

UNITED STATES  
ENVIRONMENTAL PROTECTION AGENCY  
REGION 5

\_\_\_\_\_  
IN THE MATTER OF: )

U.S. Smelter and Lead Refinery, Inc. Site )  
in East Chicago, Lake County, Indiana )

Atlantic Richfield Company, )  
The Chemours Company FC, LLC, and )  
E. I. du Pont de Nemours and Company, )

Respondents. )

Proceeding under Section 106(a) )  
of the Comprehensive Environmental )  
Response, Compensation, and Liability )  
Act, 42 U.S.C. § 9606(a). )  
\_\_\_\_\_)

CERCLA Docket No. \_\_\_\_\_

**V-W-19-C-006**

**UNILATERAL ADMINISTRATIVE  
ORDER FOR REMEDIAL ACTION  
FOR DEFINED PROPERTIES  
IN OPERABLE UNIT 1  
OF THE U.S. SMELTER AND LEAD  
REFINERY, INC., SUPERFUND SITE**

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## **I. JURISDICTION AND GENERAL PROVISIONS**

1. This Administrative Order (“Defined Properties UAO”) is issued under the authority vested in the President of the United States by Section 106(a) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), 42 U.S.C. § 9606(a). This authority was delegated to the Administrator of the United States Environmental Protection Agency (“EPA”) by Executive Order No. 12580, 52 Fed. Reg. 2923 (Jan. 23, 1987), and further delegated to the Regional Administrators by EPA Delegation Nos. 14-14-A and 14-14-B. On May 11, 1994, this authority was further redelegated by the Regional Administrator of EPA Region 5 to the Superfund Division Director of Region 5 by EPA Regional Delegation No. 14-14-B.

2. This Defined Properties UAO pertains to property located at U.S. Smelter and Lead Refinery Inc., Site in East Chicago, Lake County, Indiana (the “USS Lead Site” or the “Site”). This Defined Properties UAO directs Respondents to perform the remedial action (RA) described in the Record of Decision (“ROD”), dated November 30, 2012, for certain properties (“Defined Properties”) in Operable Unit 1 of the Site.

3. EPA has notified the State of Indiana (the “State”) of this action pursuant to Section 106(a) of CERCLA, 42 U.S.C. § 9606(a).

## **II. PARTIES BOUND**

4. This Defined Properties UAO applies to and is binding upon Respondents and their successors and assigns. Any change in ownership or control of the Site or change in corporate or partnership status of a Respondent, including, but not limited to, any transfer of assets or real or personal property, shall not alter Respondents’ responsibilities under this Defined Properties UAO.

5. Respondents are jointly and severally liable for implementing all activities required by this Defined Properties UAO. Compliance or noncompliance by any Respondent with any provision of this Defined Properties UAO shall not excuse or justify noncompliance by any other Respondent. No Respondent shall interfere in any way with performance of the Work in accordance with this Defined Properties UAO by any other Respondent. In the event of the insolvency or other failure of any Respondent to implement the requirements of this Defined Properties UAO, the remaining Respondents shall complete all such requirements.

6. Respondents shall provide a copy of this Defined Properties UAO to each contractor hired to perform the Work required by this Defined Properties UAO and to each person representing any Respondents with respect to the Site or the Work, and shall condition all contracts entered into hereunder upon performance of the Work in conformity with the terms of this Defined Properties UAO. Respondents or their contractors shall provide written notice of the Defined Properties UAO to all subcontractors hired to perform any portion of the Work required by this Defined Properties UAO. Respondents shall nonetheless be responsible for ensuring that their contractors and subcontractors perform the Work in accordance with the terms of this Defined Properties UAO.

### III. DEFINITIONS

7. Unless otherwise expressly provided in this Defined Properties UAO, terms used in this Defined Properties UAO that are defined in CERCLA or in regulations promulgated under CERCLA shall have the meaning assigned to them in CERCLA or in such regulations. Whenever terms listed below are used in this Defined Properties UAO or in its appendices, the following definitions shall apply solely for the purposes of this Defined Properties UAO:

- a. “ARC” or “Atlantic Richfield” shall mean Atlantic Richfield Company.
- b. “Carrie Gosch Property” shall mean the property owned by the School City of East Chicago and the East Chicago Multi-School Building Corp., having a street address of 455 E. 148<sup>th</sup> St, East Chicago, and identified as Parcel Nos. 45-03-28-351-043.000-024 and 45-03-28-351-044.000-024.
- c. “CD” or “Consent Decree” shall mean the Consent Decree entered on October 28, 2014, by the United States District Court, Northern District of Indiana with civil action number 2:14-cv-312.
- d. “CERCLA” shall mean the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, 42 U.S.C. §§ 9601-9675.
- e. “Chemours” shall mean The Chemours Company FC, LLC.
- f. “Corridor 3” shall mean the area labelled “Corridor 3” and outlined in red on Appendix E, owned by the East Chicago Housing Authority. It is north of 148<sup>th</sup> St., east of the Carrie Gosch Property, south of a line extending eastward from the northern boundary of the Carrie Gosch Property, and west of an alley.
- g. “Day” or “day” shall mean a calendar day. In computing any period of time under this Defined Properties UAO, where the last day would fall on a Saturday, Sunday, or federal or State holiday, the period shall run until the close of business of the next working day.
- h. “Defined Properties” shall mean the properties listed in Appendix F.
- i. “Defined Properties SOW” or “Defined Properties Statement of Work” shall mean the document describing the activities Respondents must perform to implement the Remedial Action and the Operation & Maintenance. The Defined Properties SOW is attached as Appendix A.
- j. “Defined Properties UAO” shall mean this Unilateral Administrative Order and all appendices attached hereto. In the event of conflict between this Defined Properties UAO and any appendix, this Defined Properties UAO shall control.
- k. “DuPont” shall mean E. I. du Pont de Nemours and Company.
- l. “Effective Date” shall mean the effective date of this Defined Properties UAO as provided in Section VIII.



m. “EPA” shall mean the United States Environmental Protection Agency and its successor departments, agencies, or instrumentalities.

n. “EPA Hazardous Substance Superfund” shall mean the Hazardous Substance Superfund established by the Internal Revenue Code, 26 U.S.C. § 9507.

o. “ICIAP” or “Institutional Controls Implementation and Assurance Plan” shall mean the plan that Respondents prepare for EPA’s approval pursuant to ¶ 6.7(k) of the Defined Properties SOW.

p. “IDEM” shall mean the Indiana Department of Environmental Management and any successor departments or agencies of the State.

q. “Institutional Controls” or “ICs” shall mean Proprietary Controls and state or local laws, regulations, ordinances, zoning restrictions, or other governmental controls or notices that: (a) limit land, water, or other resource use to minimize the potential for human exposure to Waste Material at or in connection with the Site; (b) limit land, water, or other resource use to implement, ensure non-interference with, or ensure the protectiveness of the RA; and/or (c) provide information intended to modify or guide human behavior at or in connection with the Site.

r. “National Contingency Plan” or “NCP” shall mean the National Oil and Hazardous Substances Pollution Contingency Plan promulgated pursuant to Section 105 of CERCLA, 42 U.S.C. § 9605, codified at 40 C.F.R. Part 300, and any amendments thereto.

s. “O&M” or “Operation and Maintenance” shall mean all activities related to the implementation and maintenance of Institutional Controls on the Defined Properties to ensure the effectiveness of the Remedial Action in accordance with the ROD as specified in the Defined Properties SOW or the EPA-approved Defined Properties O&M Plan under ¶ 6.7(j) of the Defined Properties SOW.

t. “OU1” or “Operable Unit 1” shall mean the surface and subsurface soil of the area located inside the red highlighted boundaries on Appendix B. OU1 is generally bounded on the north by East Chicago Avenue; on the east by Parrish Avenue; on the south by East 151<sup>st</sup> Street/149<sup>th</sup> Place; and on the west by the Indiana Harbor Canal.

u. “OU2” or “Operable Unit 2” shall mean groundwater associated with the Site as well as the surface soil, subsurface soil, and sediments located inside the blue highlighted boundaries on Appendix B. The area within the blue highlighted boundaries on Appendix B consists of approximately 79 acres, is commonly known as 5300 Kennedy Avenue, and is generally bounded on the north by the Indiana Harbor Belt Railroad; on the east by Kennedy Avenue; on the south and west by the Grand Calumet River; and on the northwest by the Indiana Harbor Canal.

v. “Paragraph” or “¶” shall mean a portion of this Defined Properties UAO identified by an Arabic numeral or an upper or lower case letter.

w. “Parties” shall mean EPA and Respondents.

x. “Performance Standards” shall mean the cleanup standards and other measures of achievement of the goals of the remedial action objectives, as set forth in the ROD.

y. “Personally Identifiable Information” or “PII” means “Personally Identifiable Information” as defined in 2 C.F.R. § 200.79 and EPA’s Privacy Policy, and generally includes information that can be used to distinguish, trace, or identify an individual’s identity, including personal information which is linked or linkable to an individual. Personally Identifiable Information includes but is not limited to names, addresses, GPS coordinates, telephone numbers, fax numbers, email addresses, social security numbers, or labels (including, e.g., character strings linked with real estate depicted in maps or assigned to sampling data) or other personal information that can be linked to an individual. EPA’s Privacy Policy is available at <https://www.epa.gov/privacy/epa-policy-21510-privacy-policy>.

z. “Proprietary Controls” shall mean easements or covenants running with the land that: (a) limit land, water, or other resource use and/or provide access rights; and (b) are created pursuant to common law or statutory law by an instrument that is recorded in the appropriate land records office.

aa. “RCRA” shall mean the Resource Conservation and Recovery Act, also known as the Solid Waste Disposal Act, 42 U.S.C. §§ 6901-6992.

bb. “Record of Decision” or “ROD” shall mean the EPA Record of Decision relating to Operable Unit 1 at the Site signed on November 30, 2012, by the Director of the Superfund Division, EPA Region 5, or his/her delegate, and all attachments thereto. The ROD is attached as Appendix D.

cc. “Remedial Action” or “RA” shall mean the remedial action selected in the ROD applied to the Defined Properties. The RA includes Remedial Action Construction and the implementation of Institutional Controls.

dd. “Remedial Action Levels” or “RALs” shall mean, for residential properties, 400 milligrams per kilogram (“mg/kg”) for lead and 26 mg/kg for arsenic, and for commercial/industrial properties, 800 mg/kg for lead and 26 mg/kg for arsenic.

ee. “Remedial Action Construction” or “RA Construction” shall mean the excavation and disposal of Waste Material from the Defined Properties and the restoration of those properties, but shall not include implementation of Institutional Controls.

ff. “Remedial Design” or “RD” shall mean those activities already undertaken or to be undertaken by EPA to develop final plans and specifications for Remedial Action.

gg. “Respondents” shall mean Atlantic Richfield Company, The Chemours Company FC, LLC, and E. I. du Pont de Nemours and Company.

hh. “Section” shall mean a portion of this Defined Properties UAO identified by a Roman numeral.

ii. “Site” or “USS Lead Site” shall mean the U.S. Smelter and Lead Refinery, Inc. Superfund Site in East Chicago, Lake County, Indiana, and depicted generally on the map in Appendix B. The Site includes both OU1 and OU2.

jj. “State” shall mean the State of Indiana.

kk. “Supervising Contractor” shall mean the principal contractor retained by Respondents to supervise and direct the implementation of the Work under this Defined Properties UAO.

ll. “Transfer” shall mean to sell, assign, convey, lease, mortgage, or grant a security interest in, or where used as a noun, a sale, assignment, conveyance, or other disposition of any interest by operation of law or otherwise.

mm. “United States” shall mean the United States of America and each department, agency, and instrumentality of the United States, including EPA.

nn. “Waste Material” shall mean: (a) any “hazardous substance” under Section 101(14) of CERCLA, 42 U.S.C. § 9601(14); (b) any pollutant or contaminant under Section 101(33) of CERCLA, 42 U.S.C. § 9601(33); (c) any “solid waste” under Section 1004(27) of RCRA, 42 U.S.C. § 6903(27), or under Indiana Code § 13-11-2-205; (d) any “hazardous material” under Indiana Code § 13-11-2-96(b); and (e) any “hazardous waste” under Indiana Code § 13-11-2-99(c).

oo. “Work” shall mean all activities and obligations Respondents are required to perform under this Defined Properties UAO, except those required by Section XV (Record Retention). The Work encompasses all activities within the definition of “Remedial Action,” but, in addition, it includes O&M.

pp. “Z1” or “Zone 1” shall mean the surface and subsurface soil found in an area located inside the yellow highlighted boundaries on Appendix C and labeled as “Zone 1.” Zone 1 is generally bordered: (1) on the north by the northern boundary of the Carrie Gosch Elementary School and a line extending eastward from that boundary to the eastern edge of a north/south utility right of way that runs parallel to McCook Avenue north of East 149<sup>th</sup> Place; (2) on the east by: (i) the eastern-most edge of a north/south utility right of way that runs parallel to McCook Avenue until East 149<sup>th</sup> Place, and (ii) McCook Avenue between East 149<sup>th</sup> Place and 151<sup>st</sup> Street; (3) on the south by East 151<sup>st</sup> Street; and (4) on the west by the Indiana Harbor Canal.

qq. “Z2” or “Zone 2” shall mean the surface and subsurface soil found in an area located inside the yellow highlighted boundaries on Appendix C and labeled as “Zone 2.” Zone 2 is generally bordered: (1) on the north by Chicago Avenue; (2) on the east, by the eastern edge of the railroad right of way that runs principally north and south and is labeled on Appendix C as “Elgin Joliet and Eastern Rlwy”; (3) on the south by East 151<sup>st</sup> Street; and (4) on the west by: (i) the Indiana Harbor Canal between Chicago Avenue and the northern boundary of the Carrie Gosch Elementary School; (ii) the eastern-most edge of a north/south utility right of way that runs parallel to McCook Avenue until East 149<sup>th</sup> Place, and (iii) McCook Avenue between East 149<sup>th</sup> Place and 151<sup>st</sup> Street.

rr. “Z2 Soil UAO” shall mean the Unilateral Administrative Order for Remedial Action in Zone 2 of Operable Unit 1 of the U.S. Smelter and Lead Refinery, Inc. Superfund Site, CERCLA Docket No. V-W-18-C-005, effective January 19, 2018.

ss. “Z2 Soil SOW” shall mean the Statement of Work attached as Appendix A to the Z2 Soil UAO and incorporated therein.

tt. “Z3” or “Zone 3” shall mean the surface and subsurface soil found in an area located inside the yellow highlighted boundaries on Appendix C and labeled as “Zone 3.” Zone 3 is generally bordered: (1) on the north by Chicago Avenue; (2) on the east by Parrish Avenue; (3) on the south by the northern edge of the railroad right of way located generally to the south of East 149<sup>th</sup> Place and labeled on Appendix C as “Elgin Joliet and Eastern Rlwy”; and (4) on the west by the eastern edge of the railroad right of way that runs principally north and south and is labeled on Appendix C as “Elgin Joliet and Eastern Rlwy.” The triangular plot of land bounded by several railroad spurs in the southwestern portion of the area labeled Zone 3 on Appendix C is a part of Zone 3.

#### IV. FINDINGS OF FACT

8. EPA hereby makes the following findings of fact:

a. The USS Lead Site is located in East Chicago, Indiana. The Site is generally depicted on the map in Appendix B. The Site includes both OU1 and OU2. OU2 includes the groundwater associated with the Site. OU1 is a residential neighborhood that has been further divided into three zones: Zone 1, Zone 2, and Zone 3, all defined above.

b. Historic operations at the following three facilities contributed to the contamination of the Site: (1) a facility formerly located at 5300 Kennedy Ave., that was owned and operated by U.S. Smelter and Lead Refinery, Inc. (“USS Lead”) for most of its operations (“Former USS Lead Facility”); (2) a facility formerly located in Zone 1 that was owned and operated by subsidiaries of the Anaconda Copper and Mining Company (“Former Anaconda Facility”) for most of its operations; and (3) a facility located just southeast of OU1 that was owned and operated by E. I. Du Pont de Nemours for most of its operations (“Former DuPont Facility”).

c. The Former USS Lead Facility was first constructed in 1906 and used an electrolytic process (the Betts process) to refine lead bullion that was shipped first from Midvale, Utah, and then Tooele, Utah, to East Chicago. Because lead refining produces a number of byproducts, the Former USS Lead Facility also included various secondary metal treatment operations—such as secondary lead smelting—and operated a weed killer (lead arsenate) plant. In addition, throughout its history, the Former USS Lead Facility accepted scrap lead from a variety of sources for treatment in its secondary lead smelting operations involving a blast furnace. In approximately 1972, the Former USS Lead Facility stopped refining lead bullion and instead increased its blast furnace capacity to treat more scrap lead material. Operations at the Former USS Lead Facility ceased in 1985.

d. Among other sources of contamination from the Former USS Lead Facility, slag from the blast furnace was routinely placed in piles on the ground and left exposed

to the elements. Lead and arsenic particulate was disposed of into the environment as fumes from operations, as dust from the baghouses, and as dust from lead waste piles (e.g., slag and baghouse dust) stored on the grounds.

e. Lead and arsenic from the Former USS Lead Facility came to be located in Operable Unit 1 of the Site. Wind was one manner by which lead and arsenic was dispersed into the neighborhood.

f. The Former USS Lead Facility was owned and operated by United States Metals Refining Company from 1906 to 1919 and by USS Lead from 1920 to 1985. USS Lead continues to own the land.

g. The Former Anaconda Facility operated three inter-related processes. Specifically, in 1912, a lead refinery was built on the site and used a pyrometallurgical process to refine lead bullion that was shipped from Tooele, Utah, to East Chicago. Then, in 1919, a white lead plant was constructed to produce white lead for use as an ingredient in lead paint. Finally, in 1922, a zinc oxide plant was added to the facility.

h. The Former Anaconda Facility also operated numerous secondary metal treatment processes. Byproducts of the operations included slag, lead waste, and arsenic. Among other sources of contamination, arsenic was burned off and was supposed to be recovered in flues and a baghouse. In addition, lead and arsenic particulate was disposed of into the environment in the same manner as with the Former USS Lead Facility (*see infra* ¶ 8.d). Operation of the white lead process generated additional releases.

i. Significant quantities of lead were refined from 1912 until 1946, when refining operations at the Former Anaconda Facility ceased. However, secondary smelting and white lead production continued into the 1950s. The Former Anaconda Facility was demolished over the course of the 1960s and early 1970s. In approximately 1972, the West Calumet Housing Complex was constructed on the footprint of the Former Anaconda Facility. In 2018, the West Calumet Housing Complex was torn down.

j. Lead and arsenic from the Former Anaconda Facility came to be deposited in Operable Unit 1 of the Site. Wind was one manner by which lead and arsenic was disbursed throughout the neighborhood.

k. The Former Anaconda Facility was owned and operated between 1912 and approximately 1946 by subsidiaries of the Anaconda Copper and Mining Company. Respondent Atlantic Richfield is the successor to the liabilities of one or more companies that owned and operated the Former Anaconda Facility.

l. The Former DuPont Facility began operations in 1892 to manufacture various organic and inorganic chemicals. Over the course of its operations, the Former DuPont Facility produced over one hundred different chemicals, including lead, arsenic, and calcium arsenate (1910–1949) and zinc chloride (1900–1969). Among other sources of contamination, lead and arsenic particulate generated from these operations was disposed of into the environment as stack emissions, precipitator dust, and dust from exposed waste piles stored on the grounds of the site. General operations at the Former DuPont Facility contracted significantly

during the 1980s and 1990s. The Former DuPont Facility is undergoing corrective action under federal RCRA authorities.

m. Lead and arsenic from the Former DuPont Facility came to be deposited in Operable Unit 1 of the Site. Wind was one manner in which lead and arsenic was dispersed into the neighborhood.

n. The Former DuPont Facility was owned and operated by the Grasselli Chemical Company from 1891 until 1928, when it was acquired by DuPont. The Former DuPont Facility was then owned and operated by DuPont or its subsidiaries from 1928 to 2015. In 2015, Respondent Chemours assumed ownership of the Former DuPont Facility. Chemours transferred ownership of the Former DuPont Facility to the East Chicago Gateway Partners, LLC in 2018.

o. Lead is a hazardous substance, as defined by Section 101(14) of CERCLA, 42 U.S.C. § 9601(14). The Agency for Toxic Substances and Disease Registry (“ATSDR”) has determined that exposure to lead presents human health risks. Lead exposure via inhalation and/or ingestion can have detrimental effects on almost every organ and system in the human body. Exposure may occur from direct ingestion of soil in yards, soil tracked indoors (house dust), and inhalation of fugitive dust. Lead can cause a variety of health problems to people who are exposed to it. Potential human receptors include residents, with a particular concern for children six years of age and under, and pregnant or nursing women. Children are at greatest risk from the toxic effects of lead. Initially, lead travels in the blood to the soft tissues (heart, liver, kidney, brain, etc.). Then, it gradually redistributes to the bones and teeth where it tends to remain. Children exposed to high levels of lead have exhibited nerve damage, liver damage, colic, anemia, brain damage, and death. The most serious effects associated with markedly elevated blood lead levels include neurotoxic effects such as irreversible brain damage.

p. Arsenic is a hazardous substance, as defined by Section 101(14) of CERCLA, 42 U.S.C. § 9601(14). ATSDR has determined that exposure to arsenic presents human health risks. Ingesting very high levels of arsenic can result in death. Exposure to lower levels can cause nausea and vomiting, decreased production of red and white blood cells, abnormal heart rhythm, damage to blood vessels, and a sensation of “pins and needles” in hands and feet. Ingesting or breathing low levels of inorganic arsenic for a long time can cause a darkening of the skin and the appearance of small “corns” or “warts” on the palms, soles, and torso. Skin contact with inorganic arsenic may cause redness and swelling. Several studies have shown that ingestion of inorganic arsenic can increase the risk of skin cancer and cancer in the liver, bladder, and lungs. Inhalation of inorganic arsenic can cause increased risk of lung cancer. The Department of Health and Human Services (DHHS) and the EPA have determined that inorganic arsenic is a known human carcinogen (ATSDR, Chemical Abstract Services [CAS] #7440-38-2, August 2007).

q. Pursuant to Section 105 of CERCLA, 42 U.S.C. § 9605, EPA placed the Site on the National Priorities List (“NPL”), set forth at 40 C.F.R. Part 300, Appendix B, by publication in the Federal Register on April 9, 2009, 74 Fed. Reg. 16,126–34.

r. In response to a release or a substantial threat of a release of hazardous substances at or from OU1 of the Site, EPA commenced, in June 2009, a Remedial Investigation and Feasibility Study (RI/FS) of OU1 of the Site pursuant to 40 C.F.R. § 300.430.

s. EPA completed a Remedial Investigation (“RI”) Report and a Feasibility Study (“FS”) Report of OU1 in June 2012.

t. Pursuant to Section 117 of CERCLA, 42 U.S.C. § 9617, EPA published notice of the completion of the FS for OU1 and of the proposed plan for remedial action for OU1 on July 12, 2012, in a major local newspaper of general circulation. EPA provided an opportunity for written and oral comments from the public on the proposed plan for remedial action. A copy of the transcript of the public meeting is available to the public as part of the administrative record upon which the Director of the Superfund Division, EPA Region 5, based the selection of the response action for OU1.

u. The decision by EPA on the remedial action to be implemented at OU1 of the Site is embodied in a final Record of Decision (“ROD”), executed on November 30, 2012, on which the State has given its concurrence. The ROD includes a responsiveness summary to the public comments. Notice of the final plan was published in accordance with Section 117(b) of CERCLA, 42 U.S.C. § 9617(b). The remedy selected in that ROD included:

- (1) Excavation of soil that contains lead or arsenic in concentrations that exceed the Remedial Action Levels (“RALs”) to a maximum depth of 24 inches;
- (2) Disposal of excavated soil at a CERCLA-approved disposal facility;
- (3) If contaminated soil is identified at a depth greater than 24 inches below ground surface (bgs), placement of a visual barrier over that contaminated soil before the yard is backfilled, and implementation of institutional controls to protect users of the property from exposure to contaminated soils that remain at depth; and
- (4) Restoration of the excavated yards.

v. By Consent Decree entered on October 28, 2014 (the “Consent Decree”), the United States, on behalf of EPA, Indiana, on behalf of IDEM, Respondent Atlantic Richfield, and Respondent DuPont reached an agreement regarding remedial design and remedial action (“RD/RA”) in Zones 1 and 3 of OU1 of the Site. Thereafter, Respondent Chemours assumed DuPont’s liability under the Consent Decree, although DuPont remained, and remains, liable as well. Thus, all three Respondents are liable under the Consent Decree and are considered “Settling Defendants” as that term is used in the Consent Decree.

w. RD/RA under the Consent Decree commenced in November 2014. In the spring of 2016, EPA finalized sampling results for Zone 1, including the West Calumet Housing Complex (“WCHC”), Goodman Park (immediately north of the WCHC), the Carrie Gosch Property, and Corridor 3. Parts of Goodman Park, the Carrie Gosch Property, and Corridor 3, as

well as the WCHC, contain lead and/or arsenic at levels that EPA determined pose a threat to human health or the environment.

x. In July 2016, other governmental bodies decided to permanently relocate the residents of the WCHC. They were the only residents in Zone 1. By the summer of 2017, all residents of the WCHC were relocated. In 2018, the WCHC was demolished. On November 7, 2018, EPA issued a proposed plan to amend the ROD as it applies to the WCHC and Goodman Park. The proposed plan does not include the Carrie Gosch Property or Corridor 3 and these areas remain covered by the ROD that was issued on November 30, 2012.

y. In August 2016, the school system of East Chicago decided to close the Carrie Gosch Elementary School, which, apart from the WCHC, was the only other structure in Zone 1. In light of the planned relocation of the WCHC residents and the closure of the Carrie Gosch Elementary School, EPA suspended RD/RA in Zone 1 at that time.

z. Throughout 2017 and much of 2018, the future use of the former Carrie Gosch Elementary School was unknown. Information during that time period, however, suggested a possible commercial/industrial use. In light of possible commercial/industrial use, EPA held off remediating the Carrie Gosch Property to residential standards under the 2014 Consent Decree. EPA also held off remediating Corridor 3 in light of its proximity to the Carrie Gosch Property.

aa. On October 29 and 30, 2018, EPA was first informed that part of the Carrie Gosch Property would be leased to a church and that children would utilize the area. The church has since leased part of the Property.

bb. Utilization of at least part of the Carrie Gosch Property as a church results in a designation of the Carrie Gosch Property as “residential,” consistent with the practices at the USS Lead Site.

cc. EPA’s knowledge of the “residential” use of the Carrie Gosch Property came only after EPA’s remediation crews had fully demobilized. Thus, EPA did not have timely access to remediate the Carrie Gosch Property and the adjacent Corridor 3 during the period of its mobilization.

dd. Between November 1, 2014, and November 1, 2018, EPA sampled 468 properties out of 481 properties in Zone 3. 289 of these properties were contaminated with lead and/or arsenic at levels that EPA determined posed a threat to human health or the environment.

ee. EPA started excavating and restoring properties in Zone 3 in the fall of 2016. That work continued through the 2017 and 2018 construction seasons. By the end of the 2018 construction season, EPA had completed excavation and restoration work at 278 properties in Zone 3.

ff. During the 2018 construction season, EPA recognized that it would not be able to timely secure access to either sample and/or remediate certain Zone 3 properties during the period of its mobilization.



gg. EPA's inability to secure access to either sample and/or remediate certain Zone 3 properties and the Carrie Gosch Property and Corridor 3 during the period of its mobilization caused EPA to commence a process under Paragraph 43 of the Consent Decree designed to address this situation. Specifically, for these properties, the Consent Decree establishes that Respondents can either: (1) "cash out" their liability and secure a covenant not to sue pursuant to Paragraph 73; or (2) "opt out" of the payment that EPA demands and forego the covenant not to sue in Paragraph 73.

hh. On September 27, 2018, pursuant to Paragraph 43.b of the Consent Decree, the Department of Justice, on behalf of EPA, provided Respondents with a preliminary list of all unsampled and/or unremediated properties in Zone 3 that EPA did not have access to sample or remediate by the close of the 2018 construction season. This letter is included in Appendix G.

ii. On October 5, 2018, the Department of Justice, on behalf of EPA, advised Respondents of the transportation and disposal cost information that the government would need in order to calculate the cash out values in Paragraphs 43.d and 43.e of the Consent Decree. This letter is included in Appendix G.

jj. On October 17, 2018, pursuant to Paragraph 43.b of the Consent Decree, the Department of Justice, on behalf of EPA, provided Respondents with the final list of unsampled and/or unremediated properties in Zone 3 ("Final Z3 List"). This letter is included in Appendix G.

kk. On October 29, 2018, Respondents provided the Department of Justice, on behalf of EPA, with the transportation and disposal costs information needed to calculate the cash out values. This letter is included in Appendix G.

ll. On November 1, 2018, the Department of Justice, on behalf of EPA, sent Respondents a bill under Paragraph 43.e.(1) of the Consent Decree. This bill is included in Appendix G. The payment demand in the bill was for approximately \$2.6 million. It covered all twelve residential properties on the Final Z3 List.

mm. The bill did not cover the twelve non-residential properties on the Final Z3 List and was not sent pursuant to Paragraph 43.d.(1) of the Consent Decree (*i.e.*, the Subparagraph dealing with the cash out or opt out of non-residential properties). Thus, at this time, the twelve non-residential, unremediated properties in Zone 3 that are on the Z3 Final List remain subject to the Consent Decree.

nn. Because the November 1, 2018 bill was greater than \$2 million, Respondents were entitled to opt out of the payment. Consent Decree ¶ 43.e.(2).

oo. On November 26, 2018, pursuant to Paragraph 43.e.(2) of the Consent Decree, Respondents notified the government that they had elected to opt out of the payment. This letter is included in Appendix G. Consequently, Respondents do not have a covenant not to sue for the twelve residential properties identified on the Z3 Final List.

pp. Of the twelve residential properties on the Z3 Final List, seven contain lead and/or arsenic at levels that EPA determined pose a threat to human health or the environment. Those seven are the properties listed as Numbers 1–7 in Appendix F of this Defined Properties UAO.

qq. On February 5, 2019, pursuant to Paragraph 43.b of the Consent Decree, the Department of Justice, on behalf of EPA, provided Respondents with a preliminary list of the non-residential properties in Zone 1 that it did not access to remediate by the close of the 2018 construction season. This letter is included in Appendix H of this Defined Properties UAO. The properties listed were the Carrie Gosch Property and what subsequently (on February 8, 2019) was termed Corridor 3.

rr. On February 8, 2019, pursuant to Paragraph 43.b of the Consent Decree, the Department of Justice, on behalf of EPA, provided Respondents with the final list of unremediated properties in Zone 1 (“Final Z1 List”). This letter is included in Appendix H. The Final Z1 List was the same as the preliminary list: the Carrie Gosch Property and Corridor 3.

ss. On February 15, 2019, the Department of Justice, on behalf of EPA, sent Respondents a bill under Paragraph 43.d.(1) of the Consent Decree. This bill is included in Appendix H. The payment demand in the bill was for approximately \$5,423,736. It covered the properties on the Final Z1 List: the Carrie Gosch Property and Corridor 3.

tt. Because the February 15, 2019 bill was greater than \$1 million, Respondents were entitled to opt out of the payment. Consent Decree ¶ 43.d.(2).

uu. On February 22, 2019, pursuant to Paragraph 43.d.(2) of the Consent Decree, Respondents notified the government that they had elected to opt out of the payment. This letter is included in Appendix H. Consequently, Respondents do not have a covenant not to sue for the Carrie Gosch Property and Corridor 3.

vv. EPA has not made any formal findings under Section 122(g) of CERCLA, 42 U.S.C. § 9622(g), that any potentially responsible party at this Site is or is not a *de minimis* party. Likewise, EPA has not made any informal findings to that effect.

## V. CONCLUSIONS OF LAW AND DETERMINATIONS

9. Based on the Findings of Fact set forth above, and the administrative record, EPA has determined that:

a. The U.S. Smelter and Lead Refinery, Inc., Superfund Site is a “facility” as defined by Section 101(9) of CERCLA, 42 U.S.C. § 9601(9).

b. The Former USS Lead Facility is a “facility” as defined by Section 101(9) of CERCLA, 42 U.S.C. § 9601(9). The Former USS Lead Facility is a part of the Site.

c. The Former DuPont Facility, historically located at 5215 Kennedy Avenue in East Chicago, Indiana, and previously owned and/or operated by Respondent E. I. du Pont de Nemours and Company (“Former DuPont Facility”) and by Respondent The Chemours

Company FC, LLC, is a “facility” as defined by Section 101(9) of CERCLA, 42 U.S.C. § 9601(9).

d. The Former Anaconda Facility previously located in Zone 1 of OU1 of the Site and previously owned and/or operated by predecessors of Respondent Atlantic Richfield Company is a “facility” as defined by Section 101(9) of CERCLA, 42 U.S.C. § 9601(9). The Former Anaconda Facility is a part of the Site.

e. Each Respondent is a “person” as defined by Section 101(21) of CERCLA, 42 U.S.C. § 9601(21).

f. Each Respondent is a liable party under one or more provisions of Section 107(a) of CERCLA, 42 U.S.C. § 9607(a).

(1) Respondent Atlantic Richfield Company is liable as a successor to:  
(i) one or more persons, including Anaconda Lead Products Company, International Lead Refining Company, and International Smelting and Refining Company, who, at the time of disposal of hazardous substances, “owned” and/or “operated”—within the meaning of Section 101(20) of CERCLA, 42 U.S.C. § 9601(20), and Section 107(a)(2) of CERCLA, 42 U.S.C. § 9607(a)(2)—the Former Anaconda Facility at which hazardous substances were disposed of and from which there were releases of hazardous substances; and/or (ii) one or more persons, including Anaconda Lead Products Company, International Lead Refining Company, and International Smelting and Refining Company, who arranged with USS Lead for the disposal or treatment, or arranged with a transporter for transport for disposal or treatment, of hazardous substances at the Former USS Lead Facility, within the meaning of Section 107(a)(3) of CERCLA, 42 U.S.C. § 9607(a)(3).

(2) Respondent E. I. du Pont de Nemours and Company is a person who: (i) at the time of disposal of hazardous substances, “owned” and/or “operated”—within the meaning of Section 101(20) of CERCLA, 42 U.S.C. § 9601(20), and Section 107(a)(2) of CERCLA, 42 U.S.C. § 9607(a)(2)—the Former DuPont Facility at which hazardous substances were disposed of and from which there were releases of hazardous substances to the Site; and/or (ii) arranged with USS Lead for the disposal or treatment, or arranged with a transporter for transport for disposal or treatment, of hazardous substances at the Former USS Lead Facility, within the meaning of Section 107(a)(3) of CERCLA, 42 U.S.C. § 9607(a)(3).

(3) Respondent The Chemours Chemical Company FC, LLC, is liable as a successor to E. I. du Pont de Nemours and Company (which is liable as described in Paragraph 9.f.(2) above).

g. The lead and arsenic contamination found in Operable Unit 1, as identified in the Findings of Fact above, includes “hazardous substances” as defined by Section 101(14) of CERCLA, 42 U.S.C. § 9601(14), and also includes “pollutants or contaminants” that may

present an imminent and substantial danger to public health or welfare under Section 104(a)(1) of CERCLA, 42 U.S.C. § 9604(a)(1).

h. The conditions described in Paragraphs 8.w and 8.pp of the Findings of Fact above constitute an actual or threatened “release” of a hazardous substance from the Facility as defined by Section 101(22) of CERCLA, 42 U.S.C. § 9601(22).

i. The conditions described in Paragraph 8.w and 8.pp of the Findings of Fact above may constitute an imminent and substantial endangerment to the public health or welfare or the environment because of an actual or threatened release of a hazardous substance from the facility within the meaning of Section 106(a) of CERCLA, 42 U.S.C. § 9606(a).

j. Solely for purposes of Section 113(j) of CERCLA, 42 U.S.C. § 9613(j), the remedy set forth in the ROD and the Work to be performed by Respondents shall constitute a response action taken or ordered by the President for which judicial review shall be limited to the administrative record.

k. The actions required by this Defined Properties UAO are necessary to protect the public health, welfare, or the environment.

## **VI. REMEDIAL ACTION WORK ORDER**

10. Based on the Findings of Fact and Conclusions of Law and Determinations set forth above, and the administrative record, Respondents are hereby ordered to comply with this Defined Properties UAO and any modifications to this Defined Properties UAO, including, but not limited to, all appendices and all documents incorporated by reference into this Defined Properties UAO.

## **VII. OPPORTUNITY TO CONFER**

11. No later than 5 days after this Defined Properties UAO is signed by the Regional Administrator or his/her delegatee, Respondents may, in writing, (a) request a conference with EPA to discuss this Defined Properties UAO, including its applicability, the factual findings and the determinations upon which it is based, the appropriateness of any actions Respondents are ordered to take, or any other relevant and material issues or contentions that Respondents may have regarding this Defined Properties UAO, or (b) notify EPA that they intend to submit written comments or a statement of position in lieu of requesting a conference.

12. If a conference is requested, Respondents may appear in person or by an attorney or other representative at the conference. Any such conference shall be held no later than 5 days after the conference is requested. Any written comments or statements of position on any matter pertinent to this Defined Properties UAO must be submitted no later than 5 days after the conference or, if Respondents do not request a conference, within 15 days after this Defined Properties UAO is signed. This conference is not an evidentiary hearing, does not constitute a proceeding to challenge this Defined Properties UAO, and does not give Respondents a right to seek review of this Defined Properties UAO. Any request for a conference or written comments or statements should be submitted to:

Steven Kaiser  
Office of Regional Counsel  
Region 5, US EPA  
77 West Jackson Blvd. (C-14J)  
Chicago, IL 60604-3590  
[kaiser.steven@epa.gov](mailto:kaiser.steven@epa.gov)  
(312) 353-3804

Rachel Zander  
Office of Regional Counsel  
Region 5, US EPA  
77 West Jackson Blvd. (C-14J)  
Chicago, IL 60604-3590  
[zander.rachel@epa.gov](mailto:zander.rachel@epa.gov)  
(312) 353-1505

#### **VIII. EFFECTIVE DATE**

13. This Defined Properties UAO shall be effective 5 days after it is signed by the Regional Administrator or his/her delegatee unless a conference is requested or notice is given, in accordance with Section VII (Opportunity to Confer), that written materials will be submitted in lieu of a conference. If a conference is requested or such notice is submitted, this Defined Properties UAO shall be effective on the 10th day after the date of the conference, or if no conference is requested, on the 5th day after the date of the submission of the written material, unless EPA determines that this Defined Properties UAO should be modified based on the conference or written materials. In such event, EPA shall notify Respondents, within the applicable 5 or 10-day period (depending upon whether there was a conference or written materials), that EPA intends to modify this Defined Properties UAO. The modified Defined Properties UAO shall be effective 5 days after it is signed by the Regional Administrator or his/her delegatee.

#### **IX. NOTICE OF INTENT TO COMPLY**

14. On or before the Effective Date, each Respondent shall notify EPA in writing of Respondent's irrevocable intent to comply with this Defined Properties UAO. Such written notice shall be sent to EPA as provided in ¶ 12.

15. Each Respondent's written notice shall describe, using facts that exist on or prior to the Effective Date, any "sufficient cause" defenses asserted by such Respondent under Sections 106(b) and 107(c)(3) of CERCLA, 42 U.S.C. §§ 9606(b) and 9607(c)(3). The absence of a response by EPA to the notice required by this Section shall not be deemed to be acceptance of any Respondent's assertions. Failure of any Respondent to provide such notice of intent to comply within this time period shall, as of the Effective Date, be treated as a violation of this Defined Properties UAO by such Respondent.

## X. PERFORMANCE OF THE WORK

16. **Compliance with Applicable Law.** Nothing in this Defined Properties UAO limits Respondents' obligations to comply with the requirements of all applicable federal and state laws and regulations. Respondents must also comply with all applicable or relevant and appropriate requirements of all federal and state environmental laws as set forth in the ROD and the Defined Properties SOW.

17. **Permits.**

a. As provided in Section 121(e) of CERCLA, 42 U.S.C. § 9621(e), and Section 300.400(e) of the NCP, no permit shall be required for any portion of the Work conducted entirely on-site or at any other property which is within the areal extent of contamination or in very close proximity to the contamination and necessary for implementation of the Work. Where any portion of the Work that is not on-site requires a federal or state permit or approval, Respondents shall submit timely and complete applications and take all other actions necessary to obtain all such permits or approvals.

b. This Defined Properties UAO is not, and shall not be construed to be, a permit issued pursuant to any federal or state statute or regulation.

18. **Coordination and Supervision.**

a. **Project Coordinators and Remedial Project Managers.**

(1) Respondents' Project Coordinator and Alternate Project Coordinator must have sufficient technical expertise to coordinate the Work. Respondents' Project Coordinator and Alternate Project Coordinator may not be an attorney representing any Respondent in this matter and may not act as the Supervising Contractor. Respondents' Project Coordinator and Alternate Project Coordinator may assign other representatives, including other contractors, to assist in coordinating the Work.

(2) EPA has designated Sarah Rolfes and Katherine Thomas as EPA's Remedial Project Managers (RPMs). EPA may designate other representatives, which may include its employees, contractors and/or consultants, to oversee the Work. EPA's RPM will have the same authority as a remedial project manager and/or an on-scene coordinator, as described in the NCP. This includes the authority to halt the Work and/or to conduct or direct any necessary response action when he or she determines that conditions at the Site constitute an emergency or may present an immediate threat to public health or welfare or the environment due to a release or threatened release of Waste Material.

(3) Respondents' Project Coordinator(s) shall communicate with EPA's RPMs regularly.

b. **Supervising Contractor.** Respondents' proposed Supervising Contractor must have sufficient technical expertise to supervise the Work and a quality assurance system

that complies with ASQ/ANSI E4:2014, “Quality management systems for environmental information and technology programs - Requirements with guidance for use” (American Society for Quality, February 2014).

c. Procedures for Disapproval/Notice to Proceed.

(1) Respondents shall designate, and notify EPA, within 10 days after the Effective Date, of the names, titles, contact information, and qualifications of the Respondents’ proposed Project Coordinator, Alternate Project Coordinator, and Supervising Contractor, whose qualifications shall be subject to EPA’s review for verification based on objective assessment criteria (e.g., experience, capacity, technical expertise) and that they do not have a conflict of interest with respect to the project.

(2) EPA shall issue notices of disapproval and/or authorizations to proceed regarding the proposed Project Coordinator, Alternate Project Coordinator, and Supervising Contractor, as applicable. If EPA issues a notice of disapproval, Respondents shall, within 15 days, submit to EPA a list of supplemental proposed Project and Alternate Project Coordinators and/or Supervising Contractors, as applicable, including a description of the qualifications of each. EPA shall issue a notice of disapproval or authorization to proceed regarding each supplemental proposed coordinator/alternate coordinator and/or contractor. Respondents may select any coordinator/contractor covered by an authorization to proceed and shall, within 7 days, notify EPA of Respondents’ selection.

(3) Respondents may change their Project Coordinator and/or Supervising Contractor, as applicable, by following the procedures of ¶¶ 18.c.(1) and 18.c.(2).

**19. Performance of Work in Accordance with Defined Properties SOW.**

Respondents shall: (a) perform the Work; (b) perform, if and as necessary, the Defined Properties O&M, and (c) support, if and as necessary, EPA’s periodic review efforts; all in accordance with the Defined Properties SOW and all EPA-approved, conditionally-approved, or modified deliverables as required by the Defined Properties SOW. All deliverables required to be submitted for approval under the Defined Properties UAO or Defined Properties SOW shall be subject to approval by EPA in accordance with ¶ 6.6 (Approval of Deliverables) of the Defined Properties SOW.

**20. Emergencies and Releases.** Respondents shall comply with the emergency and release response and reporting requirements under ¶ 4.6 (Emergency Response and Reporting) of the Defined Properties SOW.

**21. Community Involvement.** Respondents shall conduct community involvement activities under EPA’s oversight as provided for in, and in accordance with, Section 2 (Community Involvement) of the Defined Properties SOW.

## 22. **Modification.**

a. EPA may, by written notice from the EPA RPM to Respondents, modify, or direct Respondents to modify, the Defined Properties SOW and/or any deliverable developed under the Defined Properties SOW, if such modification is necessary to achieve or maintain the Performance Standards or to carry out and maintain the effectiveness of the Remedial Action, and such modification is consistent with the Scope of the Remedy set forth in ¶ 1.3 of the Defined Properties SOW. Any other requirements of this Defined Properties UAO may be modified in writing by signature of the Superfund Division Director for Region 5 if such modification is consistent with the ROD.

b. Respondents may submit written requests to modify the Defined Properties SOW and/or any deliverable developed under the Defined Properties SOW. If EPA approves the request in writing, the modification shall be effective upon the date of such approval or as otherwise specified in the approval. Respondents shall modify the Defined Properties SOW and/or related deliverables in accordance with EPA's approval.

c. No informal advice, guidance, suggestion, or comment by the EPA RPM or other EPA representatives regarding reports, plans, specifications, schedules, or any other writing submitted by Respondents shall relieve Respondents of their obligation to obtain any formal approval required by this Defined Properties UAO, or to comply with all requirements of this Defined Properties UAO, unless it is formally modified.

d. Nothing in this Defined Properties UAO, the attached Defined Properties SOW, any deliverable required under the Defined Properties SOW, or any approval by EPA constitutes a warranty or representation of any kind by EPA that compliance with the work requirements set forth in the Defined Properties SOW or related deliverable will achieve the Performance Standards.

## XI. **PROPERTY REQUIREMENTS**

### 23. **Agreements or Court Orders Regarding Access.**

a. EPA Responsibility for Access. With respect to each Defined Property, EPA shall provide Respondents with either: (i) a written agreement, signed by the property owner, consenting to access by EPA and its authorized representatives (which includes Respondents) to remediate the property; or (ii) a court order issued by a court of competent jurisdiction authorizing EPA and its authorized representatives (which includes Respondents) to access the property for the purpose of remediating it.

b. Voluntary Access. After EPA determines that it has secured a voluntary access agreement from the owners of all Defined Properties for which EPA believes it can secure voluntary access from, EPA will so notify Respondents and shall provide them with a copy of all access agreements. At the same time, EPA will provide Respondents with the addresses of the Defined Properties for which EPA will attempt to secure access by means of a court order.



c. Access by Court Order. EPA will keep Respondents informed of any court action involving access for any Defined Property. Upon issuance of a court order authorizing access, EPA will promptly provide the order to Respondents.

d. Timing. If, for any Defined Property, EPA is unable to provide Respondents with either a voluntary access agreement or a court access order with enough time remaining in Respondents' 2019 Z2 Soil UAO mobilization to enable Respondents to perform RA Construction on the Defined Property during that mobilization, then Respondents may postpone commencement of the Work on that Defined Property until the 2020 construction season.

e. Respondents shall not be required to commence Remedial Action at any Defined Property until EPA provides access.

24. **Proprietary and Institutional Controls.** Pursuant to the schedule set forth in Paragraph 7.2 of the Defined Properties SOW, if contamination that requires Institutional Controls pursuant to the ROD remains at one or more Defined Properties, Respondents shall submit an Institutional Controls Implementation and Assurance Plan ("ICIAP") for EPA approval. If an ICIAP is necessary, it shall include, but not be limited to, consideration of the following types of restrictions, as appropriate:

- (1) Prohibitions on activities that could interfere with the Remedial Action;
- (2) Prohibitions on the use of contaminated groundwater;
- (3) Prohibitions on activities that could result in exposure to contaminants in subsurface soils and groundwater;
- (4) Requirements ensuring that any new structures on the Defined Property will not be constructed in a manner that could interfere with the Remedial Action; and
- (5) Requirements ensuring that any new structures on the Defined Property will be constructed in a manner that will minimize potential risk of inhalation of lead and arsenic contaminants.

The ICIAP shall include a schedule for implementation. Respondents shall implement the approved ICIAP consistent with the approved schedule.

25. **Proprietary Controls and Best Efforts.**

a. With respect to any Defined Property, Respondents shall use best efforts to secure the owner's cooperation in executing and recording, in accordance with the procedures of the ICIAP, Proprietary Controls that: (i) grant a right of access to conduct any activity regarding the Defined Properties UAO, including those activities listed in ¶ 24; and (ii) grant the right to enforce the land, water, or other resource use restrictions set forth in the ICIAP, if necessary.

b. As used below in this Paragraph: (1) “Prior Encumbrances” means any encumbrance that affects the title to the Defined Property, including but not limited to prior liens, claims, rights (such as easements) and mortgages; and (2) “best efforts” means the efforts that a reasonable person in the position of Respondents would use so as to achieve the goal in a timely manner, including the cost of employing professional assistance and the payment of reasonable sums of money to secure access and/or use restriction agreements, Proprietary Controls, releases, subordinations, modifications, or relocations of Prior Encumbrances that affect the title to the Defined Property, as applicable.

c. Notification to EPA regarding Best Efforts.

(1) Land, Water, or Other Resource Use Restrictions. By no later than 180 days after completion of the RA Construction, Respondents shall notify EPA of the Defined Properties, if any, where they have not been able to secure land, water, or other resource use restrictions set forth in the ICIAP. In the notice, Respondents shall include a description of the steps they have taken to comply with the requirement to use “best efforts” to secure these restrictions. If EPA deems it appropriate, it may assist Respondents, or take independent action, in obtaining such use restrictions, Proprietary Controls, releases, subordinations, modifications, or relocations of Prior Encumbrances that affect the title to the Defined Property, as applicable. EPA reserves the right to pursue cost recovery regarding all costs incurred by the United States in providing such assistance or taking such action, including the cost of attorney time and the amount of monetary consideration or just compensation paid.

26. In the event of any Transfer of any Defined Property, unless EPA otherwise consents in writing, Respondents shall continue to comply with their obligations under the Defined Properties UAO, including their obligation to ensure compliance with any land, water, or other resource use restrictions regarding the Defined Property, and to implement, maintain, monitor, and report on Institutional Controls.

## **XII. INSURANCE**

27. Not later than 15 days before commencing any on-site Work, Respondents shall secure, and shall maintain until the first anniversary after the Certification of RA Construction Completion at the Defined Properties pursuant to ¶ 4.8 of the Defined Properties SOW, commercial general liability insurance with limits of liability of \$1 million per occurrence, and automobile insurance with limits of liability of \$1 million per accident, and umbrella liability insurance with limits of liability of \$5 million in excess of the required commercial general liability and automobile liability limits, naming the United States as an additional insured with respect to all liability arising out of the activities performed by or on behalf of Respondents pursuant to this Defined Properties UAO. In addition, for the duration of the Defined Properties UAO, Respondents shall satisfy, or shall ensure that their contractors or subcontractors satisfy, all applicable laws and regulations regarding the provision of worker’s compensation insurance for all persons performing Work on behalf of Respondents in furtherance of this Defined Properties UAO. Within the same time period, Respondents shall provide EPA with certificates of such insurance and a copy of each insurance policy. Respondents shall submit such certificate

and copies of policies each year on the anniversary of the Effective Date. If Respondents demonstrate by evidence satisfactory to EPA that any contractor or subcontractor maintains insurance equivalent to that described above, or insurance covering some or all of the same risks but in a lesser amount, then, with respect to that contractor or subcontractor, Respondents need provide only that portion of the insurance described above that is not maintained by the contractor or subcontractor. Respondents shall ensure that all submittals to EPA under this Paragraph identify the USS Lead Site in East Chicago, Indiana, and the EPA docket number for this action.

### **XIII. DELAY IN PERFORMANCE**

28. Respondents shall notify EPA of any delay or anticipated delay in performing any requirement of this Defined Properties UAO. Such notification shall be made by telephone and email to the EPA RPM within 48 hours after Respondents first knew or should have known that a delay might occur. Respondents shall adopt all reasonable measures to avoid or minimize any such delay. Within seven days after notifying EPA by telephone and email, Respondents shall provide to EPA written notification fully describing the nature of the delay, the anticipated duration of the delay, any justification for the delay, all actions taken or to be taken to prevent or minimize the delay or the effect of the delay, a schedule for implementation of any measures to be taken to mitigate the effect of the delay, and any reason why Respondents should not be held strictly accountable for failing to comply with any relevant requirements of this Defined Properties UAO. Increased costs or expenses associated with implementation of the activities called for in this Defined Properties UAO is not a justification for any delay in performance.

29. Any delay in performance of this Defined Properties UAO that, in EPA's judgment, is not properly justified by Respondents under the terms of ¶ 28 shall be considered a violation of this Defined Properties UAO. EPA will notify Respondents of any such violation, or of any change to the deadline for deliverables. Any delay in performance of this Defined Properties UAO shall not affect Respondents' obligations to fully perform all obligations under the terms and conditions of this Defined Properties UAO.

### **XIV. ACCESS TO INFORMATION**

30. Respondents shall provide to EPA, upon request, copies of all records, reports, documents, and other information (including records, reports, documents, and other information in electronic form) (hereinafter referred to as "Records") within Respondents' possession or control or that of their contractors or agents relating to activities at the Site or to the implementation of this Defined Properties UAO, including, but not limited to, sampling, analysis, chain of custody records, manifests, trucking logs, receipts, reports, sample traffic routing, correspondence, or other documents or information regarding the Work. Respondents shall also make available to EPA, for purposes of investigation, information gathering, or testimony, their employees, agents, or representatives with knowledge of relevant facts concerning the performance of the Work.

**31. Privileged and Protected Claims.**

a. Respondents may assert that all or part of a Record requested by EPA is privileged or protected as provided under federal law, in lieu of providing the Record, provided Respondents comply with ¶ 31.b, and except as provided in ¶ 31.c.

b. If Respondents assert a claim of privilege or protection, they shall provide EPA with the following information regarding such Record: its title; its date; the name, title, affiliation (e.g., company or firm), and address of the author, of each addressee, and of each recipient; a description of the Record's contents; and the privilege or protection asserted. If a claim of privilege or protection applies only to a portion of a Record, Respondents shall provide the Record to EPA in redacted form to mask the privileged or protected portion only. Respondents shall retain all Records that they claim to be privileged or protected until EPA has had a reasonable opportunity to dispute the privilege or protection claim and any such dispute has been resolved in the Respondents' favor.

c. Respondents may make no claim of privilege or protection regarding: (1) any data regarding the Site, including, but not limited to, all sampling, analytical, monitoring, hydrogeologic, scientific, chemical, radiological, or engineering data, or the portion of any other Record that evidences conditions at or around the Site; or (2) the portion of any Record that Respondents are required to create or generate pursuant to this Defined Properties UAO.

**32. Business Confidential Claims.** Respondents may assert that all or part of a Record provided to EPA under this Section or Section XV (Record Retention) is business confidential to the extent permitted by and in accordance with Section 104(e)(7) of CERCLA, 42 U.S.C. § 9604(e)(7), and 40 C.F.R. § 2.203(b). Respondents shall segregate and clearly identify all Records or parts thereof submitted under this Defined Properties UAO for which Respondents assert business confidentiality claims. Records claimed as confidential business information will be afforded the protection specified in 40 C.F.R. Part 2, Subpart B. If no claim of confidentiality accompanies Records when they are submitted to EPA, or if EPA has notified Respondents that the Records are not confidential under the standards of CERCLA Section 104(e)(7) or 40 C.F.R. Part 2, Subpart B, the public may be given access to such Records without further notice to Respondents.

**33. Personally Identifiable Information.**

a. In the course of implementing this Defined Properties UAO, Respondents shall receive from EPA and shall generate themselves written and/or electronic materials that contain Personally Identifiable Information. Respondents shall keep PII confidential and not disclose it to other persons or entities except as required by law, court order or other lawful process that protects disclosure to the public of PII. Respondents shall take all necessary and appropriate measures to maintain the confidentiality of PII and to retain written or electronic materials in a secure manner.

b. Respondents may share PII with agents and contractors of theirs who are responsible for assisting in the implementation of this Defined Properties UAO provided that any such person with whom such information is shared either: (i) is specifically made aware of, and,

prior to receiving the information, agrees in writing with Respondents to comply with the substantive requirements of Paragraph 33.a as if he/she were a Respondent; or (ii) already has executed a confidentiality agreement with the Respondent that is broad enough to cover PII.

c. PII otherwise admissible, discoverable or subject to subpoena in any proceeding shall not be rendered inadmissible, non-discoverable or not subject to subpoena because of its coverage under this Defined Properties UAO.

d. In the event that Respondents conclude in good faith that applicable law, a subpoena or other lawful process, or a court order, requires disclosure of PII to a third party, Respondents shall provide, as far as is practicable, advance written notice to EPA of the intent to disclose, including a description of the applicable law or a copy of the subpoena, process or order requiring disclosure. Respondents shall not disclose any Personally Identifiable Information sooner than one day following provision of such written notice, unless required by law or order of a court.

e. Each Respondent shall promptly report to EPA breaches of PII, unauthorized disclosures or releases, and/or system vulnerability (to the extent known). Any disclosure of PII in contravention of this Defined Properties UAO shall not result in a waiver of the claim of confidentiality, except as provided by law.

## **XV. RECORD RETENTION**

34. During the pendency of this Defined Properties UAO and for a minimum of 10 years after EPA provides Notice of Work Completion under ¶ 4.11 of the Defined Properties SOW, each Respondent shall preserve and retain all non-identical copies of Records (including Records in electronic form) now in its possession or control or that come into its possession or control that relate in any manner to its liability under CERCLA with respect to the Site, provided, however, that Respondents who are potentially liable as owners or operators of the Site must retain, in addition, all Records that relate to the liability of any other person under CERCLA with respect to the Site. Each Respondent must also retain, and instruct its contractors and agents to preserve, for the same period of time specified above, all non-identical copies of the last draft or final version of any Records (including Records in electronic form) now in its possession or control or that come into its possession or control that relate in any manner to the performance of the Work, provided, however, that each Respondent (and its contractor and agents) must retain, in addition, copies of all data generated during performance of the Work and not contained in the aforementioned Records to be retained. Each of the above record retention requirements shall apply regardless of any corporate retention policy to the contrary.

35. At the conclusion of this document retention period, Respondents shall notify EPA at least 90 days prior to the destruction of any such Records, and, upon request by EPA, and except as provided in ¶ 31, Respondents shall deliver any such Records to EPA.

36. Within 30 days after the Effective Date, each Respondent shall submit a written certification to EPA's RPM that, to the best of its knowledge and belief, after thorough inquiry, it has not altered, mutilated, discarded, destroyed, or otherwise disposed of any Records (other than identical copies) relating to its potential liability regarding the Site since notification of potential

liability by the United States or the State and that it has fully complied with any and all EPA requests for information regarding the Site pursuant to Sections 104(e) and 122(e) of CERCLA, 42 U.S.C. §§ 9604(e) and 9622(e), and Section 3007 of RCRA, 42 U.S.C. § 6927, and state law. Any Respondent unable to so certify shall submit a modified certification that explains in detail why it is unable to certify in full with regard to all Records.

## **XVI. ENFORCEMENT/WORK TAKEOVER**

37. Any willful violation, or failure or refusal to comply with any provision of this Defined Properties UAO may subject Respondents to civil penalties of up to \$53,907 per violation per day, as provided in Section 106(b)(1) of CERCLA, 42 U.S.C. § 9606(b)(1), and the Civil Monetary Penalty Inflation Adjustment Rule, 81 Fed. Reg. 43,091 (July 1, 2016), 40 C.F.R. Part 19.4. In the event of such willful violation, or failure or refusal to comply, EPA may carry out the required actions unilaterally, pursuant to Section 104 of CERCLA, 42 U.S.C. § 9604, and/or may seek judicial enforcement of this Defined Properties UAO pursuant to Section 106 of CERCLA, 42 U.S.C. § 9606. Respondents may also be subject to punitive damages in an amount up to three times the amount of any cost incurred by the United States as a result of such failure to comply, as provided in Section 107(c)(3) of CERCLA, 42 U.S.C. § 9607(c)(3).

## **XVII. NOTICES AND SUBMISSIONS**

38. All approvals, consents, deliverables, modifications, notices, notifications, objections, proposals, reports, and requests specified in this Defined Properties UAO must be in writing unless otherwise specified. Whenever, under this Defined Properties UAO, notice is required to be given, or a report or other document is required to be sent, by one Party to another, it must be directed to the person(s) specified below at the address(es) specified below. Any Party may change the person and/or address applicable to it by providing notice of such change to all Parties. All notices under this Section are effective upon receipt, unless otherwise specified. Except as otherwise provided, notice to a Party by email (if that option is provided below) or by regular mail in accordance with this Section satisfies any notice requirement of the Defined Properties UAO regarding such Party.

As to EPA:

Director, Superfund Division  
Region 5, US EPA  
77 W. Jackson Blvd. (SR-6J)  
Chicago, IL 60604-3590

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EPA RPM  
Region 5, US EPA  
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As to the Regional Financial  
Management Officer:

Chief, Program Accounting and Analysis Section  
United States Environmental Protection Agency  
Region 5, MF-10J  
77 West Jackson Blvd.  
Chicago, IL 60604-3590

As to EPA Cincinnati Finance  
Center

EPA Cincinnati Finance Center  
26 W. Martin Luther King Dr.  
Cincinnati, OH 45268  
[cinwd\\_acctsreceivable@epa.gov](mailto:cinwd_acctsreceivable@epa.gov)

## **XVIII. RESERVATIONS OF RIGHTS**

39. Nothing in this Defined Properties UAO limits the rights and authorities of EPA and the United States:

a. To take, direct, or order all actions necessary, including to seek a court order, to protect public health, welfare, or the environment or to respond to an actual or threatened release of Waste Material on, at, or from the Site;

b. To select further response actions for the Site in accordance with CERCLA and the NCP, including but not limited to further response actions relating to soils (i) on the Defined Properties that currently are covered by impermeable barriers but become exposed due to the removal of existing impermeable barriers; and (ii) at non-residential properties in Zone 3 that remain unremediated;

c. To seek legal or equitable relief to enforce the terms of this Defined Properties UAO;

d. To take other legal or equitable action as they deem appropriate and necessary, or to require Respondents in the future to perform additional activities pursuant to CERCLA or any other applicable law;

e. To bring an action against Respondents under Section 107 of CERCLA, 42 U.S.C. § 9607, for recovery of any costs incurred by EPA or the United States regarding this Defined Properties UAO or the Site;

f. To seek access, and to require land, water, or other resource use restrictions and/or Institutional Controls, regarding the Site under CERCLA, RCRA, or other applicable statutes and regulations; or

g. To obtain information and perform inspections in accordance with CERCLA, RCRA, and any other applicable statutes or regulations.

## **XIX. OTHER CLAIMS**

40. By issuance of this Defined Properties UAO, the United States and EPA assume no liability for injuries or damages to persons or property resulting from any acts or omissions of Respondents. The United States or EPA shall not be deemed a party to any contract entered into by Respondents or their directors, officers, employees, agents, successors, representatives, assigns, contractors, or consultants in carrying out actions pursuant to this Defined Properties UAO.

41. Nothing in this Defined Properties UAO constitutes a satisfaction of or release from any claim or cause of action against Respondents or any person not a party to this Defined Properties UAO, for any liability such person may have under CERCLA, other statutes, or common law, including but not limited to any claims of the United States under Sections 106 and 107 of CERCLA, 42 U.S.C. §§ 9606 and 9607.

42. Nothing in this Defined Properties UAO shall be deemed to constitute preauthorization of a claim within the meaning of Section 111 of CERCLA, 42 U.S.C. § 9611, or C.F.R. § 300.700(d).

43. No action or decision by EPA pursuant to this Defined Properties UAO shall give rise to any right to judicial review, except as set forth in Section 113(h) of CERCLA, 42 U.S.C. § 9613(h).



## XX. ADMINISTRATIVE RECORD

44. EPA has established an administrative record that contains the documents that form the basis for the issuance of this Defined Properties UAO, including, but not limited to, the documents upon which EPA based the selection of the Remedial Action selected in the ROD. EPA will make the administrative record available for review at the EPA Region 5 Superfund Record Center located at 77 W. Jackson Blvd., Chicago, IL 60604. A copy of the administrative record is also available for viewing at <https://www.epa.gov/uss-lead-superfund-site>.

## XXI. APPENDICES

45. The following appendices are attached to and incorporated into this Defined Properties UAO:

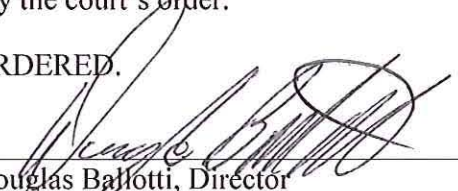
- a. Appendix A: Defined Properties SOW
- b. Appendix B: Map of USS Lead Site OU1 and OU2
- c. Appendix C: Map of USS Lead Site OU1 – Zones 1, 2, and 3
- d. Appendix D: Record of Decision
- e. Appendix E: Map identifying location of Corridor 3
- f. Appendix F: List of Defined Properties
- g. Appendix G: Correspondence under Paragraph 43 of the Consent Decree for Zone 3 properties
- h. Appendix H: Correspondence under Paragraph 43 of the Consent Decree for the Carrie Gosch Property and Corridor 3

## XXII. SEVERABILITY

46. If a court issues an order that invalidates any provision of this Defined Properties UAO or finds that Respondents have sufficient cause not to comply with one or more provisions of this Defined Properties UAO, Respondents shall remain bound to comply with all provisions of this Defined Properties UAO not invalidated or determined to be subject to a sufficient cause defense by the court's order.

It is so ORDERED.

BY:

  
\_\_\_\_\_  
Douglas Ballotti, Director  
Superfund Division  
Region 5  
U.S. Environmental Protection Agency

DATE:

  
\_\_\_\_\_  
3/27/2019

# **APPENDIX A**

**TO  
DEFINED PROPERTIES UAO**

**DEFINED PROPERTIES SOW**

**UNILATERAL ADMINISTRATIVE ORDER**  
**STATEMENT OF WORK FOR REMEDIAL ACTION FOR**  
**DEFINED PROPERTIES**  
**IN OPERABLE UNIT 1**  
**OF THE USS LEAD SUPERFUND SITE**

**City of East Chicago, Lake County, State of Indiana**

**EPA Region 5**

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## 1. INTRODUCTION

### 1.1 Background and Applicability of the Defined Properties SOW

(a) Background.

- (1) This Statement of Work forms a part of the Unilateral Administrative Order (Defined Properties UAO) for the continued implementation of remedial action in Operable Unit 1 of the U.S. Smelter and Lead Refinery, Inc. Superfund Site (Site) in East Chicago, Indiana, consistent with the Record of Decision (ROD), which was signed by the Director of the Superfund Division of the U.S. Environmental Protection Agency, Region 5, on November 30, 2012. This document shall be referred to as the “Defined Properties Statement of Work” or the “Defined Properties SOW” or “this SOW.”
- (2) Operable Unit 1. EPA has divided the Site into two operable units: Operable Unit 1 (OU1) and Operable Unit 2 (OU2). OU1 consists generally of a residential neighborhood in East Chicago, Indiana, commonly known as the Calumet neighborhood. OU1 has been further divided into three zones: Zone 1 (Z1), Zone 2 (Z2), and Zone 3 (Z3). The definition and boundaries of OU1 and Zones 1, 2, and 3 are set forth in the Definitions Section of the Defined Properties UAO.
- (3) Operable Unit 2. OU2 consists a 79-acre parcel of land that formerly housed the lead refining and smelting operations of U.S. Smelter and Lead Refinery Inc. (Former USS Lead Facility), as well as the groundwater associated with both OU1 and the Former USS Lead Facility. The definition of OU2 is set forth in the Definitions Section of the Defined Properties UAO.

(b) Contamination. Soils in yards throughout OU1 are contaminated with lead and/or arsenic above the Remedial Action Levels or “RALs.” The RALs at OU1 are 400 milligrams per kilogram (mg/kg) for lead at residential properties, schools, parks and unrestricted public right of ways; 800 mg/kg for lead at industrial/commercial properties; and 26 mg/kg for arsenic at both residential and industrial/commercial properties.

(c) Record of Decision. The ROD requires the excavation and off-Site disposal of soils in yards that contain lead or arsenic above RALs down to a maximum depth of twenty-four inches below ground surface (bgs). The ROD does not require the excavation of soils in yards that contain lead or arsenic in concentrations that exceed the RALs located more than twenty-four inches bgs. However, if soils in yards that contain lead or arsenic in concentrations that exceed the RALs are located more than twenty-four inches bgs, a visual barrier must be installed after any contaminated soils in the first twenty-four inches bgs are excavated, and Institutional Controls must be implemented.

- (d) The ROD addresses only OU1. It does not address groundwater associated with either OU1 or the Former USS Lead Facility or any other aspect of OU2.
- (e) The Defined Properties UAO addresses continued implementation of the ROD in properties located in OU1 that have not been remediated under a Consent Decree entered on October 28, 2014, by the United States District Court, Northern District of Indiana with civil action number 2:14-cv-312, and for which Respondents opted out of a covenant not to sue for those properties. Those properties are termed “Defined Properties” and are defined in the Defined Properties UAO.
- (f) This Defined Properties SOW addresses Remedial Design and Remedial Action for the Defined Properties. EPA will implement all Remedial Design and will be responsible for securing access to implement Remedial Action. Respondents will implement all Remedial Action.
- (g) Respondents are also respondents to a Unilateral Administrative Order for Remedial Action in Zone 2 of Operable Unit 1 of the U.S. Smelter and Lead Refinery, Inc. Superfund Site, CERCLA Docket No. V-W-18-C-005, effective January 19, 2018 (Z2 Soil UAO). The Z2 Soil UAO included and incorporated a Statement of Work (Z2 Soil SOW). Pursuant to the Z2 Soil SOW, Respondents have submitted, and EPA has approved, a Remedial Action Work Plan for Zone 2 (Z2 RAWP) that includes the same deliverables that are required to be included herein. Respondents shall comply with the requirement to submit the deliverables identified in ¶ 6.7(a)-(i) of this SOW by submitting Addenda to the corresponding deliverables already submitted as part of the Z2 RAWP.
- (h) Respondents will implement their activities consistent with the ROD; the Defined Properties UAO; all plans approved by EPA pursuant to the Defined Properties UAO and this Defined Properties SOW; any additional written direction provided by EPA; the *National Contingency Plan*; the *Superfund Lead-Contaminated Residential Sites Handbook*, August 2003 (“*Lead Handbook*”); and the documents and guidances identified in Section 9 of this Defined Properties SOW. Nothing in this Paragraph shall preclude EPA from providing additional guidance under the Resource Conservation and Recovery Act (RCRA) with respect to any RCRA-subject facility used during the implementation of the Remedial Action.

## 1.2 Structure of the Defined Properties SOW

- Section 2 (Community Involvement) sets forth EPA’s and Respondents’ responsibilities for community involvement.
- Section 3 (Remedial Design and Access) sets forth activities related to EPA’s development of design documents for the RA for the Defined Properties and EPA’s securing of access to the Defined Properties.

- Section 4 (Remedial Action) sets forth requirements regarding the implementation of the RA at the Defined Properties, including the primary deliverables related to completion of the RA for all of the Defined Properties.
- Section 5 (Reporting) sets forth Respondents' reporting obligations.
- Section 6 (Deliverables) describes the content of the supporting deliverables and the general requirements regarding Respondents' submission of, and EPA's review of, approval of, comment on, and/or modification of, the deliverables.
- Section 7 (Schedules) sets forth the schedule for submitting the primary deliverables, specifies the supporting deliverables that must accompany each primary deliverable, and sets forth the schedule of milestones regarding the implementation of the RA at the Defined Properties.
- Section 8 (State Participation) addresses providing documents to the State.
- Section 9 (References) provides a list of references, including URLs.

**1.3** The Scope of the Remedy includes the actions described in the ROD at Section 1.4, Section 2.8, Alternative 4A of Section 2.9.2, and Section 2.12.

**1.4** The terms used in this Defined Properties SOW that are defined in CERCLA, in regulations promulgated under CERCLA, or in the Defined Properties UAO, have the meanings assigned to them in CERCLA, in such regulations, or in the Defined Properties UAO, except that the term "Paragraph" or "¶" means a paragraph of the Defined Properties SOW, and the term "Section" means a section of the Defined Properties SOW, unless otherwise stated.

## **2. COMMUNITY INVOLVEMENT**

### **2.1 Community Involvement Responsibilities**

- (a) EPA has the lead responsibility for developing and implementing community involvement activities at the Site. Previously, EPA developed a Community Involvement Plan (CIP) for the Site.
- (b) If requested by EPA, Respondents shall participate in community involvement activities, including participation in (1) the preparation of information regarding the Work for dissemination to the public, and (2) public meetings that may be held or sponsored by EPA to explain activities at or relating to the Site. Respondents' support of EPA's community involvement activities may include providing initial submissions and updates of deliverables to (1) any Community Advisory Groups, (2) any Technical Assistance Grant recipients and their advisors, and (3) other entities to provide them with a reasonable opportunity for review and comment. EPA may describe in its CIP Respondents' responsibilities for community involvement activities. All community involvement activities conducted by Respondents at EPA's request are subject to EPA's oversight.

- (c) **Respondents' CI Coordinator.** Respondents have previously designated and notified EPA of a Community Involvement Coordinator (Respondents' CI Coordinator) for the Site. Respondents' CI Coordinator is responsible for providing support regarding EPA's community involvement activities, including coordinating with EPA's CI Coordinator regarding responses to the public's inquiries about the Site.

### **3. REMEDIAL DESIGN AND ACCESS**

**3.1 Design Planning and Soil Sampling.** EPA already has developed a work plan that includes design planning for the Defined Properties.

**3.2 Remedial Design.** EPA will perform Remedial Design for the Defined Properties and has already started the process.

- (a) For the yards of each Defined Property, EPA will develop a design document for the property which will consist of a diagram for that individual property.
  - (1) The individual property diagram will identify the areas of excavation and the depth of the excavation areas. Areas on the diagram that are not identified for excavation (such as sidewalks, impermeable driveways, and buildings) are not required to be excavated.
  - (2) The diagram will identify whether the Waste Material to be excavated is non-hazardous (identified as "Type-1 Waste") or hazardous (identified as "Type-2 Waste").
  - (3) The diagram will identify whether Waste Material is located at depths below 24 inches bgs. These areas will be colored in orange. At their election, Respondents may either: (i) install a visible barrier immediately over contamination remaining below 24 inch bgs and use best efforts to secure institutional controls; or (ii) excavate all Waste Materials above native sand that are contaminated with lead or arsenic above the RALs.
- (b) To the extent of EPA's knowledge, each property diagram will identify features that may require removal such as underground lighting systems, invisible fences, or watering systems.

**3.3** EPA will invite Respondents to discuss any Remedial Design issues as necessary.

**3.4 Access.** EPA is responsible for securing access to the Defined Properties.

- (a) EPA Responsibility for Access. With respect to each Defined Property, EPA shall provide Respondents with either: (i) a written agreement, signed by the property owner, consenting to access by EPA and its authorized representatives (which includes Respondents) to remediate the property; or (ii) a court order issued by a court of competent jurisdiction authorizing EPA and its authorized

representatives (which includes Respondents) to access the property for the purpose of remediating it.

- (b) Voluntary Access. After EPA determines that it has secured a voluntary access agreement from the owners of all Defined Properties for which EPA believes it can secure voluntary access from, EPA will so notify Respondents and shall provide them with a copy of all access agreements. At the same time, EPA will provide Respondents with the addresses of the Defined Properties for which EPA will attempt to secure access by means of a court order.
- (c) Access by Court Order. EPA will keep Respondents informed of any court action involving access for any Defined Property. Upon issuance of a court order authorizing access, EPA will promptly provide the order to Respondents.
- (d) Timing. If, for any Defined Property, EPA is unable to provide Respondents with either a voluntary access agreement or a court access order with enough time remaining in Respondents' 2019 Z2 Soil UAO mobilization to enable Respondents to perform RA Construction on the Defined Property during that mobilization, then Respondents may postpone commencement of the RA Construction on that Defined Property until the 2020 construction season.
- (e) No RA Until Access is Secured. Respondents shall not be required to commence Remedial Action at any Defined Property until EPA provides access.

#### **4. REMEDIAL ACTION**

**4.1 Remedial Action Work Plan.** Respondents previously submitted a Work Plan under the Z2 Soil SOW (Z2 RAWP) which EPA approved. Respondents shall submit an Addendum to the Z2 RAWP to include the Defined Properties. The Z2 RAWP as modified by the Addendum (hereinafter, simply RAWP) shall include:

- (a) In Gantt chart format, a proposed RA Construction Schedule for each Defined Property for which EPA has secured access by the due date of the RAWP; as access for additional Defined Properties is secured, the RA Construction Schedule shall be updated; and
- (b) The deliverables identified in ¶ 6.7(a)–(i); and
- (c) Plans for satisfying the substantive requirements of permits for on-site activity (Respondents are not required to actually obtain the applicable permits—such as storm water permits—for on-site activity but must satisfy the substantive requirements of any such permits); and
- (d) Plans for obtaining permits and satisfying those permits requirements for off-site activity, if any such off-site activity occurs; and



- (e) A list of key contractor personnel who will provide support during the RA for the Defined Properties; and
- (f) A schedule of deliverables to be provided during the RA for the Defined Properties.

**4.2 Remedial Action for the Defined Properties.** Respondents shall conduct the RA in accordance with the RAWP. Respondents shall not be required to commence RA at a Defined Property until EPA provides Respondents with either a voluntary access agreement or a court order authorizing access to the property for remediation. When conducting the RA, Respondents shall, at a minimum:

- (a) Excavate soils consistent with the individual property diagrams that EPA prepares pursuant to Section 3.2(a) of this Defined Properties SOW.
- (b) Consistent with each individual property diagram, install a visual barrier such as landscape fabric or orange construction fencing over soil containing lead or arsenic in concentrations above the RALs at depths greater than 24 inches bgs. Respondents are required to install a visual barrier only if soils above 24 inches bgs are excavated. In the alternative, at their option, Respondents may elect to excavate soil deeper than 24 inches bgs to avoid the need for a visual barrier and Institutional Controls at the property. If Respondents elect to excavate additional soils, Respondents shall revise any individual property diagram from which they deviate to show the actual excavation that was undertaken.
- (c) Deviate from the individual property diagrams that EPA prepares, as necessary.
  - (1) Deviations Requiring EPA Approval. Based on property conditions (e.g., underground utilities or features, the addition of a porch or garage), Respondents may need to deviate from an individual property diagram (e.g., by using offsets). If Respondents determine that it is necessary to deviate from an individual property diagram based on property conditions, Respondents shall confer with EPA and obtain EPA's assent. Based upon the extent of the deviation from the individual property diagram, EPA may require Respondents to: (i) submit sufficient information to document the need for the deviation; (ii) revise, prior to excavation, the individual property diagram to reflect the newly proposed excavation design; and/or (iii) undertake additional soil sampling. If EPA determines that additional soil sampling is necessary, Respondents' sampling must be consistent with sampling methods and analysis described in the *Remedial Investigation Report, Final*, June 2012, at Section 3.0 and the *Superfund Lead-Contaminated Residential Sites Handbook*, OSWER 9285.7-50 (Aug. 2003), at Section 4.3.
  - (2) Deviations Not Requiring EPA Approval. If an individual property diagram prepared by EPA does not include complete sampling data to a

depth of twenty-four inches bgs either because of refusal during RD sampling or because a previously-existing impermeable barrier has been removed, Respondents shall undertake additional soil sampling to determine whether any unsampled soils in the yard, down to a depth of at least twenty-four inches bgs, contain lead or arsenic above the RALs. Respondents' sampling must be consistent with sampling methods and analysis described in the *Remedial Investigation Report, Final*, June 2012, at Section 3.0 and the *Superfund Lead-Contaminated Residential Sites Handbook*, OSWER 9285.7-50 (Aug. 2003) at Section 4.3.

- (i) Contaminated Soils 0–24 Inches Below Ground Surface. If Respondents find additional soils containing lead or arsenic above the RALs within twenty-four inches bgs that were not identified in the individual property design provided by EPA, Respondents shall excavate those soils.
  - (ii) Unknown Contaminated Soils Below 24 Inches Below Ground Surface. If Respondents excavate additional soils down to twenty-four inches bgs that were not identified in the individual property design provided by EPA, Respondents shall also sample the next six inches of soil below twenty-four inches bgs to determine if they contain lead or arsenic above the RALs. If they do, Respondents shall either:
    - (A) Install a visual barrier (e.g., landscape fabric, orange construction fencing) over the contaminated soil at twenty-four inches bgs; or
    - (B) Excavate all soils above native sand that are contaminated with lead or arsenic above the RALs.
  - (iii) Known Contaminated Soils Below 24 Inches Below Ground Surface. If an individual property diagram prepared by EPA shows soil containing lead or arsenic above the RALs below twenty-four inches bgs, but no soil containing lead or arsenic above the RALs between 18 and 24 inches bgs, Respondents shall either:
    - (A) Excavate all soils above native sand that are contaminated with lead or arsenic above the RALs; or
    - (B) Implement Institutional Controls to prevent exposure to soil below twenty-four inches bgs contaminated with lead and/or arsenic above the RALs.
- (3) Respondents shall revise any individual property diagram from which they deviate to show the actual excavation that was undertaken.

- (d) Backfill and restore each property in a manner consistent with the *Superfund Lead-Contaminated Residential Sites Handbook*, OSWER 9285.7-50 (Aug. 2003) and the RAWP.
- (e) Transport and dispose of Waste Material consistent with ¶ 4.7 and the TST&D Plan. If Respondents temporarily store and stage Waste Material, Respondents must identify and segregate from one another hazardous waste and non-hazardous waste. If Respondents stage or stockpile contaminated soil at a Staging Area or at a transfer station, or if they arrange for the treatment of contaminated soil, Respondents shall take all necessary measures to prevent the soil from being redistributed to any area other than the container it is in or the location at the Staging Area or transfer or treatment station where the soil is being held. For purposes of this Defined Properties SOW, “Staging Area” shall mean a parcel of land, if any, utilized by Respondents to temporarily store and stage excavated soil and other Waste Materials prior to transportation to a disposal facility.
- (f) Implement Institutional Controls to preserve the protectiveness of the RA at the Defined Properties and prevent exposure to soil below twenty-four inches bgs contaminated with lead and/or arsenic above the RALs, at properties with soils below twenty-four inches bgs which contain lead or arsenic above the RALs after implementation of the RA Construction at the Defined Properties.

**4.3 Independent Quality Assurance Team.** Respondents shall notify EPA of Respondents’ designated Independent Quality Assurance Team (IQAT). The Supervising Contractor may perform this function or Respondents may hire a third party for this purpose. Respondents may use the same IQAT that is being used under the Z2 Soil UAO. If Respondents use a different IQAT, Respondents’ notice must include the names, titles, contact information, and qualifications of the members of the IQAT. The IQAT will have the responsibility to determine whether Work is of expected quality and conforms to applicable plans and specifications. The IQAT will have the responsibilities as described in ¶ 2.1.3 of the *Guidance on EPA Oversight of Remedial Designs and Remedial Actions Performed by Potentially Responsible Parties*, EPA/540/G-90/001 (Apr. 1990).

#### **4.4 Meetings and Inspections**

- (a) **Preconstruction Conference.** Respondents shall hold a preconstruction conference with EPA and others as directed or approved by EPA and as described in the *Remedial Design/Remedial Action Handbook*, EPA 540/R-95/059 (June 1995). Respondents shall prepare minutes of the conference and shall distribute the minutes to all Parties.
- (b) **Periodic Meetings.** During the construction portion of the RA for the Defined Properties (RA Construction), Respondents shall meet regularly with EPA, and others as directed or determined by EPA, to discuss construction issues. Respondents shall distribute an agenda and list of attendees to all Parties prior to

each meeting. Respondents shall prepare minutes of the meetings and shall distribute the minutes to all Parties.

(c) **Inspections**

- (1) EPA or its representative shall conduct periodic inspections of the Work at the Defined Properties. At EPA's request, the Supervising Contractor or other designee shall accompany EPA or its representative during inspections.
- (2) Upon notification by EPA of any deficiencies in the RA Construction at the Defined Properties, Respondents shall take all necessary steps to correct the deficiencies and/or bring the RA Construction into compliance with the RD, any approved design changes, and/or the approved RAWP. If applicable, Respondents shall comply with any schedule provided by EPA in its notice of deficiency.

**4.5 EPA Support**

- (a) Respondents may refer any questions or comments from the public regarding the Site to the EPA RPM(s), the EPA CI Coordinator, or any other person designated by EPA.
- (b) Upon request by Respondents' Project Coordinator or Supervising Contractor, an EPA RPM will:
  - (1) Conduct pre-construction walkthroughs of individual properties with Respondents' employees and/or contractors;
  - (2) Conduct post-construction walkthroughs of individual properties with Respondents' employees and/or contractors; and
  - (3) Conduct additional walkthroughs of individual properties with Respondents' employees and/or contractors, as practicable.

**4.6 Emergency Response and Reporting**

- (a) **Emergency Response and Reporting.** If any event occurs during performance of the Work at the Defined Properties that causes or threatens to cause a release of Waste Material on, at, or from the Site and that either constitutes an emergency situation or that may present an immediate threat to public health or welfare or the environment, Respondents shall: (1) immediately take all appropriate action to prevent, abate, or minimize such release or threat of release; (2) immediately notify the authorized EPA officer (as specified in ¶ 4.6(c)) orally; and (3) take such actions in consultation with the authorized EPA officer and in accordance with all applicable provisions of the Health and Safety Plan, the Emergency

Response Plan, and any other deliverable approved by EPA under this Defined Properties SOW.

- (b) **Release Reporting.** Upon the occurrence of any event during performance of the Work that Respondents are required to report pursuant to Section 103 of CERCLA, 42 U.S.C. § 9603, or Section 304 of the Emergency Planning and Community Right-to-know Act (EPCRA), 42 U.S.C. § 11004, Respondents shall immediately notify the authorized EPA officer orally.
- (c) The “authorized EPA officer” for purposes of immediate oral notifications and consultations under ¶ 4.6(a) and ¶ 4.6(b) are the EPA RPMs or the Emergency Response Section, Region 5, U.S. Environmental Protection Agency (if neither EPA RPM is available).
- (d) For any event covered by ¶ 4.6(a) and ¶ 4.6(b), Respondents shall: (1) within 14 days after the onset of such event, submit a report to EPA describing the actions or events that occurred and the measures taken, and to be taken, in response thereto; and (2) within 30 days after the conclusion of such event, submit a report to EPA describing all actions taken in response to such event.
- (e) The reporting requirements under ¶ 4.6 are in addition to the reporting required by CERCLA § 103 or EPCRA § 304.

#### **4.7 Off-Site Shipments**

- (a) Respondents may ship hazardous substances, pollutants, and contaminants from the Site to an off-Site facility only if they comply with Section 121(d)(3) of CERCLA, 42 U.S.C. § 9621(d)(3), and 40 C.F.R. § 300.440. Respondents will be deemed to be in compliance with CERCLA § 121(d)(3) and 40 C.F.R. § 300.440 regarding a shipment if Respondents obtain a prior determination from EPA that the proposed receiving facility for such shipment is acceptable under the criteria of 40 C.F.R. § 300.440(b).
- (b) Respondents may ship Waste Material from the Site to an out-of-state waste management facility only if, prior to any shipment, they provide notice to the appropriate state environmental official in the receiving facility’s state and to the EPA Project Coordinator. This notice requirement will not apply to any off-Site shipments when the total quantity of all such shipments does not exceed 10 cubic yards. The notice must include the following information, if available: (1) the name and location of the receiving facility; (2) the type and quantity of Waste Material to be shipped; (3) the schedule for the shipment; and (4) the method of transportation. Respondents also shall notify the state environmental official referenced above and the EPA Project Coordinator of any major changes in the shipment plan, such as a decision to ship the Waste Material to a different out-of-state facility. Respondents shall provide the notice after the award of the contract for RA Construction and before the Waste Material is shipped.

- (c) Respondents may ship Investigation Derived Waste (IDW) from the Site to an off-Site facility only if they comply with Section 121(d)(3) of CERCLA, 42 U.S.C. § 9621(d)(3), 40 C.F.R. § 300.440, EPA's *Guide to Management of Investigation Derived Waste*, OSWER 9345.3-03FS (Jan. 1992), and any IDW-specific requirements contained in the Record of Decision. Wastes shipped off-Site to a laboratory for characterization, and RCRA hazardous wastes that meet the requirements for an exemption from RCRA under 40 CFR § 261.4(e) shipped off-site for treatability studies, are not subject to 40 C.F.R. § 300.440.

#### **4.8 Certification of RA Construction Completion at the Defined Properties**

- (a) **RA Construction Completion Inspection at the Defined Properties.** The RA Construction is "Complete" for purposes of this ¶ 4.8 when it has been fully performed and the Performance Standards have been achieved at each of the Defined Properties. Respondents shall schedule an inspection for the purpose of obtaining EPA's Certification of RA Construction Completion at the Defined Properties. The inspection must be attended by Respondents and EPA and/or their representatives. Nothing in this SOW will prevent the Respondents from scheduling the inspection required under this SOW at the same time as the Z2 RA Construction Completion Inspection under Paragraph 4.8(b) of the Z2 Soil SOW.
- (b) **RA Construction Report for the Defined Properties.** Following the inspection, Respondents shall submit an RA Construction Report requesting EPA's Certification of RA Construction Completion for the Defined Properties. The report must: (1) include certifications by a registered professional engineer and by Respondents' Project Coordinator that the RA Construction is complete for the Defined Properties; (2) include as-built drawings in a package which is signed and stamped by a registered professional engineer; (3) include copies of all restoration plans generated in connection with ¶ 4.2(d); (4) be prepared in accordance with Chapter 2 of EPA's *Close Out Procedures for NPL Sites* guidance (May 2011); (5) contain post-excavation diagrams to demonstrate that Performance Standards have been achieved; and (6) be certified in accordance with ¶ 6.5 (Certification). Respondents may, but are not required to, consolidate this RA Construction Report with the Z2 RA Construction Report due under Paragraph 4.8(c) of the Z2 Soil SOW.
- (c) **EPA Notice of Deficiencies.** If EPA concludes that the RA Construction for the Defined Properties is not Complete, EPA shall so notify Respondents. EPA's notice must include a description of any deficiencies. EPA's notice may include a schedule for addressing such deficiencies or may require Respondents to submit a schedule for EPA approval. Respondents shall perform all activities described in the notice in accordance with the schedule.
- (d) If EPA concludes, based on the initial or any subsequent RA Construction Report requesting Certification of RA Construction Completion for the Defined Properties, that the RA Construction is Complete, EPA shall so certify to the

Respondents. This certification will constitute the Certification of RA Construction Completion for purposes of the Defined Properties UAO. Issuance of the Certification of RA Construction Completion will not affect Respondents' remaining obligations under the Defined Properties UAO. EPA may, but is not required to, consolidate certification of RA Construction Completion for the Defined Properties with certification of Z2 RA Construction Completion under Paragraph 4.8(e) of the Z2 Soil SOW.

**4.9 Periodic Review Support Plan.** To the extent that contamination is left at the Defined Properties that requires Institutional Controls and to the extent that EPA notifies Respondents that Respondents' submissions under the approved O&M Plan do not provide EPA with sufficient information to undertake its statutorily-mandated five-year reviews, Respondents shall submit a periodic review support plan (PRSP) for EPA approval. The PRSP addresses the studies and investigations that Respondents shall conduct to support EPA's reviews of whether the RA at the Defined Properties is protective of human health and the environment in accordance with Section 121(c) of CERCLA, 42 U.S.C. § 9621(c) (also known as "Five-year Reviews"). Respondents shall develop the plan in accordance with *Comprehensive Five-year Review Guidance*, OSWER 9355.7-03B-P (June 2001), and any other relevant five-year review guidances. Respondents may consolidate any PRSP that must be submitted under Paragraph 4.9 of the Z2 Soil SOW with any PRSP that must be submitted under this SOW.

**4.10 Notice of RA Completion at the Defined Properties**

- (a) **"RA" at the Defined Properties Distinguished from "RA Construction."**  
"RA" at the Defined Properties fully encompasses "RA Construction" but it also includes Institutional Control activities.
- (b) **If Institutional Controls are not Required at any Defined Property.**
  - (1) If Respondents leave no contamination in place that requires Institutional Controls at any of the Defined Properties, then, at the same time that Respondents seek certification from EPA of RA Construction Completion at the Defined Properties, they may also seek notification from EPA of RA Completion at the Defined Properties.
  - (2) Respondents shall not be required to prepare an RA Completion Report if no Institutional Controls are necessary because the RA Construction Completion Report shall be sufficient.
  - (3) If EPA concludes that the RA at the Defined Properties is complete, EPA shall so notify Respondents.
  - (4) If EPA concludes that the RA at the Defined Properties is not complete, the procedures identified in ¶ 4.10(c)(3)–(c)(4) shall apply.

- (c) **If Institutional Controls are Required at One or More Defined Properties.**
- (1) **RA Completion Meeting.** If Institutional Controls are required at one or more of the Defined Properties, then upon completion of the implementation of the ICIAP at the Defined Properties, Respondents shall schedule a meeting with EPA for the purpose of obtaining EPA’s Notice of RA Completion at the Defined Properties. The meeting must be attended by Respondents and EPA and/or their representatives. The RA Completion meeting under this SOW may be consolidated with the Z2 RA Completion meeting under Paragraph 4.10(c)(1) of the Z2 Soil SOW.
  - (2) **RA Completion Report.** Following the meeting, Respondents shall submit a report to EPA requesting EPA’s Notice of RA Completion at the Defined Properties. The report must: (1) include certifications by Respondents’ Project Coordinator that all requirements of Section XI (Property Requirements) of the Defined Properties UAO and all activities under the ICIAP are complete; and (2) be certified in accordance with ¶ 6.5 (Certification). Respondents may, but are not required to, consolidate this RA Completion Report with the Z2 RA Completion Report due under Paragraph 4.10(c)(2) of the Z2 Soil SOW.
  - (3) If EPA concludes that the RA at the Defined Properties is not complete, EPA shall so notify Respondents. EPA’s notice must include a description of the activities that Respondents must perform to complete the RA at the Defined Properties. EPA’s notice must include specifications and a schedule for such activities or must require Respondents to submit specifications and a schedule for EPA approval. Respondents shall perform all activities described in the notice or in the EPA-approved specifications and schedule.
  - (4) If EPA concludes, based on the initial or any subsequent RA Completion Report, that the RA is complete at the Defined Properties, EPA shall so notify Respondents. EPA may, but is not required to, consolidate certification of RA Completion for the Defined Properties with notice of RA Completion under Paragraph 4.10(c)(4) of the Z2 Soil SOW.
- (d) Issuance of the Notice of RA Completion under either ¶ 4.10(b)(3) or (c)(4) does not affect the following continuing obligations: (i) activities under the Periodic Review Support Plan, if this Plan is required; (ii) activities under the O&M Plan; and (iii) obligations under Sections XVI (Record Retention) and XV (Access to Information) of the Defined Properties UAO.

#### **4.11 Notice of Work Completion at the Defined Properties**

- (a) **“Work” Distinguished from “RA.”** “Work” at the Defined Properties fully encompasses “RA” at the Defined Properties, but also includes O&M. O&M



involves inspecting or reviewing records of properties, if any, where Institutional Controls are required. *See* Paragraph 6.7(j) below. By definition in the Defined Properties UAO, “Work” also includes all other activities required by the Defined Properties UAO except for record retention. Those other activities are addressed in Paragraph 4.11(d) below.

(b) **If Institutional Controls are not Required at any Defined Property.**

- (1) If Respondents leave no contamination in place that requires Institutional Controls at any of the Defined Properties, then Respondents shall not be required to undertake any O&M under the Defined Properties UAO. Therefore, at the same time that Respondents seek certification from EPA of RA Construction Completion and notification from EPA of RA Completion, Respondents may also seek notification of Work Completion.
- (2) Respondents shall not be required to prepare a Work Completion Report if no Institutional Controls are necessary because the RA Construction Completion Report shall be sufficient.
- (3) If EPA concludes that the Work is complete at the Defined Properties, EPA shall so notify Respondents.
- (4) If EPA concludes that the Work is not complete, the procedures identified in ¶ 4.11(c)(3)–(c)(4) shall apply.

(c) **If Institutional Controls are Required at One or More of the Defined Properties.**

- (1) **Work Completion Meeting.** If Institutional Controls are required at one or more of the Defined Properties, then upon completion of the implementation of the O&M Plan at the Defined Properties, Respondents shall schedule a meeting with EPA for the purpose of obtaining EPA’s Notice of Work Completion at the Defined Properties. The meeting must be attended by Respondents and EPA and/or their representatives. The meeting under this SOW may be consolidated with the Z2 RA Work Completion meeting under Paragraph 4.11(c)(1) of the Z2 Soil SOW.
- (2) **Work Completion Report.** Following the meeting, Respondents shall submit a report to EPA requesting EPA’s Notice of Work Completion at the Defined Properties. The report must: (1) include certifications by Respondents’ Project Coordinator that the Work at the Defined Properties, including all O&M activities, is complete; and (2) be certified in accordance with ¶ 6.5 (Certification). Respondents may, but are not required to, consolidate this Work Completion Report with the Z2 RA Work Completion Report due under Paragraph 4.11(c)(2) of the Z2 Soil UAO.

- (3) If EPA concludes that the Work Defined Properties is not complete, EPA shall so notify Respondents. EPA's notice must include a description of the activities that Respondents must perform to complete the Work at the Defined Properties. EPA's notice must include specifications and a schedule for such activities or must require Respondents to submit specifications and a schedule for EPA approval. Respondents shall perform all activities described in the notice or in the EPA-approved specifications and schedule.
  - (4) If EPA concludes, based on the initial or any subsequent Work Completion Report, that the Work for the Defined Properties is complete, EPA shall so notify Respondents. EPA may, but is not required to, consolidate notice of Work Completion for the Defined Properties with notice of Z2 RA Work Completion under Paragraph 4.11(c)(4) of the Z2 Soil UAO.
- (d) Issuance of the Notice of Work Completion for the Defined Properties does not affect the following continuing obligations: (1) activities under the Periodic Review Support Plan, if this Plan is required; and (2) obligations under Section XVI (Record Retention), and XV (Access to Information) of the Defined Properties UAO.

## **5. REPORTING**

- 5.1 Progress Reports.** Commencing in the month following the approval of the new or modified RAWP, Respondents shall submit progress reports to EPA on a monthly basis, or as otherwise requested by EPA. Respondents may consolidate the progress reports due under this SOW with those due under the Z2 Soil SOW, provided however, that the reports clearly identify the work done under the Z2 Soil UAO from the work done under the Defined Properties UAO. The reports must cover all activities that took place during the prior reporting period pursuant to the Defined Properties UAO, including:
- (a) The actions that have been taken toward achieving compliance with the Defined Properties UAO;
  - (b) A summary of all results of sampling, tests, and all other data received or generated by Respondents;
  - (c) A description of all deliverables that Respondents submitted to EPA;
  - (d) A description of all activities relating to RA Construction in the Defined Properties that are scheduled for the next six weeks;
  - (e) An updated RA Construction Schedule for the Defined Properties (if that schedule has been modified), together with information regarding percentage of completion, delays encountered or anticipated that may affect the future schedule

for implementation of the Work at the Defined Properties, and a description of efforts made to mitigate those delays or anticipated delays; and

- (f) A description of any modifications to the work plans or other schedules that Respondents have proposed or that have been approved by EPA.

**5.2 Notice of Progress Report Schedule Changes.** If the schedule for any activity described in the Progress Reports, including activities required to be described under ¶ 5.1(d), changes, Respondents shall notify EPA of such change at least 7 days before performance of the activity.

## **6. DELIVERABLES**

**6.1 Applicability.** Respondents shall submit deliverables for EPA approval or for EPA comment as specified in this Defined Properties SOW. If neither is specified, the deliverable does not require EPA's approval or comment. Paragraphs 6.2 (In Writing) through 6.4 (Technical Specifications) apply to all deliverables. Paragraph 6.5 (Certification) applies to any deliverable that is required to be certified. Paragraph 6.6 (Approval of Deliverables) applies to any deliverable that is required to be submitted for EPA approval.

**6.2 In Writing.** All deliverables under this Defined Properties SOW must be in writing unless otherwise specified.

**6.3 General Requirements for Deliverables.** All deliverables must be submitted by the deadlines in the RA Schedule. Respondents shall submit all deliverables in electronic form. Technical specifications for sampling and monitoring data and spatial data are addressed in ¶ 6.4. All other deliverables shall be submitted to EPA in the electronic form specified by the EPA RPM. If any deliverable includes maps, drawings, or other exhibits that are larger than 8.5" by 11", Respondents shall also provide EPA with paper copies of such exhibits.

### **6.4 Technical Specifications**

- (a) Sampling and monitoring data should be submitted in standard Regional Electronic Data Deliverable (EDD) format. Respondents shall consult with the EPA RPM prior to transmitting sampling and monitoring data in order to be advised of the EDD format that the data should be transmitted in. Other delivery methods may be allowed if electronic direct submission presents a significant burden or as technology changes.
- (b) Spatial data, including spatially-referenced data and geospatial data, should be submitted: (1) in the ESRI File Geodatabase format; and (2) as unprojected geographic coordinates in decimal degree format using North American Datum 1983 (NAD83) or World Geodetic System 1984 (WGS84) as the datum. If applicable, submissions should include the collection method(s). Projected

coordinates may optionally be included but must be documented. Spatial data should be accompanied by metadata, and such metadata should be compliant with the Federal Geographic Data Committee (FGDC) Content Standard for Digital Geospatial Metadata and its EPA profile, the EPA Geospatial Metadata Technical Specification. An add-on metadata editor for ESRI software, the EPA Metadata Editor (EME), complies with these FGDC and EPA metadata requirements and is available at <https://edg.epa.gov/EME/>.

- (c) Each file must include an attribute name for each site unit or sub-unit submitted. Consult <http://www.epa.gov/geospatial/geospatial-policies-and-standards> for any further available guidance on attribute identification and naming.
- (d) Spatial data submitted by Respondents does not, and is not intended to, define the boundaries of the Site.

**6.5 Certification.** All deliverables that require compliance with this ¶ 6.5 must be signed by the Respondents' Project Coordinator, or other responsible official of Respondents, and must contain the following statement:

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I have no personal knowledge that the information submitted is other than true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

## **6.6 Approval of Deliverables**

### **(a) Initial Submissions**

- (1) After review of any deliverable that is required to be submitted for EPA approval under the Defined Properties UAO or this Defined Properties SOW, EPA shall: (i) approve, in whole or in part, the submission; (ii) approve the submission upon specified conditions; (iii) disapprove, in whole or in part, the submission; or (iv) any combination of the foregoing.
- (2) EPA also may modify the initial submission to cure deficiencies in the submission if: (i) EPA determines that disapproving the submission and awaiting a resubmission would cause substantial disruption to the Work; or (ii) previous submission(s) have been disapproved due to material defects and the deficiencies in the initial submission under consideration indicate a bad faith lack of effort to submit an acceptable deliverable.

- (b) **Resubmissions.** Upon receipt of a notice of disapproval under ¶ 6.6(a) (Initial Submissions), or if required by a notice of approval upon specified conditions under ¶ 6.6(a), Respondents shall, within 14 days or such longer time as specified by EPA in such notice, correct the deficiencies and resubmit the deliverable for approval. After review of the resubmitted deliverable, EPA may: (1) approve, in whole or in part, the resubmission; (2) approve the resubmission upon specified conditions; (3) modify the resubmission; (4) disapprove, in whole or in part, the resubmission, requiring Respondents to correct the deficiencies; or (5) any combination of the foregoing.
- (c) **Implementation.** Upon approval, approval upon conditions, or modification by EPA under ¶ 6.6(a) (Initial Submissions) or ¶ 6.6(b) (Resubmissions), of any deliverable, or any portion thereof: (1) such deliverable, or portion thereof, will be incorporated into and enforceable under the Defined Properties UAO; and (2) Respondents shall take any action required by such deliverable, or portion thereof.

**6.7 Supporting Deliverables.** To implement work in Zone 2 of OU1, and pursuant to ¶ 6.7 of the Z2 Soil SOW, Respondents previously submitted to EPA the deliverables identified in ¶¶ 6.7(a)–(i) of this SOW. EPA approved those deliverables that required approval. As used in this Paragraph, therefore, “Existing” means the deliverable, by the same name, that Respondents submitted under the Z2 Soil SOW (*e.g.*, “Existing HASP” means the HASP that Respondents submitted under the Z2 Soil SOW). For purposes of complying with this SOW, Respondents shall submit, if and as necessary and/or appropriate, an Addendum to each of the Existing deliverables identified in ¶¶ 6.7(a)–(i) to include any additional requirements to implement Remedial Action at the Defined Properties. Respondents shall submit any Addenda to the Existing plans in accordance with all applicable regulations, guidance documents, and policies (see Section 9 (References)). Respondents shall update each of these supporting deliverables as necessary or appropriate during the course of the Work and/or as requested by EPA.

Under the Z2 Soil SOW, Respondents have not yet been required to submit the ICIAP identified in ¶ 6.7(k) (if Institutional Controls are necessary) or the O&M Plan identified in ¶ 6.7(j) (if properties remain that are other than “unrestricted use and unrestricted exposure”). If an ICIAP or O&M Plan are necessary under the Z2 Soil UAO, Respondents may submit one such plan under both the Z2 Soil UAO and the Defined Properties UAO. Those plans may be submitted at the date specified in ¶ 7.2 (Work Schedule).

- (a) **Health and Safety Plan.** The Existing Health and Safety Plan (HASP) describes all activities to be performed to protect on site personnel and area residents from physical, chemical, and all other hazards posed by the Work. As necessary and/or appropriate, Respondents shall submit an Addendum to the Existing HASP, to cover the Defined Properties, in accordance with EPA’s Emergency Responder Health and Safety and Occupational Safety and Health Administration (OSHA) requirements under 29 C.F.R. §§ 1910 and 1926. The HASP should cover activities during the RA and be updated to cover activities after RA completion.

EPA did not approve the Existing HASP, but did review it to ensure that all necessary elements are included and that the plan provides for the protection of human health and the environment. EPA shall do the same with any Addendum submitted under this Subparagraph.

- (b) **Emergency Response Plan.** The Existing Emergency Response Plan (ERP) describes procedures to be used in the event of an accident or emergency at the Site (for example, power outages, water impoundment failure, treatment plant failure, slope failure). If and as necessary and/or appropriate, Respondent shall submit an Addendum to the Existing ERP to cover the Defined Properties to include:
- (1) Name of the person or entity responsible for responding in the event of an emergency incident;
  - (2) Plan and date(s) for meeting(s) with the local community, including local, State, and federal agencies involved in the cleanup, as well as local emergency squads and hospitals;
  - (3) Spill Prevention, Control, and Countermeasures (SPCC) Plan (if applicable), consistent with the regulations under 40 C.F.R. Part 112, describing measures to prevent, and contingency plans for, spills and discharges;
  - (4) Notification activities in accordance with ¶ 4.6(b) (Release Reporting) in the event of a release of hazardous substances requiring reporting under Section 103 of CERCLA, 42 U.S.C. § 9603, or Section 304 of the Emergency Planning and Community Right-to-know Act (EPCRA), 42 U.S.C. § 11004; and
  - (5) A description of all necessary actions to ensure compliance with ¶ 4.6 in the event of an occurrence during the performance of the Work that causes or threatens a release of Waste Material from the Site that constitutes an emergency or may present an immediate threat to public health or welfare or the environment.
- (c) **Field Sampling Plan.** The Existing Field Sampling Plan (FSP) addresses all sample collection activities. If and as necessary and/or appropriate, Respondents shall submit an Addendum to the Existing FSP so that a field sampling team unfamiliar with the project would be able to gather the samples and field information required and so that the FSP is in accordance with *Guidance for Conducting Remedial Investigations and Feasibility Studies*, EPA/540/G 89/004 (Oct. 1988). The FSP shall be modified, as necessary, for the Carrie Gosch Property to include a subsurface field survey of Quad C.

- (d) **Quality Assurance Project Plan.** The Existing Quality Assurance Project Plan (QAPP) augments the FSP and addresses sample analysis and data handling regarding the Work. If and as necessary and/or appropriate, Respondents shall submit an Addendum to the Existing QAPP to include a detailed explanation of Respondents' quality assurance, quality control, and chain of custody procedures for all treatability, design, compliance, and monitoring samples and so that it is in accordance with *EPA Requirements for Quality Assurance Project Plans*, QA/R-5, EPA/240/B-01/003 (Mar. 2001, reissued May 2006); *Guidance for Quality Assurance Project Plans*, QA/G-5, EPA/240/R 02/009 (Dec. 2002); and *Uniform Federal Policy for Quality Assurance Project Plans*, Parts 1-3, EPA/505/B-04/900A through 900C (Mar. 2005). As necessary and/or appropriate, the Addendum shall include procedures:
- (1) To ensure that EPA and its authorized representative have reasonable access to laboratories used by Respondents in implementing the Work (Respondents' Labs);
  - (2) To ensure that Respondents' Labs analyze all samples submitted by EPA pursuant to the QAPP for quality assurance monitoring;
  - (3) To ensure that Respondents' Labs perform all analyses using EPA-accepted methods (i.e., the methods documented in *USEPA Contract Laboratory Program Statement of Work for Inorganic Analysis*, ILM05.4 (Dec. 2006); *USEPA Contract Laboratory Program Statement of Work for Organic Analysis*, SOM01.2 (amended Apr. 2007); and *USEPA Contract Laboratory Program Statement of Work for Inorganic Superfund Methods (Multi-Media, Multi-Concentration)*, ISM01.2 (Jan. 2010)) or other methods acceptable to EPA;
  - (4) To ensure that Respondents' Labs participate in an EPA-accepted QA/QC program or other program QA/QC acceptable to EPA;
  - (5) For Respondents to provide split samples and/or duplicate samples to EPA upon request;
  - (6) For EPA to take any additional samples that it deems necessary;
  - (7) For EPA to provide to Respondents, upon request, split samples and/or duplicate samples in connection with EPA's oversight sampling; and
  - (8) For Respondents to submit to EPA all sampling and tests results and other data in connection with the implementation of the Work.
- (e) **Construction Quality Assurance/Quality Control Plan (CQA/QCP).** The Existing Construction Quality Assurance Plan (CQAP) describes planned and systemic activities that provide confidence that the RA Construction will satisfy

all plans, specifications, and related requirements, including quality objectives. The purpose of the Existing Construction Quality Control Plan (CQCP) is to describe the activities to verify that RA construction has satisfied all plans, specifications, and related requirements, including quality objectives. If and as necessary and/or appropriate, Respondents shall submit an Addendum to the Existing CQA/QCP to cover the Defined Properties to:

- (1) Identify, and describe the responsibilities of, the organizations and personnel implementing the CQA/QCP;
  - (2) Describe the PS required to be met to achieve Completion of the RA;
  - (3) Describe the activities to be performed: (i) to provide confidence that PS will be met; and (ii) to determine whether PS have been met;
  - (4) Describe verification activities, such as inspections, sampling, testing, monitoring, and production controls, under the CQA/QCP;
  - (5) Describe industry standards and technical specifications used in implementing the CQA/QCP;
  - (6) Describe procedures for tracking construction deficiencies from identification through corrective action;
  - (7) Describe procedures for documenting all CQA/QCP activities; and
  - (8) Describe procedures for retention of documents and for final storage of documents.
- (f) **Construction Stormwater Pollution Prevention Plan.** An Existing Construction Stormwater Pollution Prevention Plan identifies activities designed to limit stormwater pollution. If and as necessary and/or appropriate, Respondents shall submit an Addendum to the Existing Construction Stormwater Pollution Prevention Plan to cover the Defined Properties.
- (g) **Traffic Management Plan.** An Existing Traffic Management Plan identifies activities to manage traffic. If and as necessary and/or appropriate, Respondents shall submit an Addendum to the Existing Traffic Management Plan to cover the Defined Properties.
- (h) **Temporary Storage, Transportation and Disposal Plan.** An Existing Temporary Storage, Transportation and Disposal Plan (TST&D Plan) describes storage, transportation, and disposal activities. If and as necessary and/or appropriate, Respondents shall submit an Addendum to the TST&D Plan to cover the Defined Properties to include:
- (1) Proposed routes for off-site shipment of Waste Material;



- (2) Identification of communities affected by shipment of Waste Material;
  - (3) Description of plans to minimize impacts on affected communities;
  - (4) Description of the site setup at a Staging Area, if any, including the locations of the waste staging area and laydown yard;
  - (5) Waste management control measures necessary for safety and protection of human health and the environment at a Staging Area, if any, including by not limited to erosion control, stormwater pollution prevention, dust suppression (both on the roads used by the truck traffic and near the Waste Materials), and air monitoring;
  - (6) Description of maintenance to be performed on the roads used by trucks hauling Waste Materials
  - (7) Health and safety requirements;
  - (8) Documentation requirements; and
  - (9) A description of the disposal facilities.
- (i) **Second Addendum to the Data Management Plan.** An Existing Addendum (prepared by Respondents) to an EPA-developed Data Management Plan (DMP) describes the information that Respondents are required to collect during the Z2 RA Construction and how Respondents shall collect and manage that information so that it is compatible with EPA's data management practices. If and as necessary and/or appropriate, Respondents shall submit a Second Addendum to the Existing Addendum that covers the Defined Properties to include:
- (1) For field activities, requirements to:
    - (i) Use DustTrak DRX for air monitoring and download all generated data for backup;
    - (ii) Use VIPER and associated telemetry equipment for real-time air monitoring activities;
    - (iii) Use Gillians (or equivalent) to collect air samples;
    - (iv) Fill out an Air Monitoring iForm (or equivalent) to record air sample information;
    - (v) Use XRF for soil screening (as needed);
    - (vi) Use XRF iForm (or equivalent) to record XRF QC checks and field data; and

- (vii) Use licensed surveyors or another method approved by EPA to record pre-excavation elevation and confirmation of excavation depth.
- (2) The flow chart on Page 4 of the EPA-developed DMP identifies data that must be exported to Scribe (which is a software program for managing environmental data). For data that must be exported to Scribe, the Second Addendum to the DMP must include, if and as necessary and/or appropriate, requirements to:
- (i) Re-create digital forms for field data entry (i.e., using iForms or equivalent);
  - (ii) Ensure that export data from digital forms can be imported to Scribe without adjustments to Scribe (stated otherwise, ensure that comma-separated values (CSV) files are able to be imported to Scribe without adjustments to Scribe);
  - (iii) QA/QC CSV exports for iForms (or equivalent) to ensure information entered is correct/valid;
  - (iv) Update the field version of Scribe by subscribing to the updated version of Scribe.NET;
  - (v) Upload CSV files into field version of Scribe for creation of chain of custody (COC) for submission of samples;
  - (vi) Export the COC XML files from Scribe;
  - (vii) Email the CSV files from the digital forms and the COC XML files to the database administrator;
  - (viii) Backup all CSV and COC XML files submitted to the database administrator; and
  - (ix) QA/QC pre-elevation data, excavation depth confirmation data, and the export of this data to Scribe.
- (j) **O&M Plan.** The O&M Plan shall describe the requirements for inspecting, operating, and maintaining the RA where contamination below 24 inches bgs that requires Institutional Controls has been left in place. Respondents shall develop the O&M Plan in accordance with *Operation and Maintenance in the Superfund Program*, OSWER 9200.1 37FS, EPA/540/F-01/004 (May 2001). The O&M Plan must include a description of the procedures the Respondents shall use for inspections or record reviews of properties where Institutional Controls are required. The O&M Plan must require the submission of an O&M Report following O&M activities. Remediated properties that have unlimited use and

unrestricted exposure (“UU/UE”) are not required to be included in the O&M Plan. Respondents shall submit either: (i) one O&M Plan under the Z2 Soil SOW and one under this SOW; or (ii) one under both SOWs. The timing is as set forth in Section 7.2.

(k) **Institutional Controls Implementation and Assurance Plan.**

- (1) The Institutional Controls Implementation and Assurance Plan (ICIAP) is required only if Respondents leave contamination in place below 24 inches bgs that requires Institutional Controls.
- (2) The ICIAP describes plans to implement, maintain, and enforce the Institutional Controls (ICs) at the Site. Respondents shall develop the ICIAP in accordance with *Institutional Controls: A Guide to Planning, Implementing, Maintaining, and Enforcing Institutional Controls at Contaminated Sites*, OSWER 9355.0-89, EPA/540/R-09/001 (Dec. 2012), and *Institutional Controls: A Guide to Preparing Institutional Controls Implementation and Assurance Plans at Contaminated Sites*, OSWER 9200.0-77, EPA/540/R-09/02 (Dec. 2012). The ICIAP must include the following additional requirements:
  - (i) Locations of recorded real property interests (e.g., easements, liens) and resource interests in the property that may affect ICs (e.g., surface, mineral, and water rights) including accurate mapping and geographic information system (GIS) coordinates of such interests; and
  - (ii) Legal descriptions and survey maps that are prepared according to current American Land Title Association (ALTA) Survey guidelines and certified by a licensed surveyor.
- (3) Respondents shall submit either: (i) one ICIAP under the Z2 Soil SOW and one under this SOW; or (ii) one under both SOWs. The timing is as set forth in Section 7.2.

## 7. SCHEDULES

**7.1 Applicability and Revisions.** All deliverables and tasks required under this Defined Properties SOW must be submitted or completed by the deadlines or within the time durations listed in the Work Schedule set forth below. Respondents may submit proposed revised Work Schedules for EPA approval. Upon EPA’s approval, the revised Work Schedules supersede the Work Schedule set forth below, and any previously-approved Work Schedules.

### **7.2 Work Schedule**

	<b>Description of Deliverable/Task</b>	<b>¶ Ref.</b>	<b>Deadline (dates are “no later than” dates) (“days” are calendar days)</b>
1	RAWP	4.1 and 6.7(a)-(i)	Any necessary and/or appropriate Addenda to the Z2 RAWP and the Existing HASP, ERP, FSP, QAPP, CQA/QCP, C-SWPPP, TMP, TST&D, and DMP shall be submitted 60 days after EPA’s Notice of Authorization to Proceed regarding Supervising Contractor under ¶ 18.c of the Defined Properties UAO
2	Designate IQAT (either a third party or the Supervising Contractor)	4.3	30 days after EPA’s Notice of Authorization to Proceed regarding Supervising Contractor under ¶ 18.c of the Defined Properties UAO
3	Preconstruction Conference	4.4(a)	The later of 14 days after: (1) approval of the RAWP; or (2) EPA notifies Respondents of receipt of all voluntary access agreements that it believes it will secure
4	Start of RA Construction, (which includes mobilization for RA Construction)		On such date as EPA may establish after the Preconstruction Conference (Item 3)
5	O&M Plan, if properties remain that are other than Unrestricted Use/Unrestricted Access	6.7(j)	(1) If a separate O&M Plan is submitted under this SOW than the one due under the Z2 Soil SOW, then no later than June 30, 2020 (Item 7); (2) If Respondents elect to submit only one O&M Plan pursuant to both this SOW and the Z2 Soil SOW, the earlier of the two due dates under these SOWs
6	ICIAP, if Institutional Controls are necessary	6.7(k)	(1) If a separate ICIAP is submitted under this SOW than the one due under the Z2 Soil SOW, then no later than June 30, 2020; (2) If Respondents elect to submit only one ICIAP pursuant to both this SOW and the Z2 Soil SOW, the earlier of the two due dates under these SOWs
7	Completion of RA Construction		Per approved RA Construction Schedule
8	RA Construction Completion Inspection	4.8(a)	As scheduled by Respondents when they believe the RA Construction is completed (Item 7)

9	RA Construction Report	4.8(b)	60 days after RA Construction Completion Inspection (Item 8)
10	RA Completion Meeting (may be consolidated with RA Construction Completion Inspection if Institutional Controls are not necessary)	4.10(c)(1)	As scheduled by Respondents when they believe the RA is completed
11	RA Completion Report (required only if Institutional Controls are necessary)	4.10(c)(2)	60 days after RA Completion Meeting (Item 10)
12	Work Completion Meeting (may be consolidated with RA Construction Completion Inspection and RA Completion Meeting if Institutional Controls are not necessary)	4.11(c)(1)	As scheduled by Respondent when they believe the Work is completed
13	Work Completion Report (required only if Institutional Controls are necessary)	4.11(c)(2)	60 days after the Work Completion Meeting (Item 12)
14	Periodic Review Support Plan, if required	4.9	Four years after start of RA Construction

## 8. STATE PARTICIPATION

**8.1 Copies.** Respondents shall, at any time they send a deliverable to EPA, send a copy of such deliverable to the State in care of:

Doug Petroff  
Project Manager, Federal Programs  
Indiana Dep't of Environmental Management  
100 North Senate Ave.  
IGCN – 11<sup>th</sup> Floor  
Indianapolis, IN 46204

EPA shall, at any time it sends a notice, authorization, approval, disapproval, or certification to Respondents, send a copy of such document to the State.

## 9. REFERENCES

**9.1** The following regulations and guidance documents, among others, apply to the Work. Any item for which a specific URL is not provided below is available on one of the two EPA Web pages listed in ¶ 9.2:

- (a) A Compendium of Superfund Field Operations Methods, OSWER 9355.0-14, EPA/540/P-87/001a (Aug. 1987).

- (b) CERCLA Compliance with Other Laws Manual, Part I: Interim Final, OSWER 9234.1-01, EPA/540/G-89/006 (Aug. 1988).
- (c) Guidance for Conducting Remedial Investigations and Feasibility Studies, OSWER 9355.3-01, EPA/540/G-89/004 (Oct. 1988).
- (d) CERCLA Compliance with Other Laws Manual, Part II, OSWER 9234.1-02, EPA/540/G-89/009 (Aug. 1989).
- (e) Guidance on EPA Oversight of Remedial Designs and Remedial Actions Performed by Potentially Responsible Parties, OSWER 9355.5-01, EPA/540/G-90/001 (Apr.1990).
- (f) Guidance on Expediting Remedial Design and Remedial Actions, OSWER 9355.5-02, EPA/540/G-90/006 (Aug. 1990).
- (g) Guide to Management of Investigation-Derived Wastes, OSWER 9345.3-03FS (Jan. 1992).
- (h) Permits and Permit Equivalency Processes for CERCLA On-Site Response Actions, OSWER 9355.7-03 (Feb. 1992).
- (i) Guidance for Conducting Treatability Studies under CERCLA, OSWER 9380.3-10, EPA/540/R-92/071A (Nov. 1992).
- (j) National Oil and Hazardous Substances Pollution Contingency Plan; Final Rule, 40 C.F.R. Part 300 (Oct. 1994).
- (k) Guidance for Scoping the Remedial Design, OSWER 9355.0-43, EPA/540/R-95/025 (Mar. 1995).
- (l) Remedial Design/Remedial Action Handbook, OSWER 9355.0-04B, EPA/540/R-95/059 (June 1995).
- (m) EPA Guidance for Data Quality Assessment, Practical Methods for Data Analysis, QA/G-9, EPA/600/R-96/084 (July 2000).
- (n) Operation and Maintenance in the Superfund Program, OSWER 9200.1-37FS, EPA/540/F-01/004 (May 2001).
- (o) Comprehensive Five-year Review Guidance, OSWER 9355.7-03B-P, 540-R-01-007 (June 2001).
- (p) Guidance for Quality Assurance Project Plans, QA/G-5, EPA/240/R-02/009 (Dec. 2002).

- (q) Superfund Lead-Contaminated Residential Sites Handbook, OSWER 9285.7-50 (Aug. 2003).
- (r) Institutional Controls: Third Party Beneficiary Rights in Proprietary Controls (Apr. 2004).
- (s) Quality management systems for environmental information and technology programs - Requirements with guidance for use, ASQ/ANSI E4:2014 (American Society for Quality, February 2014).
- (t) Uniform Federal Policy for Quality Assurance Project Plans, Parts 1-3, EPA/505/B-04/900A through 900C (Mar. 2005).
- (u) Superfund Community Involvement Handbook, SEMS 100000070 (January 2016) available at <http://www.epa.gov/superfund/community-involvement-tools-and-resources>.
- (v) EPA Guidance on Systematic Planning Using the Data Quality Objectives Process, QA/G-4, EPA/240/B-06/001 (Feb. 2006).
- (w) EPA Requirements for Quality Assurance Project Plans, QA/R-5, EPA/240/B-01/003 (Mar. 2001, reissued May 2006).
- (x) EPA Requirements for Quality Management Plans, QA/R-2, EPA/240/B-01/002 (Mar. 2001, reissued May 2006).
- (y) USEPA Contract Laboratory Program Statement of Work for Inorganic Analysis, ILM05.4 (Dec. 2006).
- (z) USEPA Contract Laboratory Program Statement of Work for Organic Analysis, SOM01.2 (amended Apr. 2007).
- (aa) EPA National Geospatial Data Policy, CIO Policy Transmittal 05-002 (Aug. 2008), available at <http://www.epa.gov/geospatial/geospatial-policies-and-standards> and <http://www.epa.gov/geospatial/epa-national-geospatial-data-policy>.
- (bb) Summary of Key Existing EPA CERCLA Policies for Groundwater Restoration, OSWER 9283.1-33 (June 2009).
- (cc) Principles for Greener Cleanups (Aug. 2009), available at <http://www.epa.gov/greenercleanups/epa-principles-greener-cleanups>.
- (dd) USEPA Contract Laboratory Program Statement of Work for Inorganic Superfund Methods (Multi-Media, Multi-Concentration), ISM01.2 (Jan. 2010).
- (ee) Close Out Procedures for National Priorities List Sites, OSWER 9320.2-22 (May 2011).

- (ff) Groundwater Road Map: Recommended Process for Restoring Contaminated Groundwater at Superfund Sites, OSWER 9283.1-34 (July 2011).
- (gg) Recommended Evaluation of Institutional Controls: Supplement to the “Comprehensive Five-Year Review Guidance,” OSWER 9355.7-18 (Sep. 2011).
- (hh) Construction Specifications Institute's MasterFormat 2012, available from the Construction Specifications Institute, <http://www.csinet.org/masterformat>.
- (ii) Updated Superfund Response and Settlement Approach for Sites Using the Superfund Alternative Approach , OSWER 9200.2-125 (Sep. 2012)
- (jj) Institutional Controls: A Guide to Planning, Implementing, Maintaining, and Enforcing Institutional Controls at Contaminated Sites, OSWER 9355.0-89, EPA/540/R-09/001 (Dec. 2012).
- (kk) Institutional Controls: A Guide to Preparing Institutional Controls Implementation and Assurance Plans at Contaminated Sites, OSWER 9200.0-77, EPA/540/R-09/02 (Dec. 2012).
- (ll) EPA’s Emergency Responder Health and Safety Manual, OSWER 9285.3-12 (July 2005 and updates), <http://www.epaosc.org/HealthSafetyManual/manual-index.htm>
- (mm) Broader Application of Remedial Design and Remedial Action Pilot Project Lessons Learned, OSWER 9200.2-129 (Feb. 2013).
- (nn) Guidance for Evaluating Completion of Groundwater Restoration Remedial Actions, OSWER 9355.0-129 (Nov. 2013).
- (oo) Groundwater Remedy Completion Strategy: Moving Forward with the End in Mind, OSWER 9200.2-144 (May 2014).
- (pp) Guidance for Management of Superfund Remedies in Post Construction, OLEM 9200.3-105 (Feb. 2017), available at <https://www.epa.gov/superfund/superfund-post-construction-completion>.

**9.2** A more complete list may be found on the following EPA Web pages:

Laws, Policy, and Guidance: <http://www.epa.gov/superfund/superfund-policy-guidance-and-laws>

Test Methods Collections: <http://www.epa.gov/measurements/collection-methods>

**9.3** For any regulation or guidance referenced in the Defined Properties UAO or Defined Properties SOW, the reference will be read to include any subsequent modification, amendment, or replacement of such regulation or guidance. Such modifications,

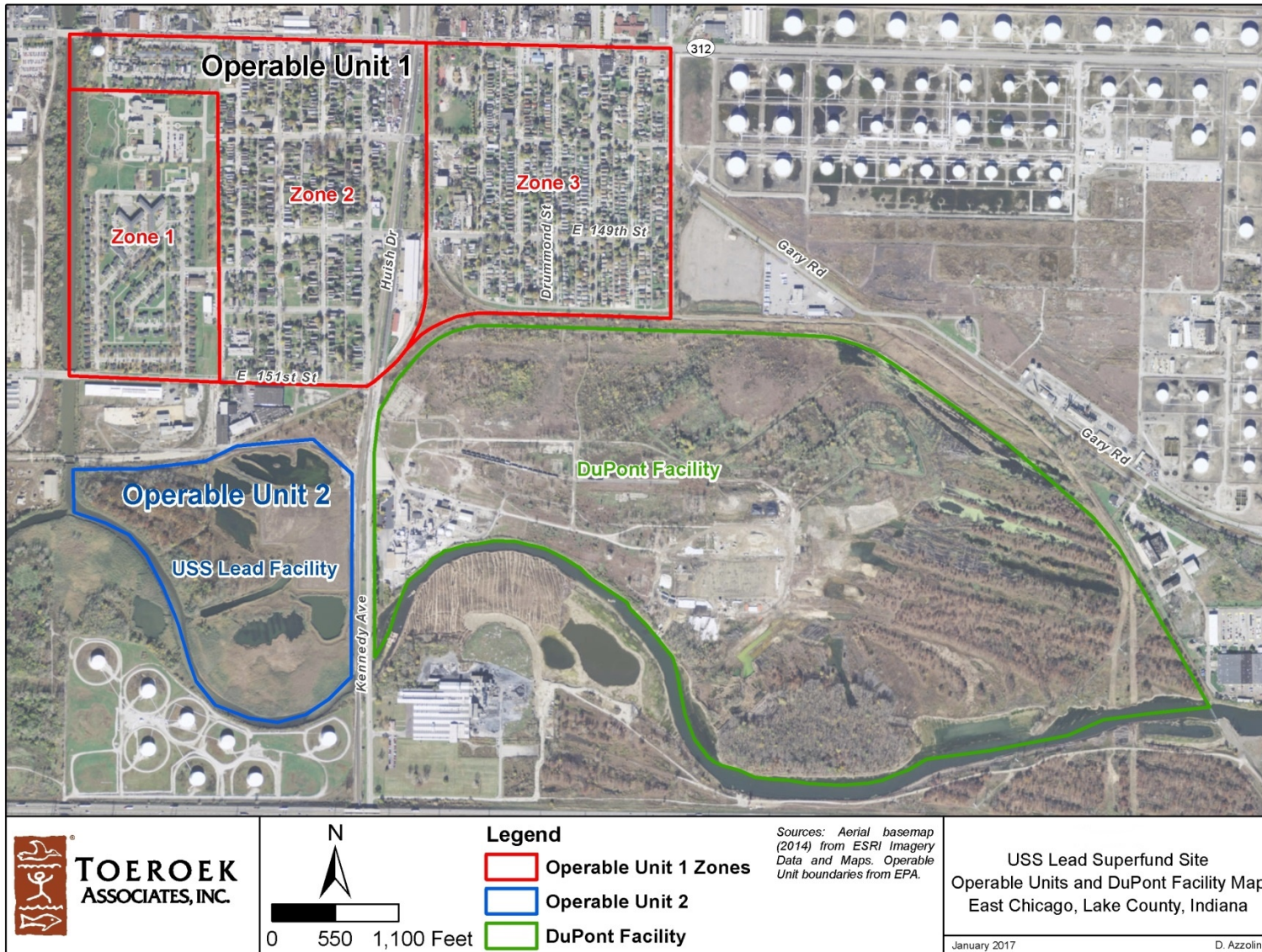


amendments, or replacements apply to the Work only after Respondents receive notification from EPA of the modification, amendment, or replacement.

# **APPENDIX B**

**TO  
DEFINED PROPERTIES UAO**

**MAP OF USS LEAD SITE OU1 AND  
OU2**



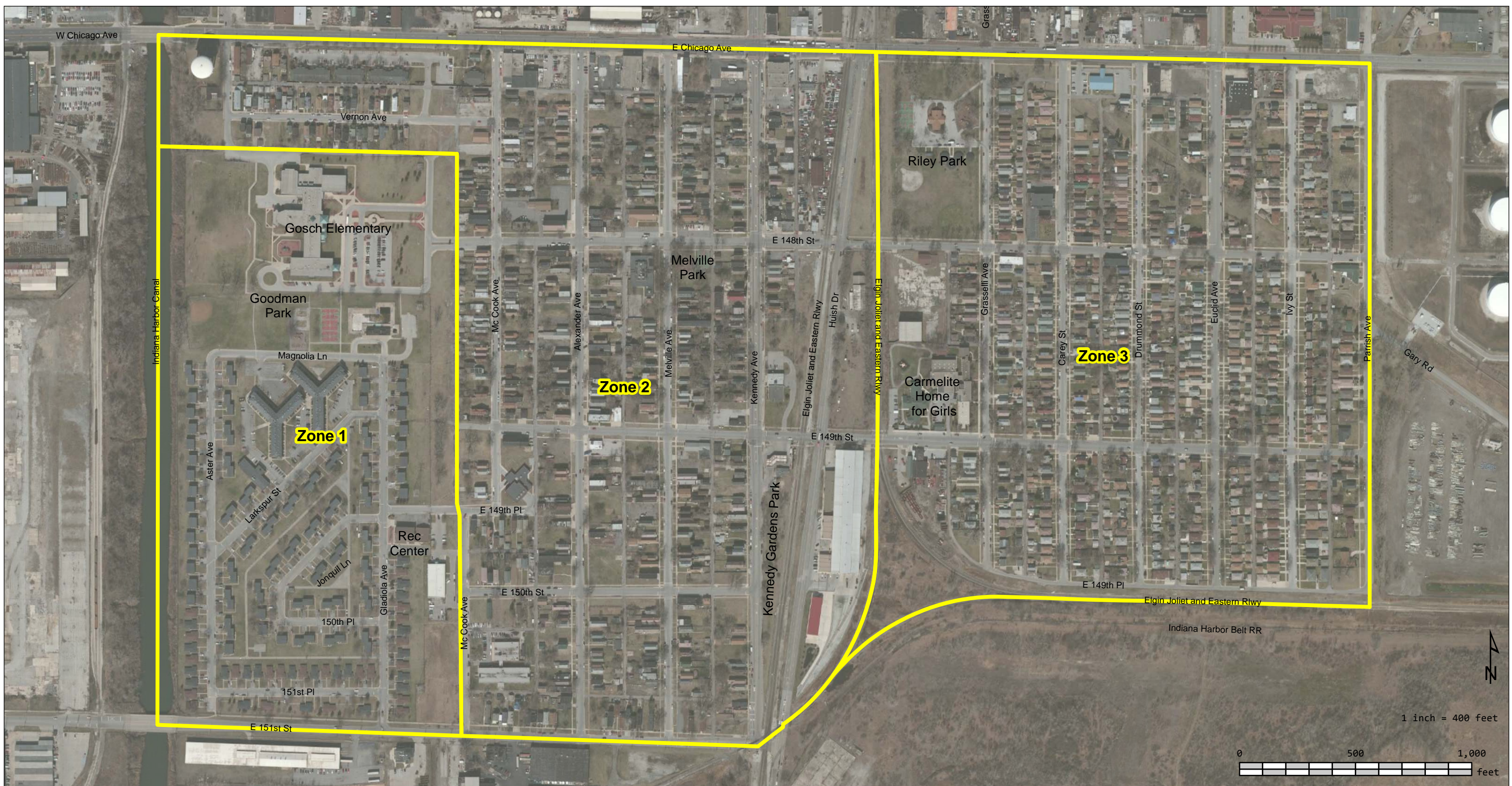
**APPENDIX B: USS Lead Superfund Site Operable Units 1 and 2**

# **APPENDIX C**

**TO  
DEFINED PROPERTIES UAO**

**MAP OF USS LEAD SITE  
OU1 – ZONES 1, 2, AND 3**





 Zone

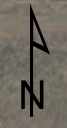
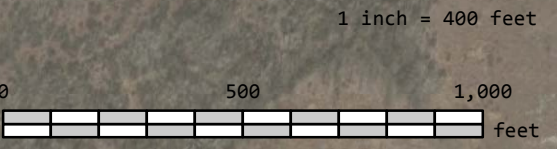
Basemap source: Esri



US SMELTER & LEAD REFINERY  
LAKE COUNTY, EAST CHICAGO, INDIANA

### APPENDIX C OU1 ZONES

EPA REGION 5 RAC 2 | REVISION 0 | JULY 2014





# **APPENDIX D**

**TO  
DEFINED PROPERTIES UAO**

# **RECORD OF DECISION**

US EPA RECORDS CENTER REGION 5



446987

# **U.S. Smelter and Lead Refinery, Inc. Superfund Site**

## **Operable Unit 1**

East Chicago, Lake County, Indiana

# ***Record of Decision***



**U.S. Environmental Protection Agency Region 5**

77 W Jackson Blvd.  
Chicago, IL 60604

November 2012

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- Appendix D – Feasibility Study Cost Estimate for Alternative 4A

## **Part 1 – Declaration**

### **1.1 – Site Name and Location**

U.S. Smelter and Lead Refinery, Inc. Site  
Operable Unit 1 (residential area)  
CERCLIS ID# IND047030226  
East Chicago, Lake County, Indiana

### **1.2 – Statement of Basis and Purpose**

This decision document presents the Selected Remedy for Operable Unit 1 (OU1) at the U.S. Smelter and Lead Refinery, Inc. (USS Lead) Site in East Chicago, Lake County, Indiana. The U.S. Environmental Protection Agency (EPA) chose the Selected Remedy for OU1 in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986, and, to the extent practicable, the National Contingency Plan (NCP). The decision is based on the Administrative Record for the USS Lead Site.

The State of Indiana concurs with the Selected Remedy.

### **1.3 - Assessment of Site**

The response action selected in this Record of Decision (ROD) is necessary to protect the public health or welfare or the environment from actual or threatened releases of hazardous substances into the environment.

### **1.4 - Description of Selected Remedy**

The USS Lead Site is being addressed as two operable units under the framework set forth in CERCLA. The selected remedy specified in this ROD addresses OU1. OU1 contains residential yards<sup>1</sup> contaminated with lead and arsenic at levels that pose a threat to human health via ingestion, inhalation and direct contact. EPA's selected remedy for OU1 addresses these risks from exposure to contaminated soils through the excavation and off-site disposal of contaminated soils. The remedial action levels (RALs) at OU1 are 400 milligrams per kilogram (mg/kg) for lead at residential properties, 800 mg/kg for lead at industrial/commercial properties, and 26 mg/kg for arsenic at both residential and industrial/commercial properties. EPA's Selected Remedy for OU1 at the USS Lead Site consists of:

---

<sup>1</sup> Yards are the risk management unit in OU1. Each individual property consists of one or more yards. Sampling during the remedial investigation demonstrated that contaminant levels in one yard were not reliably correlated with contaminant levels in other yards on the same property. The Human Health Risk Assessment evaluated the risk to human health and the environment by property, not by yard.

- Excavation of soil that contains lead or arsenic in concentrations that exceed the RALs to a maximum excavation depth of 24 inches.
- Disposal of excavated soil at an off-site Subtitle D landfill; some excavated soils may require chemical stabilization prior to off-site disposal to address exceedances of the toxicity characteristic (TC) regulatory threshold. Contaminated soil that exceeds the TC threshold is considered principal threat waste.
- If contaminated soil is identified at a depth greater than 24 inches below ground surface (bgs), a visual barrier, such as orange construction fencing or landscape fabric, will be placed above the contaminated soil before the yard is backfilled with clean soil. Institutional controls will be implemented to protect the visual barrier that separates clean backfill from impacted soils and to ensure that users of the property are not exposed to contaminated soil that remains at depth.
- Excavated soil will be replaced with clean soil to maintain the original grade. The top 6 inches of fill will consist of topsoil. Each yard will be restored as close as practicable to its pre-remedial condition.

This Selected Remedy is the first of two remedial decisions for the USS Lead Site. EPA has not yet begun the remedial investigation (RI) of Operable Unit 2 (OU2). OU2 consists of the former USS Lead property. In the future, EPA will develop a remedial investigation, feasibility study (FS), Proposed Plan, and ROD for OU2.

### **1.5 - Statutory Determinations**

The Selected Remedy is protective of human health and the environment, complies with federal and state requirements that are applicable or relevant and appropriate to the remedial action, is cost-effective, and utilizes permanent solutions and alternative treatment (or resource recovery) technologies to the maximum extent practicable.

This remedy satisfies the statutory preference for treatment as a principal element of the remedy (i.e., reduces the toxicity, mobility, or volume of hazardous substances, pollutants, or contaminants as a principal element through treatment). Soils at OU1 that have lead concentrations exceeding the TC threshold and that are therefore defined under the Resource Conservation and Recovery Act (RCRA) as hazardous waste will be treated prior to disposal. This treatment will reduce the mobility of the lead. The remaining volume of relatively low-level soil contamination that is being addressed in this remedy does not lend itself to any cost-effective treatment.

Because this remedy will likely result in hazardous substances, pollutants, or contaminants remaining on-site above levels that allow for unlimited use and unrestricted exposure, a statutory review will be conducted within five years after initiation of the remedial action to ensure that the remedy is, or will be, protective of human health and the environment.

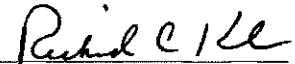
## 1.6 – Data Certification Checklist

The following information is included in the *Decision Summary* section of this ROD. Additional information can be found in the Administrative Record for this site.

Information Item	Location in ROD
Contaminants of concern and their respective concentrations	Section 2.7.2
Baseline risk represented by the contaminants of concern	Section 2.7
Cleanup levels established for contaminants of concern and the basis for these levels	Section 2.8
How source materials that constitute principal threats will be addressed	Sections 2.11 and 2.13
Current and reasonably anticipated future land use assumptions in the baseline risk assessment and the ROD	Section 2.7.1
Estimated capital, annual operation and maintenance, and total present worth costs, discount rate, and the number of years over which the remedy cost estimates are projected	Section 2.9 and Appendix D
Key factor(s) that led to the selection of the remedy	Sections 2.10 and 2.12

## 1.7 - Authorizing Signatures

EPA, as the lead agency for the U.S. Smelter and Lead Refinery, Inc. Superfund Site (IND047030226), formally authorizes this Record of Decision.

  
Richard C. Karl, Director  
Superfund Division  
EPA Region 5

11-30-12  
Date

The State of Indiana Department of Environmental Management (IDEM), as the support agency for the USS Lead Superfund Site, formally concurs with this ROD. IDEM has prepared a separate concurrence letter which is included as Appendix A.

## **Part 2 – Decision Summary**

### **2.1 - Site Name, Location, and Brief Description**

The USS Lead Site is located in the City of East Chicago, Indiana (see Figure 1). East Chicago is located on the shore of Lake Michigan and lies approximately 18 miles southeast of Chicago, Illinois. It has a total area of approximately 16 square miles (mi<sup>2</sup>) of which approximately 14 mi<sup>2</sup> are land and 2 mi<sup>2</sup> are water. The USS Lead Site comprises two separate areas each of which is called an operable unit (OU). OU1 is a predominantly residential area located in the southern portion of the City of East Chicago, north of the former USS Lead industrial facility (see Figure 1). The USS Lead facility is referred to as OU2. This ROD sets forth the remedy for OU1. OU1 is a residential soil cleanup site. Lead is the primary contaminant of concern (COC). Accordingly, EPA has followed its 2003 *Superfund Lead-Contaminated Residential Sites Handbook* in the development of the RI, FS, and ROD for OU1.

The residential area that comprises OU1 has been contaminated by aerial deposition of windblown contaminants from the USS Lead facility and other local industrial facilities and by direct deposition of contaminated fill materials. The other industrial sources of contamination in OU1 include operations conducted by the Anaconda Copper Refining Company on property within OU1 and from property located just south of OUI owned and operated by E.I. duPont deNemours and Company (DuPont) (see Figure 2).

EPA is the lead agency for the USS Lead Site. IDEM serves as the support agency. EPA conducted the RI/FS for OUI using federal funding. EPA intends to pursue responsible parties to fund or undertake the remedial design and remedial action for OUI.

### **2.2 - Site History and Enforcement Activities**

The USS Lead facility is located at 5300 Kennedy Avenue, East Chicago, Indiana. The facility (OU2) was constructed in the early 1900s by the Delamar Copper Refinery Company to produce copper. In 1920, the property was purchased by U.S. Smelting Refinery and Mining and later by USS Lead. USS Lead operated a primary lead smelter at the facility. An electrolytic process called the "Betts process" was used for refining lead ores into high-purity lead. During production, the Betts process can release fugitive metals like lead.

United States Geological Survey aerial photographs from 1939, 1951, 1959, and 2005 show OU2 and OU1 over time (Figure 3). These photographs indicate the progression of residential development within OU1. For the area located west of Huish Avenue, the photographs show that the majority of the residences were built before 1939. For the area located east of Huish Avenue, approximately half of the homes were built before 1939, approximately 75 to 80 percent of the homes were built between 1939 and 1951, and by 1959 most of the homes were built. These photographs also show that the Anaconda Copper Company was located on the area now occupied by the Gosch Elementary School and a public housing residential complex (the southwest portion of OU1). The Gosch Elementary School and the East Chicago public housing complex were built on the former Anaconda Copper Company site after 1959.

Between 1972 and 1973, the USS Lead facility was converted into a secondary lead smelter which, instead of refining lead ore, recovered lead from scrap metal and automotive batteries. All operations at OU2 were discontinued in 1985. Two primary waste materials were generated as a result of the smelting operations: (1) blast-furnace slag and (2) lead-containing dust from the blast-furnace stack. Blast-furnace slag was stockpiled south of the plant building and once per year spread over an adjoining 21-acre wetland. The blast-furnace baghouse collected approximately 300 tons of baghouse flue dust per month during maximum operating conditions. Some of the flue dust escaped the baghouse capture system and was deposited by the wind within the boundaries of OU1. By the late 1970s, USS Lead stored onsite approximately 8,000 tons of baghouse dust.

The East Chicago area in the vicinity of OU1 has historically supported a variety of industries. In addition to the USS Lead smelting operation, other industrial operations have managed lead and other metals and are sources of contamination in OU1. Immediately east of OU2, across Kennedy Avenue, is the former DuPont site (currently leased and operated by W.R. Grace & Co., Grace Davison). At this location, DuPont manufactured the pesticide lead arsenate. Anaconda Lead Products and International Lead Refining Company, two smelter operations that managed lead and other metals, operated within OU1 at the location currently occupied by an East Chicago public housing facility. Anaconda Lead Products was a manufacturer of white lead and zinc oxide, and the International Lead Refining Company was a metal-refining facility. These facilities included the following: a pulverizing mill, white-lead storage areas, a chemical laboratory, a machine shop, a zinc-oxide experimental unit building and plant, a silver refinery, a lead refinery, a baghouse, and other miscellaneous buildings and processing areas.

Starting in 1993, USS Lead began a cleanup at its facility (OU2) pursuant to an agreement with EPA under the Resource Conservation and Recovery Act. USS Lead addressed the majority of the contamination in OU2 by excavating contaminated soils and consolidating those soils within a corrective action management unit located within OU2. As part of the OU2 RCRA activities, investigations were conducted in the residential area now known as OU1 to investigate the source and identify the extent of lead-contaminated soils. Modeling of air deposition of lead in the residential area was also performed.

Responsibility for the further investigation of conditions at OU1 and OU2 was subsequently transferred from EPA's RCRA program to its Superfund program. During this transition, EPA's Superfund program conducted some limited sampling of the residential area in 2007. The Superfund program subsequently listed the USS Lead Site on the National Priorities List (NPL) in April 2009. As part of the NPL listing process, EPA and IDEM evaluated contaminant concentrations focusing on the southwestern portion of the residential area. This evaluation was later expanded during the RI to cover the entirety of OU1. EPA sampled 7% of the properties during its full-scale remedial investigation. During these investigations, EPA identified properties with lead concentrations in surface soils greater than 1,200 mg/kg. Lead in surface soils in concentrations greater than 1,200 mg/kg poses an imminent and substantial threat to human health. EPA's emergency response program addressed these most highly-contaminated parcels. EPA removed the contaminated soils to a maximum depth of two feet and backfilled the

excavated areas with clean soils. A total of 29 properties were remediated by the Superfund emergency response program in 2008 and 2011.

Although some residential properties have been cleaned up, contamination remains at many properties within OU1. This ROD sets forth EPA's approach for addressing the contaminated soils throughout OU1 that still require cleanup.

### **2.3 – Community Participation**

The RI/FS Reports and the Proposed Plan for the USS Lead Site were made available to the public in early July 2012. These documents can be found in the Administrative Record for the site. The Administrative Record is maintained at the EPA Docket Room in Chicago, Illinois, and the East Chicago Public Libraries on Chicago Avenue and Columbus Avenue. After issuing the Proposed Plan, EPA held a public comment period between July 12 and September 12, 2012. In addition, EPA held a public meeting on July 25, 2012, to present the Proposed Plan to a community audience. When the Proposed Plan was issued, EPA mailed a fact sheet to area residents informing them about the Proposed Plan. The fact sheet advised residents that the RI, FS, and Proposed Plan were available for viewing at the public repositories. The fact sheet included the date, time and location of the public meeting. At the public meeting, EPA and IDEM representatives answered questions about the site and the remedial alternatives. EPA's responses to the comments received during the public comment period are included in the *Responsiveness Summary*, which is Part 3 of this ROD.

### **2.4 - Scope and Role of Operable Unit or Response Action**

The USS Lead Superfund Site includes the former USS Lead facility with its surrounding property (OU2) and the residential area north of it (OU1). EPA estimates that approximately 57 percent of the yards (i.e., approximately 723 of the 1,271 properties) in OU1 contain concentrations of lead and/or arsenic that pose a risk to human health. EPA has concluded that USS Lead, DuPont, Anaconda Lead and International Refining were sources of contamination to OU1 through historic aerial deposition and/or direct releases to the ground. These facilities are not ongoing sources of contamination to the residential area.

EPA has organized the USS Lead Superfund Site into two OUs:

- Operable Unit 1 – The residential area north of the former USS Lead facility. OU1 is bounded by Chicago Avenue to the north, Parrish to the east, the Calumet Canal to the west, and 150<sup>th</sup>/151<sup>st</sup> Streets to the south. This ROD addresses yards in OU1 that contain lead and/or arsenic concentrations in soil that pose a threat to human health.
- Operable Unit 2 – The former USS Lead facility, its surrounding property, and site-wide groundwater. OU2 will be addressed in a future RI/FS and decision document.

The Selected Remedy for OU1 will address the principal threats by treating contaminated soil that exceeds the toxicity characteristic regulatory threshold for lead before disposing of the soil at an off-site landfill. During the RI, EPA did not test for arsenic exceedances of the TC

threshold because very few soil samples had high enough concentrations of arsenic to warrant toxicity characteristic leaching procedure (TCLP) analysis. Although the highest arsenic soil concentration detected at OU1 during the RI was 567 mg/kg, the arsenic concentration in soil was often below 100 mg/kg, the lowest concentration of arsenic in soil that would possibly fail the TCLP test and therefore be considered a hazardous waste. Based on TCLP analysis for lead conducted during the RI, EPA estimates that OU1 soils will exceed the TC threshold for lead when concentrations exceed 2,400 mg/kg. EPA does not expect the highest arsenic concentrations found at OU1 to exceed the TC threshold. Additionally, the highest concentrations of arsenic were found to be co-located with high lead concentrations. Because of this, soils with the highest arsenic concentrations are likely to be subject to treatment because they are frequently co-located with the lead concentrations that require treatment.

## **2.5 – Site Characteristics**

### **2.5.1 - Conceptual Site Model**

The conceptual site model (CSM) for the USS Lead Superfund Site (Figure 4) considers four potentially affected media at the site: air, soil, surface water, and groundwater. The CSM shows that the USS Lead Site comprises within an urban setting historically industrial areas, the residential area (OU1), and a canal. The former smelter plants are the primary source of contamination. During plant operations, the smelters generated airborne emissions from plant stacks. Leaks and spills were also likely. Fill material used to raise the ground level in OU1 is a second potential source of contaminants. Approximately two feet of fill overlie native sands throughout OU1. Metals and polycyclic aromatic hydrocarbons (PAHs) are the main constituents of interest (COIs) associated with these sources. The water table in the vicinity of the site lies approximately 8.5 feet bgs. The groundwater flows south/southwest towards the Grand Calumet River.

Contaminants were deposited at OU1 through airborne emissions from the industrial plants and direct deposition of contaminated fill material. Other possible sources of contaminants at OU1 are fertilizers and pesticides. These chemicals may have been applied to individual properties. Fertilizer can contain measurable levels of heavy metals such as lead, arsenic, and cadmium. The DuPont facility manufactured the pesticide lead arsenate using two ingredients: lead and arsenic. Both are contaminants of concern at the USS Lead Site.

Potential migration routes for COIs were assessed according to the properties of the contaminants and fate-and-transport processes. Potential migration pathways for COIs to be released, deposited, or redistributed in surface soils include:

- particulate erosion and redeposition by wind
- runoff, particulate erosion, and redeposition by surface water
- surface water percolation
- surface soil filling and excavation activities

Contaminants may migrate into the air by two distinct emission mechanisms: entrainment of contaminated particles by the wind and volatilization of chemical compounds. The most likely



transport mechanism for the COIs at OU1 is by windborne transport of contaminated dust and soil erosion. The COIs have a strong tendency to adsorb to soil particles. Wind and the concomitant release of wind-borne dust is the primary pathway for site COIs to be released to the atmosphere.

Surface-water runoff is another migration pathway that was considered. Surface-water runoff can erode surface soils and transport particles by overland flow and result in contaminated soil being picked up and redeposited at lower elevations. Because OU1 is flat and is served by a municipal sewer system, redeposition in low-lying areas is not expected to be of major significance at the site.

Excavation and filling activities are also likely migration pathways. EPA has observed these activities at the site. Excavation potentially exposes the subsurface to fugitive dust erosion and deposition. Filling activities result in topsoil that is not as compact as native soils and which may result in faster percolation and/or erosion rates. There is also a possibility that amended fill materials may be contaminated, particularly if obtained from a nearby, contaminated source.

Human and ecological receptors can be exposed to the COIs through direct dermal exposure to soil, inhalation of windborne soils, ingestion of soils, or ingestion of produce grown in affected soils. Based upon the distribution of PAHs, EPA has concluded that their presence in OU1 is not attributable to neighboring industrial activities. Rather, it is consistent with an urban residential setting. Therefore, the Selected Remedy does not address PAHs but does address lead and arsenic in surface and subsurface soils.

### **2.5.2 - Overview of site**

OU1 encompasses approximately 322 acres and is bounded by East Chicago Avenue on the north, East 151st Street on the south, the Indiana Harbor Canal on the west, and Parrish Avenue on the east (see Figure 2). OU1 is a mixed residential and commercial/industrial area north of the former USS Lead industrial facility. The mixed-use area includes the following uses: (1) residences including single and multi-family units some of which, in the southwest corner of the area, are public housing, (2) generally small commercial/industrial operations, (3) municipal and community offices and operations, (4) two schools (the Carrie Gosch Elementary School and the Carmelite School for Girls), (5) four parks, and (6) numerous places of worship. Residences, schools, and public parks constitute the large majority of properties and acreage within OU1.

The average annual precipitation in East Chicago between 1961 and 1990 was 36.82 inches. A five-year wind-rose plot for the years 1987 to 1991 at a site in nearby Hammond, Indiana, indicates that prevailing winds are from the southwest and north at less than 20 miles per hour.

### **2.5.3 - Geologic and Hydrogeologic Setting**

During site investigations, five main soil varieties were identified within OU1, including the following: organic topsoil, fill, fill with construction debris, fill with slag, and native sand. All but the native sand were found from the surface down to depths of as much as 24 inches bgs. Native sand was typically located 18 to 24 inches bgs. Nearby soil borings indicate that the

Equality Formation underlies the top few feet of soils at OU1. The Equality Formation, also known as the Calumet Aquifer, is primarily a sand unit with some silts, clays, and gravel lenses. The Equality Formation is estimated to extend to approximately 25 feet bgs.

EPA did not evaluate groundwater as part of the remedial investigation for OU1. Site-wide groundwater will be investigated as part of the OU2 RI. Residents and businesses in East Chicago are served by a municipal water system.

#### **2.5.4 - Sampling Strategy**

EPA's sampling approach at OU1 followed the methodology described in its 2003 *Superfund Lead-Contaminated Residential Sites Handbook*. As part of the RI, EPA collected surface and subsurface soil samples between December 2009 and September 2010. EPA sampled a total of 88 properties, including 74 residential properties and 14 non-residential properties (i.e., schools, parks, and commercial properties). In total, EPA sampled 232 distinct yards (including drip zone samples and quadrants from larger properties such as parks and schools) in order to characterize the nature and extent of COIs in and around OU1. Drip zone samples are soil samples collected from beneath the gutters and downspouts of buildings. The purpose of drip zone sampling is to investigate whether airborne contamination is concentrating or has concentrated along the drip lines of roofs. These 232 separate "yards" included 75 front yards, 76 back yards, 21 quadrants, and 60 drip zones. EPA elected to consider drip zones as separate "yards" because they covered a geographic area that was not confined to a front yard, back yard, or quadrant. EPA used the term "yard" throughout the RI and the FS to represent one unit of remedial area. A single remedial area generally consists of a front yard, back yard, or drip zone of a residential property, or any quadrant of a park, commercial property, easement, or school. A residential property can have up to three yards (front, back, drip zone) and a park, commercial property, easement, or school can be divided into a maximum of four yards (otherwise referred to as quadrants in the RI).

Soils from four different horizons (0-6", 6-12", 12-18", and 18-24" bgs) were analyzed from front yards, back yards, and quadrants of larger properties. The purpose of sampling soils from different soil horizons was to evaluate vertical contamination profiles. Aerial deposition of contaminants would be expected to yield contamination profiles with higher concentrations near the surface and lower concentrations at depth.

#### **2.5.5 - Sources of Contamination**

As previously discussed, the primary sources of site-related contamination are the industrial facilities that formerly operated in and around OU1, including DuPont, Anaconda Lead, Industrial Refining and the USS Lead facility. None of these facilities are still in operation, and none of them are ongoing sources of contamination to OU1. The placement of fill material and the individual application of materials such as pesticides are other potential sources of contamination in OU1 that may be ongoing.

## 2.5.6 - Types of Contaminants and Affected Media

Metals are the primary contaminants and soil is the affected media in OU1. All soil samples were analyzed for lead. In addition, a subset of samples was analyzed for various combinations of total metals, volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), PAHs, polychlorinated biphenyls (PCBs), and pesticides to provide a basis for more fully assessing contamination in shallow soils in OU1. Although SVOCs (including PAHs), pesticides, and PCBs were sampled for and discussed in the RI and evaluated in the risk assessment, there is no reasonable basis from which to conclude that there were consistent releases of these compounds into OU1 from the local industrial facilities. Rather, EPA has concluded that the detection of these compounds is associated with other anthropogenic sources typical of a metropolitan industrial area. EPA's RI Report for OUI includes all available sampling results and a full discussion of those results.

The sampling results were evaluated in the human health risk assessment. The risk assessment determined the contaminants of potential concern (COPCs) and identified which chemicals and affected media drive potential risk at the site. These findings are summarized in Section 2.7.2 of this ROD and discussed in greater detail in the RI Report. The human health risk assessment was completed using site-specific data. EPA has determined that the contaminants of concern (COCs) are lead and arsenic in residential soils.

## 2.5.7 - Extent of Contamination

Lead is the primary COC at OU1. EPA used the *Superfund Lead-Contaminated Residential Sites Handbook*, EPA remedial screening levels (RSLs), and the State of Indiana's Risk Integrated System of Closure Technical Resource Guidance Document to set the site screening levels (SSLs) for lead at 400 mg/kg for residential areas and 800 mg/kg for industrial areas. Although lead was found to be the most widespread contaminant at OU1, arsenic was also present at locations within the residential area. As detailed in the RI Report, the SSLs for arsenic in surface and subsurface soils are 14.1 mg/kg and 13.2 mg/kg, respectively, at both residential and commercial/industrial properties.

Data analysis indicated that lead and arsenic were generally correlated; arsenic was present in areas with high lead concentrations. Based on the data, OU1 soils typically do not exceed the arsenic SSL unless lead also exceeds the lead SSL. Additionally, lead and PAHs were not correlated; EPA did not discern a correlation between high lead concentrations and high concentrations of PAHs. The lack of correlation between PAHs and lead supports the hypothesis that PAHs are not site-related compounds and are likely associated with other anthropogenic sources.

During the RI sampling events in OU1, EPA analyzed samples from all 232 yards for lead. The surface and/or subsurface soil in 123 yards (53 percent of those tested) exceeded the lead SSL. The potential lateral extent of lead-impacted soil includes all areas within the OU1 boundaries. The area west of Huish Avenue contained a higher frequency of exceedances for lead in both surface and subsurface soil samples than the eastern half of OU1. Lead concentrations in all of

the nine properties (20 yards) sampled in the East Chicago Housing Authority complex in the southwest portion of the study area exceeded the SSL for lead.

During the RI sampling events, a total of 136 yards in OU1 were analyzed for arsenic. The surface and/or subsurface soil in 75 yards (55 percent of those tested) exceeded the arsenic SSL. EPA performed an analysis of arsenic concentrations in soils to further understand site conditions and to assess the evidence for aerial deposition of arsenic at OU1. Because arsenic concentrations in the public housing area soils likely resulted from direct deposition of contaminants from the former industrial facility and because operations at the industrial facility and construction of the housing area likely redistributed soils, the vertical profile of arsenic in the public housing area was excluded from the analysis. When the public housing area was excluded from the arsenic data set, it became evident that the arsenic in the remainder of OU1 was primarily dispersed due to aerial deposition because the shallow soil horizons contain higher arsenic concentrations than the deeper soil horizons.

An analysis of front and back yards suggests that there is an approximately 75% chance that if the COIs in one yard are in excess of the SSLs, then the COIs in the other yard at the same property will exceed the SSLs. In addition, based on the observed vertical distributions of lead, arsenic, and PAHs, there is only a 13% chance that sampling only the upper two depth intervals (0-6" and 6-12" bgs) would miss contamination in the lower two depth intervals (12-18" and 18-24" bgs). A comparison of soil type to COI concentration concluded that soil type is not a reliable indicator of the presence or absence of COIs. There is one exception to this rule: the native sands are generally free of contamination.

EPA concluded that the concentration levels of VOCs, SVOCs (including PAHs), PCBs, and pesticides do not require further evaluation. EPA found the highest lead and arsenic concentrations in OU1 in the East Chicago Housing Authority complex. The high concentrations in this area appear to be related to the historical operations at the Anaconda Copper Company facility.

## **2.6 – Current and Potential Future Site and Resource Uses**

The current land use at OU1 is largely residential and recreational (parks and school yards), with a small number of commercial and light industrial properties. The adjacent OU2 includes the RCRA landfill and wetland areas. EPA expects that the land use at OU1 will remain unchanged. The City of East Chicago has shared with EPA its development plans for OU1 and the surrounding area, which confirm that the land use within OU1 is not likely to dramatically change.

Lake Michigan is the municipal water source for East Chicago, and properties within OU1 do not access site-wide groundwater for any use. The surface water in the vicinity of OU1 is the Indiana Harbor Canal (OU1's western boundary) and the Grand Calumet River (south of OU2). The portion of the Indiana Harbor Canal near OU1 is not subject to much industrial use in contrast with much higher industrial activity in the northern part of the canal. The Grand Calumet River in this area is not navigable. Neither water body appears to be used recreationally.

In July 2009, East Chicago had a population of 29,900, of which 51.6% was Hispanic, 40.3% was African-American, and 7.2% was White, non-Hispanic. The density of East Chicago was approximately 2,496 people per square mile, and the average household size was 2.8 people (City-Data 2011). Based on the average household size and the number of homes in OU1, the approximate density within OU1 is 7,000 people per square mile. Based on an inspection of historical aerial photographs, the primary land use in East Chicago is industrial. Residential land use accounts for approximately 20% of the land within the city. OU1 is one of the most densely populated areas in East Chicago.

The East Chicago median household income is \$28,289, versus the Indiana median household income of \$45,424. The March 2011 unemployment rate for East Chicago was 12.7%, compared to Indiana's March 2011 unemployment rate of 8.8%. EPA considers East Chicago an environmental justice community. An environmental justice community is one characterized by low income and burdened with significant environmental challenges.

## **2.7 - Summary of Site Risks**

A human health risk assessment (HHRA) estimates what risks a site poses to human health if no action is taken. It provides the basis for taking action and identifies the contaminants and exposure pathways that need to be addressed by the remedial action. This section of the ROD summarizes the results of the HHRA for the USS Lead site. More detailed information can be found in the RI Report. The HHRA relied on Tier I screening-level evaluations to identify media and exposure pathways that may pose unacceptable risks. More detailed (Tier II) risk assessments were considered if the Tier I screening level evaluations identified potentially significant risks. The HHRA evaluated the potential risks that could result to people from exposure to the contaminants at the site. EPA conducted the HHRA consistent with EPA's Risk Assessment Guidance for Superfund (RAGS) and other supplemental guidance to evaluate human health risks. The HHRA identified possible receptors and potentially complete pathways of exposure. The information used in the HHRA helped define site-specific, risk-based screening levels. The HHRA determined that the COCs for the site are lead and arsenic for residential soils and that cleanup levels of 400 mg/kg for lead and 26 mg/kg for arsenic are protective of human health and the environment for current and future residential use.

The information presented here focuses on the information that is driving the need for a response action at the site and does not necessarily summarize the entire HHRA. Further information is contained in the risk assessment within the RI Report and is included in the Administrative Record.

EPA did not identify any ecological habitats in OU1 so did not conduct an ecological risk assessment.

### **2.7.1 - Summary of Human Health Risk Assessment**

The HHRA for the USS Lead site evaluated risks by individual property rather than by individual yard. Each property consists of one or more yards. The HHRA did not include lead

in its carcinogenic risk and non-carcinogenic hazard calculations because EPA's *Superfund Lead-Contaminated Residential Sites Handbook* specifies that lead cleanup levels should be calculated by using the Integrated Exposure Uptake Biokinetic (IEUBK) model. As discussed in the RI Report and explained in more detail in Section 2.7.7 of this ROD, EPA evaluated the available site-specific information (such as lead in drinking water and blood lead levels in children) in relation to the default exposure assumptions in the IEUBK model and concluded that there was no need to modify the default exposure assumptions.

The objectives of the risk evaluation using the HHRA (which includes the results of the IEUBK model) were the following: (1) to investigate whether site-related constituents detected in environmental media pose unacceptable risks to current and future human receptors, and (2) to provide information to support decisions concerning the need for further evaluation or action, based upon current and reasonably anticipated future land use. For the purposes of the risk assessment, future land uses were assumed to be the same as current land uses. Current land uses are primarily residential, commercial/industrial, and recreational. Human receptors at OUI include the following: child and adult residents; adult utility and construction workers; students; teachers (indoor and outdoor); adult and child recreationalists; and park workers (indoor and outdoor). All the receptors were assumed to be exposed to surface (current and future land use conditions) and subsurface soil (future land use conditions) through incidental ingestion, dermal contact, and inhalation of particulates in ambient air. Subsurface soils were included under the future land use conditions because residents and utility/construction workers may rework soils and expose deeper horizons.

In the HHRA risk characterization, the toxicity factors were integrated with concentrations of COIs and intake assumptions to estimate potential cancer risks and non-carcinogenic hazards. Risks and hazards were calculated using standard risk assessment methodologies. Risks were compared to EPA's acceptable risk range: from  $1 \times 10^{-6}$  (one cancer per one million exposed receptors) to  $1 \times 10^{-4}$  (one cancer per ten thousand exposed receptors). Risks less than  $1 \times 10^{-6}$  are considered insignificant. Risks within the above range are remediated at the discretion of EPA risk managers. Risks greater than  $1 \times 10^{-4}$  typically require remediation. Non-carcinogenic hazards are compared to a target hazard index (HI) of 1. Risks posed by lead in soil were evaluated by comparing lead exposure point concentrations (EPCs) in soil at each property to receptor-specific lead preliminary remediation goals (PRGs). Chemicals that have a risk identified through the risk assessment process become COCs.

Risks associated with lead are present throughout the study area. The HHRA found that risks and hazards associated with other compounds exist under both current and future land use conditions for between 30 and 40 percent of residential properties. At these properties, risks above EPA's acceptable risk range ( $1 \times 10^{-4}$  to  $1 \times 10^{-6}$ ) and hazard index (greater than 1) from compounds other than lead are driven primarily by exposure to arsenic and PAHs through ingestion of homegrown produce and incidental ingestion of soil. As discussed in the RI Report, the PAHs detected in soil at OUI are typical of urban soils in the Chicago metropolitan statistical area and are not related to any specific onsite or nearby offsite sources. Therefore, PAHs are not considered site-related COCs and were not addressed in the FS.

In addition, a risk management decision was made to address risk from arsenic concentrations in soil that exceed the upper tolerance limit (UTL) for background arsenic concentrations. Because of the similarity between the bulk soil concentrations for arsenic at OU1 and the background concentrations for arsenic, EPA calculated a UTL for arsenic concentrations in soil to distinguish between soil concentrations that are distributed among the naturally-occurring values at the site and those that may be impacted by activities in and around the USS Lead site. The approach of using the UTL as a value for the RAL has been used at other CERCLA sites, including the Jacobsville Neighborhood Soil Contamination site in Evansville, Indiana. This approach is discussed in greater detail in that site's RI Report. The UTL also corresponds with the soil concentration that is equivalent to a  $1 \times 10^{-4}$  cancer risk level assuming that 25% of the total produce consumed by residents in OU1 is comprised of homegrown produce.

### 2.7.2 - Identification of Contaminants of Concern

The COCs at OU1 are lead and arsenic, with lead being the primary COC. Based on lead concentrations observed during the RI, lead-contaminated soils at the USS Lead site require remedial action to address unacceptable risks. Data analysis indicates that lead and arsenic are generally co-located. The range of detected concentrations and frequency of detections for lead and arsenic in soil at OU1 are presented in Table 1.

Exposure Point	COC	Concentration Detected (mg/kg)		Frequency of Detection	Exposure Point Concentration (mg/kg)		Statistical Measure
		Min	Max		Min	Max	
Residences	Arsenic	1.6	567	252/252	8.4	169	95 UCL
	Lead	4.7	27,100	848/850	233	5,910	MAX
Parks	Arsenic	0.99	414	40/40	31.8	43.4	95 UCL
	Lead	7	6,770	82/84	276	1,460	MAX
Schools	Arsenic <sup>1</sup>	2.9	11	21/21	N/A	N/A	95 UCL
	Lead	15.6	572	39/40	257	260	MAX

### 2.7.3 - Data Quality and Usability

Data were evaluated based on completeness, holding times, initial and continuing calibrations, surrogate recoveries, internal standards, compound identification, laboratory and field quality assurance/quality control (QA/QC) procedures and results, reporting limits, documentation practices, and application of validation qualifiers. Analytical data collected as part of Phase I and Phase II RI sampling were considered to be acceptable for use in the HHRA. Data were reduced based on consideration of essential nutrient and duplicate status as described below.

- Calcium, magnesium, potassium, and sodium are classified as essential nutrients and, therefore, were eliminated from further quantitative evaluation.

- Duplicate pairs were reduced to a single value based on an evaluation of the relative percent difference between the paired results.

## 2.7.4 - Exposure Point Concentrations

EPCs were developed for both modeling and non-modeling scenarios. The same chemical-specific EPCs were used for both reasonable maximum exposure (RME) and central tendency exposure (CTE) scenarios. The approaches used to calculate EPCs under the two scenarios are presented in the HHRA.

EPCs were calculated only for chemicals with at least eight detected results. Calculations were performed for metals and PAHs in surface soil (0 to 6" bgs) and for all soil depths combined. EPCs were calculated using the 95 percent upper confidence limit of the mean following the decision rules in ProUCL 4.00.05, a statistical analysis software tool. Because EPA uses the IEUBK/Adult Lead Model in its evaluation of lead, the risk assessment used the average concentration under both RME and CTE conditions as the EPC for lead.

EPA used the approach described above to generate EPCs for all receptors except utility and construction workers. Because utility and construction workers may conduct their work within a limited area, the maximum detected concentration was used as the EPC for those receptors under both RME and CTE conditions.

EPCs were calculated following the methods and recommendations provided in EPA's risk assessment guidance. Modeling was used to generate medium-specific EPCs for media not sampled directly. Specifically, modeling was used to estimate EPCs for blood lead, outdoor air (from soil), and homegrown produce, as summarized below.

- EPA used the IEUBK model and the Adult Lead Model (ALM) to estimate soil concentrations that correspond to acceptable blood-lead concentrations for residents and non-residents, respectively. Appendix C of the HHRA presents the methodology based on the IEUBK and ALM models used to calculate acceptable receptor-specific soil lead concentrations (referred to as PRGs). The lead PRGs were compared to the lead EPCs (average lead concentrations) to evaluate whether adverse effects could result from exposure to lead in soil.
- EPA estimated concentrations of non-volatile constituents from soil in ambient air using constituent-specific and site-specific particulate emission factors as presented in the Regional Screening Level User's Guide.
- EPA evaluated the uptake of COPCs from soil into homegrown produce for current and future residents at the site using COPC-specific uptake factors. Uptakes into aboveground and belowground produce were evaluated separately. COPC-specific uptake factors were obtained from or calculated consistent with EPA's "Human Health Risk Assessment Protocol for Hazardous Waste Combustion Facilities."

Singular EPCs were not calculated for OU1 based on exposure scenarios. Instead, EPCs were calculated on a property-specific basis for the HHRA. EPCs for all COPCs from each of the 88



individual properties evaluated are presented in Appendix A (RAGs Table 7) of the HHRA. A summary of the EPCs for the COCs lead and arsenic is provided in Table 1 above.

### **2.7.5 - Exposure Assessment**

Exposure assessment is the process of measuring or estimating the intensity, frequency, and duration of human exposure to a chemical in the environment. OUI includes the following land uses: (1) numerous residences, including single and multi-family units, some of which are public housing, (2) various, generally small commercial/industrial operations, (3) various municipal and community offices and operations, (4) two schools (the Carrie Gosch Elementary School and the Carmelite School for Girls), (5) four parks, and (6) numerous places of worship. Residences, schools, and public parks constitute the large majority of properties and acreage within the USS Lead site. These properties are unlikely to soon be redeveloped and replaced by alternate property types. As a conservative approach, places of worship and commercial/municipal properties were treated as residential properties as the likely users of these properties are residents of OUI. Industrial cleanup criteria were applied to industrial properties.

The conceptual site model links contaminant concentrations in various media to potential human exposure. The CSM identified the following exposure scenarios for each of the property types:

- Residential Properties
  - Current and future residents were assumed to be exposed to surface and subsurface soil through incidental ingestion, dermal contact, inhalation of particulates in ambient air, and ingestion of homegrown produce.
  - Current and future utility and construction workers were assumed to be exposed to subsurface soil through incidental ingestion, dermal contact, and inhalation of particulates.
  
- Schools
  - Current and future students, teachers, and staff were assumed to be exposed to surface and subsurface soil through incidental ingestion, dermal contact, and inhalation of particulates in ambient air.
  - Current and future utility and construction workers were assumed to be exposed to subsurface soil.
  
- Parks
  - Current and future recreationalists and park staff were assumed to be exposed to surface and subsurface soil through incidental ingestion, dermal contact, and inhalation of particulates in ambient air.
  - Current and future utility and construction workers were assumed to be exposed to subsurface soil.

Assumptions about exposure frequency, duration, and other exposure factors are discussed in the HHRA. Sensitive sub-populations considered in the HHRA included children and adolescents. EPA used the IEUBK model to develop soil-lead PRGs for child and adolescent receptors, including child residents, adolescent school children, and child recreationalists.

## 2.7.6 - Toxicity Assessment

The toxicity assessment provides a description of the relationship between a dose of a chemical and the potential likelihood of an adverse health effect. The purpose of the toxicity assessment is to provide a quantitative estimate of the inherent toxicity of COCs for use in risk characterization. Potential health risks for COCs are evaluated for both carcinogenic and non-carcinogenic risks.

The risk assessment for the USS Lead site used the default toxicity values presented in the EPA RSL tables. The default values were obtained from the following sources:

- Integrated Risk Information System (IRIS) on-line database;
- Provisional Peer Reviewed Toxicity Values (PPRTV) derived by EPA's Superfund Health Risk Technical Support Center;
- Technical Support Center for the EPA Superfund program;
- The Agency for Toxic Substances and Disease Registry (ATSDR) minimal risk levels;
- The California Environmental Protection Agency/Office of Environmental Health Hazard Assessment's toxicity values;
- Screening toxicity values in appendices to certain PPRTV assessments; and
- The EPA Superfund program's Health Effects Assessment Summary Tables (HEAST).

Toxicity values used in the HHRA for all COPCs are presented in Tables A5.1 and A5.2 (non-cancer toxicity values) and Tables A6.1 and A6.2 (cancer toxicity values) of Appendix A of the HHRA. For the COCs lead and arsenic, the cancer toxicity data are summarized in Table 2 below and the non-cancer toxicity data are summarized in Table 3.

## 2.7.7 - Risk Characterization

For carcinogens, such as arsenic, risks are generally expressed as the incremental probability of an individual developing cancer over a lifetime as a result of exposure to the carcinogen. Excess lifetime cancer risk is calculated from the following equation:

$$\text{Risk} = \text{CDI} \times \text{SF}$$

Where:

risk = a unitless probability (e.g.,  $2 \times 10^{-5}$ ) of an individual's developing cancer

CDI = chronic daily intake averaged over 70 years (mg/kg-day)

SF = slope factor, expressed as (mg/kg-day)<sup>-1</sup>

These risks are probabilities that are expressed typically in scientific notation (e.g.,  $1 \times 10^{-6}$ ). An excess lifetime risk of  $1 \times 10^{-6}$  indicates that an individual experiencing the RME estimate has a 1 in 1,000,000 chance of developing cancer as a result of site-related exposure. This is referred to as excess lifetime cancer risk because it would be in addition to the risks of cancer individuals face from other causes such as smoking or exposure to too much sun. The chance of an

**Table 2  
Cancer Toxicity Data Summary**

Pathway: Ingestion, Dermal							
COC	Oral Cancer Slope Factor		Dermal Cancer Slope factor	Slope Factor Units	Weight of Evidence/ Cancer Guideline Description	Source	Date
Arsenic	1.5		1.5	(mg/kg-day) <sup>-1</sup>	A	IRIS	Nov-2010
Lead	NA		NA	NA	NA	IRIS	Nov-2010
Pathway: Inhalation							
COC	Unit Risk	Units	Inhalation Cancer Slope factor	Slope Factor Units	Weight of Evidence/ Cancer Guideline Description	Source	Date
Arsenic	0.0043	(µg/m <sup>3</sup> ) <sup>-1</sup>	15	(mg/kg-day) <sup>-1</sup>	A	IRIS	Nov-2010
Lead	NA	NA	NA	NA	NA	IRIS	Nov-2010
Notes: COC: Contaminant of concern NA: Not available IRIS: Integrated Risk Information System, EPA				A - Known Human Carcinogen B1- Probable human carcinogen - indicates that limited human data are available B2- Probable human carcinogen - indicates sufficient evidence in animals and inadequate or no evidence in humans C- Possible human carcinogen D- Not classifiable as a human carcinogen E- Evidence of non-carcinogenicity			
This table provides carcinogenic risk information which is relevant to the contaminants of concern in soil. At this time, slope factors are not available for lead for oral, dermal, or inhalation routes of exposures. An adjustment factor is sometimes applied, and is dependent upon how well the chemical is absorbed via the oral route. An adjustment factor of 95% was used for arsenic. Therefore, a slightly lower value than is presented above was used as the dermal carcinogenic slope factor for arsenic.							

**Table 3  
Non-Cancer Toxicity Data Summary**

<b>Pathway: Ingestion, Dermal</b>									
COC	Chronic/ Subchronic	Oral RfD value <sup>1</sup>	Oral RfD Units	Dermal RfD Value <sup>2</sup>	Dermal RfD Units	Primary Target Organ <sup>3</sup>	Combined UF/MF <sup>4</sup>	Sources of RfD Target Organ <sup>5</sup>	Date
Arsenic	Chronic	0.0003	mg/kg- day	0.0003	mg/kg- day	Cardiovascular Dermal	3	IRIS	Nov- 2010
Lead	NA	NA	NA	NA	NA	NA	NA	IRIS	Nov- 2010
<b>Pathway: Inhalation</b>									
COC	Chronic/ Subchronic	Inhalation RfC value	Inhalation RfC Units	Inhalation RfD Value	Inhalation RfD Units	Primary Target Organ <sup>6</sup>	Combined UF/MF	Sources of RfC Target Organ	Date
Arsenic	Chronic	1.5x10 <sup>-5</sup>	mg/m <sup>3</sup>	NA	NA	Development Cardiovascular CNS	NA	CalEPA	Nov- 2010
Lead	NA	NA	NA	NA	NA	NA	NA	IRIS	Nov- 2010
<p>Notes:</p> <p>COC: Contaminant of concern            NA: Value not available/not calculated            1) Oral RfD = Oral reference dose (EPA, 2010)            2) Dermal RfD = Dermal reference dose calculated as: RfDd = RfDo x GIABS (Gastrointestinal absorption efficiency EPA, 2010).            3) Primary target organ/system based on information from the Agency for Toxic Substances and Disease Registry "ToxFAQs" (ATSDR, 2010).            4) UF/MF = Uncertainty factor/modifying factor (EPA-IRIS, 2010)            5) Primary source of RfDo as cited in the RSL Tables (EPA, 2010) and date of RSL Table update. Primary sources include: 1) IRIS - Integrated Risk Information System; 2) PPRTV - Provisional Peer Reviewed Toxicity Values; 3) ATSDR = Agency for Toxic Substances and Disease Registry; 4) CalEPA - California Environmental Protection Agency; 5) HEAST - Health Effects Assessment Summary Table; 6) NJ - New Jersey Department of Environmental Quality.            6) Primary source of RfC as cited in the RSL Tables (EPA, 2010) and date of RSL Table update. Primary sources include: 1) IRIS - Integrated Risk Information System; 2) PPRTV - Provisional Peer Reviewed Toxicity Values; 3) ATSDR = Agency for Toxic Substances and Disease Registry; 4) CalEPA - California Environmental Protection Agency; 5) HEAST - Health Effects Assessment Summary Table; 6) NJ - New Jersey Department of Environmental Quality; 7) X-PPRTV = PPRTV Appendix; 8) ECAO = Environmental Criteria and Assessment Office.</p> <p>This table provides non-carcinogenic risk information which is relevant to the contaminants of concern in soil. At this time, RfDs are not available for lead for oral, dermal, or inhalation routes of exposure. An adjustment factor is sometimes applied, and is dependent upon how well the chemical is absorbed vial the oral route. An adjustment factor of 95% was used for arsenic. Therefore, a slightly lower value than was presented above is used as the dermal non-carcinogenic slope factor for arsenic.</p>									

individual developing cancer from all other causes has been estimated to be as high as one in three. EPA's generally-acceptable risk range for site-related exposures is  $1 \times 10^{-4}$  to  $1 \times 10^{-6}$ .

The potential for non-carcinogenic effects is evaluated by comparing an exposure level over a specified time period (e.g., lifetime) with a reference dose (RfD) derived for a similar exposure period. An RfD represents a level that an individual may be exposed to that is not expected to cause any adverse effect. The ratio of exposure to toxicity is called a hazard quotient (HQ). An HQ less than 1 indicates that a receptor's dose of a single contaminant is less than the RfD, and that toxic non-carcinogenic effects from that chemical are unlikely. The hazard index is generated by adding the HQs for all COCs to which a given individual may reasonably be exposed that affect the same target organ (e.g., liver) or that act through the same mechanism of action within a medium or across all media. An HI less than 1 indicates that, based on the sum of all HQs from different contaminants and exposure routes, toxic non-carcinogenic effects from all contaminants are unlikely. An HI greater than 1 indicates that site-related exposures may present a risk to human health.

The HQ is calculated as follows:

$$\text{Non-cancer HQ} = \text{CDI}/\text{RfD}$$

Where:

CDI = chronic daily intake

RfD = reference dose

CDI and RfD are expressed in the same units and represent the same exposure period (i.e., chronic, subchronic, or short-term).

Because lead does not pose a cancer risk and does not have a nationally-approved reference dose, slope factor, or other accepted toxicological factor which can be used to assess risk, standard risk assessment methods cannot be used to evaluate the health risks associated with lead contamination. EPA has developed the Integrated Exposure Uptake Biokinetic Model for Lead in Children to predict blood lead levels (BLLs) in children exposed to lead. The IEUBK model calculates the probability that a child will have a BLL greater than 10 micrograms of lead per deciliter of blood ( $\mu\text{g}/\text{dL}$ ). BLLs above  $10 \mu\text{g}/\text{dL}$  have been directly related to adverse health effects in adults and children. EPA developed the IEUBK model to assist in establishing lead cleanup levels at Superfund sites.

The IEUBK model for lead in children was used to evaluate the non-carcinogenic risks posed to young children as a result of the lead contamination at OU1. EPA ran the IEUBK model using the available site-specific data to predict a lead soil level that will be protective of children and other residents. Site-specific soil concentrations for lead were used in place of model default values. Drip zone samples were included in the IEUBK model calculations.

A blood-lead-level study was not conducted at OU1. EPA used the IEUBK model to develop soil-lead PRGs for child and adolescent receptors, including child residents, adolescent school children, and child recreationalists. For the remaining receptors considered in the OU1 HHRA, EPA used the ALM to develop soil-lead PRGs. For residential child receptors, the average lead concentration in soil at each property was compared to the EPA residential soil RSL of 400

mg/kg. The 400 mg/kg RSL was calculated using EPA's IEUBK model and default exposure assumptions.

Available site-specific information was below regulatory levels and did not appear to be significantly different from the default parameters of the IEUBK model. This information included the municipal lead result for drinking water (3.6 micrograms per liter ( $\mu\text{g/l}$ )), low reported blood lead concentrations in school children, and low bioavailability of lead in soil at the site based on leachability studies. For other site-specific factors, insufficient information was available (for example, localized concentrations of lead in air, water, and foodstuffs) to warrant calculation of a site-specific residential soil PRG. For these reasons, EPA determined it was the best practice to use the default parameters in the model rather than to use site-specific data for only certain inputs. The output from the IEUBK model identified residential properties with average lead concentrations in soil greater than 400 mg/kg as presenting potential lead risks to residential receptors.

PRGs for lead in soil for both adolescent school children and child recreationalists were calculated in accordance with EPA's "Assessing Intermittent or Variable Exposures at Lead Sites" (EPA-540-R-03-008). In performing the calculations, EPA assumed that the overall average concentration of lead in soil to which these receptors could be safely exposed was the residential soil PRG of 400 mg/kg. For each receptor, three inputs were identified: (1) the average concentration to which the receptor would be exposed at home, (2) the fraction of time the receptor would spend at home, and (3) the fraction of time the receptor would spend at the alternate exposure point (for an adolescent school child, this would be the school; for a child recreationalist, this would be a park). Using these inputs and the target acceptable overall average lead concentration of 400 mg/kg, EPA calculated receptor-specific soil-lead PRGs (the acceptable concentration of lead in soil at the alternate location) for schools and parks. The calculated soil-lead PRG for an adolescent school child is 583 mg/kg, and for a child recreationalist the soil-lead PRG is 693 mg/kg.

After evaluating all COPCs for the appropriate exposure scenarios, EPA retained only lead and arsenic as COCs. Non-carcinogenic effects attributable to COPCs other than lead at OU1 were found to be negligible for all exposure scenarios.

Tables 4, 5, and 6 summarize the total carcinogenic risks from all COPCs to residents, utility workers, and construction workers, respectively. Tables 7, 8, and 9 summarize the total non-carcinogenic risks from all COPCs to residents, utility workers, and construction workers, respectively. Because the HHRA evaluated risks on an individual, property-by-property basis, Tables 4 through 9 show the range of the property-specific risk results for each exposure route.

**Table 4  
Risk Characterization Summary for Residents - Carcinogens**

Scenario Timeframe: Current/Future

Receptor Population: Resident

Receptor Age: Adult/Child

Medium	Exposure Location	Exposure Point	Carcinogenic Risk									
			Ingestion		Inhalation		Dermal		Home Grown Produce Ingestion		Exposure Routes Total	
			Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
Surface/Subsurface Soil	Schools	Soil On-Site Adult/Child RME	$3.9 \times 10^{-8}$	$6.2 \times 10^{-6}$	$7.5 \times 10^{-9}$	$4.7 \times 10^{-6}$	$4.9 \times 10^{-17}$	$8.1 \times 10^{-9}$	$1.2 \times 10^{-5}$	$6.4 \times 10^{-5}$	$1.2 \times 10^{-5}$	$7.5 \times 10^{-5}$
	Parks	Soil On-Site Adult/Child RME	$4.7 \times 10^{-8}$	$7.9 \times 10^{-5}$	$4.9 \times 10^{-9}$	$1.8 \times 10^{-5}$	$3.7 \times 10^{-16}$	$6.4 \times 10^{-9}$	N/A	N/A	$5.2 \times 10^{-8}$	$9.7 \times 10^{-5}$
	Residential	Soil On-Site Adult/Child RME	0.0	$1.3 \times 10^{-3}$	0.0	$2.4 \times 10^{-1}$	0.0	$1.9 \times 10^{-3}$	0.0	$4.5 \times 10^{-3}$	0.0	$7.9 \times 10^{-3}$

**Table 5**  
**Risk Characterization Summary for Utility Workers - Carcinogens**

Scenario Timeframe: Current/Future

Receptor Population: Utility Worker

Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Carcinogenic Risk									
			Ingestion		Inhalation		Dermal		Home Grown Produce Ingestion		Exposure Routes Total	
			Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
Surface/Subsurface Soil	Schools	Soil On-Site Adult RME	0.0	$6.0 \times 10^{-6}$	0.0	$3.1 \times 10^{-11}$	0.0	$2.3 \times 10^{-6}$	N/A	N/A	0.0	$8.3 \times 10^{-6}$
	Parks	Soil On-Site Adult RME	$5.2 \times 10^{-6}$	$5.8 \times 10^{-5}$	$5.7 \times 10^{-10}$	$6.4 \times 10^{-9}$	$4.9 \times 10^{-7}$	$5.6 \times 10^{-6}$	N/A	N/A	$5.7 \times 10^{-6}$	$6.4 \times 10^{-5}$
	Residential	Soil On-Site Adult RME	$6.5 \times 10^{-8}$	$7.8 \times 10^{-5}$	$2.7 \times 10^{-13}$	$6.0 \times 10^{-9}$	$2.5 \times 10^{-8}$	$7.1 \times 10^{-6}$	N/A	N/A	$1.8 \times 10^{-7}$	$8.5 \times 10^{-5}$



**Table 6  
Risk Characterization Summary for Construction Workers - Carcinogens**

Scenario Timeframe: Curren/Future

Receptor Population: Construction Worker

Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Carcinogenic Risk									
			Ingestion		Inhalation		Dermal		Home Grown Produce Ingestion		Exposure Routes Total	
			Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
Surface/Subsurface Soil	Schools	Soil On-Site Adult RME	0.0	$3.6 \times 10^{-7}$	0.0	$3.7 \times 10^{-12}$	0.0	$1.4 \times 10^{-7}$	N/A	N/A	0.0	$5.0 \times 10^{-7}$
	Parks	Soil On-Site Adult RME	$3.1 \times 10^{-7}$	$3.5 \times 10^{-6}$	$6.9 \times 10^{-11}$	$7.7 \times 10^{-10}$	$7.0 \times 10^{-11}$	$3.4 \times 10^{-7}$	N/A	N/A	$3.1 \times 10^{-7}$	$3.8 \times 10^{-6}$
	Residential	Soil On-Site Adult RME	$3.9 \times 10^{-9}$	$4.7 \times 10^{-6}$	$3.3 \times 10^{-14}$	$1.8 \times 10^{-7}$	$5.7 \times 10^{-11}$	$1.6 \times 10^{-1}$	N/A	N/A	$7.9 \times 10^{-9}$	$1.6 \times 10^{-1}$

**Table 7**  
**Risk Characterization Summary for Residents - Non-Carcinogens**

Scenario Timeframe: Current/Future  
 Receptor Population: Resident  
 Receptor Age: Adult/Child

Medium	Exposure Medium	Exposure Point	Non-Carcinogenic Risk (Hazard Index)									
			Ingestion		Inhalation		Dermal		Home Grown Produce Ingestion		Exposure Routes Total	
			Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
Surface/Subsurface Soil	Schools	Soil On-Site Adult/Child RME	0.0	$2.7 \times 10^{-1}$	0.0	$2.7 \times 10^{-3}$	0.0	$2.2 \times 10^{-2}$	0.0	$2.5 \times 10^{-1}$	0.0	$5.4 \times 10^{-1}$
	Parks	Soil On-Site Adult/Child RME	$4.6 \times 10^{-3}$	6.4	$1.2 \times 10^{-4}$	$5.9 \times 10^{-1}$	$4.8 \times 10^{-4}$	$4.2 \times 10^{-1}$	N/A	N/A	$5.2 \times 10^{-3}$	7.4
	Residential	Soil On-Site Adult/Child RME	0.0	$1.6 \times 10^{+2}$	0.0	$3.0 \times 10^{+1}$	0.0	2.1	0.0	$5.3 \times 10^{+2}$	0.0	$7.2 \times 10^{+2}$

**Table 8**  
**Risk Characterization Summary for Utility Workers - Non-Carcinogens**

Scenario Timeframe: Current/Future  
 Receptor Population: Utility Worker  
 Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Non-Carcinogenic Risk (Hazard Index)									
			Ingestion		Inhalation		Dermal		Home Grown Produce Ingestion		Exposure Routes Total	
			Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
Surface/Subsurface Soil	Schools	Soil On-Site Adult RME	0.0	$6.0 \times 10^{-6}$	0.0	$3.1 \times 10^{-11}$	0.0	$2.3 \times 10^{-6}$	N/A	N/A	0.0	$8.3 \times 10^{-6}$
	Parks	Soil On-Site Adult RME	$4.5 \times 10^{-2}$	$4.9 \times 10^{-1}$	$2.3 \times 10^{-4}$	$4.2 \times 10^{-4}$	$2.9 \times 10^{-3}$	$3.2 \times 10^{-2}$	N/A	N/A	$4.8 \times 10^{-2}$	$5.2 \times 10^{-1}$
	Residential	Soil On-Site Adult RME	$2.1 \times 10^{-6}$	1.2	$3.3 \times 10^{-10}$	$1.1 \times 10^{-3}$	$3.0 \times 10^{-4}$	$4.5 \times 10^{-2}$	N/A	N/A	$3.0 \times 10^{-4}$	1.2

**Table 9**  
**Risk Characterization Summary for Construction Workers - Non-Carcinogens**

Scenario Timeframe: Current/Future  
 Receptor Population: Construction Worker  
 Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Non-Carcinogenic Risk (Hazard Index)									
			Ingestion		Inhalation		Dermal		Home Grown Produce Ingestion		Exposure Routes Total	
			Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
Surface/Subsurface Soil	Schools	Soil On-Site Adult RME	0.0	1.9x10 <sup>-1</sup>	0.0	2.7x10 <sup>-3</sup>	0.0	0.0	N/A	N/A	0.0	1.9x10 <sup>-1</sup>
	Parks	Soil On-Site Adult RME	5.8 x10 <sup>-1</sup>	6.4	6.0 x10 <sup>-3</sup>	1.1 x10 <sup>-2</sup>	7.8 x10 <sup>-3</sup>	4.2 x10 <sup>-1</sup>	N/A	N/A	6.0 x10 <sup>-3</sup>	6.8
	Residential	Soil On-Site Adult RME	2.6 x10 <sup>-7</sup>	15	1.6 x10 <sup>-1</sup>	2.4 x10 <sup>-1</sup>	2.8 x10 <sup>-3</sup>	5.8 x10 <sup>-1</sup>	N/A	N/A	3.0 x10 <sup>-3</sup>	16

Risk characterization results are discussed by property and receptor type in the following order: residential, school, and recreational properties. For each, there is a discussion of the likely exposure of the primary receptor, followed by the likely exposure to utility and construction workers (which are assumed to be potentially exposed at all properties). (See Section 2.7.5 for a discussion of the various exposure scenarios that were evaluated.)

## **Residential Properties**

The majority of OU1 is made up of residential properties. Risk was evaluated discretely at each of the 74 residential properties that were tested during the RI. Exposure routes at residential properties to lead- and arsenic-contaminated surface and subsurface soils include incidental ingestion, dermal contact, inhalation of particulates in ambient air, and ingestion of homegrown produce. For lead, these were integrated together in the IEUBK model. For other COPCs, risks were quantified individually for each exposure route at each property. The HHRA evaluated risks associated with both current and future land uses. For current land use, the HHRA considered the upper 12 inches of soil in yards and 24 inches where gardens are currently located. Future land use assumes that gardens can be relocated anywhere in the yard and the HHRA considered the top 24 inches of soil throughout the yard. Individual risks for each property can be found in the HHRA, which is included in the RI Report. The sensitive subpopulation for lead is children.

The primary non-lead drivers of risk are arsenic and carcinogenic PAHs. EPA has determined that the PAHs at OU1 are not site-related. The primary hazard drivers are arsenic, antimony, manganese, and mercury, as well as a series of other metals at a small number of properties. Risks and hazards are driven by ingestion of homegrown produce and incidental ingestion of soil. No carcinogenic COPCs were identified at 35 of the 74 residential properties tested.

### Residents

As shown in Table 4, the total carcinogenic risk for residents under both current and future land uses from all COPCs at the residential properties tested ranges from zero to  $7.9 \times 10^{-3}$ . Table 7 shows that the non-carcinogenic hazard index from all COPCs at the residential properties tested ranges from zero to 720. However, some of the COPCs were determined not to be site-related. The risks to residents when considering only the site-related COCs are summarized as follows:

- For residents under current land uses (exposed to the upper 12 inches of soil), 27 of the 74 residential properties tested have total current risks greater than  $1 \times 10^{-4}$ , the upper end of EPA's acceptable risk range. The total risks at these properties range from  $2 \times 10^{-4}$  to  $5 \times 10^{-3}$ .
- For residents under future land uses (potentially exposed to the upper 24 inches of soil), 36 of the 74 properties tested have total future risks greater than  $1 \times 10^{-4}$ , the upper end of EPA's acceptable risk range. The total risks at these properties range from  $2 \times 10^{-4}$  to  $5 \times 10^{-3}$ .
- Lead poses a risk to residents at 47 of the 74 residential properties that were tested.

### Utility Worker

The HHRA evaluated potential exposure of utility workers at the residential properties. As shown in Table 5, the total carcinogenic risk for utility workers from all COPCs ranges from  $1.8 \times 10^{-7}$  (below EPA's acceptable risk range) to  $8.5 \times 10^{-5}$  (within EPA's acceptable risk range). Table 8 shows that the non-carcinogenic hazard index from all COPCs ranges from 0.0003 (insignificant) to 1.2. However, when considering risks to utility workers only due to site-related COCs, non-carcinogenic hazards are less than 1 and insignificant at all properties. Lead poses a risk to utility workers at three of the 74 residential properties that were tested.

### Construction Worker

The HHRA evaluated potential exposure of construction workers at the residential properties. As shown in Table 6, the total carcinogenic risk for construction workers from all COPCs ranges from  $7.9 \times 10^{-9}$  (below EPA's acceptable risk range) to  $1.6 \times 10^{-1}$  (above EPA's acceptable risk range). Table 9 shows that the non-carcinogenic hazard index from all COPCs ranges from 0.003 to 16. However, when considering risks to construction workers only due to site-related COCs, carcinogenic risks were either less than  $1 \times 10^{-6}$  and considered insignificant or were within EPA's acceptable risk range. Non-carcinogenic hazards for construction workers due to the COCs exceed an HI of 1 at 11 of the residential properties that were tested. Lead poses a risk to construction workers at 16 of the 74 residential properties that were tested. The majority of the 16 properties are clustered in the public housing area at the southwest corner of OU1.

## **Schools**

There are two schools within the study area, the Carmelite School for Girls and Carrie Gosch Elementary School. The Carmelite School contains some residents. Therefore, the exposure assumptions were different for the two schools. Human health risks for students and teachers are summarized as follows:

### Carmelite School for Girls

Under both current (C) and future (F) land use conditions, total risks from all COPCs for adolescent students ( $5 \times 10^{-5}$  [C] and  $7 \times 10^{-5}$  [F]) and adult teachers and staff ( $4 \times 10^{-5}$  [C] and  $1 \times 10^{-4}$  [F]) are within EPA's acceptable risk range. Non-carcinogenic hazards for both receptor groups are less than an HI of 1 and considered insignificant. At Carmelite School for Girls, lead does not pose a risk to either adolescent students or adult teachers and staff.

### Carrie Gosch Elementary School

At Carrie Gosch Elementary School, under both current and future land use conditions, total risks from all COPCs for adolescent students, indoor teachers and staff, and outdoor teachers and staff are less than or equal to  $1 \times 10^{-5}$  and within EPA's acceptable risk range. Non-carcinogenic hazards are less than an HI of 1 and considered insignificant for all receptors. At Carrie Gosch Elementary School, lead does not pose a risk to any receptors.

### Construction and Utility Workers

There were no unacceptable risks for construction or utility workers at either school under current or future land use conditions.

### **Parks**

Under current land use conditions, total carcinogenic risks to the following groups are within EPA's acceptable risk range: (1) child, adolescent, and adult recreationalists; (2) indoor park workers; and (3) outdoor park workers at Riley Park, Goodman Park, and Kennedy Gardens Park. The maximum risk is  $3 \times 10^{-5}$  (within EPA's acceptable risk range) for an outdoor park worker at Goodman Park. Total non-carcinogenic hazards at all three parks are less than an HI of 1 and considered insignificant for all receptors.

Lead poses the following types of risk at each park:

- Riley Park – lead does not pose a risk to any receptors.
- Goodman Park – lead poses a risk to child recreationalists, indoor park workers, and outdoor park workers.
- Kennedy Gardens Park – lead poses a risk to all recreational receptors.

Under future land use conditions, the carcinogenic risks increase slightly for all receptors but remain within EPA's acceptable risk range, and non-carcinogenic hazards at the three parks also remain insignificant. The risks from lead remain similar to those described under current land use conditions.

### Construction and Utility Workers

There are no unacceptable risks for utility workers at the three parks under current or future land use conditions. For construction workers, the non-carcinogenic hazard index from all COPCs ranges from 0.006 to 6.8 (see Table 9), with the values exceeding 1 driven by concentrations of arsenic at or below background levels. When taking such non-site-related concentrations out of the evaluation, there are no unacceptable risks to construction workers at the three parks.

### **2.7.8 - Uncertainties**

Uncertainties are inherent in the process of quantitative risk assessment because of the use of environmental sampling results, assumptions regarding exposure, and the quantitative representation of chemical toxicity. Potentially significant sources of uncertainty for this assessment are discussed in the HHRA and include analytical data, exposure estimates, toxicity estimates, and background conditions. The uncertainties associated with analytical data are summarized below.

At OUI of the USS Lead Site, there are four primary sources of uncertainty with regard to the analytical data used in the HHRA: (1) the depth of surface soil samples, (2) the use of x-ray fluorescence (XRF) data, (3) the limited number of soil samples analyzed for constituents other than lead, and (4) a limited number of samples at each property. Each of these sources of uncertainty is summarized below.

- Surface soil samples were collected from 0 to 6 inches bgs. However, EPA guidance suggests that concentrations of some constituents, particularly lead, may be highest in the uppermost few centimeters (1 inch). Therefore, collection of surface soil samples from 0 to 6 inches bgs may result in a dilution of lead concentrations in surface soil samples. At OUI, EPA evaluated the concentration of lead in soil samples collected during the limited investigation in 2007. EPA concluded that concentrations of lead measured in soil samples collected from 0 to 1 inch bgs did not differ from measured lead concentrations in samples collected from 1 to 6 inches bgs at the same location.
- Field-based analytical methods have been found acceptable for use in investigating hazardous waste sites if a particular method (in this case XRF) is generally accepted and performed in accordance with QA/QC protocols and procedures. The XRF technique, well established and routinely used in site investigations, was performed using an established analytical method (Method 6200). Therefore, EPA concluded that XRF data (obtained by EPA) are acceptable for use in the RI and HHRA for the USS Lead Site. Furthermore, all XRF data used in the HHRA were first adjusted based on a correlation developed between samples analyzed using both XRF and laboratory analysis.
- All soil samples collected during the RI were analyzed for lead, either by XRF (and later adjusted as described above) or by an off-site laboratory. However, only 20 percent of the Phase I soil samples were sent to an off-site laboratory for total metals analysis. (Note: All Phase II soil samples were sent offsite for total metals analysis). Also, only eight Phase I soil samples were sent offsite for VOC, SVOC (including PAHs), PCB, and pesticide analyses. VOCs, non-PAH SVOCs, PCBs, and pesticides were not detected in any of those eight samples; therefore, VOCs, non-PAH SVOCs, PCBs, and pesticides were not analytes in Phase II sampling. Consequently, the EPCs (and in turn risks and hazards) for non-lead COPCs, particularly arsenic and PAHs, are subject to a moderate to large amount of uncertainty.
- As noted above, samples analyzed for COCs other than lead were collected less frequently than samples analyzed for lead. As a result, EPCs for COCs other than lead at individual properties are based on fewer samples than EPCs for lead. This means that EPCs for some analytes could not be calculated at some properties. At other properties, the EPCs are subject to at least a moderate amount of uncertainty because they are based on a limited number of samples. In such instances, the maximum detected concentration was used as the EPC. This may result in an overestimation of the EPC.



## 2.7.9 - Risk Assessment Conclusions

The risk to human health from lead and arsenic in residential soils drives the need for remedial action at OU1 of the USS Lead Site. The response action selected in this ROD is therefore necessary to protect public health or welfare or the environment from actual or threatened releases of pollutants or contaminants that may present an imminent and substantial endangerment.

## 2.8 – Remedial Action Objectives

Remedial action objectives (RAOs) are goals specific to media or operable units for protecting human health and the environment. Risk can be associated with current or potential future exposures. RAOs should be as specific as possible, but not so specific that the range of alternatives to be developed is unduly limited. Objectives aimed at protecting human health and the environment should specify: (1) COCs; (2) exposure routes and receptors; and (3) an acceptable contaminant level or range of levels for each exposure route.

As discussed in Section 2.7, the OU1 HHRA recognized the following receptors for current and future land-use scenarios: child, adolescent, and adult residents; child, adolescent, and adult recreationalists; and adult indoor and outdoor workers. Section 2.7 also details the exposure routes for each receptor. Current land uses within OU1 include residential, recreational, school, and industrial/commercial properties. For the purposes of the HHRA and the development of RAOs, EPA assumed that future land uses of all properties would be the same as current land uses. As land use and the potential for exposure to contaminated material is not likely to change, the RAO must reduce the risks posed by soils in yards at OU1.

EPA has identified the following RAO for OU1 of the USS Lead Site:

- Reduce to acceptable levels human health risk from exposure to COCs (lead and arsenic) in impacted surface and subsurface soils, through ingestion, direct contact, or inhalation exposure pathways, assuming reasonably anticipated future land-use scenarios.

Portions of OU1 are currently paved or covered with buildings, which limits potential exposure. However, significant portions of OU1, including yards, parks, and lawns, are unpaved. The intent of the RAO above is to address open areas to protect residents, recreationalists, and workers. A cleanup that achieves this RAO will be protective of human health and the environment as it will ensure that the soil to which residents are exposed, now and in the future, does not pose a health risk.

## Remedial Action Levels

### Lead

As discussed in Section 2.7.7, the HHRA evaluated lead by using the IEUBK model and default exposure assumptions to calculate a screening level very similar to the 400 mg/kg RSL. Available site-specific information was not significantly different than the standard parameters

of the IEUBK model, and insufficient information was available for other site-specific factors. EPA therefore used the default parameters for the IEUBK model and the ALM in its calculation of site-specific residential soil PRGs for lead, and identified average lead concentrations in soil greater than 400 mg/kg as presenting potential lead risks to residential receptors. EPA is therefore selecting 400 mg/kg as the RAL for lead in residential yards.

At schools and parks, where the calculated soil PRG is above 400 mg/kg, EPA has conservatively chosen to use the residential RSL of 400 mg/kg as the RAL since it is likely that the children potentially exposed at schools and/or parks are also exposed at residences within OU1. Given the small size of the yards at many residences within OU1, it is possible that some children spend more time outside at schools and parks than they do at home. Selecting 400 mg/kg as the lead RAL for all property types therefore takes into account cumulative risk from exposure of children at schools and parks as well as at residential properties.

At industrial/commercial properties, EPA used the ALM to identify a RAL of 800 mg/kg for lead in soil.

### Arsenic

As discussed in Section 2.7.1, the RAL for arsenic is based upon the upper tolerance limit of naturally-occurring concentrations of arsenic at OU1. Arsenic concentrations in soil samples collected within OU1 are distributed around both the site-specific background concentration of 14.1 mg/kg and the Illinois metropolitan background concentration of 13.0 mg/kg. Because of the similarity between the bulk soil concentrations for arsenic at OU1 and the naturally-occurring background concentrations, EPA made a risk-management decision to use the UTL to distinguish between arsenic soil concentrations that are distributed among the naturally-occurring values at OU1 and those that may have been impacted by activities in and around the site. The 95% UTL for arsenic in soil at OU1 is 26 mg/kg, which corresponds to the upper bound of the naturally-occurring (i.e. background) concentrations. The 26 mg/kg RAL for arsenic will be applied to residential, recreational, and commercial/industrial properties. The approach of using the UTL as a RAL has been used at other CERCLA sites, including the Jacobsville Neighborhood Soil Contamination Site in Evansville, Indiana, and is discussed more fully in the RI Report for OU1 of the USS Lead Site.

EPA notes that an arsenic soil concentration of 26 mg/kg also corresponds with a risk level of  $1 \times 10^{-4}$  for residential land use if one assumes that 25 percent of the produce consumed by residents of OU1 is comprised of homegrown produce (grown within OU1).

### RAL Summary

Table 10 summarizes the remedial action levels for soils at OU1.

Table 10 Soil Remedial Action Levels for OU1 of the USS Lead Site		
Analyte Group	Analyte Name	OU1 Soil RAL
Metals	Arsenic	26 mg/kg
	Lead	400 mg/kg (Residential) 800 mg/kg (Industrial/Commercial)

## 2.9 – Description of Alternatives

This section presents the remedial alternatives for OU1, which are numbered to correspond with the numbering system used in the FS Report. The alternatives are described more fully in Section 2.9.2. The alternatives listed in bold font are those that EPA carried forward for detailed analysis in the FS.

- **Alternative 1 – No Action**
- Alternative 2 – Institutional Controls
- **Alternative 3 – On-site Soil Cover + Institutional Controls**
- **Alternative 4A – Excavation of Soil Exceeding RALs + Off-site Disposal + Ex-situ Treatment Option**
- **Alternative 4B – Excavation to Native Sand + Off-site Disposal + Ex-situ Treatment Option**
- Alternative 5 – *In-situ* Treatment by Chemical Stabilization

In accordance with EPA guidance, the potential remedial alternatives identified in the FS and listed above were screened against three broad criteria: (1) effectiveness (both short-term and long-term), (2) implementability (including technical and administrative feasibility), and (3) relative cost (capital and operation and maintenance [O&M]). The purpose of the screening evaluation was to reduce the number of alternatives chosen for a more thorough analysis. EPA eliminated Alternative 2 (exclusive reliance on institutional controls to prevent exposure) and Alternative 5 (in-place treatment by chemical stabilization) from further consideration because EPA did not consider them to be effective for OU1. Alternative 2 does not reduce human health risk from exposure to COCs because the impacted soils would remain in place without protective barriers. Alternative 5, chemical stabilization through the introduction of ground fish bones to achieve phosphate immobilization, was eliminated because it is not proven for long-term effectiveness; there are few case studies available for review.

## 2.9.1 - Common Element of Alternatives

### Pre-Remedial Sampling

Prior to remedy implementation, pre-remedial sampling must be conducted at the remainder of the properties in OUI (i.e., those that have not yet been tested) to determine which yards require remediation. The pre-remedial sampling will take place during the remedial design phase. All field activities will be conducted in accordance with an EPA-approved, site-specific quality assurance project plan. The sampling methodologies employed will be the same as those used during the RI field work. Because EPA has secured access to fewer than 25% of the properties in OUI, additional access agreements for the remaining properties will be obtained before initiating the pre-remedial field investigation. The pre-remedial sampling results will be used in the remedial design to identify the yards that require remediation. For Alternative 4A, the pre-remedial sampling will also identify the depth of RAL exceedances in each yard. The cost of the pre-remedial sampling is included in each retained alternative, with the exception of Alternative 1, No Action.

### Assumed Number of Properties Requiring Remediation

Based on the representative sampling conducted during the RI, of the 1,271 properties in OUI, 53 percent or 672 properties are likely to require remedial action to address risks associated with lead. An additional four percent or 51 properties are likely to require remediation to address risks associated only with arsenic. In total, 723 properties are likely to require remediation.

## 2.9.2 – Summary of Remedial Alternatives

### Alternative 1 – No Action

*Estimated Capital Cost: \$0*

*Estimated Total O&M Cost: \$0*

*Cost Estimate Contingency: \$0*

*Estimated Present Worth Cost: \$0*

*Estimated Construction Timeframe: None*

Regulations governing the Superfund program generally require that the “no action” alternative be evaluated to establish a baseline against which EPA and the public can compare the costs and benefits of other alternatives. Under this alternative, EPA would take no action at OUI to prevent exposure to the soil contamination, and statutory five-year reviews would not be required.

### Alternative 3 – On-site Soil Cover + Institutional Controls

*Estimated Capital Cost: \$16,705,000*

*Estimated Total O&M Cost: \$735,000*

*Cost Estimate Contingency: \$3,500,000*

*Estimated Present Worth Cost: \$20,900,000*

*Estimated Construction Timeframe: 18 months*

Alternative 3 would achieve the RAO of preventing exposure to contaminated soil by installing a soil cover that limits direct contact with impacted soil. A visible barrier, such as orange construction fencing or landscaping fabric, would be placed over the contaminated soil and then the contaminated soil and visible barrier would be covered with clean soil. Contamination would be left in place and capped with a 12-inch-thick soil cover as specified in EPA's *Superfund Lead-Contaminated Residential Sites Handbook*. The soil cover would be composed of 6 inches of imported select borrow material topped with 6 inches of top soil, and is meant to prevent direct contact with contaminated soil. The soil cover would be placed directly on top of the existing grade. After installation of the soil cover, each yard would be restored to its pre-remedial condition. As part of the O&M cost calculations, EPA assumed that the soil cover would be inspected and repaired as needed on a semi-annual basis for the first 5 years, followed by an annual inspection for years 6 through 30. Annual repairs would include re-grading portions of the soil cover, placing additional soil to maintain the 12-inch cover, and seeding or sodding the yards as needed. Institutional controls would be implemented to maintain the integrity of the soil cover so that users of the impacted yards would not be exposed to COCs in soil. Institutional controls may include property restrictions, such as the following:

- limiting gardening to raised beds;
- requiring that all subsurface work (utility maintenance, foundation work, etc.) be done in accordance with the remedial design in order to protect workers and residents;
- requiring that sufficient coverage of impacted soils be maintained.

In accordance with CERCLA requirements, EPA would perform five-year reviews of this remedy since impacted soil would be left in place above levels that allow for unlimited use and unrestricted exposure. After remediation work is complete, this alternative would allow for the continued residential use of impacted yards.

**Alternative 4A - Excavation of Soil Exceeding RALs + Off-site Disposal + Ex-situ Treatment Option**

*Estimated Capital Cost: \$24,795,000*

*Estimated Total O&M Cost: \$67,000*

*Cost Estimate Contingency: \$4,980,000*

*Estimated Present Worth Cost: \$29,900,000*

*Estimated Construction Timeframe: 26 months*

Alternative 4A would achieve the RAO of preventing exposure to contaminated soil by removing impacted soil that exceeds RALs, to a maximum excavation depth of 24 inches, while leaving in place soils that do not exceed the RALs. This alternative requires excavation of soil exceeding RALs, disposal of excavated soil at an off-site Subtitle D landfill, and, as necessary, chemical stabilization of some excavated soil to address lead concentrations that exceed the toxicity characteristic regulatory threshold. Based upon testing conducted during the RI, EPA estimates that soil with lead concentrations above 2,400 mg/kg (an estimated 7% of the excavated yards at OU1) will exceed the TC regulatory threshold. EPA considers the soils that exceed the TC regulatory threshold to be principal threat waste, and under Alternative 4A, the principal threat wastes would be treated.

Pre-remedial sampling would be conducted at impacted properties to determine the approximate excavation depth required in each yard. The maximum excavation depth would be 24 inches, but may be less than 24 inches at many properties. Confirmation samples would be collected as needed during the excavation work to determine the final excavation depth (up to 24 inches) and to confirm that all soils exceeding RALs within the top 24 inches were excavated. If contaminated soil is identified at a depth greater than 24 inches bgs, a visual barrier such as orange construction fencing or landscape fabric would be placed above the contaminated soil and beneath the clean backfill soil. In such instances, institutional controls would be implemented, in the same way as described in Alternative 3, to ensure that users of the property are not exposed to COCs in soil. Unlike the ICs for Alternative 3, however, the ICs for Alternative 4A would not limit gardening to raised beds.

Based on the results of the RI, the native sand/soil horizon is estimated to be no more than 24 inches bgs and is clean. During the RI, native sand was encountered at most sample locations between 0 and 24 inches bgs. For this reason, EPA expects that excavating to a maximum depth of 24 inches under Alternative 4A would remove all of the soil exceeding RALs at the majority of the impacted yards within OU1.

Since no local stockpile area has been identified, EPA assumes that soil would be loaded directly into roll-off containers and transported to the landfill. If a stockpiling location is identified that is acceptable to the community, then excavated soils could be stockpiled prior to being transported off-site for disposal.

Excavated soil would be replaced with clean soil, including 6 inches of top soil, to maintain the original grade. Each yard would be restored as close as practicable to its pre-remedial condition. Once the properties are sodded or seeded, O&M of the sod or seed, including watering, fertilizing, and cutting, would be conducted for 30 days. After the initial 30-day period, property owners would be responsible for the maintenance of their own yards. Because some soil exceeding RALs would likely be left in place at OU1 (e.g., within some yards deeper than 24 inches bgs), a five-year review would be required in accordance with CERCLA. After remediation is complete, this alternative would allow for the continued residential use of impacted yards.

**Alternative 4B - Excavation to Native Sand + Off-site Disposal + Ex-situ Treatment Option**

*Estimated Capital Cost: \$37,760,000*

*Estimated Total O&M Cost: \$0*

*Cost Estimate Contingency: \$7,560,000*

*Estimated Present Worth Cost: \$45,400,000*

*Estimated Construction Timeframe: 40 months*

Alternative 4B would achieve the RAO of preventing exposure to contaminated soil by removing all of the soil at impacted yards to the native sand, even if some of the excavated soils do not exceed RALs. EPA has observed that lead is not found in the native sand layer. Under this alternative, EPA would not collect confirmation samples during the excavation work. Instead, EPA would assume that, for yards that have soils exceeding the RALs, complete removal of all

soils above the native sand layer would achieve the RAO. The goal of this alternative is the total removal of soil at identified yards down to the native sand, disposal of excavated soil at an off-site Subtitle D landfill, and, as necessary, chemical stabilization of some excavated soil to address lead concentrations that exceed the TC regulatory threshold. EPA considers the soils that exceed the TC regulatory threshold to be principal threat waste, and under Alternative 4B, the principal threat wastes would be treated.

Soil in those yards that have RAL exceedances would be excavated from the surface grade down to the native sand/soil horizon without pre-remedial testing to determine the depth of contamination. Based on the results of the RI, the native sand/soil horizon is estimated to be no more than 24 inches bgs. During the RI, native sand was encountered at most sample locations between 0 and 24 inches bgs. RI results indicated that the native sand beneath the fill soils is both clean and by sight very easily distinguished from soil and fill material. The cost estimate for this alternative assumes that all soil above the native sand would be excavated and disposed offsite with no post-excitation confirmation samples.

Since no local stockpile area has been identified, EPA assumes that soil would be loaded directly into roll-off containers and transported to the landfill. If a stockpiling location is identified that is acceptable to the community, then excavated soils could be stockpiled prior to being transported off-site for disposal.

Excavated soil would be replaced with clean soil, including 6 inches of top soil, to maintain the original grade. Each yard would be restored as close as practicable to its pre-remedial condition. Once the properties are sodded or seeded, O&M of the sod or seed, including watering, fertilizing, and cutting, would be conducted for 30 days. After the initial 30-day period, property owners would be responsible for the maintenance of their own yards. This alternative would result in the removal of all impacted soils (since excavations would go down to the native sand, and the native sand layer is clean). No institutional controls would be needed, and CERCLA would not require five-year reviews because waste would not be left in place above levels that allow for unlimited use and unrestricted exposure. After remediation is complete, this alternative would allow for the continued residential use of impacted yards.

## **2.10 – Comparative Analysis of Alternatives**

As required by CERCLA, nine criteria were used to evaluate the different remediation alternatives individually and against each other in order to select a remedy. This section of the *Record of Decision* summarizes the performance of each alternative against the nine criteria and notes how they compare to the other options under consideration.

The nine evaluation criteria fall into three groups: threshold criteria, primary balancing criteria, and modifying criteria. Threshold criteria, which include overall protection of human health and the environment and compliance with ARARs, are requirements that each alternative must meet in order to be eligible for selection. Primary balancing criteria, which include long-term effectiveness and permanence, reduction of toxicity, mobility, or volume of contaminants through treatment, short-term effectiveness, implementability, and cost, are used to weigh major trade-offs among alternatives. Modifying criteria, which include state/support agency

acceptance and community acceptance, can be fully considered only after public comment is received on the Proposed Plan, so were not evaluated in the FS. In the final balancing of trade-offs between alternatives, upon which the final remedy selection is based, modifying criteria are of equal importance to the balancing criteria. The nine evaluation criteria are discussed below.

### **2.10.1 - Overall Protection of Human Health and the Environment**

This criterion assesses how well the alternatives achieve and maintain protection of human health and the environment.

Alternative 1 (No Action) would provide no improvement over current conditions, would provide no risk reduction, and would not be protective of human health or the environment.

Alternatives 3, 4A, and 4B are each expected to be effective remedies for OU1 that would be protective of human health and the environment. Protection of human health and the environment would be achieved by addressing potential pathways of exposure to contaminated soils. Alternative 3 relies on a soil cover and compliance with institutional controls, such as restricting gardens to raised beds, to achieve protectiveness. Alternatives 4A and 4B would achieve protectiveness through removal of contaminated soils. As discussed in Section 2.5.1, the exposure pathways through which people can be exposed to the lead- and arsenic-contaminated surface and subsurface soils at OU1 are ingestion, direct contact, and inhalation.

Ingestion of contaminated soils in yards is the primary exposure route at OU1. Residents may be exposed to contaminants adhering to soils through ingestion of homegrown produce or through direct ingestion of contaminated soil. Alternatives 3, 4A, and 4B are all considered effective at preventing ingestion of contaminants.

Exposure to contaminated soils through direct contact may result from recreational activities, gardening, landscaping, or excavation activities. Each of the active alternatives would prevent most direct contact by covering or removing the contaminated soils. However, direct contact may be more likely to result from unauthorized excavation activities under Alternative 3 because the contaminated soils would remain in place under a soil cover that is only 12 inches thick.

Exposure through inhalation would most likely occur through windborne transport of contaminated dust and soil due to the COCs' low volatility and strong tendency to adsorb to soil particles. Each of the active alternatives would prevent exposure to contaminated dust over the long term by removing or covering the contaminated soils. However, the remedial activities may generate dust and cause short-term exposure, particularly under Alternatives 4A and 4B, which would excavate contaminated soils.<sup>2</sup>

Alternatives 3, 4A, and 4B address potential exposure to contaminants by covering or removing the contaminated soil. Alternative 4B would eliminate all potential exposure pathways because

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<sup>2</sup> Any dust generated under Alternative 3 would be created by the placement of clean soils as cover material, since excavation of contaminated soils is not part of that alternative.



all of the soil at yards that exceed the RALs would be removed down to native sand. Alternatives 3 and 4A would reduce or eliminate potential exposure pathways. Alternative 3 would leave contaminated soil behind at all properties under a 12-inch soil cover, and EPA would rely on institutional controls (such as prohibiting excavation work deeper than 12 inches and limiting gardening to raised beds) to prevent exposure. Alternative 4A would leave contaminated soil in place at some properties at depths greater than 24 inches. At those properties where contaminated soil remains at depth, EPA would rely on institutional controls (such as prohibiting excavation of contaminated soils) to prevent exposure.

Each active remedial alternative is expected to be protective of human health and the environment, provided that the cover is properly maintained under Alternative 3 and institutional controls are effective under Alternatives 3 and 4A. Active Alternatives 3 and 4A could allow exposure to contaminated soils through unauthorized excavation, if institutional controls are not effective. The potential for such exposure is highest for Alternative 3 where the greatest volume of contaminated soils would remain in place.

### **2.10.2 - Compliance with Applicable or Relevant and Appropriate Requirements**

This criterion assesses how the alternatives comply with regulatory requirements. Federal and state regulatory requirements that are either applicable or relevant and appropriate are known as ARARs. Only state requirements that are more stringent than federal requirements are ARARs. There are three different categories of ARARs: chemical-specific, action-specific, and location-specific ARARs. Potential ARARs were identified during the FS and were included in Table 1 of EPA's July 2012 Proposed Plan.

Alternatives 3, 4A and 4B would all comply with ARARs. Alternative 1 would not comply with ARARs.

The ARARs that have been identified for the Selected Remedy are included in this ROD as Appendix B.

### **2.10.3 - Long-term Effectiveness and Permanence**

This criterion evaluates the effectiveness of the alternatives in protecting human health and the environment in the long term, after the cleanup is complete.

Alternative 1 would not provide any degree of long-term effectiveness or permanence because no action would be taken. Each of the remaining, active alternatives would meet the RAO and provide long-term effectiveness and permanence once the RAO is met. The active alternatives are combinations of proven and reliable remedial processes, and the potential for failure of any individual component is low. The evaluation of the active alternatives against this criterion resulted in the following findings:

- Alternative 3 would achieve long-term effectiveness through covering the metals-contaminated soil onsite as the primary component of the remedy, with O&M and

institutional controls to ensure and verify the ongoing effectiveness and permanence of the remedy. Implementation of Alternative 3 would introduce topographic changes to the properties that would need to be maintained to ensure protectiveness. Therefore, the long-term effectiveness of this alternative is completely dependent on (1) O&M to prevent erosion and potential exposure to contaminated soils that remain in place, and (2) institutional controls to prevent unauthorized activities that could result in exposure to contaminated soils that remain in place.

- Alternative 4A would achieve long-term effectiveness by removing soil that exceeds RALs and disposing of it at an off-site disposal facility. Alternative 4A would likely leave some contaminated material in place deeper than 24 inches bgs if the contamination exceeding RALs extends deeper than 24 inches. (Native sand was encountered above 24 inches bgs at all but a few locations in OUI where borings were advanced.) Any material exceeding RALs that is left in place would require O&M and institutional controls to maintain the effectiveness and permanence of the remedy.
- Alternative 4B would achieve long-term effectiveness by removing all non-native soils down to native sand (estimated to be no more than 24 inches bgs at most properties) from yards that exceed RALs and disposing of those soils at an off-site disposal facility.

Alternatives 3, 4A, and 4B are all proven methodologies that meet the requirements for long-term effectiveness and permanence. Compared to Alternative 3, Alternatives 4A and 4B would provide an additional level of protectiveness because wastes above RALs would be removed and sent off-site for disposal. Alternative 4B would provide the greatest degree of long-term effectiveness and permanence because all soil exceeding RALs would be removed from impacted yards.

#### **2.10.4 - Reduction of Toxicity, Mobility, or Volume through Treatment**

This criterion addresses the preference for selecting remedial actions that use treatment technologies that permanently and significantly reduce the toxicity, mobility, or volume of the hazardous substances. This preference is satisfied when treatment is used to reduce the principal threats at a site through destruction of toxic contaminants, reduction of the total mass of toxic contaminants, irreversible encapsulation, or reduction of total volume of contaminated media.

EPA has estimated that approximately 7% of the soils at OUI have lead concentrations that exceed the TC threshold and that would therefore be considered hazardous waste. These soils are considered principal threat wastes due to their toxicity and potential to leach to groundwater.

Alternatives 1 and 3 would not reduce the toxicity, mobility, or volume of contaminated materials since no treatment would be applied. Alternatives 4A and 4B would reduce the toxicity and mobility of those soils with lead levels that exceed the TC threshold through the use of ex-situ treatment prior to disposal. The amount of material requiring treatment is expected to be the same for Alternatives 4A and 4B. The treatment used under Alternatives 4A and 4B would not reduce the volume of contaminated materials.

### **2.10.5 - Short-term Effectiveness**

This criterion examines the effectiveness of the alternatives in protecting human health and the environment during implementation of the cleanup until the cleanup is complete. It considers protection of the community, workers, and the environment during the cleanup. For OU1, the short-term effectiveness criterion is primarily related to the volume of contaminated soils addressed in each alternative, the time necessary to implement the remedy, potential risks to workers, and potential impacts to the community during implementation of the remedy.

Each of the active alternatives would have short-term impacts that include increased potential for exposure to lead-contaminated soils and construction-related risks. Potential for exposure to lead-contaminated soils would increase in the short term through creation of dust during excavation activities and increased potential for workers to come in contact with lead-contaminated soils above RALs. Construction-related risks include the potential for vehicle accidents, traffic and noise from construction vehicles, increased wear on local roads, and other risks associated with construction work. These impacts can be mitigated by implementing a project-specific health and safety plan, keeping excavation areas properly wetted to reduce dust generation, planning truck routes to minimize disturbances to the surrounding community, and using other best management practices.

There are no short-term impacts associated with Alternative 1 since no action would be taken. Of the action alternatives, Alternative 3 requires the least disturbance of lead-contaminated soils and the shortest duration of construction. Compared to Alternative 3, Alternatives 4A and 4B present greater short-term impacts because they require a greater amount of material to be moved to and from the site. Construction of these alternatives would also take longer than Alternative 3. The duration of construction work for the action alternatives progresses from an estimated 18 months for Alternative 3, to 26 months for Alternative 4A, to 40 months for Alternative 4B. Increasing the duration of construction means increased truck traffic, potential for vehicle accidents, construction-related and exposure risks to workers, as well as extending the time during which the local community would be subjected to increased dust and noise.

### **2.10.6 - Implementability**

This criterion assesses the technical and administrative feasibility of an alternative and the availability of required goods and services. Technical feasibility considers the ability to construct and operate a technology and its reliability, the ease of undertaking additional remedial actions, and the ability to monitor the effectiveness of a remedy. Administrative feasibility considers the ability to obtain approvals from other parties or agencies and the extent of required coordination with other parties or agencies.

Alternative 1 could easily be implemented as no action would be taken. Alternatives 3, 4A, and 4B are proven, could be readily implemented, and have been used successfully for other environmental cleanup projects. In addition, Alternatives 3, 4A, and 4B could all be completed using readily available conventional earth-moving equipment. EPA expects that most of the necessary services and construction materials are readily available. Qualified commercial contractors with experience are available locally to perform the work.

Alternative 3 would be more difficult to implement than Alternatives 4A and 4B since it requires a more detailed remedial design plan to maintain safe grading for each of the contaminated yards. Raising the grade of each impacted yard by 12 inches under Alternative 3 would pose technical and administrative challenges. The areas where the soil cover must be tied into the existing grade (such as at streets) would require excavation and would likely erode more rapidly than the surrounding areas. This could pose physical safety concerns for the elderly and young. Each yard would need to undergo a custom remedial design to achieve proper storm water drainage.

All of the alternatives are administratively feasible. Although no permits would be required, a similar level of coordination would be needed with state and local parties during design and construction activities for the action alternatives. However, Alternative 3 would likely be more difficult to implement because property owners may not want the grade of their properties raised by 12 inches; access may therefore be difficult to obtain.

### **2.10.7 - Cost**

This criterion evaluates the capital and operation and maintenance costs of each alternative. Present-worth costs are presented to help compare costs among alternatives with different implementation times.

The present worth costs for the alternatives are presented within the descriptions of alternatives in Section 2.9.2 of this ROD. The detailed cost estimates and associated assumptions for all alternatives are in the FS and other documents within the administrative record. The cost estimates are consistent with the level of estimation required in the FS phase. The estimate is within a range of accuracy of +50 to -30 percent. A final cost estimate will be developed and refined during the remedial design process.

Alternative 1 has no associated capital or O&M costs since no action would be taken. The remaining three alternatives are progressively more expensive. Alternative 3 is the least costly action alternative (\$20.9 million) and Alternative 4A is the next most costly option (\$29.9 million). Alternative 4B is the most costly alternative (\$45.4 million), costing more than twice as much as Alternative 3. The cost savings anticipated to be realized in Alternative 4B by not collecting and analyzing post-excavation confirmation samples are more than offset by the increased cost of handling and transporting for off-site disposal a greater volume of soil, since the process of removing all soils down to the native sand would include soils that do not exceed the RALs.

### **2.10.8 - State/Support Agency Acceptance and Community Acceptance**

State/support agency acceptance considers the state's preferences among or concerns about the alternatives, including comments on regulatory criteria or proposed use of waivers. Community acceptance considers the community's preferences or concerns about the alternatives.

The State of Indiana supports the selection of Alternative 4A as the Selected Remedy. The State's concurrence letter is included as Appendix A.

During the public comment period, the community expressed general support for Alternative 4A, although some citizens and the City of East Chicago supported Alternative 4B. All attendees who expressed their opinion at the proposed plan public meeting strongly disliked Alternative 3. A complete list of the public comments and EPA's response to the comments is contained in the *Responsiveness Summary*, which is Part 3 of this ROD. In addition, the transcript from the proposed plan public meeting is included in the administrative record.

### **2.10.9 – Comparative Analysis Summary**

Appendix C provides a summary, in table form, of the comparative analysis of the alternatives described in Sections 2.10.1 through 2.10.8 above.

### **2.11 – Principal Threat Waste**

The NCP establishes an expectation that EPA will use treatment to address the principal threats posed by a site wherever practicable (NCP §300.430(a)(1)(iii)(A)). Identifying principal threat wastes combines concepts of both hazard and risk. In general, principal threat wastes are those source materials considered to be highly toxic or highly mobile which generally cannot be contained in a reliable manner or will present a significant risk to human health or the environment should exposure occur. Conversely, low-level threat wastes are those source materials that generally can be reliably contained and that will present only a low risk in the event of exposure. The manner in which principal threats are addressed generally will determine whether the statutory preference for treatment as a principal element is satisfied.

Wastes that generally will be considered to constitute principal threats include but are not limited to the following:

- **Liquid source material** - wastes contained in drums, lagoons or tanks, or free product in the subsurface (i.e., non-aqueous phase liquids) containing contaminants of concern (generally excluding groundwater).
- **Mobile source material** - surface soil or subsurface soil containing high concentrations of chemicals of concern that are (or potentially are) mobile due to wind entrainment, volatilization (e.g., volatile organic compounds), surface runoff, or subsurface transport.
- **Highly toxic source material** – buried, drummed non-liquid wastes; buried tanks containing non-liquid wastes; or soils containing significant concentrations of highly toxic materials.

Wastes that generally will not constitute principal threats include but are not limited to the following:

- **Non-mobile contaminated source material of low to moderate toxicity** - surface soil containing chemicals of concern that generally are relatively immobile in air or

groundwater (i.e., non-liquid, low volatility, low leachability contaminants such as high molecular weight compounds) in the specific environmental setting.

- **Low toxicity source material** - soil and subsurface soil concentrations not greatly above reference dose levels or that present an excess cancer risk near the acceptable risk range if exposure were to occur.

At OU1 of the USS Lead site, EPA considers soils with lead concentrations exceeding the TC threshold to be principal threat waste that requires chemical stabilization prior to disposal. Without treatment, lead from such soils could potentially leach to groundwater.

Cleanup Alternatives 4A and 4B will best address the principal threat wastes at OU1 by chemically stabilizing those soils with lead concentrations above the TC threshold prior to disposal.

## **2.12 – Selected Remedy**

The Selected Remedy for OU1 of the USS Lead Site is Remedial Alternative 4A: Excavation of Soil Exceeding RALs + Off-site Disposal + *Ex-situ* Treatment Option.

### Summary of the Rationale for the Selected Remedy

EPA chose Alternative 4A as the Selected Remedy because it represents the best balance of the evaluation criteria among all the alternatives. Alternative 4A meets the RAO of reducing exposure of residents to contaminated soils that pose a health risk through the removal and off-site disposal of those soils, and allows for the continued residential use of impacted residential properties within OUI. Alternative 4A is more easily implemented and requires fewer restrictions on property use than Alternative 3, which involves placing a soil cover on the contaminated soil. Alternative 4A also reduces risk within a more reasonable time frame and at a lower cost than the other excavation alternative (Alternative 4B), and provides for long-term reliability of the remedy.

Based on the information available at this time, EPA and the State of Indiana believe that the Selected Remedy will (1) be protective of human health and the environment, (2) comply with ARARs, (3) be cost-effective, and (4) utilize permanent solutions and alternative treatment technologies to the maximum extent practicable. Because it will treat those soils constituting principal threats, the remedy also will meet the statutory preference for the selection of a remedy that involves treatment as a principal element.

### Description of the Selected Remedy

The Selected Remedy achieves protectiveness by removing impacted soil that exceeds RALs, to a maximum excavation depth of 24 inches, while leaving in place soils with concentrations below the RALs. The RALs for lead are 400 mg/kg at residential properties and 800 mg/kg for commercial/industrial properties. The RAL for arsenic is 26 mg/kg. Under the Selected Remedy, soil exceeding RALs will be excavated from impacted yards within OU1 to a maximum depth of 24 inches bgs and transported off-site for disposal at a Subtitle D landfill.

Excavated soil that exceeds the TC regulatory threshold will be chemically stabilized prior to disposal. EPA estimates that soil with lead concentrations above 2,400 mg/kg (an estimated 7% of the excavated yards at OU1) exceeds the TC regulatory threshold and considers these soils to be principal threat waste.

Pre-remedial sampling will be conducted at impacted properties to determine the approximate excavation depth required in each yard, and confirmation samples will be collected as needed during the excavation work to confirm that all soils exceeding RALs within the top 24 inches were excavated. If contaminated soil is identified at a depth greater than 24 inches bgs, a visual barrier such as orange construction fencing or landscape fabric will be placed above the contaminated soil and beneath the clean backfill soil. In such instances, institutional controls will be implemented to ensure that users of the property are not exposed to COCs in soil. The institutional controls will be deed restrictions that will require the use of the proper procedures for handling contaminated material in the event that any future excavation work must intrude into the underlying contamination.

EPA assumes that soil will be loaded directly into roll-off containers and transported to the landfill for disposal. If a stockpiling location that is acceptable to the community is identified, then excavated soils could be stockpiled prior to being transported to the landfill.

Excavated soil will be replaced with clean soil, including 6 inches of top soil, to maintain the original grade. Each yard will be restored as close as practicable to its pre-remedial condition. Once the properties are sodded or seeded, O&M of the sod or seed, including watering, fertilizing, and cutting, will be conducted for 30 days. After the initial 30-day period, property owners will be responsible for the maintenance of their own yards. Since some soil exceeding RALs will likely be left in place at OU1 (e.g. within some yards deeper than 24 inches bgs), statutory five-year reviews of the remedy will be required in accordance with CERCLA.

#### Summary of the Estimated Remedy Costs

The estimated cost of implementing the Selected Remedy at OU1 is \$29.9 million. A detailed cost estimate for the Selected Remedy, Alternative 4A, is included as Appendix D. The cost estimate is based on the best available information regarding the anticipated scope of the remedial alternative. Changes in the cost elements are likely to occur as a result of new information and data that will be collected during the remedial design phase. This is an order-of-magnitude engineering cost estimate that is expected to be within +50 to -30 percent of the actual project cost.

#### Expected Outcome of the Selected Remedy

The expected outcome of the Selected Remedy is that residents in OU1 will no longer be exposed to soil that poses a threat to human health. The land use of the properties will remain unchanged, and the Selected Remedy will allow for the continued residential use of impacted yards. As noted above, some properties may require institutional controls, for those situations where contamination remains in place at depths greater than 24 inches bgs.

## **2.13 – Statutory Determinations**

Under CERCLA §121 and the NCP, the lead agency must select remedies that are protective of human health and the environment, comply with applicable or relevant and appropriate requirements (unless a statutory waiver is justified), are cost-effective, and utilize permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable. In addition, CERCLA includes a preference for remedies that employ treatment that permanently and significantly reduces the volume, toxicity, or mobility of hazardous wastes as a principal element and a bias against off-site disposal of untreated wastes. The following sections discuss how the Selected Remedy meets these statutory requirements.

### **Protection of Human Health and the Environment**

The current and potential future risks at OU1 are due to the presence of lead and arsenic in residential soils. Implementation of the Selected Remedy, Alternative 4A, will be protective of human health and the environment through the removal of soils with lead concentrations above 400 mg/kg at residential properties, schools and parks, 800 mg/kg at commercial or industrial properties, and/or arsenic concentrations above 26 mg/kg. The site-specific RAO was developed to protect current and future receptors that are potentially at risk from exposure to the contaminants at OU1. The Selected Remedy will achieve the RAO. Institutional controls will be employed at those properties where contamination is left in place at depths greater than 24 inches bgs in order to ensure that the remedy remains protective.

### **Compliance with Applicable or Relevant and Appropriate Requirements**

Section 121(d) of CERCLA requires that Superfund remedial actions meet ARARs. Appendix B provides all ARARs that have been identified for the remedial action. The Selected Remedy will comply with the identified ARARs.

### **Cost-Effectiveness**

EPA has concluded that the Selected Remedy is cost-effective and represents a reasonable value for the money to be spent. In making this determination, the following definition was used: “A remedy shall be cost-effective if its costs are proportional to its overall effectiveness” (NCP §300.430(f)(1)(ii)(D)). For OU1, this determination was made by evaluating the “overall effectiveness” of those alternatives that satisfied the threshold criteria (i.e., were both protective of human health and the environment and ARAR-compliant). Overall effectiveness was evaluated by assessing three of the five balancing criteria in combination (long-term effectiveness and permanence; reduction in toxicity, mobility, and volume through treatment; and short-term effectiveness). Overall effectiveness was then compared to costs to determine cost-effectiveness. The relationship of the overall effectiveness of the Selected Remedy was determined to be proportional to its costs. The Selected Remedy therefore represents a reasonable value for the money to be spent.



## **Utilization of Permanent Solutions and Alternative Treatment Technologies (or Resource Recovery Technologies) to the Maximum Extent Practicable**

EPA has determined that the Selected Remedy for OU1 represents the maximum extent to which permanent solutions and treatment technologies can be utilized in a practicable manner. Of those alternatives that are protective of human health and the environment and comply with ARARs, EPA has determined that the Selected Remedy provides the best balance of trade-offs in terms of the five balancing criteria, while also considering the statutory preference for treatment as a principal element and bias against off-site disposal, and considering state and community acceptance. The Selected Remedy removes the contaminated soils at OU1 from the top 24 inches of impacted yards, and treats those materials constituting principal threats. The Selected Remedy therefore provides a permanent solution for both the low-level and principal threat wastes at OU1 that is effective in the long term, and achieves significant reductions in leachability to groundwater. The short-term risks associated with the Selected Remedy are greater than those presented by Alternative 3 and less than those presented by Alternative 4B, but those risks are offset by implementability and cost considerations.

### **Preference for Treatment as a Principal Element**

By treating those soils that exceed the TC threshold prior to disposal, the Selected Remedy addresses the principal threats posed at OU1 through the use of chemical stabilization treatment technologies. By utilizing treatment as a portion of the remedy, the Selected Remedy satisfies to the maximum extent practicable the statutory preference for remedies that employ treatment as a principal element.

### **Five-Year Review Requirements**

Because this remedy will likely result in hazardous substances, pollutants, or contaminants remaining on-site, at depth but above levels that allow for unlimited use and unrestricted exposure, a statutory review will be conducted within five years after initiation of the remedial action to ensure that the remedy is, or will be, protective of human health and the environment.

## **2.14 – Documentation of Significant Changes**

The Proposed Plan for OU1 was released for public comment on July 12, 2012. The Proposed Plan identified as the preferred alternative Remedial Alternative 4A, Excavation of Soil Exceeding RALs + Off-site Disposal + *Ex-situ* Treatment Option. After carefully reviewing all written and verbal comments submitted during the public comment period, EPA has determined that no significant changes to the remedy as originally identified in the Proposed Plan are necessary or appropriate. While not considered a significant change, EPA notes that the cost estimates and estimated construction timeframes for Alternatives 3, 4A and 4B are slightly different in the ROD than in the Proposed Plan. After release of the Proposed Plan, the cost and time estimates were revised as a result of refined estimates of the volume of contamination that would need to be addressed under each of the alternatives. The revised cost and time estimates neither impact the outcome of the comparison of alternatives nor alter EPA's selection of Alternative 4A as the Selected Remedy.

## **Part 3 – Responsiveness Summary**

The Proposed Plan for the USS Lead Site was released for public comment on July 12, 2012. At the request of the City of East Chicago, Indiana, EPA extended the public comment period for thirty days until September 12, 2012. EPA held a public meeting in East Chicago, Indiana, on July 25, 2012, to describe the Proposed Plan and answer questions about the different cleanup alternatives. The public meeting also provided the community with an opportunity to comment on the proposed cleanup alternative and the other alternatives evaluated. EPA received several general comments and a few technical comments at the public meeting. Additional comments were provided to EPA in writing during the comment period. These comments and responses are divided into two parts in this *Responsiveness Summary*. Part 1 includes general stakeholder issues and lead agency responses. Part 2 includes specific technical comments related to the alternatives evaluated in the Proposed Plan.

### **3.1 – Stakeholder Comments and Lead Agency Responses**

**Comment:** A resident expressed support for EPA's preferred remedy (Alternative 4A).

**Response:** EPA has noted the support.

**Comment:** Two persons stated that EPA should select Alternative 4B.

**Response:** EPA carefully considered Alternative 4B during its comparative analysis of the various cleanup alternatives. Under Alternative 4B, impacted yards would be excavated down to native sand without confirmation sampling, which means that clean soils that do not exceed RALs would also be excavated and transported off-site for disposal along with contaminated soils. EPA selected Alternative 4A, which excavates contaminated soils to a maximum depth of 24 inches and includes confirmation sampling, because it represents the best balance of the evaluation criteria. EPA determined that Alternative 4B is not significantly more protective in the long term than Alternative 4A. It is, however, much more expensive, would take longer to implement, and would pose higher short-term risks to the community than Alternative 4A. Because Alternative 4B is estimated to cost about \$15 million more than Alternative 4A while providing only an insignificant increase in long-term effectiveness, it is much less cost effective than Alternative 4A. Both alternatives remove all of the soils above RALs that pose a risk to residents – namely the contamination within the top two feet of impacted yards.

**Comment:** Several persons commented that EPA should conduct medical testing of residents in the area, particularly lifelong residents. One commenter stated that she is a life-long resident of the area and suffer from illnesses.

**Response:** EPA does not intend to conduct medical testing as a part of the remedy. EPA is confident that the remedy, once implemented, will reduce to an acceptable level the risk to human health and the environment posed by lead- and arsenic-contaminated soils. Section 104 of CERCLA (the Superfund law) authorized the creation of the Agency for Toxic Substances and Disease Registry (ATSDR). ATSDR has the primary

responsibility at the federal level for performing health assessments. The Indiana Department of Health and the Lake County, Indiana, Department of Health may also be better positioned to address these concerns.

**Comment:** A commenter requested that EPA conduct health studies on residents in conjunction with implementation of the remedy. The commenter stated that they are a life-long resident of the area and suffer from illnesses.

**Response:** EPA conducts cleanups based upon the current or future risk of human or environmental exposure to contaminated material. This approach is conservative in that there does not need to be actual current exposure – or evidence of adverse impacts to human health or the environment – for EPA to require a cleanup. Health studies are based upon current conditions and at USS Lead would reflect how current residents are using their yards. As future residents may use yards differently than current residents, health studies done on current residents may not reflect future health risks posed to future residents. For these reasons, EPA does not conduct health studies as a part of the remedy selection process.

**Comment:** EPA should not dispose of contaminated soil removed from the USS Lead Site at the new East Chicago Landfill.

**Response:** EPA does not yet know where the contaminated soil excavated from OUI will be sent for disposal. EPA does not always select the disposal location during the remedy selection process, but does require that the disposal location be permitted to accept the waste materials from the site and be in compliance with federal and state regulations. EPA will decide where to dispose of the contaminated soil from OUI during the remedial design phase.

**Comment:** One commenter stated that he did not believe the soil at his property is contaminated and for that reason does not want his property excavated.

**Response:** EPA will respect the wishes of individual homeowners if they refuse access to their property, though it strongly encourages homeowners to allow their yards to be tested and remediated if appropriate. All testing and cleanup work will be conducted at no cost to the property owner.

**Comment:** The City of East Chicago commented that EPA should consider area restoration and reuse and partner with the city throughout the cleanup process.

**Response:** The area that makes up OUI of the USS Lead Site is predominantly residential. EPA's Selected Remedy will maintain current land uses within OUI. Further, the Selected Remedy does not prevent construction or redevelopment at any property within OUI, although if any properties have contamination left behind deeper than 24 inches bgs, institutional controls would require that all subsurface work at those properties be done in accordance with approved procedures. Additionally, EPA will communicate and coordinate closely with the city during the OUI cleanup process.

### 3.2 – Technical and Legal Issues

**Comment:** EPA should evaluate use of the USS Lead property as a disposal facility.

**Response:** EPA does not intend to dispose of contaminated material at the USS Lead facility (OU2) for the following reasons: (1) The residential portion of the USS Lead Site is located within an environmental justice community that is already home to several disposal facilities. Further disposal at the USS Lead property, immediately adjacent to the southern edge of OU1, would increase the environmental burden already borne by the residents of OU1; (2) contamination still remains at the USS Lead property that requires further evaluation; and, (3) some of the material that will be excavated and require disposal will be a hazardous waste; the corrective action management unit located within the USS Lead facility is not a hazardous waste landfill and cannot accept such wastes.

**Comment:** The ATSDR's January 27, 2011, report does not support EPA's determination that the USS Lead Site requires a cleanup.

**Response:** ATSDR's statement that, "Breathing the air, drinking tap water or playing in soil in neighborhoods near the USS Lead Site is not expected to harm people's health," is based upon low blood lead levels in children within East Chicago. In determining whether to perform response actions, EPA evaluates the current and potential threats to human health and the environment posed by exposure to hazardous substances. EPA estimates these threats by using risk calculations that are based upon the physical characteristics of the site and the general characteristics of the hazardous substances. Present day blood lead levels reflect neither current nor future risk of exposure. EPA has analyzed the current and potential threats posed by contaminated soil within the residential portion of the USS Lead Site and concluded that soils with lead levels exceeding 400 mg/kg and arsenic levels exceeding 26 mg/kg pose a risk to the health of residents living within OU1. EPA has concluded that these conditions require it to undertake response actions.

**Comment:** Several persons commented that a RAL for lead of 400 mg/kg is too conservative. They recommended that EPA calculate a site-specific Preliminary Remediation Goal for lead and noted that the RAL of 400 mg/kg (the standard output from the IEUBK model) is not site-specific. They also stated that EPA should perform a bioavailability study for the site, and argued that a bioavailability study would likely conclude that lead in the residential portion of the USS Lead Site poses a low risk because it is not readily bioavailable.

**Response:** EPA did evaluate the use of site-specific inputs for the IEUBK model but decided to use the IEUBK model set to the general default parameters. EPA compared the available site-specific data with the default parameters and concluded that the site-specific information was not significantly different from the default inputs. For example, EPA looked at lead uptake through drinking water at the USS Lead site. The source drinking water lead data is from samples collected annually by the City of East Chicago at 30 residential taps within East Chicago. In 2011, the lead in drinking water in East Chicago was reported as 3.6 ppb (or 4 ppb if you round up to the nearest integer). The

default drinking water input for the IEUBK model is 4 ppb. As these concentrations are not significantly different, EPA deemed it appropriate to use the base input parameter.

**Comment:** EPA should not select cleanup Alternative 4A (excavation with confirmation sampling to a maximum depth of 24 inches) as it is not cost effective. The commenter added that Alternative 3 (installation of a 12-inch soil cap) is cost effective and should be the selected remedy.

**Response:** EPA determines cost effectiveness by comparing the cost of an alternative with its long-term effectiveness and permanence, reduction of toxicity, mobility, or volume through treatment, and short-term effectiveness. Alternative 3 would leave all contaminated materials in place and would introduce topographic changes to the properties. These changes would need to be maintained to ensure the remedy's permanence and long-term effectiveness. Alternative 4A removes the soil contamination within the top two feet bgs and restores yards to their existing topography, so erosion of soil barriers is not a concern with Alternative 4A. Alternative 4A therefore offers greater long-term effectiveness and permanence than Alternative 3. Alternative 4A represents the best combination of all the balancing criteria. Alternative 4A will also treat those soils considered to be principal threat waste, while the principal threat waste would go untreated in Alternative 3. For these reasons, Alternative 4A is more cost-effective than Alternative 3, despite its higher absolute cost.

**Comment:** One commenter stated that it is inappropriate for EPA to require the excavation of all soils at yards down to 24 inches if EPA collects a single sample with a concentration of lead above 400 mg/kg.

**Response:** The commenter's statement is not accurate. Under Alternative 4A, the decision to clean up any given yard will typically be made based on the results of composite soil samples collected from discrete 6-inch horizons. A composite soil sample combines the soil collected from several different areas within the yard, and therefore represents the average concentration in that yard. The only exception to this is that single, discrete soil samples will be considered when evaluating the contamination levels in gardens and play areas. Additionally, contaminated yards will not automatically be excavated to the depth of 24 inches. The maximum excavation depth is 24 inches, but could be less based on the amount of contamination present in a particular yard.

**Comment:** Alternative 3 would be preferable to the community as it is less intrusive in the community.

**Response:** During the public meeting on July 25, 2012, the community expressed general disapproval of Alternative 3.

**Comment:** USS Lead Refinery, Inc. is bankrupt and unable to fund a cleanup.

**Response:** EPA's remedy selection process is independent of available funding. EPA intends to pursue other potentially responsible parties to design and conduct the Selected Remedy.

**Comment:** It is unclear if EPA followed the *Superfund Lead-Contaminated Residential Sites Handbook* in consideration of future land use or sampling techniques.

**Response:** EPA followed the Residential Lead Sites Handbook throughout the RI and FS processes, including sampling techniques and consideration of future land use.

**Comment:** The *Superfund Lead-Contaminated Residential Sites Handbook* is not straightforward.

**Response:** EPA disagrees with this comment and is confident in its ability to follow and interpret the cited document.

**Comment:** Several persons commented that EPA should consider alternative remediation techniques.

**Response:** EPA did consider alternative remediation techniques during the Feasibility Study. In-situ treatment technologies for soils contaminated with metals largely consist of encapsulation or the introduction of soil amendments to make the metals less bioavailable. These technologies show promise but the duration of their effectiveness is not yet known. It is possible that following treatment, metals over time may again become bioavailable. For these reasons, EPA decided that an alternative treatment technology remedy for OU1 of the USS Lead Site would not be protective of human health and the environment. EPA elected not to carry an alternative remediation technique remedy forward into the final array of cleanup alternatives.

**Comment:** The City of East Chicago stated its support for Alternative 4B (excavation down to native sand without confirmation sampling) over Alternative 4A (excavation to a maximum depth of 24 inches with confirmation sampling) because the former is more protective than Alternative 4A.

**Response:** EPA has determined that at OU1 of the USS Lead Site, soils that exceed RALs in the top 24 inches of residential yards pose a threat to current and future residents. Alternative 4A may leave some contaminated soil deeper than 24 inches bgs at a limited number of yards, but EPA has concluded that soil deeper than 24 inches does not pose a risk to residents, and institutional controls will be implemented in situations where contamination remains at depth. Alternative 4B is not significantly more protective in the long term than Alternative 4A. It is, however, much more expensive, would take longer to implement, and would pose higher short-term risks to the community than Alternative 4A. Because Alternative 4B is estimated to cost about \$15 million more than Alternative 4A while providing only an insignificant increase in long-term effectiveness, it is much less cost effective than Alternative 4A. Both alternatives remove all of the soils above RALs that pose a risk to residents – namely the contamination within the top two feet of impacted yards.

**Comment:** The City of East Chicago supports Alternative 4B over Alternative 4A because excavation to native sand would not leave in place any contaminated soil. If contaminated soil is left in place, the remedy requires the installation of subsurface barriers, maintenance of a soil cover, and the recording of deed restrictions or other requirements for construction activities at some properties located within the site. Alternative 4B is consistent with EPA's *Superfund Lead-Contaminated Residential Sites Handbook* that sets forth EPA's preference for permanent remedies that allow for remediated yards to be returned to unrestricted use. Furthermore, leaving contaminated material below 24 inches will make it more difficult or costly for the city or others to redevelop properties.

**Response:** EPA recognizes that leaving some contaminated soils in place imposes burdens on the city and affected property owners. EPA has concluded, however, that these burdens do not warrant the expenditure of an additional \$15 million when the expenditure will not yield any greater protection of human health or the environment.

**Comment:** A reader cannot determine which properties are to be remediated.

**Response:** EPA intentionally removed references to individual addresses out of concern for the privacy of the property owners.

**Comment:** There are areas of the RI/FS in which EPA's data analysis is not transparent. Also, the text and tables present conflicting information. Finally, steps could be taken to increase the clarity of EPA's data analysis.

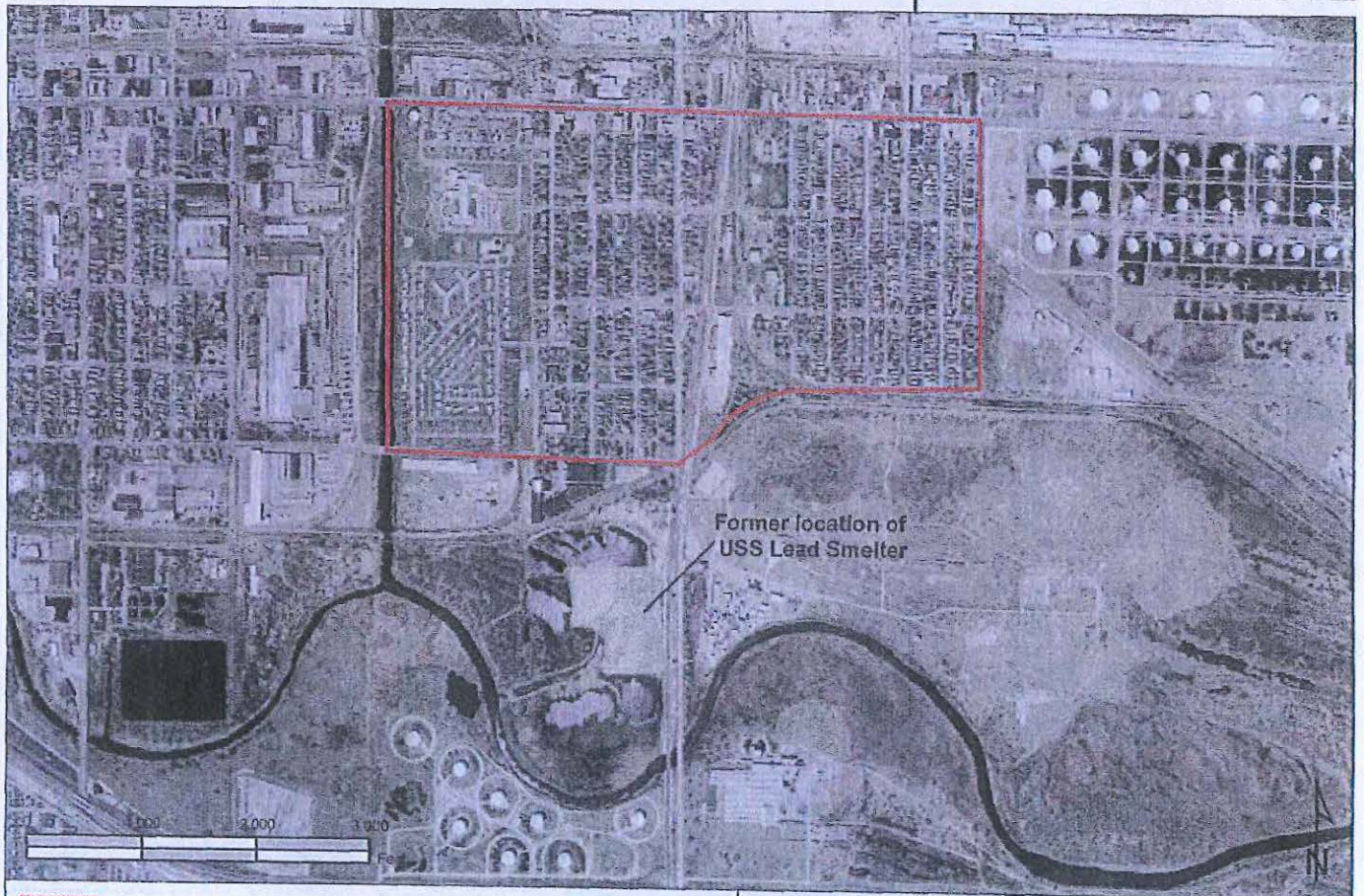
**Response:** EPA is not aware of places within the RI/FS where statements in the text conflict with information presented in the tables. EPA has provided tables to indicate which data were included in statistics and how they were evaluated. The Human Health Risk Assessment Appendix to the RI contains close to 1700 pages of detailed tables that provide the data EPA considered for its evaluation of risks to human health. Section 5.2 of the RI contains a detailed description of the data upon which the RI is based. Section 5.3 of the RI contains a detailed description of the statistical treatment of data and data used for each contaminant of concern.


**Comment:** It is difficult to follow EPA's calculations for the purpose of estimating remedial volume.

**Response:** Volume estimates are based on a number of factors, including the number of yards within each sub-area of the site, the average yard size for different types of properties, the proportion of those yards estimated to require cleanup, and the anticipated depths of excavation for the various different remedial alternatives. EPA calculated these volumes based on the information it collected during the RI so that it could conduct a comparison of relative costs of cleanup alternatives. During the remedial design phase, EPA will calculate more precise remedial volumes based upon data from many, if not all, of the properties in OUI.

## FIGURES





 OU1 boundary

Imagery sources (clockwise from upper left):  
 ESRI Resource Center  
 Google Maps  
 ISDP (Indiana Spatial Data Portal)

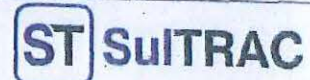


US SMELTER & LEAD REFINERY  
 LAKE COUNTY, EAST CHICAGO, INDIANA

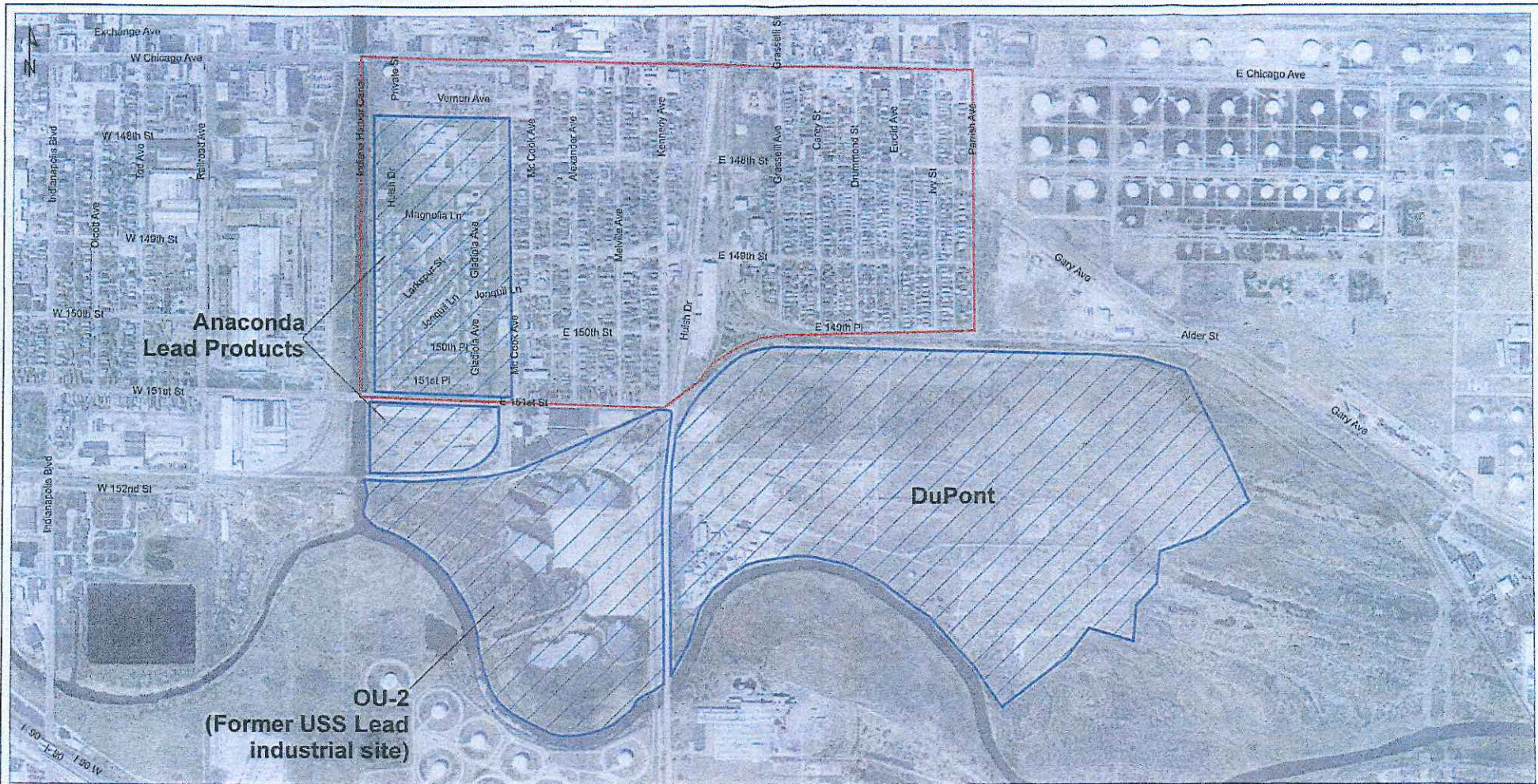
RECORD OF DECISION

**FIGURE 1**  
**USS LEAD RESIDENTIAL AREA**  
**SITE LOCATION MAP**

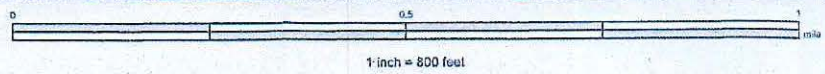
EPA REGION 5 RAC 2 | REVISION 0 | AUGUST 2012







- OU-1 boundary
- Industrial sites

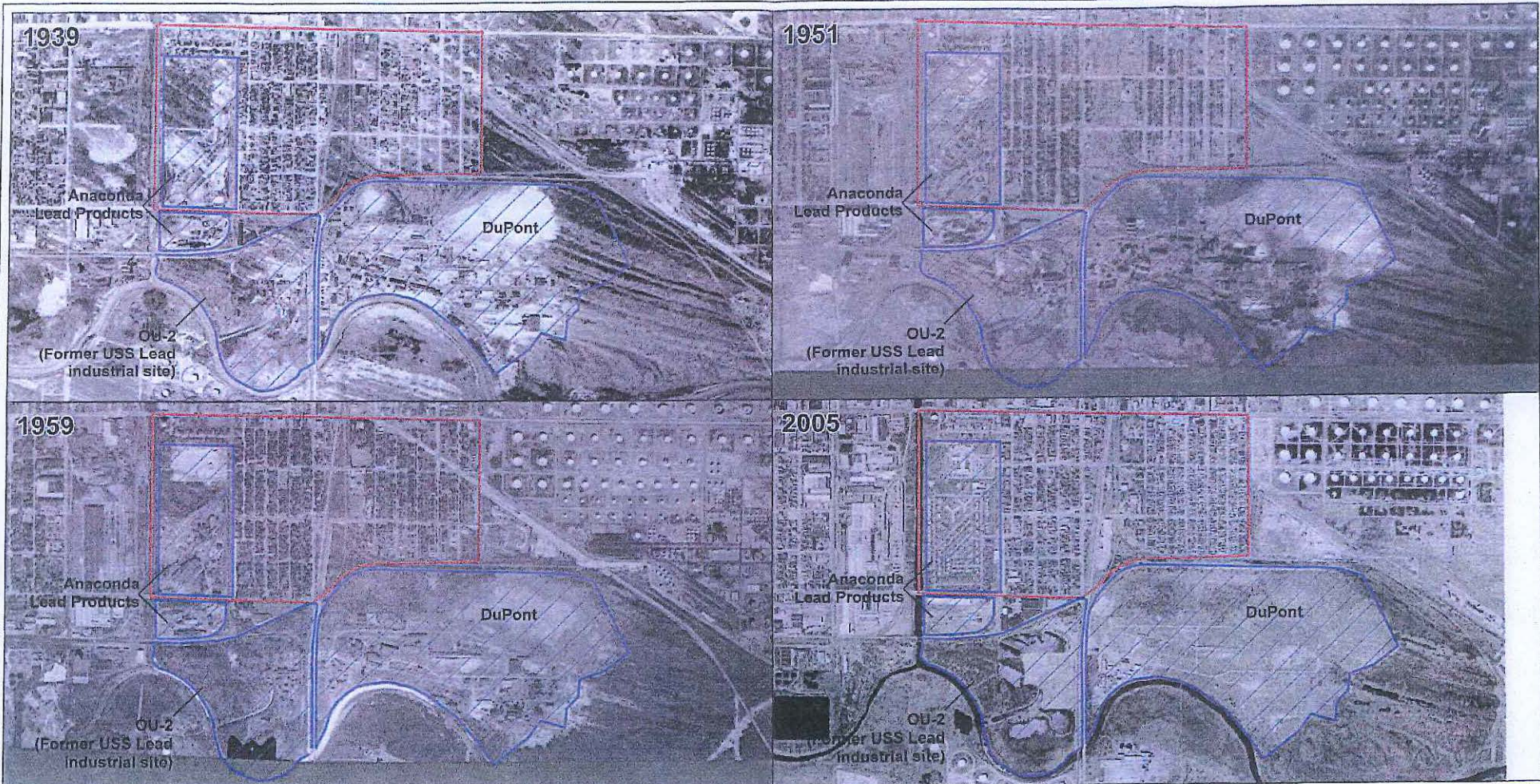




Imagery source:  
ISDP (Indiana Spatial Data Portal)

US SMELTER & LEAD REFINERY  
 LAKE COUNTY, EAST CHICAGO, INDIANA  
 RECORD OF DECISION  
**FIGURE 2**  
 HISTORICAL OVERVIEW OF STUDY AREA  
 EPA REGION 5 FAC 2 | REVISION 6 | AUGUST 2012

**ST** SulTRAC





 OU-1 boundary  
 Industrial sites

Imagery sources (clockwise from upper left):  
 Indiana State Archives,  
 USGS EarthExplorer,  
 ISDP (Indiana Spatial Data Portal),  
 USGS EarthExplorer

Note: Graphic scale is approximate for the 1939, 1951 & 1959 imagery

0 1,000 2,000 3,000 4,000 5,000 approximate feet      1 inch approximately = 1,500 feet

▲ N



US SMELTER & LEAD REFINERY  
 LAKE COUNTY, EAST CHICAGO, INDIANA

RECORD OF DECISION

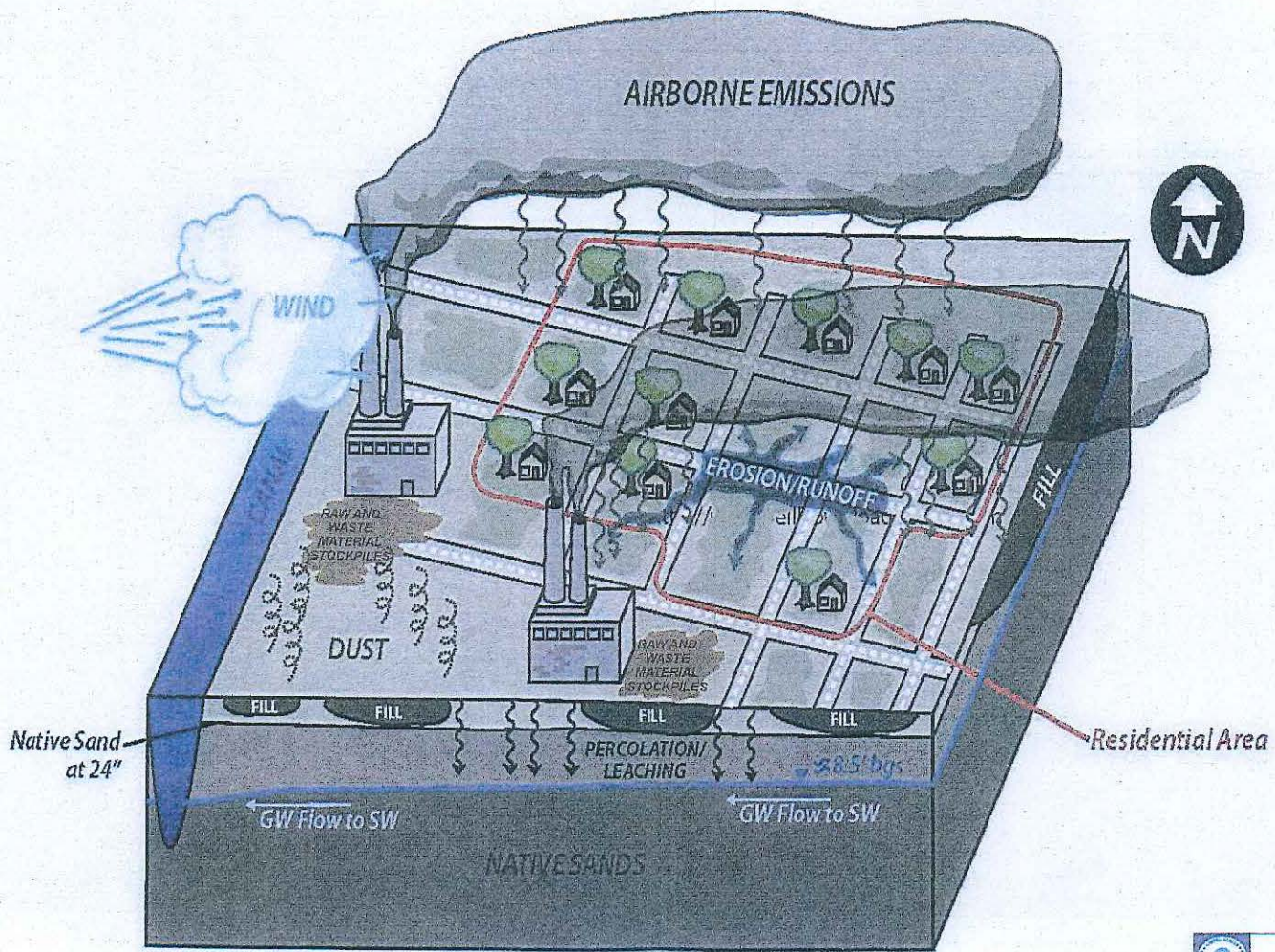
**FIGURE 3**



HISTORICAL IMAGERY

EPA REGION 5 FAC 2 | REVISION 0 | AUGUST 2012

**ST** SulTRAC





	US SMELTER & LEAD REFINERY LAKE COUNTY, EAST CHICAGO, INDIANA
	RECORD OF DECISION
	<b>FIGURE 4</b>
	CONCEPTUAL SITE MODEL
EPA REGION 5 RAC 2   REVISION 0   AUGUST 2012	
	

APPENDIX A  
State Concurrence Letter



INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT  
*We Protect Hoosiers and Our Environment.*

*Mitchell E. Daniels, Jr.*  
Governor

*Thomas W. Easterly*  
Commissioner

100 North Senate Avenue  
Indianapolis, Indiana 46204  
(317) 232-8603  
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[www.idem.IN.gov](http://www.idem.IN.gov)

September 25, 2012

Ms. Susan Hedman  
Regional Administrator  
U.S. EPA, Region V  
77 West Jackson St.  
Chicago, Illinois 60604-3507  
Mail Code: SRF-6J

Dear Ms. Hedman:

Re: Draft Record of Decision (ROD)  
USS Lead Superfund Site  
East Chicago, Indiana

The Indiana Department of Environmental Management (IDEM) has reviewed the U.S. Environmental Protection Agency's draft Record of Decision (ROD) document for the USS Lead Superfund site in East Chicago, Indiana. IDEM is in full concurrence with the major components of the selected remedy outlined in the document which include the following:

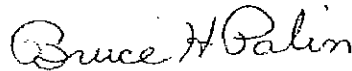
- Excavation of impacted soils that exceed Remedial Action Levels (RALs) to a maximum depth of two feet below the ground surface (bgs) and replacement with clean soil.
- Chemical stabilization of excavated soils, as necessary prior to disposal, to address soils exceeding the toxicity characteristic (TC) regulatory threshold.
- Disposal of excavated soils at an off-site Subtitle D landfill.
- Placement of a buried visual barrier, such as orange construction fencing, above soils exceeding the RALs if such soils are identified at a depth greater than two feet bgs, and the placement of Environmental Restrictive Covenants (ERCs) to protect the barrier.

Ms. Susan Hedman  
Page 2

IDEM staff agree that the selected remedy is protective of human health and the environment, complies with Federal and State requirements that are legally applicable or relevant and appropriate to the remedial action, and is cost effective. IDEM staff have been working closely with Region V staff in the selection of an appropriate remedy and are satisfied with the selected alternative.

Please be assured that IDEM is committed to accomplish cleanup at all Indiana sites on the National Priorities List and intends to fulfill all obligations required by law to achieve that goal. We look forward to beginning remediation work on this project.

Sincerely,



Bruce H Palin  
Assistant Commissioner  
Office of Land Quality

BP:DP:bl

cc: Peggy Dorsey, IDEM  
Bruce Oertel, IDEM  
Rex Osborn, IDEM  
Michael Berkoff, EPA

## APPENDIX B

### List of Applicable or Relevant and Appropriate Requirements



**APPENDIX B**  
**List of Applicable or Relevant and Appropriate Requirements**  
**USS Lead Site, OU1**  
**East Chicago, Indiana**

Applicable/ Relevant and Appropriate Requirements	Description	Type of ARAR	Applicable/ Relevant and Appropriate	Comment
<b>CLEAN AIR ACT (CAA) of 1974</b>				
42 USC Section 7401-7671	The Act is intended to protect the quality of air and promote public health. Title I of the Act directed the U.S. Environmental Protection Agency (EPA) to publish national ambient air quality standards for "criteria pollutants." In addition, EPA has provided national emission standards for hazardous air pollutants under Title III of the Act. Hazardous air pollutants are also designated hazardous substances under CERCLA. The Clean Air Act amendments of 1990 greatly expanded the role of National Emission Standards for Hazardous Air Pollutants by designating 179 new hazardous air pollutants and directed EPA to attain maximum achievable control technology standards for emission sources. Such emission standards are potential ARARs if selected remedial technologies produce air emissions of regulated hazardous air pollutants.	Action-specific	Applicable	The Act is considered an ARAR for remedies that involve creation of air emissions, such as excavation activities that might create dust. Also includes emissions rules that apply to equipment working on the project (based on date of manufacture and/or rebuild and/or overhaul).
<b>FLOODPLAIN MANAGEMENT EXECUTIVE ORDER No. 11988</b>				
40 CFR Part 6, Appendix A	Requires federal agencies to evaluate the potential adverse effects associated with direct and indirect development of a floodplain. Alternatives that involve modification/ construction within a floodplain may not be	Location-specific	Applicable	The Act is considered an ARAR as some properties within OU1 are adjacent to the Calumet Canal which feeds into the Grand Calumet River.

**APPENDIX B**  
**List of Applicable or Relevant and Appropriate Requirements**  
**USS Lead Site, OU1**  
**East Chicago, Indiana**

Applicable/ Relevant and Appropriate Requirements	Description	Type of ARAR	Applicable/ Relevant and Appropriate	Comment
	selected unless a determination is made that no practicable alternative exists. If no practicable alternative exists, potential harm must be minimized and action taken to restore and preserve the natural and beneficial values of the floodplain.			
<b>CLEAN WATER ACT (CWA) OF 1977</b>				
Protection of Wetlands Executive Order 11990 [40 CFR Part 6, Appendix A]	Under this Order, federal agencies are required to minimize the destruction, loss, or degradation of wetlands, and preserve and enhance natural and beneficial values of wetlands. If remediation is required within wetland areas and no practical alternative exists, potential harm must be minimized and action taken to restore natural and beneficial values.	Location-specific	Applicable	Applicability will be determined by location of wetlands, if any, along Grand Calumet River
Federal Water Pollution Control Act Section 401: Water Quality Certification	Establishes a permit program to regulate a discharge into the navigable waters of the U.S., including wetlands.	Action-specific	Relevant and Appropriate	

**APPENDIX B**  
**List of Applicable or Relevant and Appropriate Requirements**  
**USS Lead Site, OUI**  
**East Chicago, Indiana**

Applicable/ Relevant and Appropriate Requirements	Description	Type of ARAR	Applicable/ Relevant and Appropriate	Comment
National Pollutant Discharge Elimination System 33 U.S.C. §§1251-1387 Clean Water Act NPDES Permit Program (40 CFR 122)	Regulates discharges of pollutants to navigable waters.	Action-specific and may be Chemical-specific	Relevant and Appropriate	Applies to disturbances of one acre or more of total land area and disturbances of less than one acre of land that are part of a larger common plan of development or sale if the larger common plan will ultimately disturb one or more acres of land.
<b>FISH AND WILDLIFE COORDINATION ACT</b>				
Fish and Wildlife Coordination Act; 16 U.S.C. §§661 et seq. 16 USC 742a 16 USC 2901 40 CFR 6.302 50 CFR 402	Actions that affect species/habitat require consultation with U.S. Department of Interior, U.S. Fish and Wildlife Service, and National Marine Fisheries Service, and/or state agencies, as appropriate, to ensure that proposed actions do not jeopardize the continued existence of the species or adversely modify or destroy critical habitat. The effects of water-related projects on fish and wildlife resources must be considered. Action must be taken to prevent, mitigate, or compensate for project-related damages or losses to fish and wildlife resources. Consultation with the responsible agency is also strongly recommended for on-site actions. Under 40 CFR Part 300.38, these requirements apply to all response activities under the National Contingency Plan.	Location-specific	Applicable	

**APPENDIX B**  
**List of Applicable or Relevant and Appropriate Requirements**  
**USS Lead Site, OU1**  
**East Chicago, Indiana**

Applicable/ Relevant and Appropriate Requirements	Description	Type of ARAR	Applicable/ Relevant and Appropriate	Comment
<b>RESOURCE CONSERVATION AND RECOVERY ACT OF 1976</b>				
Off-Site Land Disposal Subtitle C [40 CFR 260-268]	Soil and/or sediment that is excavated for off-site disposal and constitutes a hazardous waste must be managed in accordance with the requirements of RCRA.	Action-specific	Applicable	Applicable for management of soils that are characteristic hazardous wastes.
Land Disposal Restrictions [40 CFR 268.2]	The land disposal restrictions (LDR) provide a second measure of protection from threats posed by hazardous waste disposal by ensuring that hazardous waste cannot be placed on the land until the waste meets specific treatment standards to reduce the mobility or toxicity of its hazardous constituents. Hazardous waste destined for land disposal must meet the applicable Land Disposal Regulations of 40 CFR 268.	Action-specific	Relevant and Appropriate	Relevant for treatment of soils that are characteristic hazardous wastes.
Land Treatment [40 CFR 264.270 to 264.283 Subpart M]	Establishes standards applicable for owners and operators of facilities that treat or dispose of hazardous waste in land treatment units to ensure that hazardous constituents placed in or on the treatment zone are degraded, transformed, or immobilized within the treatment zone.	Action-specific	Relevant and Appropriate	Applicable if treatment of residue piles to render them non-hazardous occurs in a land treatment unit.
Special Provisions for Cleanup [40 CFR 264.550 to 264.555 Subpart S]	Establishes standards for corrective action management units, temporary units, and staging piles.	Action-specific	Applicable	Staging piles or temporary units may be needed for residue that may be a characteristic hazardous waste.

**APPENDIX B**  
**List of Applicable or Relevant and Appropriate Requirements**  
**USS Lead Site, OUI**  
**East Chicago, Indiana**

Applicable/ Relevant and Appropriate Requirements	Description	Type of ARAR	Applicable/ Relevant and Appropriate	Comment
Miscellaneous Units [40 CFR 264.600 to 264.603 Subpart X]	Establishes design and operating requirements, detection and monitoring requirements, and requirements for responses to releases of hazardous waste or hazardous constituents from the unit.	Action-specific	Applicable/Relevant and Appropriate	ARAR if treatment or storage of the TCLP hazardous materials is in miscellaneous units.
Definition of a hazardous waste [40 CFR 261.3(d) and 329 IAC 3.1]	Applies to contaminated containment components, contaminated soils, and structures and equipment contaminated with waste.	Action-specific	Relevant and Appropriate	Substantive requirements are ARARs for identifying and managing characteristic hazardous waste.
Hazardous waste determination [40 CFR 262.11 and 329 IAC 3.1-6]	Requires that a proper hazardous waste determination must be made on all wastes generated from remedial actions.	Action-specific	Relevant and Appropriate	Substantive requirements are ARARs for identifying and managing characteristic hazardous waste.
Pre-Transportation Requirements [40 CFR 262.30, 262.31, 262.32, and 262.33 and 329 IAC 3.1-7 and 329 IAC 3.1-8]	All hazardous waste must be properly packaged, with labels, markings, and placards, prior to transport.	Action-specific	Relevant and Appropriate	
Standards applicable to the generators of hazardous waste - The manifest [40 CFR 262, Subpart B and 329 IAC 3.1-7 and 329 IAC 3.1-8]	Hazardous waste stored on-site in containers for greater than 90 days shall be managed in accordance with 40 CFR 262, Subpart B (329 IAC 3.1-7 and 329 IAC 3.1-8).	Action-specific	Applicable	

**APPENDIX B**  
**List of Applicable or Relevant and Appropriate Requirements**  
**USS Lead Site, OUI**  
**East Chicago, Indiana**

Applicable/ Relevant and Appropriate Requirements	Description	Type of ARAR	Applicable/ Relevant and Appropriate	Comment
Standards applicable to the generators of hazardous waste - The manifest [40 CFR 262, Subpart B and 329 IAC 3.1-7 and 329 IAC 3.1-8]	Hazardous waste must be manifested as such for transport to a permitted treatment, storage, or disposal facility (TSDF)	Action-specific	Relevant and Appropriate	
Standards for owners and operators of hazardous waste treatment, storage, and disposal facilities - Waste piles [40 CFR 264, Subpart L]	Any excavated contaminated soils must not be placed back on the ground so as to create a waste pile. Covered rolloff containers may be used.	Action-specific	Relevant and Appropriate	
Use and management of containers [40 CFR 265, Subpart I and 329 IAC 3.1-10]	Hazardous waste stored on-site in containers for 90 days or less shall be managed in accordance with the standards of 40 CFR 265, Subpart I (329 IAC 3.1-10).	Action-specific	Relevant and Appropriate	
<b>SOLID WASTE DISPOSAL ACT</b>				
Identification and Listing of Hazardous Waste (40 CFR 261) Subpart B	Sets criteria for identifying a hazardous waste.	Action-specific	Relevant and Appropriate	

**APPENDIX B**  
**List of Applicable or Relevant and Appropriate Requirements**  
**USS Lead Site, OU1**  
**East Chicago, Indiana**

Applicable/ Relevant and Appropriate Requirements	Description	Type of ARAR	Applicable/ Relevant and Appropriate	Comment
Identification and Listing of Hazardous Waste (40 CFR 261) Subpart C	Identifies the characteristics of a hazardous waste.	Action-specific	Relevant and Appropriate	
Identification and Listing of Hazardous Waste (40 CFR 261) Subpart D, List of Hazardous Waste	Lists hazardous waste from sources	Action-specific	Relevant and Appropriate	
Standards for Hazardous Waste Generators (40 CFR 263)	General requirements for packaging, labeling, marking, and manifesting hazardous wastes for temporary storage and transportation off-site	Action-specific	Applicable	
Solid Wastes (40 CFR 264), Subpart D	Hazardous waste and debris may be placed in units known as containment buildings for the purpose of interim storage or treatment.	Action-specific	Applicable	
<b>ENDANGERED SPECIES ACT</b>				
Endangered Species Act [16 USC 1531]; 50 CFR 200	Requires that federal agencies ensure that any action authorized, funded, or carried out by the agency is not likely to jeopardize the continued existence of any threatened or endangered species or adversely modify critical habitat.	Location-specific	Applicable	No endangered species are known to be present on the site that would be affected by remedial actions.

**APPENDIX B**  
**List of Applicable or Relevant and Appropriate Requirements**  
**USS Lead Site, OU1**  
**East Chicago, Indiana**

Applicable/ Relevant and Appropriate Requirements	Description	Type of ARAR	Applicable/ Relevant and Appropriate	Comment
<b>NATURAL HISTORIC PRESERVATION ACT</b>				
National Historic Preservation Act [16 USC 661 et seq.] 36 CFR Part 65	Establishes procedures to provide for preservation of scientific, historical, and archaeological data that might be destroyed through alteration of terrain as a result of a federal construction project or a federally licensed activity or program. If scientific, historical, or archaeological artifacts are discovered at the site, work in the area of the site affected by such discovery will be halted pending a completion of any data recovery and preservation activities required pursuant to the act and any implementing regulations.	Location-specific	Applicable	No part of the USS Lead Residential Area is listed on the national register of historic places. Would be applicable during remedial activities if scientific, historic, or archaeological artifacts are identified during implementation of the remedy.
<b>DEPARTMENT OF TRANSPORTATION</b>				
Requirements for the Transport of Hazardous Materials [40 CFR 172]	Transportation of hazardous materials on public roadways must comply with the requirements.	Action-specific	Applicable	
<b>OTHER FEDERAL GUIDELINES TO BE CONSIDERED</b>				
Integrated Risk Information System (IRIS)	Risk reference doses (RfD) are estimates of daily exposure levels that are unlikely to cause adverse non-carcinogenic health effects over a lifetime. Cancer Slope Factors (CSF) are used to compute the incremental cancer risk from exposure to site	Chemical-specific	To Be Considered	Levels may be considered for use as cleanup goals.



**APPENDIX B**  
**List of Applicable or Relevant and Appropriate Requirements**  
**USS Lead Site, OUI**  
**East Chicago, Indiana**

Applicable/ Relevant and Appropriate Requirements	Description	Type of ARAR	Applicable/ Relevant and Appropriate	Comment
	contaminants and represent the most up-to-date information on cancer risk from EPA's Carcinogen Assessment Group.			
EPA Regional Screening Levels	EPA Regional Screening Levels (RSLs and associated guidance necessary to calculate them) are risk-based screening levels developed using risk assessment guidance from the USEPA Superfund program. These are risk-based concentrations derived from standardized equations combining exposure information assumptions with USEPA toxicity data. Screening levels are considered to be protective for humans over a lifetime; however, screening levels do not address non-human health endpoints, such as ecological impacts.	Chemical-specific	To Be Considered	Levels may be considered for use as cleanup goals.
EPA Area of Contamination Policy under RCRA	Allows wastes within an Area of Contamination to be consolidated and treated in-situ without triggering RCRA LDRs or minimum technology requirements. This policy does not have the effect of law.	Action-specific	To Be Considered	Applicable to on-site consolidation, treatment and covering/capping of soils and sediments.
EPA's Contained-in Policy under RCRA	Deals with management of remediation waste. This policy does not have the effect of law.	Action-specific	To Be Considered	
Occupational Safety and Health Act [29 CFR 61]	The Act was passed in 1970 to ensure worker safety on the job. Worker safety at hazardous waste sites is addressed under 29 CFR 1910.120:	Action-specific	Applicable	The Act is considered an ARAR for construction activities performed during the implementation of remedies.

**APPENDIX B**  
**List of Applicable or Relevant and Appropriate Requirements**  
**USS Lead Site, OU1**  
**East Chicago, Indiana**

Applicable/ Relevant and Appropriate Requirements	Description	Type of ARAR	Applicable/ Relevant and Appropriate	Comment
	Hazardous Waste Operations and Emergency Response. General worker safety is covered elsewhere within the law.			
<b>INDIANA ADMINISTRATIVE CODE</b>				
Indiana Solid Waste Rules (IAC Title 329)	This law applies to remedies that involve off-site disposal of materials typically involved with excavations. Contaminated soils or wastes that are excavated for off-site disposal would be tested for hazardous waste characteristics and requirements of the Rules would be followed if hazardous waste is found.	Action-specific	Relevant and Appropriate	
Generator Responsibilities for Waste Information (329 IAC 10-7.2-1)	Requires all wastes undergo a waste determination, and if found to be nonhazardous, be disposed of in a permitted solid waste disposal facility.	Action-specific	Relevant and Appropriate	
Indiana Air Pollution Control Regulations (IAC Title 326)	This law applies to the regulation of air emissions, for activities such as excavation, that have the potential to create dust and sets emissions limits for particulates.	Action-specific and may be Chemical-specific	Relevant and Appropriate	
Rule 4. Fugitive Dust Emission (326 IAC 6-4-1[4])	Rule 4 establishes that visible fugitive dust must not escape beyond the property line or boundaries of the property, right-of-way, or easement on which the source is located.	Location/Action-specific	Relevant and Appropriate	

**APPENDIX B**  
**List of Applicable or Relevant and Appropriate Requirements**  
**USS Lead Site, OU1**  
**East Chicago, Indiana**

Applicable/ Relevant and Appropriate Requirements	Description	Type of ARAR	Applicable/ Relevant and Appropriate	Comment
Motor vehicle fugitive dust sources (326 IAC 6-4-4)	No vehicle driven on any public right of way may allow its contents to escape and form fugitive dust.	Action-specific	Relevant and Appropriate	
Storm Water Run-off Associated with Construction Activity (327 IAC 15-5)	Sets requirements for managing storm water during construction activities, including sediment and erosion control.	Action-specific	Relevant and Appropriate	Will be required if remedial activities generate storm water runoff.
Voluntary Remediation of Hazardous Substances and Petroleum (Indiana Code [IC] 13-25-5)	IC 13-25-5 established the Voluntary Remediation Program in 1993 and gave the IDEM the authority to establish guidelines for voluntary site closure. Under this authority IDEM developed a non-rule policy document, the Risk Integrated System of Closure (RISC), to guide site closures within the authority of IDEM's remediation programs. This guidance document does not have the effect of law.	Chemical-specific	To Be Considered	The RISC document provides a methodology for establishing remedial goals and determining that remediation has been achieved. The RISC policy does not apply to Superfund sites, but does apply to remedial sites under several state programs, including the state version of RCRA, the state Leaking Underground Storage Tank program, the State Cleanup Program (state equivalent of the Federal Superfund Program) and the Voluntary Remediation Program.

## APPENDIX C

### Remedial Alternatives Evaluation Summary

APPENDIX C  
Remedial Alternatives Evaluation Summary  
USS Lead Site, OU-1  
East Chicago, Indiana

Evaluation Criteria	Alternative 1 No Action	Alternative 3 On-Site Soil Cover + Institutional Controls	Alternative 4A Excavation of Soil Exceeding RALs + Off-Site Disposal + <i>Ex Situ</i> Treatment Option	Alternative 4B Excavation to Native Sand + Off-Site Disposal + <i>Ex Situ</i> Treatment Option
<b>Overall Protection to Human Health and the Environment</b> Protection of human health and the environment	Not protective	Protective	Protective	Protective
<b>Compliance with ARARs</b> Location-specific ARARs Action-specific ARARs Chemical-specific ARARs	Not in compliance Not in compliance Not in compliance	In compliance In compliance In compliance	In compliance In compliance In compliance	In compliance In compliance In compliance
<b>Long-Term Effectiveness and Permanence</b> Magnitude of residual risk Adequacy and reliability of controls Need for 5-year review	Residual risk remains No controls Required	Some residual risk Somewhat reliable Required	Minimal residual risk Reliable to very reliable May be required	No residual risk Very reliable Not required
<b>Reduction of Toxicity, Mobility, or Volume through Treatment</b> Treatment processes used and materials treated Amount of hazardous material destroyed or treated Expected reduction in toxicity, mobility, or volume of the waste Irreversibility of treatment Type and quantity of residuals that will remain following treatment Statutory preference for treatment	None None None Not applicable Not applicable Does not satisfy	None None None Not applicable Not applicable Does not satisfy	Some treatment utilized ~7% treatment Toxicity and mobility reduced Not likely reversible Metals less than TC threshold Partially satisfies	Some treatment utilized ~7% treatment Toxicity and mobility reduced Not likely reversible Metals less than TC threshold Partially satisfies
<b>Short-Term Effectiveness</b> Protection of workers during remedial action Protection of the community during remedial action Potential environmental impacts of remedial action Time until protection is achieved	Not applicable Not applicable Not applicable Protection not achieved	High High Low Immediate	Moderate-High Moderate-High Low Immediate	Moderate-High Moderate-High Low Immediate
<b>Implementability</b> Technical feasibility Reliability of technology Administrative feasibility Availability of services, equipment, and materials	Not applicable Not applicable Not applicable Not applicable	Moderate Somewhat reliable Difficult Readily available	Easy Very reliable Feasible Readily available	Easy Very reliable Feasible Readily available
<b>Cost</b> Total construction cost Total engineering and construction management cost Total present worth O&M Period of analysis (yrs) Total cost (including 20% contingency)	\$0 \$0 \$0 NA \$0	\$13,905,000 \$2,800,000 \$735,000 30 \$20,900,000	\$21,600,000 \$3,195,000 \$67,000 30 \$29,900,000	\$32,800,000 \$4,960,000 \$0 NA \$45,400,000

## APPENDIX D

### Feasibility Study Cost Estimate for Alternative 4A

**APPENDIX D**  
**FEASIBILITY STUDY COST ESTIMATE**  
**ALTERNATIVE 4A: EXCAVATION OF SOIL EXCEEDING RALS + OFF-SITE**  
**DISPOSAL + EX SITU TREATMENT OPTION**  
**USS Lead Site, OU-1**  
**East Chicago, Indiana**

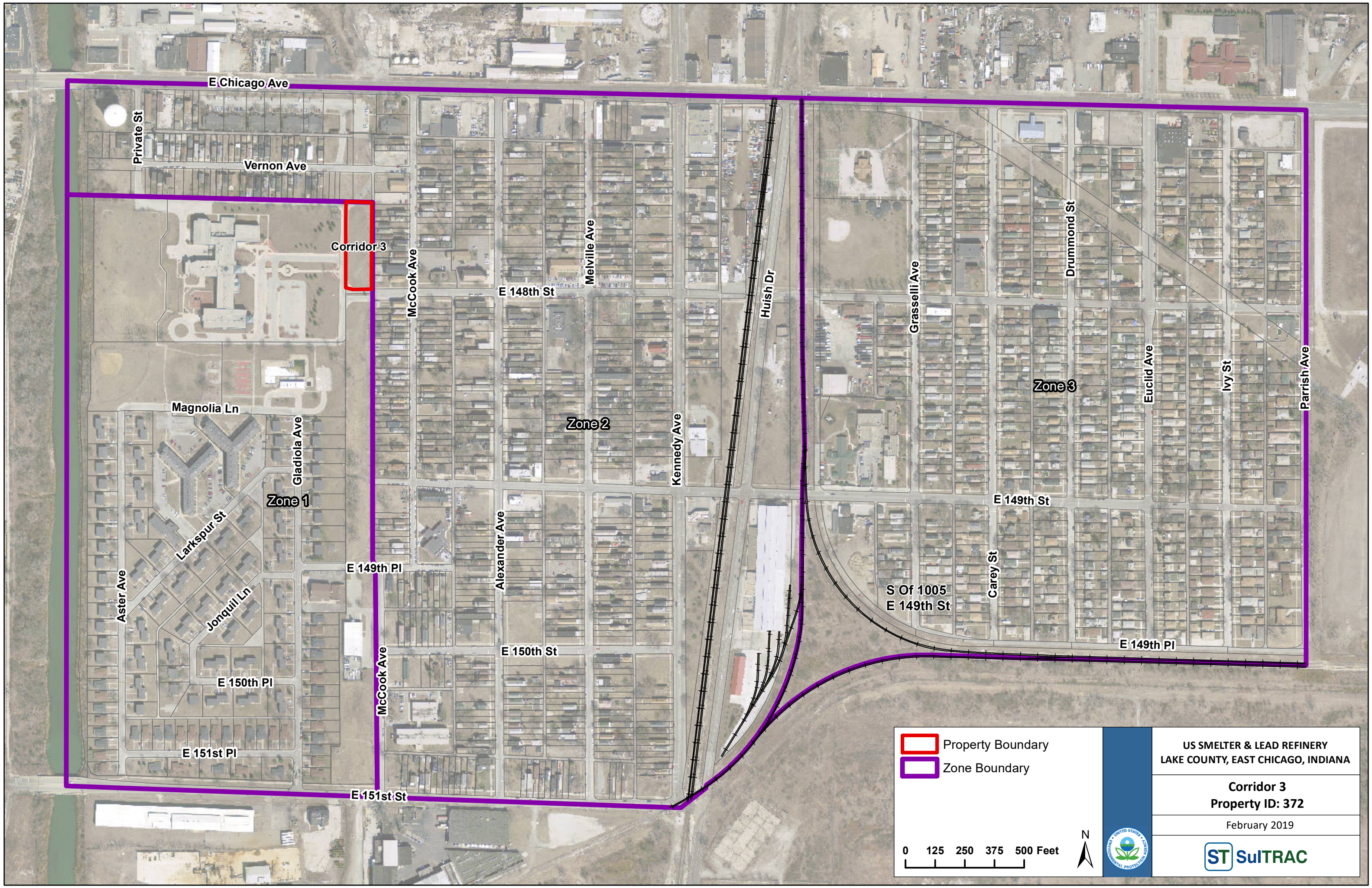
Estimate Category	Cost			
	Eastern Area	Southwestern Area	Northwestern Area	TOTAL
<b>PRE-REMEDIAL DESIGN SAMPLING</b>				
Sample Labor	\$583,000	\$408,000	\$451,000	\$1,442,000
ODCs	\$84,000	\$60,000	\$66,000	\$210,000
<b>REMEDY CONSTRUCTION</b>				
Preconstruction Activities	\$180,000	\$186,000	\$173,000	\$539,000
Site Preparation and Access	\$460,000	\$685,000	\$268,000	\$1,413,000
Institutional Controls	\$5,000	\$5,000	\$5,000	\$15,000
Contaminated Soil Excavation and Backfilling	\$2,203,000	\$3,793,000	\$1,548,000	\$7,544,000
Contaminated Soil Transportation and Disposal	\$1,509,000	\$2,411,000	\$943,000	\$4,863,000
Soil Cover	\$1,000	\$2,000	\$1,000	\$4,000
Property Restoration	\$1,407,000	\$2,278,000	\$927,000	\$4,612,000
Contractor's Oversight, Health & Safety, Quality Control	\$280,000	\$455,000	\$175,000	\$910,000
<b>Construction Subtotal</b>	<b>\$6,700,000</b>	<b>\$10,300,000</b>	<b>\$4,600,000</b>	<b>\$21,600,000</b>
<b>ENGINEERING &amp; CONSTRUCTION MANAGEMENT</b>	<b>\$991,000</b>	<b>\$1,548,000</b>	<b>\$656,000</b>	<b>\$3,195,000</b>
<b>OPERATIONS AND MAINTENANCE</b>	<b>\$27,068</b>	<b>\$18,961</b>	<b>\$20,971</b>	<b>\$67,000</b>
<b>Project Subtotal</b>	<b>\$7,700,000</b>	<b>\$11,900,000</b>	<b>\$5,300,000</b>	<b>\$24,900,000</b>
20% Contingency	\$1,540,000	\$2,380,000	\$1,060,000	\$4,980,000
<b>Project Total</b>	<b>\$9,200,000</b>	<b>\$14,300,000</b>	<b>\$6,400,000</b>	<b>\$29,900,000</b>

# **APPENDIX E**

**TO  
DEFINED PROPERTIES UAO**

**MAP IDENTIFYING LOCATION OF  
CORRIDOR 3**





Property Boundary  
 Zone Boundary

0 125 250 375 500 Feet

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US SMELTER & LEAD REFINERY  
 LAKE COUNTY, EAST CHICAGO, INDIANA

**Corridor 3**  
**Property ID: 372**

February 2019



# **APPENDIX F**

**TO  
DEFINED PROPERTIES UAO**

## **LIST OF DEFINED PROPERTIES**

## Appendix F – List of Defined Properties

### Defined Properties: Zone 3 (residential)

No.	Property ID No.
1.	3141
2.	3052
3.	3040
4.	3154
5.	3027
6.	3363
7.	3058

### Defined Properties: Zone 1 (nonresidential)

1. Carrie Gosch Property  
Parcel Nos.: 45-03-28-351-043.000-024 and 45-03-28-351-044.000-024  
Owners: School City of East Chicago and East Chicago Multi-Building Corp.  
Site Address: 455 E. 148<sup>th</sup> St.
2. Corridor 3 (as identified on Appendix E)  
Owner: East Chicago Housing Authority  
Mailing Address: 4444 Railroad Ave.  
Site Address: None

# **APPENDIX G**

**TO  
DEFINED PROPERTIES UAO**

**CORRESPONDENCE UNDER  
PARAGRAPH 43 OF THE CD FOR  
ZONE 3 PROPERTIES**



U.S. Department of Justice

Environment and Natural Resources Division

90-11-3-10884/1

*Environmental Enforcement Section  
P.O. Box 7611  
Ben Franklin Station  
Washington, DC 20044-7611*

*Telephone (202) 514-4213  
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annette.lang@usdoj.gov*

September 27, 2018

**VIA REGULAR MAIL AND EMAIL**  
**SETTLEMENT CONFIDENTIAL COMMUNICATION**

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RE: *United States, et al. v. Atlantic Richfield Co., et al.*  
CA No. 2:14-CV-312 (PS)  
Preliminary List of Unsampled and/or Unremediated Properties in Zone 3

Dear Counsel and Technical Personnel:

Introduction. As you know, Atlantic Richfield, DuPont, and Chemours (“Settling Defendants” or “SDs”) have been performing work at the USS Lead Superfund Site in East Chicago, Indiana,

under a consent decree entered in the above-referenced case in 2014 (“2014 Consent Decree”) by funding EPA’s remedial design work in Zones 1 and 3, funding EPA’s excavation and restoration work in Zone 3, and transporting and disposing of contaminated soil from the excavation work in Zone 3.

EPA started excavating and restoring properties in Zone 3 in the fall of 2016. That work has continued through the 2017 and 2018 construction seasons. By the end of the 2018 construction season, EPA will have completed all work at all Zone 3 properties to which they have been given access. There remain 13 residential properties and 12 commercial/industrial properties in Zone 3 that EPA has been unable to either sample or remediate because of a lack of timely access.

Cashout or Opt-Out under Paragraph 43 of the 2014 Consent Decree. Pursuant to Paragraph 43 of the 2014 Consent Decree, Settling Defendants have the option to either “cashout” or “opt-out” of properties that EPA has not secured access to. Specifically, Paragraph 43.d and 43.e provide formulas for SDs to “cashout” their liabilities for “Z3 Excluded Properties” and by doing so, securing a covenant not to sue in Paragraph 73 for these properties. By contrast, Paragraph 43.f provides SDs with the ability to opt-out of this payment and consequently not receive the covenant not to sue in Paragraph 73 for the Z3 Excluded Residential and Non-Residential Properties. This letter commences the process under Paragraph 43.<sup>1</sup>

Preliminary List of Z3 Excluded Residential and Non-Residential Properties. As a first step in the process, EPA must prepare and provide the following:

1. A preliminary list of all unsampled and/or unremediated residential properties in Zone 3;
2. A preliminary list of all unsampled and/or unremediated non-residential properties in Zone 3.

*See* 2014 Consent Decree ¶ 43.b. These preliminary lists are Attachment A to this letter.

Under Paragraph 43.b of the Consent Decree, the parties must now informally discuss the lists. The language of Paragraph 43.b appears to contemplate that the parties might need some time to discuss the lists (presumably because there might be some disagreement about the properties listed). However, given the ongoing communications between technical personnel at EPA and the Settling Defendants regarding remediation work in Zone 3 for the last two years, lengthy

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<sup>1</sup> Paragraph 43 of the Consent Decree is styled “Cashout of Z1&3 Excluded Properties or Opt-Out.” Throughout Paragraph 43, references and requirements related to Zone 1 properties are mentioned. However, as Settling Defendants are aware, after remedial design work in Zone 1 was completed in May of 2016, the City of East Chicago and the East Chicago Housing Authority made decisions that resulted in the relocation of all former residents in Zone 1 and the demolition and removal of all structures and hardscapes in the former West Calumet Housing Complex. As a result, work in Zone 1 under the Consent Decree was put “on hold,” and EPA will be issuing a ROD Amendment for all areas of Zone 1 except the former Carrie Gosch Elementary School. Therefore, no work in Zone 1 other than remedial design has proceeded under the 2014 Consent Decree. As such, references in Paragraph 43 to Zone 1 or Zone 1 properties are not operative at this time and the process we are commencing under Paragraph 43 addresses only Zone 3.

discussions likely will be unnecessary. It has been obvious for some time that EPA has not and will not be able to sample and/or remediate some Zone 3 properties for lack of timely access.

Nevertheless, we are prepared to describe the difficulties encountered with respect to each of the properties on the attached preliminary lists.

Final List and T&D Information. After EPA concludes that no further discussion of the preliminary lists is needed, EPA will prepare and share final lists of the Z3 residential and non-residential properties that are unsampled and/or unremediated. *See* 2014 Consent Decree ¶ 43.c. Within 10 days after receipt of those lists, Settling Defendants are to provide EPA with the following:

1. The total of SDs' Transportation and Disposal ("T&D") costs for residential properties remediated in Zone 3;
2. The SD's average T&D cost per cubic yard for residential properties remediated in Zone 3; and
3. The SD's T&D cost per cubic yard for non-residential properties remediated.

*See id.* ¶ 43.c.

We believe it may be appropriate for SDs to start to pull together this information now. However, having reviewed the cash-out formula in Paragraph 43.e for residential properties, the information in Item 2 is not relevant to that formula. Therefore, we do not need the information in Item 2. Instead, for the residential formula in Paragraph 43.e, if you provide the information in Item 1 together with the number of residential properties covered by those costs, that will be sufficient.

If you have difficulty separating out the T&D costs you incurred as between residential and non-residential properties, we can discuss that. At bottom, for the formula in Paragraph 43.e, what we need is the average T&D cost per residential property.

We are also willing to discuss any other matters related to the Items in Nos. 1 and 3.

Bill. In accordance with the provisions of Paragraph 43.d and 43.e, we will ultimately send you a bill for the Z3 Excluded Properties. You may either pay the bill or opt-out pursuant to Paragraph 43.f.

Please do not hesitate to call with any questions regarding this process. We look forward to discussing the attached Preliminary Lists with you soon.

Sincerely,

s/Annette M. Lang

Annette M. Lang  
Senior Counsel

Att.

cc (by email):

Katherine Thomas  
Sarah Rolfes  
Lisa McCoy  
Doug Petroff  
Steve Kaiser  
Rachel Zander  
Doug Dixon



## **ATTACHMENT A**

### **Preliminary List of All Unsampled and/or Unremediated Residential Properties in Zone 3**

1. 4737 Drummond St.
2. 4744 Drummond St.
3. 4907 Drummond St.
4. 4913 Drummond St.
5. 4807 Euclid St.
6. 4924 Euclid St.
7. 4805 Grasselli Ave.
8. 4840-52 Grasselli Ave.
9. 4720-24 Ivy St.
10. 4802-04 Ivy St.
11. 4845 Ivy St.
12. 4902-04 Ivy St.
13. 4828 Parrish Ave.

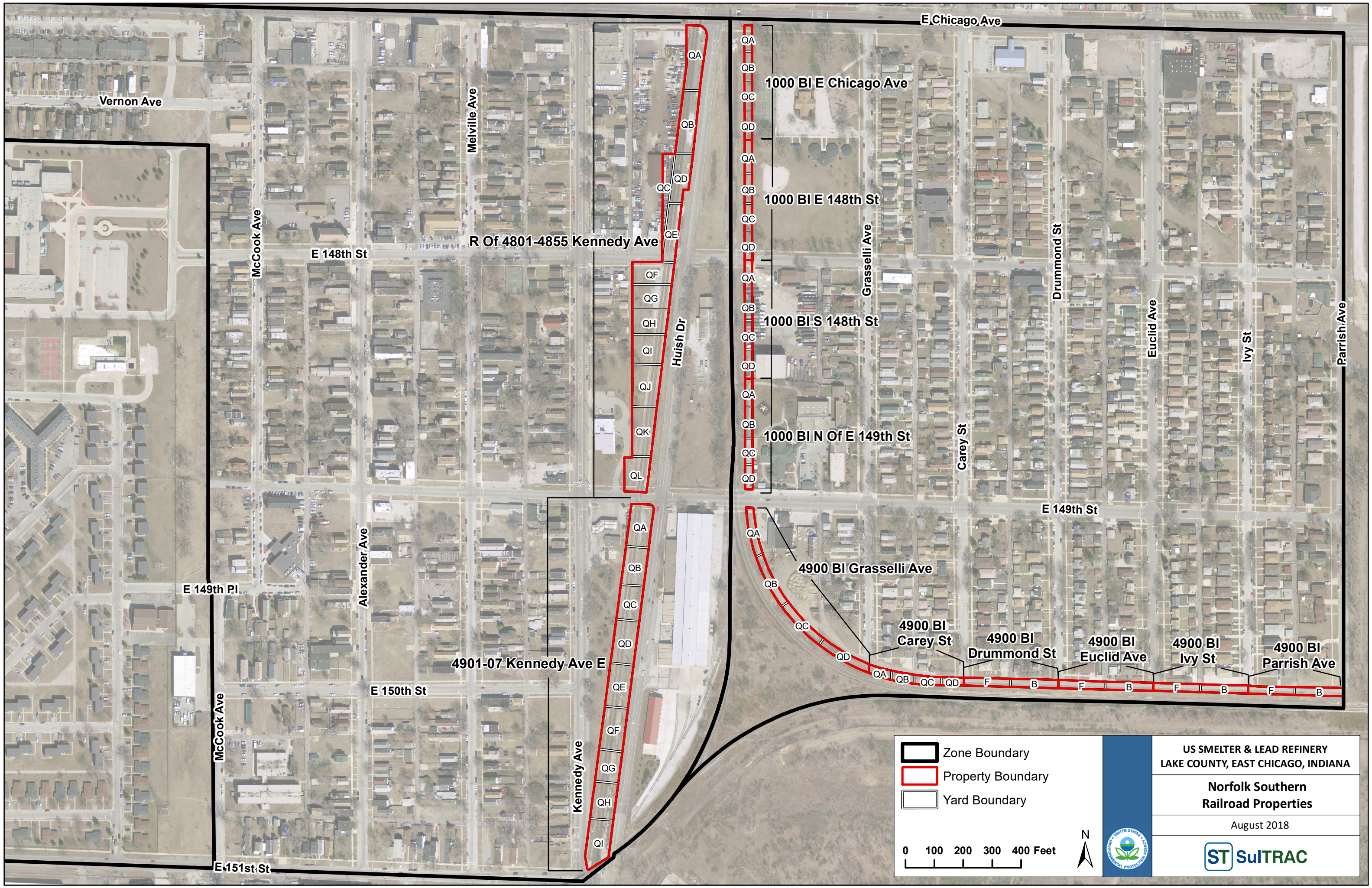
### **Preliminary List of All Unsampled and/or Unremediated Non-Residential Properties in Zone 3**

1. 1000 Bl. E. Chicago Ave.<sup>2</sup>
2. 1000 Bl. E. 148<sup>th</sup> St.
3. 1000 Bl. S. 148<sup>th</sup> St.
4. 1000 Bl. N. of E. 149<sup>th</sup> St.
5. 4900 Bl. Grasselli Ave.
6. 4900 Bl. Carey St.
7. 4900 Bl. Drummond St.
8. 4900 Bl. Euclid Ave.
9. 4900 Bl. Ivy St.
10. 4900 Bl. Parrish Ave.
11. E. of 4701–59 Kennedy Ave.
12. S. of 1005 E. 149<sup>th</sup> St.

---

<sup>2</sup> The first ten properties on this list are owned by the Norfolk and Southern Railway Company (“NSRC”). The next page is a map showing the location of these 10 properties in Zone 3. The properties shown on the map in Zone 2 are not relevant to this discussion. They are not covered under the 2014 Consent Decree.





Zone Boundary  
 Property Boundary  
 Yard Boundary

0 100 200 300 400 Feet

N

US SMELTER & LEAD REFINERY  
 LAKE COUNTY, EAST CHICAGO, INDIANA

**Norfolk Southern**  
**Railroad Properties**

August 2018







U.S. Department of Justice

Environment and Natural Resources Division

90-11-3-10884/1

Environmental Enforcement Section  
P.O. Box 7611  
Ben Franklin Station  
Washington, DC 20044-7611

Telephone (202) 514-4213  
Fax: (202) 616-6584  
annette.lang@usdoj.gov

October 5, 2018

**VIA REGULAR MAIL AND EMAIL**  
**SETTLEMENT CONFIDENTIAL COMMUNICATION**

TO: Michael Elam  
Counsel to Atlantic Richfield Co.  
Barnes & Thornburg  
One North Wacker Dr.  
Suite 4400  
Chicago, IL 60606-2833

Bernard J. Reilly  
The Chemours Co.  
Chemours Legal D-7054  
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Sathya Yalvigi  
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Patricia McGee  
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974 Centre Road  
Wilmington, DE 19805

Allison Crane  
Atlantic Richfield Co.  
201 Helios Way  
Houston, TX 77079

RE: *United States, et al. v. Atlantic Richfield Co., et al.*  
CA No. 2:14-CV-312 (PS)  
T&D Costs for purposes of Paragraphs 43.d and 43.e of the 2014 CD

Dear Counsel and Technical Personnel:

**Introduction.** This letter follows up on my September 27, 2018 letter regarding the Preliminary List of Z3 Excluded Residential and Non-Residential Properties and two subsequent calls where

EPA and I discussed with Settling Defendants the problems associated with securing access to the properties identified on the lists. In those calls, we also started to discuss the nature of the transportation and disposal (“T&D”) costs that the United States would need in order to calculate the cash-out sums required pursuant to the formulas in Paragraphs 43.d (non-residential properties) and 43.e (residential properties) of the 2014 Consent Decree.

**Preliminary Lists.** With respect to the lists, we are still discussing these but look forward to concluding these discussions in the near term.

**Formula for Residential Properties in Paragraph 43.e.**

**T&D Costs.**<sup>1</sup> With respect to the T&D costs required by the formula for Zone 3 residential properties, we believe *the only information we need is the total T&D costs that Settling Defendants paid for the T&D work that was done in 2017.* (Please note: we need the total T&D costs for the 2017 work regardless of whether the costs were all paid in 2017 or whether some were carried over into 2018.)

As we discussed on the phone, we choose 2017 because all but 1 of the 120 properties that was remediated in Zone 3 that year was a residence. The one property that was not a residence was a City-owned lot that was remediated to residential standards. Therefore, if Settling Defendants provide us with their total T&D costs in 2017, we can divide that number by 120 to derive a “T&D cost per residential property.” We can then plug that number into the formula in Paragraph 43.e.

If Settling Defendants disagree with the approach identified here for the T&D costs to be used for the formula in Paragraph 43.e, please let us know.

**EPA’s Direct Extramural Costs Per Property.** In like manner, for the formula in Paragraph 43.e, for EPA’s direct, *extramural* contractor costs (which are one part of EPA’s direct costs), the United States proposes to use the 2017 cost per property incurred by EPA’s contractor, CH<sub>2</sub>M Hill. We have previously advised you that that cost was \$64,167.

Again, if Settling Defendants disagree with the use of this value as the average, extramural direct cost per property for purposes of the formula in Paragraph 43.e, please let us know.

**EPA’s Other Direct and Indirect Costs.** We will provide you with our calculations for EPA’s direct, *intramural* costs (which are mostly Region 5’s payroll costs) as well as EPA’s indirect costs based on the appropriate indirect rate. Both of these categories of costs will be a function of the extramural costs.

---

<sup>1</sup> We raise the T&D cost information issue now not because Settling Defendants owe us the information at this time. Rather, it is apparent that all of the T&D cost information that was contemplated at the time of the 2014 Consent Decree is not necessary for the formula Paragraph 43.e. Moreover, the 2014 Consent Decree provides a short time frame for Settling Defendants to provide the T&D information (10 days after receipt of the final lists) and so we want to be sure all parties have a clear understanding of what is needed.

Before sending Settling Defendants any bill, however, we will identify for you the calculations for the direct, intramural costs and the indirect rate that we propose to use so that the parties can discuss them.

**Formula for Non-Residential Properties in Paragraph 43.d.**

T&D Costs. Eight commercial/industrial properties have been remediated in Zone 3 during the 2018 construction season. As we are all aware, one property was unique, including the fact that the waste was “direct loaded” for transportation to a landfill. However, for the other commercial/industrial properties, we understand that Settling Defendants did not have to differently stockpile or dispose of the soil based on its source being commercial/industrial versus its source being residential. Specifically, we understand that Settling Defendants did not have to dispose of any of the waste at a hazardous waste landfill. Therefore, contrary to what the T&D cost provisions of Paragraph 43.c require, we understand that Settling Defendants cannot separate out “per cubic yard” T&D costs as between residential and commercial/industrial properties. If we are wrong in our understandings, please let us know.

If we are correct, however, then *we believe we need only two pieces of information:* (1) whether, based on the lead and arsenic concentrations that we have provided you with for the 10 Norfolk and Southern Railroad in Zone 3 that have been sampled, would you predict that this soil could be disposed of at a non-hazardous waste landfill? and (2) the Settling Defendants’ average T&D costs per cubic yard from 2017 through the date in 2018 that you have your most recent T&D cost information.

EPA’s Direct *Extramural* Costs. Under the formula in Paragraph 43.d, EPA will do a cost estimate for each of commercial/industrial property on the final list. As part of that estimate, EPA will work with its contractors to develop the estimate of the costs the remedial contractor would incur.

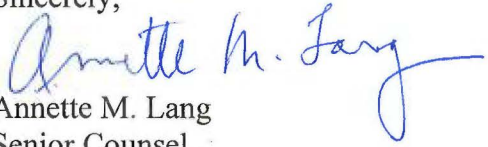
EPA’s Other Direct and Indirect Costs. As with the residential properties, we will then provide you with our calculations for EPA’s direct, *intramural* costs (which are mostly Region 5’s payroll costs) as well as EPA’s indirect costs based on the appropriate indirect rate. Both of these categories of costs will be a function of the extramural costs.

Before sending Settling Defendants any bill for the commercial/industrial properties on the Z3 Excluded Properties list, we will identify for you the calculations and assumptions we propose to use so that the parties can discuss them.

**Conclusion.**

We look forward to finalizing the list of Z3 Excluded Properties and we request that you start to prepare the T&D cost information identified in this letter.

Sincerely,

A handwritten signature in blue ink that reads "Annette M. Lang". The signature is fluid and cursive, with a long horizontal stroke extending to the right.

Annette M. Lang  
Senior Counsel

cc: (by email)

Katherine Thomas  
Sarah Rolfes  
Lisa McCoy  
Doug Petroff  
Steve Kaiser  
Rachel Zander  
Doug Dixon



U.S. Department of Justice

Environment and Natural Resources Division

90-11-3-10884/1

*Environmental Enforcement Section  
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annette.lang@usdoj.gov*

October 17, 2018

**VIA REGULAR MAIL AND EMAIL**  
**SETTLEMENT CONFIDENTIAL COMMUNICATION**

TO: Michael Elam  
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Bernard J. Reilly  
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Chemours Legal D-7054  
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Counsel to The Chemours Co.  
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Sathya Yalvigi  
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DuPont Legal 721/1268  
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Allison Crane  
Atlantic Richfield Co.  
201 Helios Way  
Houston, TX 77079

RE: *United States, et al. v. Atlantic Richfield Co., et al.*  
CA No. 2:14-CV-312 (PS)  
Final List of Unsampled and/or Unremediated Properties in Zone 3

Dear Counsel and Technical Personnel:

Please find attached the Final List of Unsampled and/or Unremediated Properties in Zone 3 pursuant Paragraph 43.b of the 2014 Consent Decree. *See* Attachment A.

Consistent with Paragraph 43.c of the 2014 Consent Decree, Settling Defendants must now provide transportation and disposal ("T&D") cost information to us by no later than 10 days after receipt of this letter, which, because the tenth day falls on a Saturday, is October 29, 2018. The T&D cost information may be limited as set forth in my letter of October 5, 2018.

Please do not hesitate to call with any questions regarding this process.

Sincerely,



Annette M. Lang  
Senior Counsel

Att.

cc (by email):

Katherine Thomas  
Sarah Rolfes  
Lisa McCoy  
Doug Petroff  
Steve Kaiser  
Rachel Zander  
Doug Dixon



## ATTACHMENT A

### Final List of All Unsampled and/or Unremediated Residential Properties in Zone 3

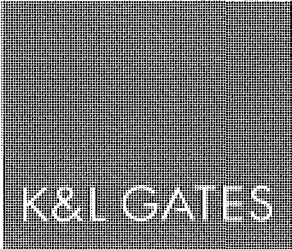
1. 4737 Drummond St.
2. 4744 Drummond St.
3. 4907 Drummond St.
4. 4913 Drummond St.
5. 4807 Euclid St.
6. 4924 Euclid St.
7. 4805 Grasselli Ave.
8. 4840-52 Grasselli Ave. (one quadrant)
9. 4802-04 Ivy St.
10. 4845 Ivy St.
11. 4902-04 Ivy St.
12. 4828 Parrish Ave.

### Final List of All Unsampled and/or Unremediated Non-Residential Properties in Zone 3

1. 1000 Bl. E. Chicago Ave.<sup>1</sup>
2. 1000 Bl. E. 148<sup>th</sup> St.
3. 1000 Bl. S. 148<sup>th</sup> St.
4. 1000 Bl. N. of E. 149<sup>th</sup> St.
5. 4900 Bl. Grasselli Ave.
6. 4900 Bl. Carey St.
7. 4900 Bl. Drummond St.
8. 4900 Bl. Euclid Ave.
9. 4900 Bl. Ivy St.
10. 4900 Bl. Parrish Ave.
11. E. of 4701-59 Kennedy Ave.
12. S. of 1005 E. 149<sup>th</sup> St.

---

<sup>1</sup> All properties on this list are railroad properties. The first ten are owned by the Norfolk and Southern Railway Company. The last two are owned by Canadian Northern. We have already provided Settling Defendants with maps showing the location of these twelve railroad properties.



October 29, 2018

David L Rieser  
David.rieser@klgates.com

T +1 312 807 4359  
F +1 312 827 8000

**Via First Class Mail and Email**

Annette M. Lang  
Senior Counsel  
Environment & Natural Resources Division  
P.O. Box 7611  
Ben Franklin Station,  
Washington, DC 20044-7611

**Re: 2014 Consent Order-Excluded Properties**

Dear Annette:

I am writing in response to your recent letters to the Settling Defendants regarding the excluded properties and our discussions regarding these issues. You have asked for two specific pieces of information to which we respond below:

1. For use in the Residential Properties formula:

Total T&D costs in 2017 = \$477,410.82

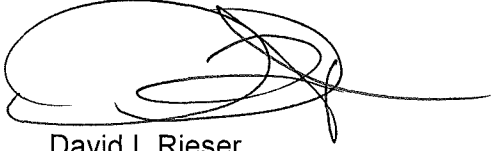
2. For use in the Non-Residential Properties Formula

Average T&D costs per cubic yard: \$40 /ton for non-hazardous waste, \$101 /ton for hazardous waste.

Information regarding transportation and disposal activities and costs was consistently collected by weight (tons) and not by volume (yards). There may be factors that could be used to convert this into a range of costs, however, the Settling Defendants believe that this cost information will still allow EPA to calculate reasonable and acceptable cost estimates for the purpose of Paragraph 43 of the Consent Decree.

Please advise if you require further information.

Sincerely,

A handwritten signature in black ink, consisting of several overlapping loops and a long horizontal stroke extending to the right.

David L Rieser

cc (email): Michael Elam  
Douglas Reinhart  
Allison Crane  
Bernard Reilly  
Todd Coomes  
Sathya Yalvigi  
Patricia McGee  
Rachel Zander



U.S. Department of Justice

Environment and Natural Resources Division

90-11-3-10884/1

*Environmental Enforcement Section  
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*Telephone (202) 514-4213  
Fax: (202) 616-6584  
annette.lang@usdoj.gov*

November 1, 2018

**VIA EMAIL AND CERTIFIED MAIL/RETURN RECEIPT REQUESTED**  
**SETTLEMENT CONFIDENTIAL COMMUNICATION**

TO: Michael Elam  
Counsel to Atlantic Richfield Co.  
Barnes & Thornburg  
One North Wacker Dr.  
Suite 4400  
Chicago, IL 60606-2833

Bernard J. Reilly  
The Chemours Co.  
Chemours Legal D-7054  
P.O. Box 2047  
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Wilmington, DE 19899

David Rieser  
Counsel to The Chemours Co.  
K&L Gates  
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Suite 3100  
Chicago, IL 60602

Sathya Yalvigi  
The Chemours Co.  
Project Director  
Corporate Remediation Group, D-3084  
1007 Market St.  
Wilmington, DE 19899

Douglas Reinhart  
Atlantic Richfield Co.  
150 W. Warrenville Rd.  
Mail Code 200-1W  
Naperville, IL 60563

Patricia McGee  
DuPont de Nemours  
DuPont Legal 721/1268  
974 Centre Road  
Wilmington, DE 19805

Allison Crane  
Atlantic Richfield Co.  
201 Helios Way  
Houston, TX 77079

RE: *United States, et al. v. Atlantic Richfield Co., et al.*  
CA No. 2:14-CV-312 (PS)  
Bill for Payment for Z3 Excluded Residential Properties or Opt-Out

Dear Counsel and Technical Personnel:

**Introduction.** As you are aware, on September 27, 2018, the United States, on behalf of EPA, provided Settling Defendants with a Preliminary List of Z3 Excluded Residential Properties

pursuant to Paragraph 43.b of the 2014 Consent Decree in the above-referenced matter. After discussion, and pursuant to that same Paragraph, we provided you with a Final List of Z3 Excluded Residential Properties on October 17, 2018.<sup>1</sup> That final list is Attachment 1 to this letter.

This letter constitutes the bill, under Paragraph 43.e.(1), of the amount necessary to cash-out Settling Defendants' liabilities for the Z3 Excluded Residential Properties. Because the bill is greater than \$2 million, Settling Defendants may elect to "opt-out" of this payment pursuant to the "opt-out" provision of Paragraph 43.e.(2).

**Overall Cash-Out Formula.** Under Paragraph 43.e.(1), the United States is required to use the following formula to calculate the cash-out value for the twelve Z3 Excluded Residential Properties:

Zone 3 Cash-Out = Average Residential Property Cleanup Cost in Zone 3 x Number of residential properties that are Excluded Properties in Zone 3 x 2

Therefore:

Z3 Cash-Out = Average Residential Property Cleanup Cost in Zone 3 x 12 x 2

**Average Residential Property Cleanup Cost in Zone 3.** Under Paragraph 43.e.(1), the "Average Residential Property Cleanup Cost in Zone 3" equals:

EPA's average direct and indirect costs per residential property remediated in Zone 3 + [(Total of SDs' T&D costs for residential properties in Zone 3 divided by Number of residential properties remediated in Zone 3) x 1.6.]

As previously discussed, we agreed to use the cost figures from 2017 to plug into this formula because all 120 properties remediated in 2017 were residential.

**EPA's Average Direct Costs.** \$66,329 (\$64,167 + \$2,162). EPA's average direct costs are the sum of EPA's average extramural direct costs and EPA's average intramural direct costs.

EPA's Average Extramural Direct Costs. \$64,167. We have previously provided you with information showing that \$64,167 was the average cost per property that CH<sub>2</sub>M Hill remediated in 2017.

EPA's Average Intramural Direct Costs. \$2,162. For 2017, EPA incurred the following intramural direct costs:

---

<sup>1</sup> By those same letters, we also provided Settling Defendants with a Preliminary and Final List of Z3 Excluded *Non-Residential* Properties. Because we have not yet finalized our calculations for the cash-out payment for the twelve non-residential properties on the Final List, this letter does not include a bill for the Z3 Excluded *Non-Residential* Properties.

Regional Payroll:	\$ 126,321
Headquarters Payroll:	\$ 1,364
Regional Travel:	\$ 4,069
DOJ Costs:	<u>\$ 127,739</u>
	\$ 259,493

This results in an average per property intramural direct cost of \$2,162 (\$259,493 ÷ 120).

**EPA’s Indirect Costs.** \$36,740 (\$66,329 x 55.39%). EPA’s indirect rate for 2017 was recently finalized at 55.39%.

**Settling Defendants’ Transportation and Disposal Costs per Property.** \$3,978 (477,411 ÷ 120). By letter dated October 29, 2018, Settling Defendants advised us that their total T&D Costs in 2017 was \$477,411.

**Final Calculation of Average Residential Property Cleanup Cost in Zone 3.** Pursuant to the formula in Paragraph 43.e.(1), the “Average Residential Property Cleanup Cost in Zone 3” is:

EPA’s Average Direct Costs	\$ 66,329
EPA’s Indirect Costs	\$ 36,740
SDs’ T&D Costs x 1.6	<u>\$ 6,365</u>
Total	\$ 109,434

**Final Calculation of Cash-Out Amount for Zone 3 Excluded Residential Properties.**

$$\$109,434 \times 12 \times 2 = \$2,626,416$$

Therefore, if Settling Defendants seek to cash-out their liabilities for the twelve Zone 3 Excluded Residential Properties, they must pay \$2,626,416.

**Conclusion.** Settling Defendants have 60 days after receipt of this bill to pay the amount due unless Settling Defendants elect to opt-out of the payment pursuant to Paragraph 43.e.(2). 2014 CD at ¶ 43.e.(1).<sup>2</sup> Settling Defendants may not contest this bill. *Id.* at ¶ 46.a.(3). Settling Defendants’ only remedy is to opt-out of the payment under the terms of Paragraph 43.e.(2). *Id.*

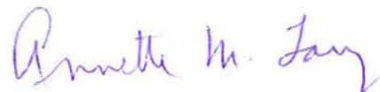
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<sup>2</sup> For purposes of the meaning of “receipt” in Paragraphs 43.e.(1) and (2), we will use the last day that at least one representative of each Settling Defendant receives a copy of this letter by certified mail/return receipt requested. We will notify you what that date is.

If Settling Defendants seek to opt-out of this payment, Settling Defendants must do so within 30 days of receipt of this bill. *Id.* at ¶ 43.e.(2).

Please do not hesitate to call with any questions.

Sincerely,



Annette M. Lang  
Senior Counsel

cc (by email):

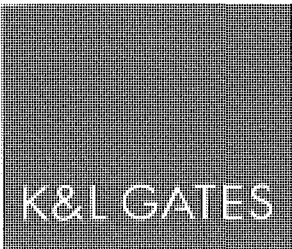
Sarah Rolfes  
Katherine Thomas  
Lisa McCoy  
Doug Petroff  
Steve Kaiser  
Rachel Zander  
Doug Dixon

## **ATTACHMENT 1**

### **Final List of All Unsampled and/or Unremediated Residential Properties in Zone 3**

1. 4737 Drummond St.
2. 4744 Drummond St.
3. 4907 Drummond St.
4. 4913 Drummond St.
5. 4807 Euclid St.
6. 4924 Euclid St.
7. 4805 Grasselli Ave.
8. 4840-52 Grasselli Ave. (one quadrant)
9. 4802-04 Ivy St.
10. 4845 Ivy St.
11. 4902-04 Ivy St.
12. 4828 Parrish Ave.





November 26, 2018

David L Rieser  
David.rieser@kigates.com

**CONFIDENTIAL**  
**By E-mail and Post**

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F +1 312 827 8000

Annette M. Lang  
Senior Counsel  
Environment & Natural Resources Division  
P.O. Box 7611  
Ben Franklin Station,  
Washington, DC 20044-7611

Dear Annette:

I am writing on the behalf of the Settling Defendants in response to your letter to November 1, 2018 regarding the Z3 Excluded Residential Properties. Pursuant to Paragraph 43(e)(2) of the Consent Decree, the Settling Defendants state that they are opting out of the requirement to pay EPA to remediate these properties.

Please advise if you have any questions.

Sincerely,

A handwritten signature in black ink, appearing to be 'D. Rieser', written over a faint dotted line.

David L Rieser

Cc: Bernard Reilly  
Todd Coomes  
Pat McGee  
Michael Elam  
Doug Reinhart  
Lisa McCoy

# **APPENDIX H**

**TO  
DEFINED PROPERTIES UAO**

**CORRESPONDENCE UNDER  
PARAGRAPH 43 OF THE CD FOR  
THE CARRIE GOSCH PROPERTY  
AND CORRIDOR 3**



U.S. Department of Justice

Environment and Natural Resources Division

90-11-3-10884/1

Environmental Enforcement Section  
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Washington, DC 20044-7611

Telephone (202) 514-4213  
Fax: (202) 616-6584  
annette.lang@usdoj.gov

February 5, 2019

**VIA REGULAR MAIL AND EMAIL**

TO: Michael Elam  
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Chicago, IL 60606-2833

Todd Commes  
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Chemours Legal D-7054  
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Allison Crane  
Atlantic Richfield Co.  
201 Helios Way  
Houston, TX 77079

RE: *United States, et al. v. Atlantic Richfield Co., et al.*  
CA No. 2:14-CV-312 (PS)  
Preliminary List of Unremediated Non-Residential Properties in Zone 1

Dear Counsel and Technical Personnel:

**Introduction.** As you know, Atlantic Richfield, DuPont, and Chemours (“Settling Defendants” or “SDs”) have been performing work at the USS Lead Superfund Site in East Chicago, Indiana, under a consent decree entered in the above-referenced case in 2014 (“2014 Consent Decree”) by funding EPA’s remedial design work in Zones 1 and 3, funding EPA’s excavation and restoration work in Zone 3, and transporting and disposing of contaminated soil from the excavation work in Zone 3.

**Background.** With respect to Zone 1, EPA commenced remedial design sampling in November 2014. In July 2016, other governmental bodies decided to permanently relocate the residents of the West Calumet Housing Complex (“WCHC”). They were the only residents in Zone 1. In August 2016, the East Chicago school system, formally known as the School City of East Chicago, decided to close the Carrie Gosch Elementary School, which, apart from the WCHC, was the only other structure in Zone 1.

By the summer of 2017, all residents of the WCHC were relocated. In 2018, the WCHC was demolished. In November 2018, EPA proposed a ROD Amendment for the area encompassing the WCHC and a park immediately to the north known as Goodman Park.

The proposed ROD Amendment did not include the area north of Goodman Park because no structures or features had changed in that area of Zone 1.

The vast majority of the land north of Goodman Park is owned by the East Chicago school system. The building and grounds of the former Carrie Gosch Elementary School (collectively “Carrie Gosch Property” or “Property”) are located there.

In addition, the proposed ROD Amendment did not include several narrow parcels of undeveloped land owned by the East Chicago Housing Authority (“ECHA”) that are due east of the Carrie Gosch Property and sandwiched between that Property and an alley. Of relevance to this letter are the following parcels because some part of them have contamination above the Remedial Action Levels:

1. Parcel No. 45-03-28-351-045.000-024  
Mailing Address: 4444 Railroad Ave.  
Site Address: None
2. Parcel No. 45-03-28-351-046.000-024  
Mailing Address: 4444 Railroad Ave.  
Site Address: 4726-60 McCook Ave.

(collectively “ECHA Parcels”).

Throughout 2017 and much of 2018, the future use of the former Carrie Gosch Elementary School was unknown. Information during that time period, however, suggested a possible commercial/industrial use. In light of that, EPA held off remediating the Carrie Gosch Property

to residential standards under the 2014 Consent Decree. It was appropriate to hold off the clean-up of the adjacent ECHA Parcels in light of their proximity.

On October 29 and 30, 2018, EPA was first informed that part of the Carrie Gosch Property would be leased to a church; children would utilize the area. The church has since leased part of the Property.

Utilization of at least part of the Carrie Gosch Property as a church results in a designation of the Carrie Gosch Property as “residential” under the guidelines EPA uses at the USS Lead Site.

Unfortunately, EPA’s knowledge of the “residential” use of the Carrie Gosch Property came only after EPA’s remediation crews had fully demobilized. Thus, EPA did not have timely access to remediate the Carrie Gosch Property and the corresponding ECHA Parcels during the period of its mobilization.

Cashout or Opt-Out under Paragraph 43 of the 2014 Consent Decree. Pursuant to Paragraph 43 of the 2014 Consent Decree, Settling Defendants have the option to either “cashout” or “opt-out” of properties that EPA has not timely secured access to in Zones 1 and 3. Specifically, for non-residential properties in Zone 1, Paragraph 43.d.(1) provides a formula for a payment that SDs may make to “cashout” their liabilities and secure a covenant not to sue. By contrast, under Paragraph 43.d.(2), SDs may opt-out of the payment if the demand is greater than \$1 million. If SDs opt-out, they do not receive a covenant not to sue. This letter commences the CD Paragraph 43 process for the “Zone 1 Excluded Non-Residential Properties.”<sup>1</sup>

Preliminary List of Z1 Excluded Non-Residential Properties. As a first step in the Paragraph 43 process, EPA must prepare and provide a preliminary list of all unsampled and/or unremediated non-residential properties in Zone 1. *See* 2014 Consent Decree ¶ 43.b. The preliminary list of Z1 Excluded Non-Residential Properties is short: the Carrie Gosch Property and the ECHA Parcels.

Under Paragraph 43.b of the Consent Decree, the parties are required to now informally discuss this list. The language of Paragraph 43.b appears to contemplate that the parties might need some time to discuss the list (presumably because there might be some disagreement about the properties listed). However, because the list is quite short, we do not believe discussions of any significant duration need to take place but we are more than willing to discuss these.

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<sup>1</sup> Paragraph 43 of the Consent Decree is styled “Cashout of Z1&3 Excluded Properties or Opt-Out.” Previously, the United States and the Settling Defendants completed the Paragraph 43 process for the “Excluded Residential Properties” in Zone 3 *See* Letters from A. Lang to M. Elam, *et al.* (Sept. 27, Oct. 5, Oct. 17 and Nov. 1, 2018) and Letters from D. Rieser to A. Lang (Oct. 29 and Nov. 26, 2018).

In my September 27, 2018 letter, I correctly indicated that EPA’s work in Zone 1 had been halted due to the circumstances described above in the body of this letter. I also correctly stated that EPA would be issuing a ROD Amendment for all areas of Zone 1 except for the former Carrie Gosch Elementary School. Thereafter, however, I inadvertently made an overly broad statement, writing that the “references in Paragraph 43 [of the 2014 Consent Decree] to Zone 1 or Zone 1 properties are not operative at this time. . . .” Because the proposed ROD amendment did not and does not include the Carrie Gosch Property and the ECHA Parcels, the 2014 Consent Decree—including the provisions of Paragraph 43—was and still is fully in effect for the Carrie Gosch Property and the ECHA Parcels.

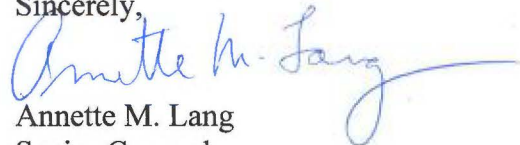
Final List. After EPA concludes that no further discussion of the preliminary list is needed, EPA is required to prepare and share with Settling Defendants a final list. *See* 2014 Consent Decree ¶ 43.b. EPA will, of course, comply with this requirement; however, EPA is confident that the final list will be the same as the preliminary list.

T&D Costs. After we send the final list, Settling Defendants are required to submit T&D costs. *Id.* ¶ 43.c. However, by letter dated October 29, 2018, SDs already provided their average T&D costs for non-residential properties. Therefore, this additional step is not needed for these Z1 Excluded Non-Residential Properties.

Bill for Payment. In accordance with the provisions of Paragraph 43.d, after circulating the final list, we will send SDs a bill for the Z1 Excluded Non-Residential Properties (*i.e.*, the Carrie Gosch Property and the ECHA Parcels). SDs may either pay the bill or, if the bill is greater than \$1 million, opt-out, pursuant to Paragraph 43.d.(2).

Please do not hesitate to call with any questions regarding this process.

Sincerely,



Annette M. Lang  
Senior Counsel

cc (by email):

Katherine Thomas  
Sarah Rolfes  
Lisa McCoy  
Doug Petroff  
Kate Abend  
Steve Kaiser  
Rachel Zander  
Barbara Gutierrez



U.S. Department of Justice

Environment and Natural Resources Division

90-11-3-10884/1

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Washington, DC 20044-7611*

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annette.lang@usdoj.gov*

February 8, 2019

**VIA REGULAR MAIL AND EMAIL**

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Allison Crane  
Atlantic Richfield Co.  
201 Helios Way  
Houston, TX 77079

RE: *United States, et al. v. Atlantic Richfield Co., et al.*  
CA No. 2:14-CV-312 (PS)  
Final List of Unremediated Non-Residential Properties in Zone 1



Dear Counsel and Technical Personnel:

Following up on my letter dated February 5, 2019 (“Preliminary List Letter”), and our phone call on February 7, 2019, and pursuant to Paragraph 43.b of the 2014 Consent Decree, this letter serves as the final list of unremediated non-residential properties in Zone 1.

Unfortunately, in the Preliminary List Letter, we defined what we called the “ECHA Parcels” too broadly. Specifically, some areas of both ECHA Parcels extend into the area now covered by EPA’s November 7, 2018 Proposed Plan for the West Calumet Housing Complex and Goodman Park. Because the 2012 Record of Decision no longer applies to some areas of the previously-defined “ECHA Parcels,” we have to better define the areas still covered by the 2014 CD and on the “Final List.”

To that end, EPA intended to include in the Preliminary List Letter only the relatively small area of undeveloped land that is north of 148<sup>th</sup> St., east of the Carrie Gosch Property, south of a line extending eastward from the northern boundary of the Carrie Gosch Property, and west of an alley. For ease and accuracy of description, we have attached a map that shows the area we intended to include and now are specifically including on the final list. The area is labelled “Corridor 3” on the map and is outlined in red. We will call this area “Corridor 3.”


Thus, the final list of unremediated non-residential properties in Zone 1 is as follows:

1. Carrie Gosch Property  
Parcel Nos.: 45-03-28-351-043.000-024 and 45-03-28-351-044.000-024  
Owners: School City of East Chicago and East Chicago Multi-Building Corp.  
Site Address: 455 E. 148<sup>th</sup> St.
2. Corridor 3, as identified on the attached map  
Owner: East Chicago Housing Authority  
Mailing Address: 4444 Railroad Ave.  
Site Address: None

On October 29, 2018, Settling Defendants submitted T&D costs for non-residential properties to us; therefore, we do not need you to send that information again. We will use the previously-provided information to prepare a bill pursuant to the formula in Paragraph 43.d.(1). After receipt of the bill, Settling Defendants may either pay the bill, or, if the bill is greater than \$1 million, may opt out.

Please do not hesitate to call with any questions regarding this process.

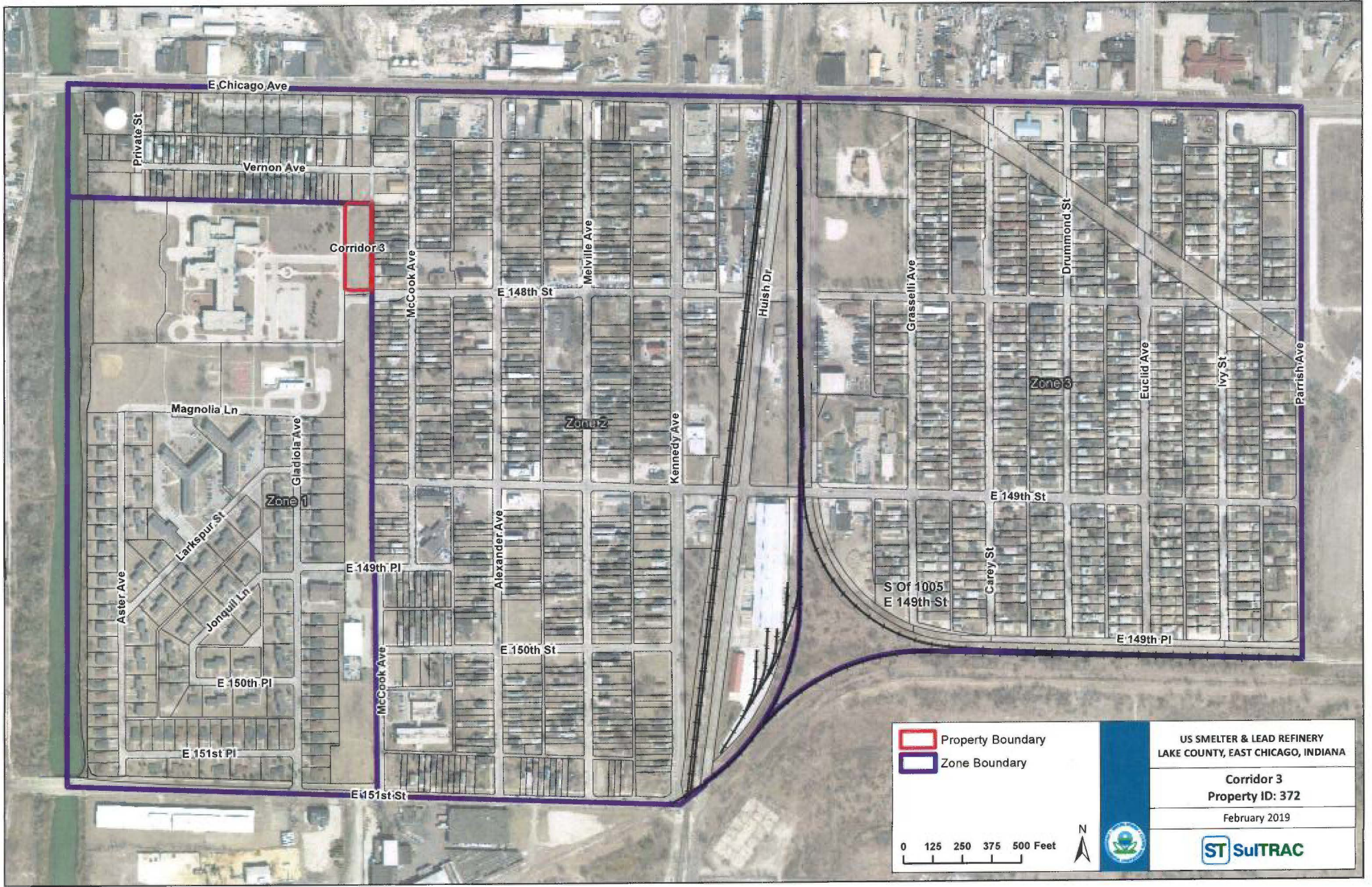
Sincerely,


  
Annette M. Lang  
Senior Counsel



cc (by email):

Katherine Thomas  
Sarah Rolfes  
Lisa McCoy  
Doug Petroff  
Kate Abend  
Steve Kaiser  
Rachel Zander  
Barbara Gutierrez



 Property Boundary  Zone Boundary	<p data-bbox="1722 1242 1995 1291">US SMELTER &amp; LEAD REFINERY LAKE COUNTY, EAST CHICAGO, INDIANA</p> <p data-bbox="1785 1299 1932 1347">Corridor 3 Property ID: 372</p> <p data-bbox="1806 1356 1911 1380">February 2019</p>  
<p data-bbox="1354 1396 1575 1421">0 125 250 375 500 Feet</p> 	





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Environment and Natural Resources Division

90-11-3-10884/1

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February 15, 2019

**VIA EMAIL AND CERTIFIED MAIL/RETURN RECEIPT REQUESTED**

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RE: *United States, et al. v. Atlantic Richfield Co., et al.*  
CA No. 2:14-CV-312 (PS)  
Bill for Payment for Z1 Excluded Non-Residential Properties or Opt-Out

Dear Counsel and Technical Personnel:

**Introduction.** As you are aware, on February 5, 2019, the United States, on behalf of EPA, provided Settling Defendants with a Preliminary List of Z1 Excluded Non-Residential Properties pursuant to Paragraph 43.b of the 2014 Consent Decree in the above-referenced matter. After

discussion, and pursuant to that same Paragraph, we provided you with a Final List of Z1 Excluded Non-Residential Properties by letter dated February 8, 2019. That final list was as follows:

1. Carrie Gosch Property (“Carrie Gosch”)
  - Parcel Nos.: 45-03-28-351-043.000-024 and 45-03-28-351-044.000-024
  - Owners: School City of East Chicago and East Chicago Multi-Building Corp.
  - Site Address: 455 E. 148<sup>th</sup> St.
  
2. Corridor 3, (which was identified on an attached map)
  - Owner: East Chicago Housing Authority
  - Mailing Address: 4444 Railroad Ave.
  - Site Address: None

This letter constitutes the bill, under Paragraph 43.d.(1), of the amount necessary to cash-out Settling Defendants’ liabilities for the Z1 Excluded Non-Residential Properties. Because the bill is greater than \$1 million, Settling Defendants may elect to “opt-out” of this payment pursuant to the “opt-out” provision of Paragraph 43.d.(2).

**Overall Cash-Out Formula.** Under Paragraph 43.d.(1), the United States is required to use the following formula to calculate the cash-out value for the Z1 Excluded Non-Residential Properties:

$$\text{Individual Cash-Out Payment} = \text{EPA’s Cost Estimate for that Particular Z1\&3 Excluded Non-Residential Property} \times 2$$

Where: “EPA’s Cost Estimate for that Particular Z1&3 Excluded Non-Residential Property” shall equal the estimate of the direct and indirect costs (including T&D costs) that EPA expects to incur, based on all relevant information, for the specific non-residential property in question.

**EPA’s Estimate of Direct Costs.** EPA’s estimate of the direct costs is the sum of EPA’s estimate of the extramural direct costs and the intramural direct costs.

**EPA’s Estimate of Extramural Direct Costs.**

	Excavation & Restoration	Transportation & Disposal	Total
Carrie Gosch	\$1,114,375	\$166,080	\$1,280,455
Corridor 3	\$355,820	\$53,080	\$408,900
<b>Total</b>	<b>\$1,470,195</b>	<b>\$219,160</b>	<b>\$1,689,355</b>

**EPA’s Estimate of Intramural Direct Costs. \$55,846.** In our November 1, 2018 letter for the cash-out value of the Z3 Excluded Residential Properties, we advised you that EPA incurred a total of \$259,493 in intramural direct costs in

2017 related to the Zone 3 work. The \$259,493 in intramural direct costs represented 3.2% of the total direct costs [*i.e.*, 3.2% =  $\$259,493 \div (\$7,700,040 + \$259,493)$ ].<sup>1</sup>

For estimating purposes, we will use 3.2% as the percentage of total direct costs that the intramural costs represent. Using 3.2%, we estimate that EPA's intramural direct costs will be \$55,846 [ $\$55,846 = 3.2\%$  of  $(\$1,689,355 + \$55,846)$ ].

**EPA's Estimate of Total Direct Costs: \$1,745,201** [ $\$1,689,355 + \$55,846$ ].

**EPA's Estimate of Indirect Costs. \$966,667** ( $\$1,745,201 \times 55.39\%$ ). EPA's indirect rate for FY2017 was recently finalized at 55.39%. 55.39% remains the provisional indirect rate for FY2018 and FY2019.

**EPA's Estimate of Total Direct and Indirect Costs: \$2,711,868** ( $\$1,745,201 + \$966,667$ )

**Final Calculation of Cash-Out Amount for Zone 1 Excluded Non-Residential Properties.**

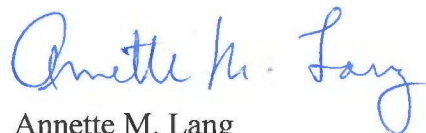
$$\$2,711,868 \times 2 = \$5,423,736$$

Therefore, if Settling Defendants seek to cash-out their liabilities for the Zone 1 Excluded Non-Residential Properties, Settling Defendants must pay \$5,423,736.

**Conclusion.** Settling Defendants have 60 days after receipt of this bill to pay the amount due unless Settling Defendants elect to opt-out of the payment pursuant to Paragraph 43.d.(2). 2014 CD at ¶ 43.d.(1).<sup>2</sup> Settling Defendants may not contest this bill. *Id.* at ¶ 46.a.(3). Settling Defendants' only remedy is to opt-out of the payment under the terms of Paragraph 43.d.(2). *Id.* at ¶ 46.a.(3). If Settling Defendants seek to opt-out of this payment, Settling Defendants must do so within 30 days of receipt of this bill. *Id.* at ¶ 43.d.(2).

Please do not hesitate to call with any questions.

Sincerely,



Annette M. Lang  
Senior Counsel

<sup>1</sup> \$7,700,040 ( $\$64,167$  per property costs  $\times$  120 properties) was the total, extramural direct cost for EPA's contractor in Zone 3 in 2017. *See* Letter from A. Lang to M. Elam re: Bill for Payment for Z3 Excluded Residential Properties or Opt-out (Nov. 1, 2018).

<sup>2</sup> For purposes of the meaning of "receipt" in Paragraphs 43.d.(1) and (2), we will use the last day that at least one representative of each Settling Defendant receives a copy of this letter by certified mail/return receipt requested.

cc (by email):

Sarah Rolfes  
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Lisa McCoy  
Doug Petroff  
Kate Abend  
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February 22, 2019

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**CONFIDENTIAL**  
**By E-mail and Post**

Annette M. Lang  
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Dear Annette:

I am writing on the behalf of the Settling Defendants in response to your letter of February 15, 2019 regarding the Z1 Excluded Non-Residential Properties. Pursuant to Paragraph 43(e)(2) of the Consent Decree, the Settling Defendants state that they are opting out of the requirement to pay EPA to remediate these properties.

Please advise if you have any questions.

Sincerely,



David L Rieser

Cc: Todd Coomes  
Pat McGee  
Michael Elam  
Doug Reinhart  
Lisa McCoy