgs. 514, 515; 56, pg. 1; 94, pg. 2; 96, pg. 5; 97, pg. 2
143676	6/18/18	6	Lead	765 J [531.25] *	0.31	Ref. 4, pg. 15; 13, pgs. 1567, 2427; 40, pgs. 514, 515; 56, pg. 1; 94, pg. 2; 95, pgs. 309, 311, 315; 96, pg. 5; 97, pg. 2

Lab # (Refer to Ref. 78 for the corresponding sample ID)	Date Sampled	Depth of Sample (inches bgs)	Hazardous Substance	Hazardous Substance Concentration (mg/kg) [Adjusted Concentration]	Laboratory Reporting Limit/Adjusted Method Detection Limit (mg/kg)	Reference (Refer to Tables 28 and 29 for references regarding inferred locations)
143686	6/18/18	6	Lead	689	0.31	Ref. 4, pg. 154; 13, pgs. 1568, 2431; 40, pgs. 514, 515; 56, pg. 1; 94, pg. 2; 96, pg. 5; 97, pg. 2
132471	6/6/18	6	Lead	433	0.29	Ref. 4, pg. 154; 13, pgs. 49, 272; 40, pgs. 506, 507; 56, pg. 1; 94, pg. 2; 96, pg. 5; 97, pg. 2
820341	11/29/16	6	Lead	377	0.93	Ref. 4, pg. 146; 21, pgs. 229, 777; 40, 524, 525; 56, pg. 1; 94, pg. 2; 96, pg. 2; 97, pg. 1
820325	11/28/16	6	Lead	597	0.78	Ref. 4, pg. 149; 21, pgs. 211, 749; 40, pgs. 526, 527, 528, 529; 56, pg. 1; 94, pg. 1; 96, pg. 3; 97, pg. 4
955621	10/30/17	6	Lead	680	0.28	Ref. 4, pg. 149; 10, pgs. 37, 243; 40, pgs. 530, 531; 56, pg. 1; 94, pg. 2; 96, pg. 3; 97, pg. 2
136538	6/11/18	6	Lead	525	0.36	Ref. 13, pgs. 809, 1463; 40, pgs. 100, 101; 56, pg. 1; 94, pg. 1; 96, pg. 2; 97, pg. 1
136541	6/11/18	6	Lead	415	0.34	Ref. 4, pg. 152; 13, pgs. 808, 1465; 40, pgs. 100, 101; 56, pg. 1; 94, pg. 1; 96, pg. 2; 97, pg. 1

Lab # (Refer to Ref. 78 for the corresponding sample ID)	Date Sampled	Depth of Sample (inches bgs)	Hazardous Substance	Hazardous Substance Concentration (mg/kg) [Adjusted Concentration]	Laboratory Reporting Limit/Adjusted Method Detection Limit (mg/kg)	Reference (Refer to Tables 28 and 29 for references regarding inferred locations)
1809674005	4/3/18	6	Lead	434	0.21	Ref. 4, pg. 147; 20, pgs. 15, 52, 144-145, 252; 40, p. 33; 94, pg. 3; 96, pg. 2; 97, pg. 3
132481	6/5/18	6	Lead	420	0.28	Ref. 4, pg. 143; 13, pgs. 30, 285; 40, pgs. 84, 85; 56, pg. 1; 94, pg. 3; 96, pg. 2; 97, pg. 3
114801	4/4/18	6-12	Lead	562	0.34	Ref. 4, pg. 147; 11, pgs. 622, 831; 40, pgs. 86, 87; 56, pg. 1; 94, pg. 3; 96, pg. 2; 97, pg. 3
1809674010	4/4/18	6	Lead	640	0.22	Ref. 4, pg. 147; 20, pgs. 20, 57, 154-155, 254; 40, pgs. 55,56; 94, pg. 3; 96, pg. 2; 97, pg. 3
136490	6/14/18	6	Lead	528	0.34	Ref. 4, pg. 143; 13, pgs. 820, 1452; 40, pgs. 88, 89; 56, pg. 1; 94, pg. 3; 96, pg. 2; 97, pg. 3
153911	7/19/18	6	Lead	761	0.32	Ref. 4, pg. 147; 14, pgs. 961, 1114; 40, pg. 92, 93; 56, pg. 1; 94, pg. 3; 96, pg. 2; 97, pg. 3
Inferred						
114778	4/5/18	12-18	Lead	546	0.32	Ref. 4, pg. 147; 11, pgs. 626, 951; 56, pg. 1; 94, pg. 3; 96, pg. 2; 97, pg. 3
132467	6/4/18	6	Lead	408	0.29	Ref. 4, pg. 152; 13, pgs. 17, 260; 40, pgs. 98, 99; 56, pg. 1; 94, pg. 1; 96, pg. 4; 97, pg. 1

Lab # (Refer to Ref. 78 for the corresponding sample ID)	Date Sampled	Depth of Sample (inches bgs)	Hazardous Substance	Hazardous Substance Concentration (mg/kg) [Adjusted Concentration]	Laboratory Reporting Limit/Adjusted Method Detection Limit (mg/kg)	Reference (Refer to Tables 28 and 29 for references regarding inferred locations)
197014	10/18/18	6	Lead	698	0.31	Ref. 4, pg. 153; 17, pgs. 352, 436; 56, pg. 1; 94, pg. 2; 96, pg. 3; 97, pg. 2
820334	12/16/16	6	Lead	1,680	0.70	Ref. 4, pg. 148; 21, pgs. 187, 765; 56, pg. 1; 94, pg. 2; 96, pg. 3; 97, pg. 2
Inferred						
151960	6/28/18	6	Lead	468	0.33	Ref. 4, pg. 61; 14, pgs. 13, 596, 879; 23, pgs. 27, 28; 40, pgs. 104, 105; 56, pg. 1; 94, pg. 1; 96, pg. 4; 97, pg. 1; 122. pg. 1
151961	6/28/18	6	Lead	453	0.30	Ref. 4, pg. 61; 14, pgs. 14, 597, 879; 40, pgs. 104, 105; 56, pg. 1; 94, pg. 1; 96, pg. 4; 97, pg. 1; 122; pg. 1
151913	7/12/18	6	Lead	702	0.29	Ref. 4, pg. 61, 67, 116, 152; 14, pgs. 15, 565, 877; 40, pgs. 106, 107; 56, pg. 1; 94, pg. 1; 96, pg. 4; 97, pg. 1; 122, pg. 1
151907	7/12/18	6	Lead	497	0.32	Ref. 4, pg. 152; 14, pgs. 16, 436, 877; 40, pgs. 106, 107; 56, pg. 1; 94, pg. 1; 96, pg. 4; 97, pg. 1
151886	7/16/18	6	Arsenic Lead	149 469	0.95 0.30	Ref. 4, pg. 152, 188; 14, pgs. 17, 402, 876; 40, pgs. 108, 109; 56, pg. 1; 94, pg. 1; 96, pg. 4; 97, pg. 1
Inferred						

Lab # (Refer to Ref. 78 for the corresponding sample ID)	Date Sampled	Depth of Sample (inches bgs)	Hazardous Substance	Hazardous Substance Concentration (mg/kg) [Adjusted Concentration]	Laboratory Reporting Limit/Adjusted Method Detection Limit (mg/kg)	Reference (Refer to Tables 28 and 29 for references regarding inferred locations)
151955	6/28/18	6	Lead	395	0.32	Ref. 4, pg. 152; 14, pgs. 20, 586, 878; 40, pgs. 110, 111; 56, pg. 1; 94, pg. 1; 96, pg. 4; 97, pg. 1
Inferred						
151962	6/12/18	6	Lead	422	0.36	Ref. 4, pg. 152; 13, pgs. 825, 1454; 40, pgs. 112, 113; 56, pg. 1; 94, pg. 1; 96, pg. 4; 97, pg. 1
132494	6/7/18	6	Lead	446	0.35	Ref. 4, pg. 152; 13, pgs. 33, 341; 40, pgs. 114, 115; 56, pg. 1; 94, pg. 1; 96, pg. 4; 97, pg. 1
136544	6/7/18	6	Lead	362	0.32	Ref. 4, pg. 152; 13, pgs. 834, 1466; 40, pgs. 118, 119; 56, pg. 1; 94, pg. 1; 96, pg. 4; 97, pg. 1
136545	6/7/18	6	Lead	435	0.34	Ref. 4, pg. 152; 13, pgs. 835, 1466; 6, pg. 1; 94, pg. 1; 96, pg. 4; 97, pg. 1
143684	6/26/18	6	Lead	636	0.35	Ref, 4, pg. 152; 13, pgs. 1528, 2430; 40, pgs. 120, 121; 56, pg. 1; 94, pg. 1; 96, pg. 4; 97, pg. 1
143688	6/26/18	6	Lead	491	0.34	Ref. 4, pg. 152; 13, pgs. 1526, 2432; 40, pgs. 120, 121; 56, pg. 1; 94, pg. 1; 96, pg. 4; 97, pg. 1
143697	6/26/18	6	Lead	475	0.33	Ref. 4, pg. 152; 13, pgs. 1527, 2435; 56, pg. 1; 94, pg. 1; 96, pg. 4; 97, pg. 1
Inferred						

Lab # (Refer to Ref. 78 for the corresponding sample ID)	Date Sampled	Depth of Sample (inches bgs)	Hazardous Substance	Hazardous Substance Concentration (mg/kg) [Adjusted Concentration]	Laboratory Reporting Limit/Adjusted Method Detection Limit (mg/kg)	Reference (Refer to Tables 28 and 29 for references regarding inferred locations)
Inferred						
197022	10/18/18	6	Lead	588	0.31	Ref. 4, pg. 152; 17, pgs. 347, 444; 56, pg. 1; 94, pg. 1; 96, pg. 4; 97, pg. 1
197021	10/18/18	6	Lead	376	0.31	Ref. 4, pg. 152; 17, pg. 346, 443; 56, pg. 1; 94, pg. 1; 96, pg. 4; 97, pg. 1
955590	10/30/17	6	Lead	416	0.29	Ref. 4, pg. 152; 10, pgs. 15, 366; 40, pgs. 122, 123; 56, pg. 1; 94, pg. 1; 96, pg. 4; 97, pg. 1
955594	10/30/17	6	Lead	569	0.29	Ref. 4, pg. 153; 10, pgs. 18, 375; 56, pg. 1; 94, pg. 1; 96, pg. 4; 97, pg. 1
955613	10/30/17	6	Lead	766	0.30	Ref. 4, pg. 153; 10, pgs.19, 230; 40, pgs. 124, 125; 56, pg. 1; 94, pg. 1; 96, pg. 4; 97, pg. 1
955589	10/30/17	6	Lead	912	0.30	Ref. 4, pg. 153; 10, pgs. 20, 365; 40, pgs. 126, 127; 56, pg. 1; 94, pg. 1; 96, pg. 5; 97, pg. 1
956979	11/20/17	6	Lead	987	0.36	Ref. 4, pg. 153; 10, pgs. 733, 884; 40, pgs. 128, 129; 56, pg. 1; 94, pg. 1; 96, pg. 5; 97, pg.1
956980	11/20/17	6	Lead	900	0.31	Ref. 4, pg. 153; 10, pgs. 5, 734, 885; 40, pgs. 128, 129; 56, pg. 1; 94, pg. 1; 95, pgs. 221, 223, 227, 567, 568; 96, pg. 5; 97, pg. 1

Lab # (Refer to Ref. 78 for the corresponding sample ID)	Date Sampled	Depth of Sample (inches bgs)	Hazardous Substance	Hazardous Substance Concentration (mg/kg) [Adjusted Concentration]	Laboratory Reporting Limit/Adjusted Method Detection Limit (mg/kg)	Reference (Refer to Tables 28 and 29 for references regarding inferred locations)
Inferred						
Inferred						
Inferred						
Inferred						
1809673 013	4/4/18	6	Lead	580	0.17	Ref. 4, pg. 153; 19, pgs. 25, 63, 165-166, 307; 94, pg. 1; 96, pg. 5; 97, pg. 1
163424	8/9/18	6	Lead	2,400	0.46	Ref. 4, pg. 153; 15, pgs. 15, 175; 40, pgs. 130, 131; 56, pg. 1; 94, pg. 1; 96, pg. 5; 97, pg. 1
Inferred						
136495	6/12/18	6	Lead	920	0.32	Ref. 4, pg. 153; 13, pgs. 847, 1454; 40, pgs. 138, 139; 56, pg. 1; 94, pg. 2; 96, pg. 5; 97, pg. 2
Inferred						
1809673 008	4/3/18	6	Lead	520	0.19	Ref. 4, pg. 154; 19. pgs. 20, 58, 155-156, 304; 40, pgs. 39, 140, 141; 94, pg. 2; 96, pg. 5; 97, pg. 2
1809674 006	4/3/18	6	Lead	514	0.22	Ref. 4, pg. 154; 20, pgs. 16, 53, 146-147, 252; 40, pgs. 36; 94, pg. 2; 96, pg. 5; 97, pg. 2
105041	4/3/18	6	Lead	568 J [394.44]	0.33	Ref. 4, pg. 154; 11, pgs. 21, 339-340; 40, pgs. 140, 141; 56, pg. 1; 94, pg. 1; 95, pgs. 38, 40, 41, 51; 96, pg. 5; 97, pg. 2
143717	6/28/18	6	Lead	723	0.32	Ref. 4, pg. 154; 13, pgs. 1569, 2443; 40,

Lab # (Refer to Ref. 78 for the corresponding sample ID)	Date Sampled	Depth of Sample (inches bgs)	Hazardous Substance	Hazardous Substance Concentration (mg/kg) [Adjusted Concentration]	Laboratory Reporting Limit/Adjusted Method Detection Limit (mg/kg)	Reference (Refer to Tables 28 and 29 for references regarding inferred locations)
						pgs. 142, 143; 56, pg. 1; 94, pg. 2; 96, pg. 5; 97, pg. 2
Inferred						
Inferred						
955584	11/2/17	6	Lead	817	0.34	Ref. 10, pgs. 32,361; 40, pgs. 144, 143; 56, pg. 1; 94, pg. 2; 96, pg. 5; 97, pg. 2
169980	8/7/18	6	Lead	707	0.37	Ref. 4, pg. 154; 15, pgs. 462, 656; 40, pgs. 146, 147; 56, pg. 1; 94, pg. 2; 96, pg. 5; 97, pg. 2
Inferred						
211509	11/14/18	6	Lead	535	0.32	Ref. 4, pg. 154; 18, pgs. 37, 157; 56, pg. 1; 94, pg. 2; 96, pg. 5; 97, pg. 2
211510	11/14/18	6	Lead	407	0.32	Ref. 4, pg. 154; 18, pgs. 38, 158; 56, pg. 1; 94, pg. 2; 96, pg. 5; 97, pg. 2
211511	11/14/18	6	Lead	392	0.30	Ref. 4, pg. 154; 18, pgs. 39, 159; 56, pg. 1; 94, pg. 2; 96, pg. 5; 97, pg. 2

bgs = below ground surface

151963 – J Laboratory noted “matrix spike and/or matrix spike duplicate recoveries and post-digestion recoveries, outside the acceptance limits” for this sample result. However, spike recovery limits do not apply when the sample concentration is ≥ 4X the spike added. Serial dilution was also performed on this sample and the percent difference values exceeded the acceptance limits. Therefore, the result for Lead in this sample is qualified as estimated, and the result has been adjusted using the appropriate factor per EPA fact sheet, Using Qualified Data to Document an Observed Release and Observed Contamination (Ref. 24).

32497 – J Laboratory noted “matrix spike and/or matrix spike duplicate recoveries and post-digestion recoveries, outside the acceptance limits” for these sample results. However, spike recovery limits do not apply when the sample concentration is ≥ 4X the spike added. Serial dilution was also performed on these samples and the percent difference values exceeded the

acceptance limits. Therefore, the results for Lead in these samples are qualified as estimated, and the results have been adjusted using the appropriate factor per Using Qualified Data to Document an Observed Release and Observed Contamination (Ref. 24).

211530 – J – Laboratory noted “matrix spike and/or matrix spike duplicate recovery outside acceptance limits” for this sample result. However, spike recovery limits do not apply when the sample concentration is ≥ 4X the spike added, and therefore, the result is not qualified for matrix spike recovery outside acceptable limits. The serial dilution for lead exceeded the control limit for Lead. The results are qualified estimated, bias unknown and adjusted per Using Qualified Data to Document an Observed Release and Observed Contamination (Refs. 24; 95, pg. 2).

211530 – J – Laboratory noted “matrix spike and/or matrix spike duplicate recovery outside acceptance limits” for this sample result. However, spike recovery limits do not apply when the sample concentration is ≥ 4X the spike added, and therefore, the result is not qualified for matrix spike recovery outside acceptable limits. The serial dilution for lead exceeded the control limit for Lead. The results are qualified estimated, bias unknown and adjusted per Using Qualified Data to Document an Observed Release and Observed Contamination (Refs. 24; 95, pg. 2).

820326 – J** The field duplicate sample results for these two samples qualified as estimated with an unknown bias and have been adjusted using the appropriate factor per Using Qualified Data to Document an Observed Release and Observed Contamination (Refs. 24; 95, pg. 2).

820331 and 820332 – J Laboratory noted “matrix spike and/or matrix spike duplicate recoveries and post-digestion recoveries, outside the acceptance limits” for this sample result. However, spike recovery limits do not apply when the sample concentration is 2: 4X the spike added. Serial dilution was also performed on this sample and the percent difference values exceeded the acceptance limits. Therefore, the result for Lead in this sample is qualified as estimated with an unknown bias, and the result has been adjusted using the appropriate factor per Using Qualified Data to Document an Observed Release and Observed Contamination (Refs. 24; 95, pg. 2).

184413 – J- = Sample concentration may be biased low and did not require adjustment per Using Qualified Data to Document an Observed Release and Observed Contamination (Ref. 24).

143676 - * Lead results qualified as estimated (flagged “J”) with an unknown bias due to serial dilution recovery failures and have been adjusted using the appropriate factor per Using Qualified Data to Document an Observed Release and Observed Contamination (Ref. 24).

105041 – J Laboratory noted “matrix spike and/or matrix spike duplicate recoveries and post-digestion recoveries, outside the acceptance limits” for this sample result. However, spike recovery limits do not apply when the sample concentration is ≥ 4X the spike added. Serial dilutions were also performed on these two samples and the percent difference values exceeded the acceptance limits. Therefore, the results for Lead in these two samples are qualified as estimated with an unknown bias, and the results were adjusted using the appropriate factor per Using Qualified Data to Document an Observed Release and Observed Contamination (Ref. 24).

Table 11 below depicts the containment description and containment value with references.

TABLE 11

Containment Description and Value

Containment Description	Containment Factor Value	References
Gas release to air:	NS	
Particulate release to air:	NS	
Release to ground water:	NS	
Release via overland migration and/or flood: Samples were collected from residential yards. No maintained engineered cover and no functioning and maintained run-on control system and runoff management system for the residential contaminated soils were noted on the field sheets, thus enabling hazardous substances to migrate from the contaminated soils on the former Federated Metals property.	10	Refer to Table 10 of this HRS documentation record; Figure 3; Figure 2; Ref. 1, Table 4-2; 76, pg. 2; 40

Notes:
NS Not Scored

2.4.2.1 HAZARDOUS WASTE QUANTITY

The hazardous substances associated with each waste type are shown in Section 2.2.2 of this documentation record.

Area of Contamination Hazardous Waste Quantity for Source #3

2.4.2.1.1 Tier A - Hazardous Constituent Quantity:

The total hazardous constituent quantity for AOC A could not be adequately determined according to the HRS requirements; that is, the total mass of all CERCLA hazardous substances in Source #3 (AOC A) is not known and cannot be estimated with reasonable confidence (Ref. 1, Section 2.4.2.1.1). Contaminant concentrations are not uniform throughout the source and sufficient historical and current data (manifests, potentially responsible party [PRP]) records, State records, permits, waste concentration data, etc.) are not available to adequately calculate the total or partial mass of all CERCLA hazardous substances associated with Source #3 (AOC A). Therefore, there is insufficient information to calculate a total or partial Hazardous Constituent Quantity estimate for Source #3 (AOC A) with reasonable confidence. As a result, scoring proceeds to the evaluation of Tier B, Hazardous Wastestream Quantity (Ref. 1, Section 2.4.2.1.1, Table 5-2).

Hazardous Constituent Quantity Assigned Value: NS
Hazardous Constituent Quantity Complete? No

2.4.2.1.2 Tier B - Hazardous Wastestream Quantity:

The total hazardous wastestream quantity for Source #3 (AOC A) could not be adequately determined according to the HRS requirements; that is, the total mass of all hazardous wastestreams and CERCLA pollutants and contaminants in Source #3 (AOC A) are not known and cannot be estimated with reasonable confidence (Ref. 1, Section 2.4.2.1.2). Contaminant concentrations are not uniform throughout the source and sufficient historical and current data (manifests, PRP records, State records, permits, waste concentration data, annual reports, etc.) are not available to adequately calculate the total mass of all hazardous wastestreams and CERCLA pollutants and contaminants in and Source #3 (AOC A). Therefore, there is insufficient information to adequately calculate the total or partial mass of the wastestream in Source #3 (AOC A). Therefore, there is insufficient information to evaluate the hazardous wastestream quantity for Source #3 (AOC A) with reasonable confidence. As a result, scoring proceeds to the evaluation of Tier C, Volume (Ref. 1, Section 2.4.2.1.2, Table 5-2).

Hazardous Wastestream Quantity Assigned Value: NS

2.4.2.1.3 Tier C - Volume:

The information available on the depth of Source #3 (AOC A) is not sufficiently specific to support a volume of contaminated soil with reasonable confidence; therefore, it is not possible to assign a volume (Tier C) in cubic yards (yd^3) for Source #3 (AOC A) (Ref. 1, Section 2.4.2.1.3). The source has been assigned a value of 0 for the volume measure (Ref. 1, Section 2.4.2.1.3). As a result, scoring of proceeds to the evaluation of Tier D, Area (Ref. 1, Sec. 2.4.2.1.4, Table 5-2).

Volume Assigned Value: 0
(Ref. 1, Section 2.4.2.1.3)
Are the data complete for volume quantity for this area? No

2.4.2.1.4. Tier D - Area

Description

The contaminated soil consisting of lead and arsenic concentrations that are equal to or greater than three (3) times background levels for Source #3 has been found to exist throughout residential areas north and east of the former Federated Metals facility (Ref 76, pg. 2; Tables 2, 10, Figure 2 and Figure 3 of this HRS documentation record shows the outline of Source #3 (AOC A). Since not every residential property has been sampled to determine the impacted area, an exact area of contamination is not known.

TABLE 12

Area Assigned Value

Source Type	Units (ft^2)	References
Contaminated Soil	Unknown but > 0	Unknown but > 0

Sum (ft^2):
Equation for Assigning Value (Ref. 1, Section 2.4.2.1.4, Tables 2-5 and 5-2): Area (A)/34,000
Unknown but > 0

Area Assigned Value: Unknown but > 0
(Ref. 1, Section 2.4.2.1.4)

2.4.2.1.5. Source Hazardous Waste Quantity Value

According to Section 2.4.2.1.5 of the HRS, select the highest of the values assigned to the source (or areas of observed contamination, areas of observed exposure, or areas of subsurface contamination) for the hazardous constituent quantity, hazardous wastestream quantity, volume, and area measures. Assign this value as the source hazardous waste quantity value for Source #3 (Ref. 1, Section 2.4.2.1.5).

Highest assigned value assigned from Ref. 1, Table 2-5: Unknown but > 0

4.0 SURFACE WATER MIGRATION PATHWAY

4.1 OVERLAND/FLOOD MIGRATION COMPONENT

Lake George is located adjacent to the south/southwest of the former Federated Metals property. Various wetlands surround this lake (Figure 5 of this HRS documentation record). The RCRA Corrective Measure report, stated that the overall Corrective Action Objectives for site media are, to the extent practicable, to eliminate significant releases from SWMUs that pose threats to human health and the environment, and to clean up contaminated media to a level consistent with reasonably expected and current uses (Ref. 38, pg. 8).

The RCRA SWMU #1 (Source #1) accepted much of the wastes generated at the facility, including the following solid wastes: blast furnace slag from cupola operations; zinc oxide fume from the brass and cupola operation; tin/lead fume; low tin slag; zinc hopper dust; zinc sludge; and used firebrick (Ref. 38, pg. 13). This landfill is considered Source #1. Sediment sampling conducted for RCRA by the RCRA Facility Investigation (RFI) suggested elevated levels of contaminants, including lead (Ref. 38, pgs. 16, 21).

Materials at SWMU#1 (Source #1) encroached into Lake George and a sedge meadow (Ref. 38, pg. 21; 101, pg. 20). The sedge meadow is a wetland being scored that is located along the south side of Source #1 and adjacent to the southern PPE (Ref. 27, pg. 38; Figure 6 of this HRS documentation record).

Because materials at SWMU #1 (Source #1) encroached into the lake and sedge meadow, Corrective Action Objectives for Lake George included bringing visible waste materials that encroached into the lake and sedge meadow back to the landfill where they were confined under an engineered barrier (Ref. 38, pg. 21; 101, pg. 20). Only a 100-foot area of Lake George was dredged and deposited into SWMU #1 (Source #1) (Ref. 27, pgs. 17, 38).

In addition, contaminated soils (Source #2) within the top two (2) feet are present on the former Federated Metals property (Refs. 37; 57, pgs. 1- 7; 76, pg. 2; Table 6 and Figures 2 and 3 of this HRS documentation record).

Additional sediment sampling of Lake George by IDEM during the ESI, revealed that high levels of lead are still present in Lake George and within surrounding wetlands (Ref. 5, pg. 49; Table 15 and 19 of this HRS documentation record).

Lead levels in the Lake George sediments were found to be as high as 2,000 mg/kg (Ref. 5, pg. 49; Table 15 of this HRS documentation record). Lead levels in the wetland sediments were found to be as high as 2,500 mg/kg (Ref. 5, pg. 49; Table 19 of this HRS documentation record).

The surface water pathway starts at the edge of the RCRA SWMU #1 (Source #1) which is the entire west and south portions of the former Federated Metals property. SWMU #1 (Source #1) is adjacent to Lake George and wetlands (Ref. 4, pg. 50; 38, pg. 21; Tables 15 and 19 of this documentation record; Figure 6 of this documentation record). There are sensitive environments such as wetlands and habitats for endangered species in the vicinity of the site (Ref. 63, pgs. 1-3; 70, pg. 1; 91, pg. 2; 113, pg. 3).

4.1.1.1 Definition of Hazardous Substance Migration Pathway for Overland/Flood Component

The Federated Metals property is adjacent to north basin of Lake George (Figures 1, 2, 3, 4, 5, and 6 of this HRS documentation record). Surface water flow from the north basin flows to the south basin of Lake George where it discharges into a road ditch along Calumet Avenue to the south and drains into the Lake George Canal then enters into the Indiana Harbor Canal where it finally discharges into Lake Michigan (Ref. 4, pg. 50; 5, pg. 39).

As stated in Sections 2.2.1, 4.1.2.1.1, and 4.1.4.2.2, Because materials on the west and south side of the former Federated Metals property, SWMU #1 (Source #1) had encroached into the lake and sedge meadow, RCRA Corrective Action objectives for Lake George included bringing visible waste materials that encroached into the lake and sedge meadow back to the landfill where they were confined under an engineered barrier (Ref. 38, pg. 21; 101, pg. 20). Only a 100-foot area of Lake George was dredged and deposited into SWMU #1. However, elevated levels of lead were detected in sediment sampling of Lake George indicating that hazardous substances still remain in Lake George (Ref. 27, pgs. 17, 38; Table 16 of this HRS documentation record).

As stated above, materials had encroached into a sedge meadow. Since some segments of the overland migration routes from Source #1 lead directly into the wetland (i.e. parts of the probable points of entry [PPEs] are directly into the wetland), this allows for the perimeter rather that the frontage of the impacted adjacent wetlands, which are within the zone of contamination and are part of the surface water pathway watershed, to be measured (See East Wetland adjacent to the historic PPE area in Figure 6 of this HRS documentation record).

The release of hazardous wastes at Federated Metals poses a significant threat to surface water in the area because the source of contamination lies adjacent to Lake George where sensitive environments, wetlands and a State-endangered Trumpeter Swan exists (48, pg. 4; 63; 91, pg. 2; 113, pg. 3; Figure 6 of this HRS documentation record). Sampling by IDEM for the ESI confirmed the presence of high levels of lead in the sediments of Lake George and wetlands (Tables 14 and 20 of this HRS documentation record).

Historical PPEs for contamination of the surface water pathway occur along the entire southern perimeter of the former Federated Metals property where contaminated dredged material from Lake George was deposited into SWMU #1 (Source #1). The PPE is zero (0) feet from the Source #1 into Lake George. The PPE from Source #1 into the wetlands on the east side of Lake George is also 0 feet (Tables 16 and 20 and Figure 6 of this documentation record; Ref. 27, pg. 17; 38, pg. 61). Hazardous materials can also be released into Lake George via overland flow from Source #2 over the adjacent landfill (Source #1). The overland flow distance from Source #2 to the PPE into Lake George is approximately 360 feet as measured from Sample S03/1905008-03; the overland flow distance from Source #2 to the PPE into the wetlands on the east side of Lake George is approximately 180 feet as measured from sample BC1 (Table 6 and Figures 2, 3, 4, 6 of this HRS documentation record; Ref. 57, pgs. 1, 2, 7).

Likelihood of Release

4.1.2.1.1 Observed Release

Chemical Analysis

Observed releases to the wetlands and to the sediment of Lake George have been documented by chemical analysis of sediment samples collected during the 2021 ESI (Tables 13, 14, 15, 16, 17, 18, 19, 20 and Figure 6 of this HRS documentation record).

IDEM conducted an ESI in July 2021. Background lake sediments were collected during the July 14, 2021, ESI. The background sediment samples were collected from two (2) lakes; Powderhorn Lake located in Illinois and an unnamed lake located north of the Gary Airport (Ref. 5, pg. 47; Figure 5 of this HRS documentation record). During the ESI, background wetland sediment samples were collected from the wetland area that surround the west side of Lake George (Ref. 5, pg. 13; Figure 5 of this HRS documentation record). Analytical data from the 2021 ESI sampling event supports an observed release by chemical analysis to the sediment of Lake George and to the wetlands located on the eastern side of Lake George (Table 13, 14, 15, 16, 17, 18, 19, 20 and Figure 6 of this HRS documentation record).

Background Level for Lake Sediments

Background lake sediments were collected during the July 14, 2021, ESI. The background sediment samples were collected from two (2) lakes; Powderhorn Lake located in Illinois and an unnamed lake located north of the Gary Airport (Ref. 5, pg. 47; Figure 5 of this HRS documentation record). Powderhorn Lake is located approximately two and one-half (2.5) miles southwest of the former Federated Metals property and the unnamed lake is located approximately four (4) miles southeast of Federated Metals property. These samples were collected from the upper six (6) inches of sediment and were of the same general soil description as all of the other wetland samples collected (Ref. 116, pg. 1). Four (4) samples were selected for background sediment samples (Ref. 5, pg. 41; 48, pgs. 3; Figure 5 of this HRS documentation record).

Table 13 below depicts the sample ID, the location of each background sediment sample, the depth and physical characteristics of each background lake sediment sample.

TABLE 13

Background Sediment Sample Description

Sample ID	Sample Location	Physical Characteristics	Depth (inches bgs)	Date Sampled	References
ET1B2	Unnamed Lake north of Gary Airport	Black silt, no odor	0-6	7/14/21	Ref. 5, pgs. 4,293, 4,340, 4,341; 116, pg. 1; Figure 5 of this HRS documentation record

Sample ID	Sample Location	Physical Characteristics	Depth (inches bgs)	Date Sampled	References
ET1B3	Unnamed Lake north of Gary Airport	Black silt, strong organics, muck odor	0-6	7/14/21	Ref. 5, pgs. 4,294, 4,342, 4,343; 116, pg. 1; Figure 5 of this HRS documentation record
ET1BO	Powderhorn Lake	Black silt, no sheen, no odor	0-6	7/14/21	Ref. 5, pgs. 4,291, 4,336, 4,337; 116, pg. 1; Figure 5 of this HRS documentation record
ET1G8	Powderhorn Lake	Duplicate of ET1BO	0-6	7/14/21	Ref. 5, pg. 4,324;116, pg. 1; Figure 5 of this documentation HRS record

Table 14 below depicts the analytical results for the background lake sediment samples.

TABLE 14

Background Sediment Sample Results

Sample ID	Hazardous Substance	Concentration (mg/kg)	MRL/ CRQL (mg/kg)	References
ET1B3	Lead	**290 J#**	3.8	Ref. 64, pgs. 10, 58, 508, 509
ET1BO	Lead	130	4.9	Ref. 64, pgs. 7, 55, 504
ET1B2	Lead	69J#	1.8	Ref. 64, pgs. 9, 57, 506, 507
ET1G8	Lead	140	0.89	Ref. 66, pgs. 21, 65, 524, 571-573

290 mg/kg is the highest background level of lead in lake sediments.
J# The MS/MSD recoveries for this sample were high, outside the laboratory established control limits for Lead. A postdigestion spike (PDS) was performed on the sample and the recoveries failed. Therefore, the Lead concentration in this sample was qualified as estimated biased high (flagged "J"). (Refs. 5, pg. 88; 64, pg. 3). Results were not adjusted per EPA factsheet, Using Qualified Data to Document an Observed Release and Observed Contamination (Ref. 24).

Observed Release in Lake Sediments

Table 15 below depicts those sample that meet the criteria for an observed release to the sediments of Lake George. The table shows the sample ID, the location of the observed release sample in the sediments, the depth and physical characteristics of each sediment sample.

TABLE 15

Lake George Observed Release Sediment Sample Description

Sample ID	Sample Location	Physical Characteristics	Depth (inches bgs)	Date Sampled	References
ET1F6	Lake George	Black silt, no trace organics, wet, non-plastic	0-6	7/14/21	Ref. 5, pgs. 4,330, 4,402, 4,403; Ref. 116, pg. 1; Figure 6 of this HRS documentation record
ET1G2	Lake George	Black silt, non-plastic, trace organic, wet	0-6	7/14/21	Ref. 5, pgs. 4,334, 4,410, 4,411; Ref. 116, pg. 1; Figure 6 of this HRS documentation record
ET1F2	Lake George	Black silt, wet, non-plastic, slight petroleum odor, trace organic	0-6	7/14/21	Ref. 5, pg. 4,327, 4,394, 4,395; Ref. 116, pg. 1; Figure 6 of this HRS documentation record
ET1F3	Lake George	Black silt, wet, non-plastic, slight petroleum odor	0-6	7/14/21	Ref. 5, pg. 4,328, 4,396, 4,397; Ref. 116, pg. 1; Figure 6 of this HRS documentation record

Table 16 below lists the lead concentrations that were detected in each observed release sample to the sediment of Lake George. The samples listed in the table were found to be at or above three times background for lead (Lead 290 x 3 = 870 mg/kg).

TABLE 16

Lake George Observed Release Sediment Sample Results

Sample ID (EPA ID) /Lab #	Location	Date Sampled	Depth (inches bgs)	Hazardous Substance	Hazardous Substance Concentration (mg/kg)	Laboratory Reporting Limit (mg/kg)	Reference
ET1F6	Lake George	7/14/21	0-6	Lead	2,000	1.8	Ref. 66, pgs. 8, 56, 515, 560, 561, 562
ET1G2	Lake George	7/14/21	0-6	Lead	870	2.5	Ref. 66, pgs. 12, 60, 519, 566
ET1F2	Lake George	7/14/21	0-6	Lead	1,700	5.4	Ref. 65, pgs. 44, 91, 531, 972
ET1F3	Lake George	7/14/21	0-6	Lead	1,900	6.8	Ref. 65, pgs. 45, 92, 532, 973

Background Level for Wetlands

Background wetland sediments were collected during the July 14, 2021, ESI. The background wetland samples were collected from wetlands adjacent to two (2) lakes; Powderhorn Lake and an unnamed lake located north of the Gary Airport. The wetlands adjacent to Powderhorn Lake is located approximately two and one-half (2.5) miles southwest of the former Federated Metals property and the unnamed lake is located approximately 4 (four) miles southeast of Federated Metals property. In addition, background wetland samples were also collected from the southwest sector of the north basin of Lake George. These samples were collected from the upper six (6) inches of the wetland sediment and were of the same general soil description as all of the other wetland samples collected (Ref. 5, pg. 41; Figures 5 and 6 of this HRS documentation record).

Table 17 below depicts the sample ID, the location of the background wetland sample, the depth and physical characteristics of each background wetland sample.

TABLE 17

Background Wetland Sample Description

Sample ID	Sample Location	Physical Characteristics	Depth (inches bgs)	Date Sampled	References
ET1B6	West side of north basin of Lake George	Brown sandy sediment, some root/vegetative matter	0-6	7/14/21	Ref. 5, pgs. 49, 54, 4,297, 4,348, 4,349; 121, pg. 1

Sample ID	Sample Location	Physical Characteristics	Depth (inches bgs)	Date Sampled	References
ET1B5	West side of north basin of Lake George	Brown sandy loam vegetative matter, roots, wet	0-6	7/14/21	Ref. 5, pgs. 49, 53, 4,296, 4,346, 4,347; 121, pg. 1
ET1B4	Southwest corner, of north basin of Lake George	Dark sandy loam, lots of vegetative matter/roots	0-6	7/14/21	Ref. 5, pgs. 49, 53, 4,295, 4,344, 4,345; 121, pg. 1
ET1G7	Unnamed Lake north of Gary Airport	Brown, sandy, organics, no odor	0-6	7/14/21	Ref. 5, pgs. 59, 4,323, 4,418; 121, pg. 1
ET1B1	Powderhorn Lake	Brown, sandy silt, organics, mucky odor	0-6	7/14/21	Ref. 5, pgs. 53, 4,292, 4,338, 4,339; 121, pg. 1
ET1C5	Powderhorn Lake	Duplicate of ET1B1; Brown, sandy silt, organics, mucky odor	0-6	7/14/21	Ref. 5, pgs. 53, 55, 4,292, 4,306, 4,338, 4,399; 121, pg. 1
ET1B7	West side of north basin of Lake George	Sandy loam with vegetation and roots, wet, brown	0-6	7/14/21	Ref. 5, pgs. 54, 4,298, 4,350, 4,351; 121, pg. 1
ET1B8	Same as ET1B7	Duplicate of ET1B7	0-6	7/14/21	Ref. 5, pgs. 54, 4,299, 4,350-4,353; 121, pg. 1
ET1B9	West side of North basin of Lake George	Brown sandy loam, wet, very little vegetative material	0-6	7/14/21	Ref. 5, pgs. 54, 4,300, 4,354, 4,355; 121, pg. 1

The lead concentrations that were detected in the background wetland samples are shown below in Table 18.

TABLE 18

Background Wetland Sample Results

Sample ID	Hazardous Substance	Concentration (mg/kg)	MRL/CRQL (mg/kg)	References
ET1B6	Lead	30J+	1.4	Ref. 5, pgs. 102, 146, 597; 64, pgs. 17, 61, 512
ET1B5	Lead	16J+	1.8	Ref. 5, pgs. 596, 145, 596; 64, pgs. 12, 60, 511
ET1B4	Lead	**220J+**	2.7	Ref. 5, pgs. 96, 144, 595; 64, pgs. 11, 59, 510
ET1G7	Lead	34	1.5	Ref. 66, pgs. 20, 64, 523, 570

Sample ID	Hazardous Substance	Concentration (mg/kg)	MRL/CRQL (mg/kg)	References
ET1B1	Lead	51J+	1.9	Ref. 64, pgs. 8, 56, 505
ET1C5	Lead	38	1.6	Ref. 65, pgs. 11, 77, 517, 958
ET1B7	Lead	7.6	1.2	Ref. 64, pgs. 18, 62, 513
ET1B8	Lead	30J+	1.4	Ref. 64, pgs. 19, 63, 514
ET1B9	Lead	53J+	1.2	Ref. 64, pgs. 23, 64, 515

220 mg/kg is the highest background level for lead in the wetland sediments.
J+ "The associated lead sample Matrix Spike sample has spike analyte %R greater than 125% and Post-digestion spike analyte %R less than or equal to 125% and/or a duplicate sample has analyte results are greater than or equal to 5xCRQL in both Duplicate and original samples and RPD is greater than 20. Therefore, the Lead concentration in this sample was qualified as estimated biased high (flagged "J+"). (Refs. 5, pg. 88; 64, pg. 3). Results were not adjusted per Using Qualified Data to Document an Observed Release and Observed Contamination (Ref. 24, pgs. 8 and A-6).

Observed Release in Wetlands

Table 19 below depicts those sample that meet the criteria for an observed release to the wetlands. The impacted wetlands are located along the eastern perimeter of Lake George. The table shows the sample ID, the location of the background sediment sample, the depth and physical characteristics of each wetland sample.

TABLE 19
Wetlands Observed Release Sample Description

Sample ID	Sample Location	Physical Characteristics	Depth (inches bgs)	Date Sampled	References
ET1C1	PEM East Wetland	Dark silty with root material	0-6	7/14/21	Ref. 5, pgs. 4,302, 4,358, 4,359; 121, pg. 1; Figure 6
ET1C4	PFO East Wetland	Silty rooted material, dark	0-6	7/14/21	Ref. 5, pgs. 4,305, 4,365, 4,366; 121, pg. 1; Figure 6
ET1E3	PFO East Wetland	Black to dark brown, silty loam with many roots	0-6	7/14/21	Ref. 5, pgs. 4,317, 4,388, 4,389; 121, pg. 1; Figure 6
ET1E6	PFO East Wetland	Dark brown, mossy with some loam	0-6	7/14/21	Ref. 5, pgs. 4,318, 4,390, 4,391; 121, pg. 1; Figure 6

The lead concentrations that were detected in the observed release wetland samples are shown below in Table 20. The samples were listed in the table were found to be at or above three times background for lead (Lead 220 x 3 = 660 mg/kg).

TABLE 20

Wetlands Observed Release Sample Results

Sample ID (EPA ID) /Lab #	Sample Location	Date Sampled	Depth of Sample (inches bgs)	Hazardous Substance	Hazardous Substance Concentration (mg/kg)	Laboratory Reporting Limit (mg/kg)	References
ET1C1	PEM East Wetland	7/14/21	0-6	Lead	2,500 J# (1,736.11)	5.3	Ref. 64, pgs. 25, 66, 517; 121, pg. 1; Figure 6
ET1C4	PFO East Wetland	7/14/21	0-6	Lead	1,300	5.4	Ref. 65, pgs. 10, 76, 516; 121, pg. 1; Figure 6
ET1E3	PFO East Wetland	7/14/21	0-6	Lead	1,600	4.7	Ref. 65, pgs. 41, 88, 528; 121, pg. 1; Figure 6
ET1E6	PFO East Wetland	7/14/21	0-6	Lead	870	1.5	Ref. 65, pgs. 42, 89, 529, 970; 121, pg. 1; Figure 6

J# The MS/MSD recoveries for this sample were high, outside the laboratory established control limits for Lead. A postdigestion spike (PDS) was performed on the sample and the recoveries failed. Therefore, the lead concentration in this sample was qualified as estimated (flagged "J") (Ref. 5, pg. 88; 64, pg. 3). Results were adjusted per Using Qualified Data to Document an Observed Release and Observed Contamination (Ref. 24).

Attribution:

Numerous facilities operated at the former Federated Metals facility property. Facilities at the property include Federated Metals, Whiting Metals, ASARCO, HBR Partners, Northern Indiana Metals, and Saxon Metals (Ref. 37, pg. 12, 13). As discussed in the Facility History of this HRS documentation record, Operations at the former Federated Metals facility included storage of raw materials, offices, lead dross (impurities that floated on refined lead) reclamation, foundry operations, white metal (alloying), a large baghouse (dust collector), oil storage, and a charcoal briquetting operation (Ref. 37, pgs. 12). Violations also occurred at the former Federated Metals facility (Ref. 30, pg. 7). See the Facility History section of this HRS documentation record for additional information regarding issues at the property.

As a result of the former Federated Metals operations, elevated levels of lead greater than three (3) times background have been detected on the Federated Metals property at Source #1 and Source #2 (Tables 2, 3, and 6 of this HRS documentation record).

The RCRA SWMU #1 (Source #1) accepted much of the wastes generated at the facility, including the following solid wastes that were deposited in the landfill: blast furnace slag from cupola operations; zinc oxide fume from the brass and cupola operation; tin/lead fume; low tin slag; zinc hopper dust; zinc sludge; and used firebrick (Ref. 38, pg. 13). Sediment sampling

conducted for RCRA by the RCRA Facility Investigation (RFI) suggested elevated levels of contaminants, including lead (Ref. 38, pgs. 16, 21).

The primary mode of deposition of the lead contamination in Lake George is by historic overland flow (run off) from Source #1. Materials at SWMU #1 (Source #1) encroached into Lake George and an adjacent sedge meadow (Refs. 27, pgs. 17, 38 38, pg. 21; 101, pg. 20; Figure 6 of the HRS documentation record).

Because materials from the SWMU #1 (Source #1) encroached into the lake and sedge meadow, RCRA Corrective Action Objectives for Lake George included bringing visible waste materials that encroached into the lake and sedge meadow back into the landfill where they could be confined under an engineered barrier (Ref. 38, pg. 21; 101, pg. 20). The sedge meadow is wetlands (Ref. 27, pg. 38; Figure 6 of the HRS documentation record). Only an area extending 100-feet into Lake George from the landfill was dredged and deposited back into SWMU #1 (Source #1) wetlands (Ref. 27, pg. 17, 38; Figure 6 of the HRS documentation record).

Additional sediment sampling of Lake George by IDEM during the ESI revealed that high levels of lead are still present in Lake George beyond the 100-foot dredged area of the lake and within surrounding wetlands (Ref. 5, pg. 49; Tables 16 and 20 of this HRS documentation record).

Therefore, the lead in the sediments of Lake George and surrounding wetlands can be attributed to former Federated Metals site. Also, please see the information in the Site Summary of this HRS documentation record.

Other Potential Sites (Ref. 38, pgs. 11, 12, 13; Figure 4 of this HRS documentation record)

Four (4) other facilities near Federated Metals are located within 1,000 feet of Lake George and are described below (Figure 4 of this HRS documentation record).

(Calumet College AKA Amoco Research Facility (U.S. EPA ID #IND074379306) (Ref. 117, pg. 1)
In 1984, the U.S. EPA completed a hazardous waste site preliminary assessment at the Amoco Research facility. According to this study, a former Amoco employee reported to the U.S. EPA that a disposal pit existed on-site. Elevated concentrations of semi-volatile organic compounds (SVOCs), polychlorinated biphenyls (PCBs), and heavy metals were detected in soil at the site. Elevated concentrations of toluene were detected in groundwater. Further investigation of soil indicated the presence of approximately two (2) to three (3) dozen pits at the site and high concentrations of volatile organic compounds (VOCs) and SVOCs (Ref. 84, pg. 11).

A Focused Site Inspection (FSI) was conducted for this site in 1995. The FSI concluded that the Calumet College site is fenced and is not located near residences. The site is inaccessible to the public. There are no residences within 200 feet of the site. The closest residence lies approximately 300 feet away to the southeast of the site. There is no evidence that terrestrial sensitive environments are located on site. A release of hazardous substances to air is unlikely because an air emission containment system (e.g., final cover) has been installed at the site. Exact information concerning the nature of this cover is not available in the site files. The site is currently inactive, and no workers are associated with the site. No records of complaints regarding odors are known to exist (Ref. 103, pg. 26). It is unlikely that a release to surface water has occurred because there is no direct pathway for overland flow of surface water runoff from the site to Lake George. (Ref. 103, pg. 25).

Bairstow Company site (U.S. EPA ID #IND980679021) (Ref. 118, pg. 1)
The Bairstow site consists of approximately 100 acres and was operated as a slag landfill from 1946 to 1980. Reportedly, approximately 4,000,000 cubic yards of slag were deposited on the site. In addition, approximately 100 drums containing oily wastes were noted on the property.

Slag from Northern Indiana Power Services Company (NIPSCO) operations was also deposited at the property. The slag has reportedly encroached more than 100 feet into Lake George. Sampling of wastes by Ecology & Environment in 1986 indicated elevated levels of SVOCs and inorganic compounds including up to 17,000 parts per million (ppm) aluminum, 51 ppm arsenic, 1,100 ppm barium, 200 ppm lead, and 0.4 ppm mercury (Ref. 84, pg. 11).

A Focused Site Inspection was conducted at this site in 1995. The report concluded that the analytical results of on-site soil samples collected from around the slag piles indicated that the site contained heavy metals at elevated levels. Sediment sampling at Lake George and at the wetlands adjacent to the lake showed the presence of heavy metals that were also detected in the on-site soil samples. (Ref. 104, pg. 39).

It should be noted that this site was located on the west side of the south basin of Lake George (Figure 4 of this HRS documentation record). Since 1995, the city of Hammond has remediated the property and the adjacent south basin. The entire area has been covered with soil and vegetated in grass and it is now being used as a city golf course. Water in Lake George flows from the north basin to the south basin via culverts. Water in the south basin flows south along the road ditch via an outfall (Figure 3 of the HRS documentation record; Refs. 4, pgs. 19, 29, 50, 19429; 104, pgs. 9, 11, 12).

Amoco Oil J & L Disposal Area site aka AMOCO Oil Company Boat Docks (U.S. EPA ID #IND074375585) (Ref. 119, pg. 1)

The J & L disposal site was an area where drums containing caustic solutions and other materials were disposed by Amoco Oil Company (Ecology & Environment, 1985). Materials reportedly deposited at the site include spent caustics, heavy oil slops, sludge, semi-liquid tank bottoms, and solid waste. These wastes were reportedly deposited into two (2) large ponds for a period of over 15 years (Ref. 84, pg. 11).

Based on the historical groundwater flow diagrams and the June 2022 flow diagram, J & L's groundwater is not contaminating Lake George. The geological formation of J & L makes it rather difficult for groundwater to flow off-site. The former Jones & Laughlin Steel Company which owned the J & L site before BP used it as an area to dispose of liquid slag which when cooled formed barrier walls restricting groundwater flow. Surface water from the site flows south away from Lake George (Ref. 106, pg. 1; Figure 4 of this HRS documentation record).

Union Carbide Corporation Whiting Plant off-site landfill (U.S. EPA ID #IND980607014, adjacent to Lake George)

The Whiting Plant off-site landfill was an area that Union Carbide Corporation used for disposal of miscellaneous drums, contaminated demolition wastes, and inert wastes. This area is reported to encompass 34 acres. Some of the material that was dumped includes acidic anhydride, dirpolene, and waste oil. Currently, truck terminals and a service station are built on a portion of the site. A site investigation indicated elevated concentrations of chlorobenzene, ethylbenzene, methylisobutyl ketone, toluene, and xylenes. Also, moderately low levels of SVOCs were detected at the site (Ref. 84, pg. 11, 12).

On June 4, 1991, Ecology and Environment, Inc., Field Investigation Team (FIT) conducted an off-site reconnaissance inspection of the Whiting Pit Off-Site Landfill site. At that time, the site appeared to be paved and completely covered, and no evidence of hazardous waste was observed. Based on the FIT field observations and the fact that no surface water migration route was observed to exist between the site and nearby surface water bodies, FIT recommended that no further action be taken at the Whiting Pit Off Site landfill site (Ref. 105, pg. 1).

Since materials at SWMU #1 (Source #1) encroached into the lake and adjacent sedge meadow prior to RCRA involvement, and RCRA Corrective Action for Lake George included bringing visible waste materials that encroached into the lake and sedge meadow by dredging only an area extending 100-feet into Lake George from the landfill, and that elevated levels of

lead in the lake and wetlands remained after the dredging, and that investigations conducted at four (4) known potential sources of contamination revealed that there was no impact to Lake George from those potential sources as described above, it is concluded that at this point in time the primary source of contamination to the lake is from the former Federated Metals facility.

Hazardous Substances Released:
Lead

Surface Water Observed Release Factor Value: 550

Surface Water Observed Release Factor Value: 550

4.1.4 Environmental Threat

4.1.4.2 Environmental Threat Waste Characteristics

4.1.4.2.1 Ecosystem Toxicity/Persistence/Bioaccumulation

The ecosystem toxicity and persistence values, the environmental bioaccumulation values, and the ecosystem toxicity/persistence/bioaccumulation factor values for all hazardous substances associated with Source #1 and Source #2 are presented in Table 21 below. The combined ecosystem toxicity/persistence/bioaccumulation factor values were obtained from HRS Table 4-21 (Ref. 1, Section 4.1.4.2.1.4).

TABLE 21

Ecosystem Toxicity/Persistence/Bioaccumulation Factor Values

Hazardous Substance	Source Nos.	Ecosystem Toxicity Factor Value	Persistence Factor Value*	Bioaccumulation Value**	Ecosystem Tox/ Persistence/ Bio Factor Value (Table 4-21)	References (Ref. 1, Section 4.1.4.2.1.4)
Lead	1, 2	1,000	1	50,000	50,000,000	Ref. 2, p. 13
Arsenic	1, 2	10	1	50,000	500,000	Ref. 2, p. 2

* The lake persistence value was used.
**Bioaccumulation factor value for Freshwater

Ecosystem Toxicity/Persistence/Bioaccumulation Factor Value: 5×10^7

4.1.4.2.2 Hazardous Waste Quantity

Since materials at SWMU #1 (Source #1) encroached into the lake and sedge meadow, RCRA Corrective Action Objectives for Lake George included bringing visible waste materials that encroached into the lake and sedge meadow back to the landfill where they were confined under an engineered barrier (Ref. 38, pg. 21; 101, pg. 20). Only a 100-foot area of Lake George was dredged and deposited into SWMU #1 (Source #1) (27, pg. 17).

However, additional sediment sampling of Lake George by IDEM during the ESI, revealed that high levels of lead are still present in Lake George beyond the 100-foot dredged area of the lake and within surrounding wetlands (Ref. 5, pg. 49; Tables 15, 16, 19 and 20 of this documentation record).

The source waste quantity for Sources 1 and 2 are listed in Table 22 below (See Source 1 and Source 2 sections 2.4.2.1.1 of this HRS documentation record).

Table 22 Hazardous Waste Quantity Factor Value		
Source No.	**Source Type**	**Source Hazardous Waste Quantity**
Source #1	Buried Pile	34,020
Source #2	Contaminated Soils	>0, but value is unknown

Sum of Values: 34,020

As documented in Section 5.1.3.5 of this HRS documentation record, the Trumpeter Swan and wetland targets along Lake George of the surface water migration pathway are subject to Level II concentrations. Additionally, as documented in Source 1 and Source 2 sections 2.4.2.1.1 of this HRS documentation record, hazardous constituent quantity (Tier A) has not been adequately determined; therefore, a Hazardous Waste Quantity factor value from Table 2-6 or 100, whichever is greater, is assigned as the hazardous waste quantity factor value for that pathway (Ref. 1, Section 2.4.2.2). The sum of Source 1 and Source 2 hazardous waste quantity is assigned a surface water migration pathway hazardous waste quantity factor value of 10,000 in HRS Table 2-6.

Hazardous Waste Quantity Factor Value: 10,000
(Ref. 1, Section 2.4.2.2; Table 2-6)

4.1.4.2.3 Waste Characteristics Factor Category Value

The environmental waste characteristics factor value is obtained by multiplying the (ecosystem toxicity/persistence factor value) and the hazardous waste quantity factor value for the watershed, subject to a maximum product of 1×10^8. Then multiply the product by the ecosystem bioaccumulation potential factor value for that hazardous substance, subject to a maximum product of 1×10^{12} (Ref. 1, Section 4.1.4.2.3). The product is assigned a waste characteristic factor category value from HRS Table 2-7 (Ref. 1, Section 2.4.3.1). The values presented below are for lead.

Ecosystem Toxicity/Persistence Factor Value: 1,000
Hazardous Waste Quantity Factor Value: 10,000
Bioaccumulation Potential Factor Value: 50,000

1,000 (Ecotox) X 10,000 (Hazardous Waste Quantity is 100) = 1×10^7

Then 1×10^7 X 50,000 (Bio Accumulation) = 5×10^{11}
Then enter 5×10^{11} into HRS Table 2-7

HRS Table 2-7 gives a waste characteristics factor category value of 560.

Waste Characteristics Factor Category Value: 560
(Ref. 1, Table 2-7)

4.1.4.3 Environmental Threat Targets

4.1.4.3.1 Sensitive Environments

4.1.4.3.1.1 Level I Concentrations

There are no Level I concentrations; therefore, targets subject to Level I concentrations were not evaluated as part of this HRS documentation record.

Level I Concentrations Factor Value: NS

4.1.4.3.1.2 Level II Concentrations

Contaminants that meet the criteria for observed releases to the surface water pathway were detected in sediment samples (Section 4.1.2.1.1 of this HRS documentation record). Therefore, Level II concentrations are assigned (Ref. 1, Sec. 2).

Several wetland areas are present south of the former Federated Metals property and have been impacted with lead. These wetlands meet the criteria for a wetland as defined by the Hazard Ranking System and as defined in 40 CFR Section 230.3 (Refs. 1, section 4.1.4.3.1). National Wetland Inventory Maps published by the U.S. Fish and Wildlife Service indicate that wetlands within the zone of actual contamination are designated as freshwater emergent wetlands (PEM1C and PEM5C) and a freshwater forested/shrub wetland (PF01C (48, pgs. 4; 90, pg. 1; Figure 6 of this HRS documentation record). These wetlands meet the HRS definition of a wetland, 40 CFR 230.3, and are considered eligible for HRS scoring (Refs. 1, Table 4-24; 87; 110).

Listed Sensitive Environments

The Lake George and adjacent wetlands is an area/habitat known to be used by the Trumpeter Swan, a state designated endangered bird (Refs. 63, pgs. 1-3; 91, pg. 2, 112, pg. 2; 113, pg. 3). The most recent sighting of the bird was in December 2021 (Ref. 63).

TABLE 23

Level II Listed Sensitive Environments Value

Sensitive Environment	Distance from PPE to Nearest Sensitive Environment	Reference	Sensitive Environment Value (Ref. 1, Table 4-23)
Habitat known to be used by State designated endangered species (Trumpeter Swan)	0 ft.	Ref. 63, pg. 1, 2; Ref. 91, pg. 2; 112, pg. 2; 113, pg. 3	50

As Source #1 is adjacent to the wetlands, there is no distance from the PPE to the nearest sensitive environment. The PPE is the entire west and south portions of the former Federated Metals property where (Source #1) is now located (Figures 2 and 6 of the HRS documentation record).

Sum of Level II Listed Sensitive Environments Value: 50

Wetlands

The PPE of Source #1 is directly in a wetland. Wetland sediment samples ET1E6, ET1E3, ET1C4, and ET1C1 meet the requirements for an observed release (Refs. 1, Section 2.3; Section 4.1.2.1.1 and Figure 6 and Tables 18, 19 and 20 of this HRS documentation record). The total length of wetlands frontage and perimeter that have been impacted with lead at Level II concentrations is shown on Figure 6 of this HRS documentation record. The perimeter of the wetlands outlined on the east side of Lake George represents a quadrilateral (Figure 6 of this HRS documentation record). The wetland frontage of the wetlands on the west side of Lake George are in the zone of contamination. Refer to Reference 87 which discusses how the wetland frontage and perimeter were calculated. Sample locations are depicted in Figure 6. The assigned HRS wetland rating for Level II concentrations is 50 (Ref. 1, Table 4-24).

Table 24

Wetlands Value

Wetland	Wetland Perimeter (ft)	Wetland Perimeter (miles)	Reference
PEM/PFO Wetlands (East Wetland)	5,136.20	0.9727266	Refs. 48, pgs. 4; 87, pg. 1; 90; Figure 6 of this HRS documentation record
Wetland	**Wetland Frontage (ft)**	**Wetland Frontage (miles)**	**Reference**
PEM Wetland (West Wetland)	598.419	0.113337	Refs. 48, pgs. 4; 87, pg. 3; 90; Figure 6 of this HRS documentation record

Sum of Level II Wetland Frontage/Perimeter: The perimeter of the impacted wetlands on the east side of Lake George is 5,136.20 feet (0.9727266 miles) (Figure 6; Ref. 87). The wetland frontage of the impacted wetlands on the west side of Lake George is 598.419 feet (0.113337 mile) (Figure 6; Ref. 87). The sum of the wetland lengths being evaluated is: 0.9727266 mile + 0.113337 mile = 1.0860636. The sum of wetlands length is in the greater than 1 to 2 mile category in HRS Table 4-24, which is assigned a wetlands value of 50 in HRS Table 4-24 (HRS Section 4.1.4.3.1.2 and HRS Table 4-24).

IDEM's Wetland specialist stated that it was his judgement that the PUBHX pond is surrounded by emergent or scrub shrub wetland (Ref. 127, pg. 1).

It should be noted that regulatory purposes of Section 404 and Section 401 of the Clean Water Act, the area is one continuous wetland and shoreline (48, pgs. 4; 110, pg. 2; Figure 6 of this documentation record). Refer also to Ref. 110, pgs. 1 through 14 which discusses the wetlands in an area of Lake George and an error in the National Wetland Inventory Maps.

Wetlands Value (Ref. 1, Table 4-24): 50

Sum of Level II Listed Sensitive Environments Value + Wetlands Value: 50 + 50 = 100

Level II Concentrations Factor Value: 100

4.1.4.3.1.3 Potential Contamination

Potentially contaminated targets were not evaluated as part of this HRS documentation record.

Potential Contamination Factor Value: NS

5.0 SOIL EXPOSURE AND SUBSURFACE INTRUSION PATHWAY

5.1 Soil Exposure Component

5.1.0 General Considerations

According to the HRS, the soil exposure component of the soil exposure and subsurface intrusion pathway is based on areas of observed contamination (Ref. 1, Section 5.1.0). All soil samples evaluated for the area of observed contamination were collected at a depth less than two (2) feet below ground surface (bgs) (Refs. 4, pgs. 20, 18807, 18810, 18813, 18816, 18818, 18821, 18824, 18827, 18830, 18833, 18836, 18839, 18842, 18845, 18847, 18849, 18851, 18853, 18857, 18861, 18865, 18868, 18871, 18873, 18875, 18877, 18879; 56, pg. 1; Tables 9 and 10 of this documentation record). The Federated Metals area of observed soil contamination is defined for HRS scoring purposes based on analytical results for surface soil samples collected during the U.S. EPA and IDEM sampling events conducted from 2016 through 2019 and from data submitted to IDEM from Whiting Metals' contractor, MH Environmental (Ref. 37, pgs. 513 through 522; Tables 6, 9 and 10 of this documentation record). Analytical results for surface soil samples indicated lead and arsenic are present at concentrations equal to or greater than three (3) times the designated background level and at concentrations greater than the corresponding sample quantitation limits (SQL) or detection limit (Tables 2, 6 and10 of this documentation record). Since metal contamination in residential properties is assumed to be from airborne deposition from historic activities conducted by the former Federated Metals and Whiting Metals activities (see Source #3 section 2.2.1 of this HRS documentation record), observed contamination is also inferred in some residential properties (that have not been sampled) that lie within and in between areas of observed contamination.

Letter by which this area is to be identified: A

Type of the area:

Contaminated Soil

Location and description of the area (with reference to a map of the site): Figure 3; Ref. 76, pg. 2

AOC A is an area of contaminated soil on residential and commercial/industrial properties Figure 3 of this HRS documentation record). The soils in AOC A have been impacted with elevated levels of lead and/or arsenic (Table 10 of this HRS documentation record). AOC A is also identified as Source #3 (Figures 2 and 3 and section 2.2.2 for Source #3 of this HRS documentation record).

Federated Metals conducted smelting (extractive metallurgy) and refining (purification) operations on approximately 36 acres of land. Operations included storage of raw materials, offices, lead dross (impurities that floated on refined lead) reclamation, foundry operations, white metal (alloying), a large baghouse (dust collector), oil storage, and a charcoal briquetting operation. The charcoal was used as a reducing agent for the smelting of certain ores. During smelting, a flux chemical cleaning agent was used to remove impurities that leads to the formation of a molten slag. The slag associated with the smelting of lead is high in iron and silica and once hardened can have a glasslike appearance. Federated Metals was disposing of various wastes generated during operations, such as the slag, by discharging to the land and/or nearby waterways, in particular Lake George (Ref. 37, pgs. 12, 13).

The primary mode of deposition of the contamination in the soils within the AOC is believed to be air deposition of lead particles in residential yard via a smelting process. Over time, lead particles and other heavy metal particles associated with the smelters' operations became airborne and settled onto area properties (Refs. 6, p. 4; 39, p. 4**;** 52, pg. 1). As stated in the **"**Previous Investigations Conducted by the U.S. EPA and IDEM**"** Section, Whiting Metals had exceeded their lead particulate levels and received a notice of violation in September 2018 from US EPA and IDEM (Ref. 30).

AOC A is comprised of surface soils impacted by elevated (equal to or greater than three [3] times background) levels of lead and/or arsenic on residential (single and multi-family) and non-residential (churches, parks, play areas, and vacant lots) properties in an area in the northern portion of Hammond, Indiana and the northwest portion of Whiting, Indiana where elevated levels of lead and/or arsenic had contaminated residential properties (Ref. 76, pg. 2; Figure 3, Tables 9, and 10, 27, 28, and 29 of this of this documentation record).

The impacted area includes the residential portions of Atchison Avenue, Birch Avenue, Center Street, Central Avenue, Clark Street, Davidson Place, Euclid Avenue, Fischrupp Avenue, Fred Street, Indianapolis Boulevard, John Street, Lakeview Avenue, Laporte Avenue, Lincoln Avenue, New York Avenue, Ohio Avenue, Oliver Street, Schrage Avenue, Sheridan Avenue, Steiber Street, Wespark Avenue, White Oak Avenue, and 120th and 121st Streets in Hammond and Whiting, Indiana, Lake County, Indiana (see Figure 2, Figure 3, Table 10 of this HRS documentation record). Eastlake Metals LLC is now doing business at the former Whiting Metals facility (Ref. 93, pg. 2). The Level I and Level II residential and non-residential properties where lead and/or arsenic were detected in surface soil samples are above background levels that comprise the area of observed contamination (Ref. 54, pgs. 1 through 35; 76, pg. 2; Figure 2 and Figure 3, Table 2, and Table 10 of this HRS documentation record). All of the residential properties included in AOC Athat were found to contain elevated levels of lead and/or arsenic are residential properties with house dwellings (Ref. 4, pg. 27,856; Table 10 of this HRS documentation record).

Surface soil samples that meet observed contamination criteria were used to delineate AOC A (Table 10 this documentation record). All soil samples were collected within the top two feet and were collected within 200 feet of the regularly occupied structure on the property (99, pg. 1; See also sample field sheets and logbook pages in Ref. 40). Lead and/or arsenic have been detected at varying concentrations in surface soil samples collected from AOC A (Table 10 of this documentation record; Ref. 54, pgs. 1 through 35). Refer to Reference 40 which describes and/or depicts where the samples were collected. The surface soil samples collected from AOC A were collected predominantly from 0 to 6 inches bgs and primarily consisted essentially of dark brown sandy loam, and sometimes contained root material (Ref. 40 pages shown in Table 10); Table 10 of this documentation record; Ref. 111, pg. 1 discusses the structure of the sample IDs which indicates the depth of sample, Ref. 78 depicts the sample ID).

Lead and/or arsenic have been detected in AOC A above background levels on 168 residential properties including the soils of the businesses that currently occupy the former Federated Metals property (Table 10 listing all observed contamination samples, Table 27 [listing 9 Level I residential properties in Whiting, Indiana and Hammond, Indiana], Table 28 [listing 121 Level II residential properties in Whiting, Indiana], and Table 29 [listing 38 residential properties in Hammond, Indiana]). The extent of AOC A is delineated by individual residential properties that have been contaminated. In accordance with HRS Section 5.1.0, General Considerations of the HRS, areas lying between sampling locations, except those areas that are covered by an impenetrable material, are included in AOC A (Ref. 1, Section 5.1.0) (Refer to Reference 54, pgs. 1 through 35). These areas are considered inferred areas of contamination. Therefore, in the absence of sampling results, contamination on residential properties is also being inferred in AOC A. As a result, residential properties that have not been sampled but lie between properties that contain elevated levels of lead and/or arsenic that are greater than three (3) times above

background levels are also being included (Table 10 of this HRS documentation record; Ref. 54, pgs. 1-35). Most of these areas where residential areas have been inferred to be contaminated that lie between residential yards contaminated properties have been grouped to form polygons (Ref. 54, pgs. 1 through 35; Figures 2 and 3 and Table 10 of this HRS documentation record).

AOC A consists of 27 separate polygon areas (groups of residential properties) designated as A to Z and AA with a total number of 51 individual residential properties (Ref. 54; 76, pg. 2; Figure 3 and Table 10 of this HRS documentation record). These polygon areas are comprised of individual residential properties that contain lead and/or arsenic three (3) times above background levels located on the streets mentioned above as well as inferred residential properties (that were not sampled) that are located between properties that are known to have elevated levels of lead and/or arsenic (Ref. 54, pgs. 1-35).

Properties where U.S. EPA removal actions have occurred or are ongoing are not included in the scoring of this site. Also, properties that have been remediated by the city of Hammond are not included in the scoring of this site.

Background Levels

Refer to the background samples shown in Table 1 and Table 2 of this HRS documentation record which lists background residential soil concentrations along with other related information.

Lead and arsenic, metals that are related to the lead smelter, are the only contaminants evaluated in this HRS documentation record (Table 10 of this HRS documentation record).

Based on the background surface soil samples discussed in the SI and the ESI, and information provided by an IDEM staff geologist, a lead concentration value of 120 mg/kg will be used as lead background for this HRS documentation record. In addition, the highest background concentration for arsenic will be 11 mg/kg so this will be used as the arsenic background level for this HRS documentation record (Table 2 of this HRS documentation record).

As discussed in Source #3, the USDA NRCS Web Viewer classified soil in Whiting, Indiana for the northern portion of Forsythe Park as Oakville-Adrian complex (OkB), 0 to 6 percent slopes, while the southern portion of Forsythe Park and the residential neighborhood to the east classified as undescribed Urban Land. The OkB soil consists of drained eolian dune sands. While a detailed description of the Urban Land soils was not listed in the Web Viewer, the General Soil Map from the Soil Survey for Lake County, Indiana illustrated Forsythe Park and the residential area to the east as Oakville-Tawas associated, indicating the surface soil in the two areas would be considered similar. This will also include the original Source #1 soils and Source #2 soils on the Federated Metals facility (Ref. 102, pg. 1).

Urban land (Ur) in the northern part of Lake County, Indiana consists of areas that have been filled with earth, cinders, basic slag, trash, or any combination of these, and that then have been smoothed over. Urban land in northern lake county also includes those areas where sand dunes have been removed and the areas leveled. Thus, surface soils between the Federated Metals original Source #1 and Source 32 soils and off-site contaminated residential soils and the background residential soils samples can be considered similar (Ref. 102, pg. 1).

Letter by which this area is to be identified: B

Type of the area:

Contaminated Soil

Location and description of the area (with reference to a map of the site): Figure 3; Ref. 76, pg. 2

AOC B is a portion of the Former Federated Metals Property (which is currently being occupied by Village Discount and East Lake Metals (Refs. 8, pg. 1; 74, pg. 1)). These soils are those soils discussed for Source #2 (Section 2.2.1 for Source #2 of this HRS documentation record). The soils in AOC B have been impacted with elevated levels of lead and/or arsenic (Table 6 of this HRS documentation record). All soil samples were collected within the top two feet and were collected within 200 feet of the plant buildings currently occupied by Village Discount and East Lake Metals workers (Ref. 57, pgs. 1-7).

AOC B is comprised of surface soils impacted by elevated (equal to or greater than three [3] times background) levels of lead and/or arsenic on the former Federated Metals/Whiting Metals property (Ref. 57, pgs. 1 through 7; 76, pg. 2; Figure 3, Tables 2, 6 of this documentation record). Sampling by MH Environmental that was submitted to IDEM's VRP and soil sampling that was conducted by U.S. EPA staff on the former Federated Metals/Whiting Metals property revealed elevated levels of lead (Refs. 37, pgs. 46, 47; 57, pgs. 1 through 7). No remediation activities have been conducted on this property.

Whiting Metals conducted sampling upon exterior areas of the property outside of the narrowly defined boundaries of the Federated Metals defined SWMU #1 (Source #1). The purpose of the Site Investigation conducted by MH Environmental was to determine if contamination was present in areas not addressed during the RCRA Corrective Action conducted by Federated Metals. Contamination was expected to be situated at near surface depths at an indeterminate number of locations. As such, sampling was conducted within the upper 0.5 to 1.0 feet at previously unsampled areas (Ref. 37, pg. 7).

Areas extraneous to the buildings, that included an approximate 3.73 acres, were divided into individual parcels. No parcel was greater in size than 0.5 acres. The resulting eight (8) areas were designated as Areas A through H. Twelve (12) samples were collected from each area for a total of 96 samples. The results demonstrated that contamination exists in areas outside of the SWMU that is consistent with the level and type of contaminants and materials identified during the Federated Metals activities. Areas extraneous to former lead/lead dross processing areas, and the former bag house demonstrated impacts of lead and arsenic (Ref. 37, pg. 7). The contamination discovered consisted in large part of slags and metals refinery waste that are not generated by the processes currently ongoing at the facility. In addition, arsenic and antimony was discovered at the Site that is a common byproduct of the smelting/refining of lead ores such as galena. These activities were conducted at the facility by Federated Metals in the building that is located at the southwest corner of the Whiting Metals property. When Federated Metals was operating at the Site the smelting/refining of the lead ores resulted in the generation of lead dross. This material was further refined in a lead dross building located near the southwest corner of the property in an area now owned by Monaghan, LLC (Ref. 59, pg. 1). The refining of the dross yielded additional lead and quantities of arsenic and antimony. It is further known from a photograph of the Site taken in 1940 that the area located south of the Site buildings had a significant storage of material (Ref. 37, pgs. 16, 17; 84, pg. 2). Sample Field Sheets or logbooks were not supplied to IDEM as part of the Site Investigation.

On May 2, 2019, U.S. EPA staff collected twelve (12) soil samples from the access Road located along the north perimeter of the Village Discount property. The sample identifications were noted as S1 through S12. The main objective of Road surface soil sampling at Village Discount was to determine the composition of metals potentially emitted, in the form of fugitive dust, by truck traffic when the Road is in use (Ref. 4, pg. 24).

The samples listed in Table 6 of this HRS documentation record represent those samples collected for the Whiting Metals Site Investigation (Ref. 37). Those results were found to be greater than three (3) times background level. In addition, the twelve (12) samples that were collected by U.S. EPA staff in May of 2019 as discussed above are also listed in Table 6 of this documentation record. As discussed in Section 2.2.2 of this HRS documentation record, samples listed in Table 6 are also considered source 2 for this HRS documentation record.

Background Levels

Refer to the background samples shown in Table 1 and Table 2 of this HRS documentation record which lists background residential soil concentrations along with other related information.

Based on the background surface soil samples discussed in the SI and the ESI, and information provided by an IDEM staff geologist, a lead concentration value of 120 mg/kg will be used as lead background for this documentation record. In addition, the highest background concentration for arsenic will be 11 mg/kg (Table 2 of this HRS documentation record).

As stated in the background discussions for Source #1, Source #2, Source #3, and in AOC A, the soils in AOC B and off-site contaminated residential soils and the background residential soils samples can be considered similar (Ref. 102, pg. 1).

Hazardous Substances Released:
Lead
Arsenic

Attribution

The information gathered documents the presence of a contaminant associated with the Federated Metals and Whiting Metals operational activities and elevated levels of lead and arsenic on on-site soils of the property. As discussed below, the hazardous substances in the AOC A and B are attributable to Federated Metals and Whiting Metals due to emissions of lead and other metals occurred at the facility. The concentrations of lead in the background samples are significantly less than what is currently being seen on the Former Federated Metals / Whiting property (Table 2, Table 3, and Table 6 of this documentation record). Operations at the Federated Metals facility included storage of raw materials, offices, lead dross (impurities that floated on refined lead) reclamation, foundry operations, white metal (alloying), a large baghouse (dust collector), oil storage, and a charcoal briquetting operation. Hazardous substances from these operations included lead and arsenic (Ref. 37, pgs. 12, 16, 17; 84, pg. 2). Therefore, elevated levels of lead and arsenic in adjacent residential properties can be at least partly attributed to the former operations of Federated Metals and Whiting Metals. Also, please refer to the information in the Site Summary and Section 2.2 of this documentation record.

The primary mode of deposition of the contamination is believed to be air deposition of lead particles in residential yard via a smelter process. Over time, lead particles and other heavy metal particles associated with the smelters' operations became airborne and settled onto area

properties (Ref. 52, pg. 1). Analysis of residential soil particles reveal that the particles contained a mixture of metals consistent with slag; they also contained much higher concentrations of carbon, oxygen aluminum and/or silicon than one would expect in a slag produced from a metal foundry (Ref. 6, pg. 4). In general, some of the samples appeared more likely to have been impacted by foundry metals than others (Ref. 6, pg. 4).

As discussed in the Facility's History section of the HRS Documentation Record, as a result of the operations and disposal activities, elevated levels of lead were detected in the air while Whiting Metals was operating. IDEM had installed an air monitoring station downwind from the former Whiting Metals plant building (Ref. 73, pg. 1). The air monitoring station is approximately 100 feet from the former Federated Metals/Whiting Metals facility (Ref. 109, pg. 1). As a result of elevated lead emission to the air, the U.S. EPA and IDEM issued a Notice of Violation (NOV) to Whiting Metals (a company that conducted operations after Federated Metals) on November 8, 2018 (Ref. 30, pg. 3). The facility was believed to have emitted lead from the Site in a manner that caused ambient air quality to exceed 0.15 microgram per cubic meter (mg/m^3) of air averaged from August 3, 2018, through November 4, 2018, in violation of IC 13-30-2-1 and 326 IAC 1-3-4 (Ref. 30, pg. 3). Also, On November 8, 2018, the U.S. EPA issued a NOV under Section 113(a)(l) of the Clean Air Act, 42 U.S.C. § 7413(a)(l) for violating the Indiana State Implementation Plan (SIP) (Ref. 30, pg. 7).

A review of the IDEM's ambient air monitoring network shows that there are two (2) air monitoring stations within 5 miles of the former Federated Metals/Whiting Metals facility. One monitoring station is located at 1500 Center in Whiting, Indiana. This monitoring station which is located approximately 1.1 miles to the north is monitoring volatile organic compounds (VOCs) only. The other air monitoring station is located at 1350 E. Lakeview Street, Whiting, Indiana. This station is located approximately 100 feet north of the former Federated Metals/Whiting Metals facility. There are no other air monitoring stations in the vicinity where monitoring for lead would be an issue at any other known facility (Ref. 109, pg. 1).

Also, on September 14, 2018, emissions to the air from a gravel road was observed just west of Whiting Metals (Ref. 4, pg. 22,468). This area was sampled by the U.S. EPA in 2019 and found high concentrations of lead in the soils of the Road (Ref. 4, pgs. 28,240 – 28,245; 57, pgs. 1 ,2, 3). These lead emissions to the air from the Whiting Metals facility operations can deposit in residential yards via air deposition.

Major sources of lead in the air are ore and metals processing and piston-engine aircraft operating on leaded aviation fuel. Other sources are waste incinerators, utilities, and lead-acid battery manufacturers. The highest air concentrations of lead are usually found near lead smelters (Ref. 52, pg. 1).

As discussed in the Historical documents, a train left the National Lead Company in Granite City, IL carrying forty-nine unsealed, steel drums of raw materials in what a Hammond Times story reported as open train cars. Each drum carried 700 to 1,000 pounds of metal dross, bound for Federated Metals, next door to Robertsdale's Goose Island neighborhood. National Lead had skimmed this dross from its refining pots and sold it to Federated, where it was to be refined further. While unloading the drums of dross, workers dumped the contents on the floor of the receiving department. Using shovels, the men mixed the dross, some of which was wet from rain, and made separate piles for production and for lab samples. By late morning a worker noticed white fumes coming from the piles and hosed them down with water. The dross that National Lead in Granite City skimmed off and sold to Federated Metals contained aluminum arsenide. It had formed when National Lead smelted raw materials containing high concentrations of arsenic (Ref. 84, pg. 1, 2). When aluminum arsenide comes into contact with water, it decomposes in a chemical reaction that creates deadly arsine gas (Ref. 84, pg. 3).

As stated in Section 4.1.2.1.1 of this documentation record, four (4) sites near Federated Metals, all located within 1,000 feet of Lake George, are listed in the Comprehensive Environmental Response, Compensation and Liability (CERCLIS). However as discussed in that section:

The contamination is attributed to the Federated Metals and Whiting Metals facility based on the following:

1) The entire area of the Site outside the buildings, that had not been previously investigated during the RFI/CMI activities, was designated as "Areas that may be contaminated" per Section 3.3.3 of the RISC Technical Guide (Ref. 26, pg. 79). Soils outside the area of the Site buildings were found to have elevated levels of lead (Ref. 26, pg. 110; 37, pg. 47).

2) Emissions were observed coming from the gravel road of the property owned by Monaghan, LLC. which is just west of Whiting Metals, LLC plant building (now currently owned by East Lake Metals (Refs. 4, pg. 22,468; 7, pg., 1; 8, pg. 1; 32, pgs. 9, 29; 59, pg. 1; 74, pg. 1). A company called) Village Discount is currently occupying this area to the west of East Lake Metals.

3) IDEM and the U.S. EPA recorded exceedances of lead to the air from Whiting Metals that resulted in notices of violation (Ref. 30, pgs. 1-13).

As previously stated, the Federated Metals Corp Whiting site is composed of lead and arsenic-contaminated soil at the former facility property and on residential (single and multi-family) properties and a release to Lake George and wetlands. The U.S. EPA has conducted time-critical removal actions at 34 properties to mitigate potential threats to human health and the environment (Ref. 42, pgs. 1, 2). The properties addressed during the removal actions are not included in Tables 6 and 10 of this documentation record and are not included in the HRS score.

5.1.1 RESIDENT POPULATION THREAT

The resident population threat is evaluated if there is an AOC within the residential property boundary and within 200 feet of the respective residence. The surface soil samples collected from each respective residential property were within 200 feet of the residence because the parcel sizes are less than 200 feet in length and width (Ref. 1, Section 5.1.1). All the observed contamination samples summarized in Table 10 of this HRS documentation record are on residential parcels.

Table 10 of this HRS documentation record lists surface soil samples (0 to 6 inches bgs) collected from December 2016 through 2019 by the U.S. EPA and IDEM and includes occupied residential properties located within AOC A that were found to have an observed release of lead and/or arsenic at levels greater than three (3) times background (Ref. 54; See sample field sheets and log book pages in Ref. 40).

All surface soil samples listed in Table 10, 27, 28, and 29 of this HRS documentation record were collected within the individual property boundaries and are part of AOC A; the soil samples collected at each residential property is less than 200 feet from the dwelling (Refs. 1, Section 5.1.1; 54; 99, pg. 1; See also sample field sheets and log book pages in Ref. 40). Properties that were sampled and where the U.S. EPA conducted removal activities (Ref. 42) are not included as resident population threat targets.

5.1.1.1 LIKELIHOOD OF EXPOSURE

As documented in Section 5.1 of this HRS documentation record, observed contamination has been established on residential properties; therefore, a value of 550 is assigned to the resident population threat likelihood of exposure factor category.

Resident Population Threat Likelihood of Exposure Factor Category Value: 550
(Ref. 1, Section 5.1.1.1)

5.1.1.2 WASTE CHARACTERISTICS

5.1.1.2.1 Toxicity

The toxicity values for the hazardous substances detected in the AOC A are summarized in Table 25 below of this HRS documentation record.

TABLE 25
Soil Exposure Toxicity

Hazardous Substance	Toxicity Factor Value	Reference
Lead	10,000	Ref. 2, pg. 14
Arsenic	10,000	Ref. 2, pg. 3

Lead and arsenic are the only hazardous substance evaluated for this HRS documentation record. The toxicity factor value for lead is 10,000. The toxicity factor value for arsenic is also 10,000. Both lead and arsenic qualify for a maximum toxicity factor value of 10,000 (Refs. 1, Sections 2.4.1.1 and 5.1.1.2.1; 2, pgs. 3, 14).

Toxicity Factor Value: 10,000
(Ref. 1, Section 5.1.1.2.1)

5.1.1.2.2 Hazardous Waste Quantity

The hazardous constituent quantity for AOC A and AOC B is not adequately determined (see Source #2 and Source #3 sections 2.4.2.1.1 of this HRS documentation record). AOC A is comprised of contaminated soil on residential properties that contain elevated concentrations of lead and/or arsenic. AOC B is composed of lead and/or arsenic contaminated soils at the former Federated Metals facility (Ref. 54, Tables 2, 6 and 10 of this HRS documentation record). The approximate area of observed contamination, excluding impervious surfaces, was not estimated for AOC A or AOC B. The full extent contamination of lead and arsenic in residential properties has not been determined at this time. Per HRS Section 2.4.2.2, if the hazardous constituent quantity is not adequately determined for one or more areas of observed contamination, the hazardous waste quantity (HWQ) factor value is assigned either the value from Table 2-6 or a value of 10, whichever is greater as the hazardous waste quantity factor value for the soil exposure component of the soil exposure and subsurface intrusion pathway (Ref. 1, Section 2.4.2.2, Table 2-6).

TABLE 26
Hazardous Waste Quantity

Area of Observed Contamination Letter	Type	Area Hazardous Waste Quantity
A	Contaminated Soil	Undetermined but greater than zero
B	Contaminated Soil	Undetermined but greater than zero

Hazardous Waste Quantity Factor Value: 10
(Ref. 1, Sections 2.4.2.2 and 5.1.1.2.2)

5.1.1.2.3 Calculation of Waste Characteristics Factor Category Value

Two (2) hazardous substances were evaluated for the waste characteristics. Lead has a toxicity factor value of 10,000 (Ref. 2, p. 14) and arsenic has a toxicity factor value of 10,000 (Ref. 2, pg. 3). The waste characteristics factor category was obtained by multiplying the toxicity and HWQ factor values. Based on this product, a value was assigned in accordance with Reference 1, Table 2-7 (Ref. 1, Section 5.1.1.2.3, Table 2-7).

Toxicity Factor Value (see Table 25 of this HRS documentation record): 10,000
Hazardous Waste Quantity Factor Value: 10
Toxicity Factor Value × Hazardous Waste Quantity Factor Value: 1×10^5

Waste Characteristics Factor Category Value: 18
(Ref. 1, Table 2-7)

5.1.1.3 TARGETS

Only those individuals whose residence or workplace is both on the property of and within 200 feet of documented contamination that meet observed contamination criteria are included as resident population threat targets (Ref. 1, Section 5.1.1.3, 99, pg. 1; See also sample field sheets and log book pages in Ref. 40). Residents at properties that were not sampled but are within the 27 polygons where contamination has been inferred are evaluated in the Level II population (Tables 28 and 29 of this HRS documentation record). These polygon areas are comprised of individual residential properties that contain lead and/or arsenic three times above background levels as well as inferred residential properties (that were not sampled) that are located between properties that are known to have elevated levels of lead and/or arsenic (Ref. 54, pgs. 1-35). Properties included in AOC A that contained an unoccupied residence, vacant lots and parks at the time of sampling were not evaluated as resident population threat targets. Workers at the at the former Whiting Metals and Discount Village properties are evaluated. No research was conducted to determine if day care facilities exist at the churches.

Properties where removal actions have been conducted by the City of Hammond, as well as those that were remediated by EPA are not evaluated as resident population targets for this HRS documentation record.

Level I Concentrations

Lead and arsenic are the only hazardous substance scored in this HRS documentation record (Tables 6 and10 of this HRS documentation record). An HRS cancer or non-cancer screening concentration is not available for lead (Ref. 2, pg. 16). Therefore, Level I concentrations for lead are not scored. Arsenic has an HRS Soil Cancer Risk screening concentration of 7.72E-01 mg/kg (Ref. 2, pg. 5). Therefore, a Level I concentration for arsenic is scored. Table 27 of this HRS documentation record lists those soil samples that meet arsenic Level I concentrations.

Level II Concentrations

Surface soil samples were collected from residential properties that met Level II concentrations (Table 28 [listing 121 residential properties in Whiting] and Table 29 [listing 38 residential properties in Hammond]); the surface soil samples collected by the U.S. EPA consisted of composite samples collected from the front, back, and side yards, as well as from garden and playground areas on the properties (Ref. 40, pgs. 1-531; 54). Some residential surface soil samples collected by IDEM were grab samples (Ref. 40, pgs. 65-71). The residential surface soil samples were collected less than two (2) feet on each property and within 200 feet of the residences (Ref. 54, 99, pg. 1; Table 10 of this HRS documentation record; see also sample field sheets and logbook pages in Ref. 40).

All the observed contamination samples are three times background levels (see Table 10 of this HRS documentation record). Refer to Table 2 of this documentation record for the lead and arsenic concentrations in background samples. As stated above, HRS cancer and non-cancer screening concentrations can be calculated for arsenic but cannot be calculated for lead. An HRS benchmark for lead in surface soils has not been established (Ref. 2, pgs. 5, 16).

5.1.1.3.1 Resident Individual

Area of Observed Contamination Letter: AOC A
Level of Contamination (Level I/Level II): Level I

As presented in Table 27 of this HRS documentation record, and illustrated in Reference 54, arsenic concentrations in 16 samples collected within AOC A from residential properties meet the criteria for Level I concentrations. The 9 residential properties listed in Table 27 of this HRS documentation record meet observed contamination for arsenic and exceed the HRS cancer risk benchmark of 0.772 mg/kg listed in the Superfund Chemical Data Matrix (Ref. 2, pg. 5).

Resident Individual Factor Value: 50
(Ref. 1, Section 5.1.3.1)

5.1.1.3.2 Resident Population

The surface soil samples listed in Tables 27, 28, and 29 of this HRS documentation record were collected from December 2016 through 2019 (see Table 10 of this HRS documentation record). The surface soil samples were collected less than two (2) feet bgs (Table 10 of this HRS documentation record). The average number of persons per residence was obtained from the 2020 U.S. Census (Ref. 67) for Lake County Indiana.

5.1.1.3.2.1 Level I Concentrations

Level I concentrations were scored. Arsenic is the only hazardous substance scored in this HRS documentation record for Level I concentrations (Table 27 of this HRS documentation record).

The surface soil samples listed in Table 27 this HRS documentation record were collected from December 2016 through 2019 (see Table 10 of this HRS documentation record). The vacant lots and properties that were unoccupied residences at the time of sampling are not evaluated at Level I concentrations. Residential properties that were remediated by the U.S. EPA and the city of Hammond were not evaluated for scoring (Ref. 92, pg. 1; Table 2 of this documentation record). Since the highest background concentration for arsenic is 11 ppm, all concentrations of arsenic that are greater than three (3) times that level in residential yards and above the cancer risk soil benchmark of 0.772 mg/kg are considered Level I concentrations (Refs. 1, Sections 2.5.2, 5.1.1.3.2; 2, pg. 5).

Level I Resident Population Targets:

Any unoccupied residences and residential properties that were remediated by the U.S. EPA are not included as Level I resident population. The average number of persons per residence was obtained from the 2020 U.S. Census Bureau (Ref. 1, Section 5.1.1.3.2; Ref. 67). The U.S. Census Bureau persons-per-household factor value of 2.55 for Lake County Indiana was used for all residences (Ref. 67, p. 1).

Analysis of the residential samples listed in Table 27 below have been found to have arsenic concentrations that exceed three (3) times background samples and exceed the cancer risk benchmark of .772 mg/kg (Ref. 2, pg. 5; Tables 2 and 10 of this HRS documentation record). The samples listed in this table are at Level I concentrations, and the associated

residents at those sample locations are considered Level I targets in Hammond, Indiana and Whiting, Indiana. Refer to Table 10 of this HRS documentation record for the arsenic concentration for each of the listed samples and the corresponding references. The average number of persons-per-household in Lake County Indiana is 2.55 (Ref. 67, pg. 1). Refer to Ref. 79, page 1, which depicts the residential address for each sample.

TABLE 27

Level I Targets – Arsenic

According to the U. S. Census for Lake County, Indiana, there is an average of 2.55 people per household (Ref. 67, pg. 1)

Number	AOC Letter	Laboratory ID (Refer to Ref. 78 and Table 10 for arsenic results associated with each sample ID/Lab ID including other references. Refer to Ref. 79 for addresses associated with Laboratory IDs	Arsenic Concentration (mg/kg)	City Name	Average Number of Residents	Polygon Letter	Ref. 54, Map ID
1	A	151954	41.2	Whiting	2.55	T	Ref. 54, pg. 35, Map J1
2	A	136530	37.2	Whiting	2.55	T	Ref. 54, pg. 10, Map D3
3	A	198274	50.0	Whiting	2.55	T	Ref. 54, pg. 10, Map D3
4	A	143732	40.2	Whiting	2.55	V	Ref. 54, pg. 7, Map C1
5	A	955603	52.2	Whiting	2.55	W	Ref. 54, pg. 19, Map F2
6	A	114795	128	Whiting	2.55	N	Ref. 54, pg. 21, Map F4
6	A	1809674002	206	Whiting		N	Ref. 54, pg. 21, Map F4
6	A	105043	66.1	Whiting		N	Ref. 54, pg. 21, Map F4
6	A	14793	50.1	Whiting		N	Ref. 54, pg. 21, Map F4

Number	AOC Letter	Laboratory ID (Refer to Ref. 78 and Table 10 for arsenic results associated with each sample ID/Lab ID including other references. Refer to Ref. 79 for addresses associated with Laboratory IDs	Arsenic Concentration (mg/kg)	City Name	Average Number of Residents	Polygon Letter	Ref. 54, Map ID
7	A	11478	66.9	Whiting	2.55	W	Ref. 54, pg. 4, Map B2
7	A	1809674001	73.4	Whiting		W	Ref. 54, pg. 4, Map B2
7	A	105028	44	Whiting		W	Ref. 54, pg. 4, Map B2
7	A	114777	45.2	Whiting		W	Ref. 54, pg. 4, Map B2
8	A	820358	45	Whiting	2.55	W	Ref. 54, pg. 17, Map E6
8	A	820357	57.1	Whiting		W	Ref. 54, pg. 17, Map E6
10	A	151886	149	Hammond	2.55	H	Ref. 54, pg. 25, Map G3

Eight (8) properties in Whiting and one (1) property in Hammond, totaling nine (9) properties, are subject to Level I concentrations of arsenic. The number of persons per household is 2.55 for Lake County, Indiana (Ref. 67, pg. 1). The total population subject to Level I concentrations is 22.95 (9 residences x 2.55) = 22.95. For individuals subject to Level I contamination, the Level I concentration factor value is determined by multiplying by 10 (Ref. 1, Section 5.1.1.3.2.1), yielding a total factor value of 229.5.

Level I Concentrations Factor Value: 229.5
(Ref. 1, Section 5.1.3.2.1)

5.1.1.3.2.2 Level II Concentrations

The surface soil samples listed in Tables 28 and 29 of this HRS documentation record, were collected from December 2016 through 2019 (see Table 10 of this HRS documentation record). The vacant lots and properties that were unoccupied residences at the time of sampling that are included in AOC A are not evaluated at Level II concentrations.

Level II Resident Population Targets

The surface soil samples listed below in Table 28 of this HRS documentation record were collected in Whiting, Indiana from December 2016 through 2019 (Ref. 54; Table 10 of this HRS documentation record). Any unoccupied residences and residential properties that were remediated by the U.S. EPA and the City of Hammond are not included as Level II resident population targets in Table 28 of this documentation record. The average number of persons per residence was obtained from the 2020 U.S. Census Bureau. According to the U.S. Census Bureau, there are 2.55 persons-per-household. for Lake County (Ref. 1, Section 5.1.1.3.2; Ref. 67, pg. 1). Refer to Table 10 of this HRS documentation record for the lead concentrations for each of the listed samples.

TABLE 28

Level II Targets – Residential Properties in Whiting, Indiana

See Ref. 81 for the addresses for each Laboratory sample.

Number	AOC Letter	Sample ID / Laboratory ID	Total Number of Residents	Polygon Letter	Reference
1	**A**	845980	2.55	N/A	Ref. 54, pg. 6, Map B4
1	**A**	845981		N/A	Ref. 54, pg. 6, Map B4
2	**A**	136505	2.55	W	Ref. 54, pg. 3, Map B1
3	**A**	151963	2.55	W	Ref. 54, pg. 3, Map B1
4	**A**	845982	2.55	I	Ref. 54, pg. 9, Map D2
5	**A**	Inferred	2.55	I	Ref. 54, pg. 9, Map D2
6	**A**	Inferred	2.55	R	Ref. 54, pg. 15, Map E4
7	**A**	Inferred	2.55	R	Ref. 54, pg. 15, Map E4
8	**A**	105035	2.55	R	Ref. 54, pg. 15, Map E4
9	**A**	955583	2.55	N/A	Ref. 54, pg. 20, Map F3
10	**A**	184404	2.55	N/A	Ref. 54, pg. 20, Map F3
11	**A**	845992	2.55	N/A	Ref. 54, pg. 20, Map F3

Number	AOC Letter	Sample ID / Laboratory ID	Total Number of Residents	Polygon Letter	Reference
12	**A**	211527	2.55	N	Ref. 54, pg. 21, Map F4
12	**A**	211528		N	Ref. 54, pg. 21, Map F4
13	**A**	123836	2.55	S	Ref. 54, pg. 8, Map D1
14	**A**	153914	2.55	V	Ref. 54, pg. 7, Map C1
14	**A**	153918		V	Ref. 54, pg. 7, Map C1
15	**A**	Inferred	2.55	V	Ref. 54, pg. 7, Map C1
16	**A**	Inferred	2.55	T	Ref. 54, pg. 10, Map D3
17	**A**	Inferred	2.55	V	Ref. 54, pg. 7, Map C1
18	**A**	136543	2.55	T	Ref. 54, pg. 10, Map D3
19	**A**	Inferred	2.55	V	Ref. 54, pg. 7, Map C1
20	**A**	Inferred	2.55	V	Ref. 54, pg. 7, Map C1
21	**A**	153915	2.55	V	Ref. 54, pg. 7, Map C1
21	**A**	153916		V	Ref. 54, pg. 7, Map C1
21	**A**	153917		V	Ref. 54, pg. 7, Map C1
22	**A**	151910	2.55	V	Ref. 54, pg. 7, Map C1
22	**A**	151889		V	Ref. 54, pg. 7, Map C1
23	**A**	151896	2.55	U	Ref. 54, pg. 10, Map D3
23	**A**	151889		U	Ref. 54, pg. 10, Map D3
24	**A**	153913	2.55	V	Ref. 54, pg. 7, Map C1
25	**A**	153920	2.55	V	Ref. 54, pg. 7, Map C1
25	**A**	153919		V	Ref. 54, pg. 7, Map C1
26	**A**	169976	2.55	N/A	Ref. 54, pg. 11, Map D4
27	**A**	169977	2.55	N/A	Ref. 54, pg. 11, Map D4
28	**A**	132475	2.55	K	Ref. 54, pg. 18, Map F1
29	**A**	143720	2.55	L	Ref. 54, pg. 18, Map F1

Number	AOC Letter	Sample ID / Laboratory ID	Total Number of Residents	Polygon Letter	Reference
29	**A**	143729		L	Ref. 54, pg. 18, Map F1
30	**A**	Inferred	2.55	L	Ref. 54, pg. 18, Map F1
31	**A**	151897	2.55	L	Ref. 54, pg. 18, Map F1
32	**A**	132498	2.55	L	Ref. 54, pg. 18, Map F1
32	**A**	132499		L	Ref. 54, pg. 18, Map F1
33	**A**	143693	2.55	P	Ref. 54, pg. 13, Map E2
34	**A**	Inferred	2.55	P	Ref. 54, pg. 13, Map E2
35	**A**	Inferred	2.55	P	Ref. 54, pg. 13, Map E2
36	**A**	105042	2.55	P	Ref. 54, pg. 13, Map E2
37	**A**	105037	2.55	P	Ref. 54, pg. 13, Map E2
37	**A**	105039		P	Ref. 54, pg. 13, Map E2
37	**A**	1809674009		P	Ref. 54, pg. 13, Map E2
38	**A**	151895	2.55	P	Ref. 54, pg. 13, Map E2
39	**A**	211530	2.55	N/A	Ref. 54, pg. 22; Map F5
40	**A**	Inferred	2.55	N/A	Ref. 54, pg. 22, Map F5
41	**A**	Inferred	2.55	N/A	Ref. 54, pg. 22, Map F5
42	**A**	955605	2.55	N/A	Ref. 54, pg. 19, Map F2
43	**A**	211521	2.55	Q	Ref. 54, pg. 14, Map E3
43	**A**	211523		Q	Ref. 54, pg. 14, Map E3
44	**A**	955622	2.55	M	Ref. 54, pg. 19, Map F2
44	**A**	955620		M	Ref. 54, pg. 19, Map F2
45	**A**	Inferred	2.55	M	Ref. 54, pg. 19, Map F2
46	**A**	Inferred	2.55	M	Ref. 54, pg. 19, Map F2
47	**A**	Inferred	2.55	N	Ref. 54, pg. 21, Map F4
48	**A**	Inferred	2.55	N	Ref. 54, pg. 21, Map F4

Number	AOC Letter	Sample ID / Laboratory ID	Total Number of Residents	Polygon Letter	Reference
49	**A**	Inferred	2.55	N	Ref. 54, pg. 21, Map F4
50	**A**	Inferred	2.55	N	Ref. 54, pg. 21, Map F4
51	**A**	211504	2.55	N	Ref. 54, pg. 21, Map F4
51	**A**	211503		N	Ref. 54, pg. 21, Map F4
52	**A**	Inferred	2.55	N	Ref. 54, pg. 21, Map F4
53	**A**	132479	2.55	N	Ref. 54, pg. 21, Map F4
54	**A**	955581	2.55	N/A	Ref. 54, pg. 21, Map F4
55	**A**	132483	2.55	N	Ref. 54, pg. 21, Map F4
55	**A**	132487		N	Ref. 54, pg. 21, Map F4
56	**A**	Inferred	2.55	O	Ref. 54, pg. 22, Map F5
57	**A**	845987	2.55	O	Ref. 54, pg. 22, Map F5
58	**A**	Inferred	2.55	O	Ref. 54, pg. 22, Map F5
59	**A**	Inferred	2.55	O	Ref. 54, pg. 22, Map F5
60	**A**	143695	2.55	O	Ref. 54, pg. 22, Map F5
60	**A**	143683		O	Ref. 54, pg. 22, Map F5
61	**A**	Inferred	2.55	Z	Ref. 54, pg. 22, Map F5
62	**A**	132463	2.55	Z	Ref. 54, pg. 22, Map F5
62	**A**	132464		Z	Ref. 54, pg. 22, Map F5
62	**A**	132474		Z	Ref. 54, pg. 22, Map F5
63	**A**	211530	2.55	N/A	Ref. 54, pg. 16, Map E5
64	**A**	1809673012	2.55	N/A	Ref. 54, pgs. 16-22, Maps E5 & F5
65	**A**	821153	2.55	N/A	Ref. 54, pg. 3, Map B1
66	**A**	Inferred	2.55	S	Ref. 54, pg. 8, Map D1
67	**A**	Inferred	2.55	S	Ref. 54, pg. 8, Map D1

Number	AOC Letter	Sample ID / Laboratory ID	Total Number of Residents	Polygon Letter	Reference
68	**A**	Inferred	2.55	S	Ref. 54, pg. 8, Map D1
69	**A**	143680	2.55	S	Ref. 54, pg. 8, Map D1
70	**A**	151905	2.55	Q	Ref. 54, pg. 14, Map E3
70	**A**	151906		Q	Ref. 54, pg. 14, Map E3
71	**A**	Inferred	2.55	Q	Ref. 54, pg. 14, Map E3
72	**A**	211506	2.55	Q	Ref. 54, pg. 14, Map E3
72	**A**	211514		Q	Ref. 54, pg. 14, Map E3
73	**A**	211505	2.55	Q	Ref. 54, pg. 14, Map E3
74	**A**	Inferred	2.55	Q	Ref. 54, pg. 14, Map E3
75	**A**	955599	2.55	Q	Ref. 54, pg. 14, Map E3
76	**A**	Inferred	2.55	AA	Ref. 54, pg. 27, Map G5
77	**A**	Inferred	2.55	AA	Ref. 54, pg. 27, Map G5
78	**A**	151967	2.55	AA	Ref. 54, pg. 27, Map G5; 80, pg. 1
80	**A**	132489	2.55	U	Ref. 54, pg. 10, Map D3
80	**A**	132495		U	Ref. 54, pg. 10, Map D3
81	**A**	197012	2.55	R	Ref. 54, pg. 15, Map E4
82	**A**	136528	2.55	N/A	Ref. 54, pg. 16, Map E5
82	**A**	132480		N/A	Ref. 54, pg. 16, Map E5
83	**A**	184413	2.55	N/A	Ref. 54, pg. 11, Map D4
84	**A**	105030	2.55	N/A	Ref. 54, pg. 5, Map B3
84	**A**	105031		N/A	Ref. 54, pg. 5, Map B3
84	**A**	1809673002		N/A	Ref. 54, pg. 5, Map B3
85	**A**	132469	2.55	O	Ref. 54, pg. 22, Map F5
85	**A**	132482		O	Ref. 54, pg. 22, Map F5
86	**A**	Inferred	2.55	I	Ref. 54, pg. 28, Map G6

Number	AOC Letter	Sample ID / Laboratory ID	Total Number of Residents	Polygon Letter	Reference
87	**A**	820336	2.55	I	Ref. 54, pg. 28, Map G6
88	**A**	1809673001	2.55	N/A	Ref. 54, pg. 5, Map B3
89	**A**	151946	2.55	N/A	Ref. 54, pg. 4, Map B2
89	**A**	151947		N/A	Ref. 54, pg. 4, Map B2
89	**A**	151953		N/A	Ref. 54, pg. 4, Map B2
89	**A**	169978		N/A	Ref. 54, pg. 4, Map B2
90	**A**	1809673007	2.55	X	Ref. 54, pg. 4, Map B2
91	**A**	Inferred	2.55	X	Ref. 54, pg. 4, Map B2
92	**A**	18096740	2.55	N/A	Ref. 54, pg. 4, Map B2
93	**A**	Inferred	2.55	X	Ref. 54, pg. 4, Map B2
94	**A**	151909	2.55	X	Ref. 54, pg. 4, Map B2
94	**A**	151959		X	Ref. 54, pg. 4, Map B2
95	**A**	132470	2.55	H	Ref. 54, pg. 32, Map H4
95	**A**	136537		H	Ref. 54, pg. 32, Map H4
95	**A**	136540		H	Ref. 54, pg. 32, Map H4
96	**A**	Inferred	2.55	I	Ref. 54, pg. 28, Map G6
97	**A**	143689	2.55	I	Ref. 54, pg. 28, Map G6
97	**A**	143690		I	Ref. 54, pg. 28, Map G6
98	**A**	143691	2.55	N/A	Ref. 54, pg. 33, Map H5
99	**A**	143705	2.55	N/A	Ref. 54, pg. 33, Map H5
99	**A**	143676		N/A	Ref. 54, pg. 33, Map H5
99	**A**	143686		N/A	Ref. 54, pg. 33, Map H5
100	**A**	132471	2.55	J	Ref. 54, pg. 28, Map G6
101	**A**	955621	2.55	N/A	Ref. 54, pg. 17, Map E6
102	**A**	136538	2.55	K	Ref. 54, pg. 18, Map F1

Number	AOC Letter	Sample ID / Laboratory ID	Total Number of Residents	Polygon Letter	Reference
102	**A**	136541		K	Ref. 54, pg. 18, Map F1
103	**A**	1809674005	2.55	N/A	Ref. 54, pg. 13, Map E2
104	**A**	132481	2.55	S	Ref. 54, pg. 8, Map D1
105	**A**	114801	2.55	N/A	Ref. 54, pg. 13, Map E2
105	**A**	1809674010		N/A	Ref. 54, pg. 13, Map E2
106	**A**	136490	2.55	S	Ref. 54, pg. 8, Map D1
107	**A**	153911	2.55	P	Ref. 54, pg. 13, Map E2
108	**A**	Inferred	2.55	P	Ref. 54, pg. 13, Map E2
109	**A**	114778	2.55	P	Ref. 54, pg. 13, Map E2
110	**A**	197014	2.55	N	Ref. 54, pg. 21, Map F4
111	**A**	Inferred	2.55	K	Ref. 54, pg. 18, Map F1
112	**A**	Inferred	2.55	AA	Ref. 54, pg. 27, Map G5
113	**A**	136495	2.55	AA	Ref. 54, pg. 27, Map G5
114	**A**	Inferred	2.55	I	Ref. 54, pg. 28, Map G6
115	**A**	1809673008	2.55	I	Ref. 54, pg. 28, Map G6
115	**A**	1809674006		I	Ref. 54, pg. 28, Map G6
115	**A**	105041		I	Ref. 54, pg. 28, Map G6
116	**A**	143717	2.55	J	Ref. 54, pg. 28, Map G6
117	**A**	Inferred	2.55	J	Ref. 54, pg. 28, Map G6
118	**A**	Inferred	2.55	J	Ref. 54, pg. 28, Map G6
119	**A**	955584	2.55	J	Ref. 54, pg. 28, Map G6
120	**A**	169980	2.55	J	Ref. 54, pg. 28, Map G6
121	**A**	Inferred	2.55	J	Ref. 54, pg. 28, Map G6
122	**A**	211509	2.55	J	Ref. 54, pg. 28, Map G6
122	**A**	211510		J	Ref. 54, pg. 28, Map G6

Number	AOC Letter	Sample ID / Laboratory ID	Total Number of Residents	Polygon Letter	Reference
122	**A**	211511		J	Ref. 54, pg. 28, Map G6

N/A – Not Applicable

Residents at one hundred and twenty-one (121) residential properties in Whiting are evaluated at Level II concentrations. The average number of persons per household in Whiting is 2.55 people per household (Ref. 67, pg. 1).

(Ref. 1, Section 5.1.1.3.2.2)

The surface soil samples listed below in Tables 29 of this HRS documentation record were collected In Hammond, Indiana from December 2016 through 2019 (Ref. 54; Table 10 of this HRS documentation record). Any unoccupied residences and residential properties that were remediated by the U.S. EPA or the city of Hammond are not included as Level II resident population targets in this table. The average number of persons per residence was obtained from the 2020 U.S. Census Bureau for Lake County, Indiana (Ref. 1, Section 5.1.1.3.2; Ref. 67) (specific page numbers for References 54 and 55 are provided below). The U.S. Census Bureau persons-per-household factor value of 2.55 for Lake County was used for all residences except for one (1) residence where an actual house count was available (Ref. 67, pg. 1; 124, pg. 1). Refer to Table 10 of this HRS documentation record for the lead concentrations for each of the listed samples.

TABLE 29

Level II Surface Soil Sample Targets – Residential Properties in Hammond, Indiana

See Ref. 82 for the address for each sample

Property Number	AOC Letter	Lab ID	Average Total No. of Residents	Polygon Letter (if applicable)	Reference
1	**A**	105024	2.55	N/A	Ref. 54, pg. 2, Map A1
1	**A**	1809674014		N/A	Ref. 54, pg. 2, Map A1
2	**A**	169990	2.55	N/A	Ref. 54, pg. 34, Map I1
3	**A**	151968	2.55	N/A	Ref. 54, pg. 34, Map I1
4	**A**	132493	2.55	N/A	Ref. 54, pg. 29, Map H1
5	**A**	132490	2.55	A	Ref. 54, pg. 29, Map H1
6	**A**	Inferred	2.55	A	Ref. 54, pg. 29, Map H1
8	**A**	197023	2.55	A	Ref. 54, pg. 29, Map H1
9	**A**	Inferred	2.55	E	Ref. 54, pg. 25, Map G3
10	**A**	151892	2.55	E	Ref. 54, pg. 25, Map G3
11	**A**	Inferred	2.55	B	Ref. 54, pg. 30, Map H2
12	**A**	Inferred	2.55	C	Ref. 54, pg. 30, Map H2
13	**A**	Inferred	2.55	F	Ref. 54, pg. 26, Map G4
14	**A**	Inferred	2.55	F	Ref. 54, pg. 26, Map G4

Property Number	AOC Letter	Lab ID	Average Total No. of Residents	Polygon Letter (if applicable)	Reference
16	**A**	151894	2.55	N/A	Ref. 54, pg. 24, Map G2
17	**A**	820341	2.55	N/A	Ref. 54, pg. 12, Map E1; 123, pg. 1
18	**A**	132467	2.55	N/A	Ref. 54, pg. 25, Map G3
19	**A**	151960	2.55	E	Ref. 54, pg. 25, Map G3
20	**A**	151961	2.55	E	Ref. 54, pg. 25, Map G3
20	**A**	151913		E	Ref. 54, pg. 25, Map G3
21	**A**	151907	2.55	E	Ref. 54, pg. 25, Map G3
22	**A**	Inferred	2.55	E	Ref. 54, pg. 25, Map G3
23	**A**	151955	2.55	E	Ref. 54, pg. 25, Map G3
24	**A**	Inferred	2.55	E	Ref. 54, pg. 25, Map G3
25	**A**	151962	2.55	E	Ref. 54, pg. 25, Map G3
26	**A**	132494	2.55	E	Ref. 54, pg. 25, Map G3
27	**A**	136544	2.55	E	Ref. 54, pg. 25, Map G3
27	**A**	136545		E	Ref. 54, pg. 25, Map G3
28	**A**	143684	2.55	E	Ref. 54, pg. 25, Map G3
28	**A**	143688		E	Ref. 54, pg. 25, Map G3
28	**A**	143697		E	Ref. 54, pg. 25, Map G3
29	**A**	Inferred	2.55	E	Ref. 54, pg. 25, Map G3
30	**A**	Inferred	2.55	E	Ref. 54, pg. 25, Map G3
31	**A**	197021	2.55	E	Ref. 54, pg. 25, Map G3
32	**A**	955590	2.55	E	Ref. 54, pg. 25, Map G3
33	**A**	955594	2.55	F	Ref. 54, pg. 26, Map G4
33	**A**	955613		F	Ref. 54, pg. 26, Map G4
34	**A**	955589	2.55	F	Ref. 54, pg. 26, Map G4
35	**A**	956980	2.55	F	Ref. 54, pg. 26, Map G4
36	**A**	Inferred	2.55	F	Ref. 54, pg. 26, Map G4
37	**A**	Inferred	2.55	F	Ref. 54, pg. 26, Map G4
38	**A**	Inferred	2.55	F	Ref. 54, pg. 26, Map G4
39	**A**	1809673013	2.55	G	Ref. 54, pg. 26, Map G4
40	**A**	163424	3	N/A	Ref. 54, pg. 26, Map G4; 124, pg.1

N/A – Not Applicable

Thirty-eight (38) residential properties in Hammond are evaluate at Level II concentrations of lead. Of those, thirty-seven (37) residential properties in Hammond are estimated to have 2.55 persons per household and one (1) property with 3 confirmed residents (Refs. 1, Section 5.1.1.3.2.2; 67, pg. 1; 124).

The Level II concentrations factor is calculated as follows: One hundred and twenty-one (121) Whiting properties and thirty-eight (38) Hammond properties, totaling 159 properties are subject to Level II concentrations of lead. The number of persons per household is 2.55 for Lake County, Indiana. The total population subject to Level II concentrations is [(158 residences x 2.55)] + 3 (one property is confirmed to have 3 residents) = 405.9. [The Whiting population is 121 x 2.55 = 308.55. The Hammond population is (37 x 2.55) + 3 = 94.35. Together the total is 405.9]. Thus, the Level II concentration factor value is 405.9 (Refs. 1, Section 5.1.1.3.2.2; 124).

Level II Concentrations Factor Value: 405.9

5.1.1.3.3 Workers

Surface soil sampling by U.S. EPA Air Enforcement Program staff in 2019 at the former Whiting Metals and Discount Village properties and sampling conducted by Whiting Metals consultant for the IDEM's VRP surface soil samples were found to be contaminated greater than three (3) times background concentrations. The samples collected from these properties include the following sample IDs:

> Aa1, Aa3, Ab1, Ab2, Ab3, Ac2, Ad1, Ad2, Ad3, Ba1, Ba2, Ba3, Bb1, Bb2, Bb3, Bc1, Bc3, Bd1, Bd2, Bd3, Ca1, Ca3, Cb1, Cb3, Cc1, Cc3, Da2, Db3, Dc2, Eb1, Eb2, Fa2, Fc1, Fc2, Fd1, Ga1, Ga2, Ga3, Gb2, Gc1, Gc2, Ha1, Ha2, Ha3, Hb1, Hb2, Hb3, Hc1, Hc2, Hc3, Hd1, Hd2, Hd3, Village Discount samples 1905008-03, 1905008-05, 1905008-06,1905008-07, 1905008-09, 1905008-10, 1905008-11, 1905008-12; Whiting Metals Property samples 1906001-01, 1906001-02, 1906001-03, 1906001-04, 1906001-05, 1906001-06, 1906001-07, and 1906001-08 (Refs. 57;59; pgs. 1-7; 76, pg. 2; 94, pg. 1; Figure 2; Figure 3; Table 6 of this documentation record).

Since Whiting Metals had ceased operations, a new company, Eastlake Metals LLC aka Alex Gross & Eastlake Metals LLC aka Jeff Condon (Eastlake Metals LLC), has moved into the former Whiting Metals plant building (Ref. 93, pg. 2).

According to an email from IDEM's Deputy Assistant Commissioner, there are 13 people working at Eastlake Metals LLC (former Federated Metals/Whiting Metals facility) and 16 people working at Village Discount (Ref. 60, pg. 2).

13 workers at Eastlake Metals LLC+ 16 workers at Village Discount = 29 workers

Total Number of Workers: 29 (Ref. 60, pg. 2)

Workers Factor Value: 5
(Ref. 1, Section 5.1.1.3.3 and Table 5-4)

5.1.1.3.4 Resources

Description of Resource(s): No resources as stated in the HRS, Section 5.1.1.3.4, have been documented on AOC A and AOC B.

Resources Factor Value: NS

5.1.1.3.5 Terrestrial Sensitive Environments

No terrestrial sensitive environments as stated in the HRS, Section 5.1.1.3.5, have been documented on AOC A and AOC B.

Terrestrial Sensitive Environments: NS

5.1.1.3.6 Calculation of Resident Population Targets Factor Category Value

Resident Individual + Level I + Level II + Workers + Resources + Terrestrial Sensitive Environments = 50 + 229.5 + 405.9 + 5 +0 + 0 = 690.4

5.1.2 NEARBY POPULATION THREAT

The nearby population threat was not evaluated. Properties that are part of the time-critical U.S. EPA Removal action are not scored in this HRS documentation record.

5.1.2.1 Likelihood of Exposure

Attractiveness/Accessibility — Assigned Value: Not Scored

Areas of Contamination — Assigned Value: Not Scored

Likelihood of Exposure — Assigned Value: Not Scored

Waste Characteristics Targets

Nearby Population

The table below shows the number of people within each depicted distance ring (Ref. 61, pg. 1).

DISTANCE	POPULATION
0.25 Mile	779
0.5 Mile	3,664
1 Mile	5,682
2 Mile	4,374
3 Mile	33,344
4 Mile	46,435

Nearby Population Threat

Assigned Value: Not Scored