EXPLANATION OF SIGNIFICANT DIFFERENCES

U.S. SMELTER AND LEAD REFINERY, INC. SUPERFUND SITE
EAST CHICAGO, LAKE COUNTY, INDIANA

EPA Region 5 **April 2018**

I. INTRODUCTION

The United States Environmental Protection Agency (EPA) is issuing this Explanation of Significant Differences (ESD) to document the significant increase in cost between the estimated cost of the remedy selected in the 2012 Record of Decision (ROD) for Zones 2 and 3 of Operable Unit 1 (OU1) of the U.S. Smelter and Lead Refinery, Inc. Superfund Site (Site) and the current estimated cost of the remedy for those two Zones. Previously, the estimated cost for Zones 2 and 3 was $22.8 million; currently, the estimate is $84.9 million. Notwithstanding this projected increase in costs, EPA has determined that the remedy selected in the 2012 ROD—excavation of contaminated soil and off-site disposal (with an off-site soil treatment option)—is still the correct remedy for Zones 2 and 3 and continues to meet the requirements of the National Oil and Hazardous Substances Contingency Plan (NCP). EPA would have selected this remedy even if the projected costs in 2012 had been more consistent with the current estimate. Thus, this ESD does not include any changes to the remedy selected for Zones 2 and 3 of OU1. It merely explains the differences in the costs between then and now.[1]

Under Section 117(c) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA or Superfund), as amended, EPA is required to publish an Explanation of Significant Differences when, after issuance of a Record of Decision,[2] subsequent enforcement or remedial actions differ in any significant respects from the final plan set forth in the ROD. Sections 300.435(c)(2)(i) and 300.825(a)(2) of the NCP set forth the criteria for issuing an ESD and requiring that an ESD be published if, after issuance of the ROD, there is a significant, but not fundamental, difference in the scope, performance, or cost of the remedy. A difference is significant, but not fundamental, if it affects basic features of the remedy such as timing and cost, but does not affect the overall approach to managing hazardous waste at a site.[3]

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[1] This ESD does not address Zone 1 of OU1 of the Site. In 2016 and 2017, all residents of Zone 1 were relocated out of their housing complex and the housing complex was slated for demolition. Consequently, for the former residential and park areas of Zone 1, EPA is in the process of preparing a Feasibility Study Addendum to the 2012 ROD. EPA may fundamentally change the remedy for those areas, which would necessitate a ROD Amendment. In addition, there may be changes in the land use for some areas of Zone 1 that currently house a former elementary school. Therefore, no areas of Zone 1 are addressed in this ESD.

This ESD also does not include costs associated with indoor response actions. Those actions were performed pursuant to EPA's removal, not remedial, authorities.

[2] A ROD documents the EPA's remedy decision.

[3] *See* 55 Fed. Reg. 8,666, 8,771-72 (Mar. 8, 1990).

The remedial investigation (RI)[4] performed by the EPA at OU1 of the Site identified lead and arsenic in soil as the contaminants of concern. EPA's 2012 ROD estimated it would cost $29.9 million to implement the selected remedy across all areas of OU1, which were then designated as an "eastern" area, a "southwestern" area, and a "northwestern" area. In 2014, OU1 was subdivided into three geographic "zones": Zones 1, 2, and 3. These Zones differed to some extent from the "areas" previously identified, but the original "area" costs were relatively easily reallocated to the "Zones." EPA estimated it would cost $13.4 million to remediate Zone 2 and $9.4 million to remediate Zone 3, for a total of $22.8 million for both Zones.[5]

From approximately May 2015 to early 2016, extensive soil sampling in Zones 2 and 3 was conducted during remedial design to better delineate the extent of contamination at each property.[6] Based on that sampling, EPA determined that the actual volume of contaminated soil that needs to be excavated is greater than what was originally estimated. In addition, based largely on more up-to-date engineering estimates, EPA determined that the "per unit" cost of various tasks required by remediation work is greater than what was originally estimated. As a result of the increased volume of contaminated soil and the increased per unit costs of remediating that soil, the current estimated cost of remediating Zones 2 and 3 has increased to $84.9 million.[7]

There are no material differences between this ESD and the proposed ESD that was publicly noticed on December 12, 2017. For further discussion of the proposed ESD and associated public comments, please refer to Section VII (Public Participation and the Administrative Record) and Appendix C (Responsiveness Summary) of this ESD.

II. SITE BACKGROUND

The U.S. Smelter and Lead Refinery, Inc. Superfund Site is located in the City of East Chicago, Indiana. The Site has been divided into two operable units (OUs). *See* Appendix A. Operable Unit 1 (OU1) is a predominantly residential neighborhood which is generally bounded on the north by East Chicago Avenue, on the east by Parrish Avenue, on the south by East 151st Street/149th Place, and on the west by the Indiana Harbor Canal. OU1 has been further subdivided in Zones 1, 2, and 3. *See* Appendix A. Operable Unit 2 (OU2) includes the 79-acre former USS Lead facility as well as groundwater beneath the entire Site. The Site was placed on the National Priorities List (NPL) in April 2009.

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[4] An RI determines the nature and extent of contamination at a site for the purposes of developing a ROD. EPA sampled 7.4% of properties in OU1 during the RI.

[5] *See* Appendix B: *Technical Memorandum: Final Comparison of Original Cost Estimates and Current Cost Estimates for Zones 2 and 3 of Operable Unit 1, USS Lead Superfund Site*, at Table 1 (December 2017) ("Z2&3 ESD Technical Memorandum").

[6] Remedial design determines the extent of contamination at properties that are not sampled during the RI.

[7] EPA has taken a conservative approach to the current cost estimate. Once remedial design is completed, EPA typically targets a cost estimate that is within +15% to -10% of the final cost. *See A guide to Developing and Documenting Cost Estimates During the Feasibility Study*, EPA 540-R-00-002, OSWER 93355.0-75 at 2-4 (July 2000). That said, the current estimate of $84.9 million includes a 20% contingency both because remedial design is not yet completed and because the original estimate used a 20% contingency. It is likely that the 20% contingency is high for both Zones, but especially for Zone 3 where more than 50% of the properties have already been remediated.

Contamination in OU1 is largely derived from historic operations at three nearby facilities: (1) the USS Lead facility; (2) a facility formerly located in Zone 1 and owned and operated by subsidiaries of the Anaconda Copper and Mining Company (the "Anaconda facility"); and (3) the E. I. Du Pont de Nemours facility located just southeast of OU1 (the "DuPont facility"). Fill materials (including slag) have also contributed to contamination at the Site.

The USS Lead facility was constructed in 1906 and used an electrolytic process (the Betts process) to refine lead bullion that was shipped from Midvale, Utah, to East Chicago.[8] Because lead refining produces a number of byproducts, the 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 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 USS Lead facility stopped refining lead bullion and instead increased its blast furnace capacity to treat more scrap lead material. Operations at the USS Lead facility ceased in 1985.

Among other sources of contamination from the 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.

The Anaconda facility operated three inter-related processes. In 1912, a lead refinery was built on the site and used a pyrometallurgical process to refine lead bullion that was shipped from Toole, Utah, to East Chicago. 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.

As with the USS Lead facility, the 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 USS Lead facility. Operation of the white lead process generated additional releases.

Significant quantities of lead were refined from 1912 until 1946, when refining operations at the Anaconda facility ceased. However, secondary smelting and white lead production continued into the 1950s. The 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 facility's footprint.

The DuPont facility was constructed in 1892 to manufacture various organic and inorganic chemicals. Over the course of its operations, the DuPont facility produced over one hundred different chemicals, including lead and calcium arsenate (1910–1949) and zinc chloride (1900–1969). Among other sources of contamination, lead and arsenic particulate generated from these

[8] The ROD incorrectly stated that the USS Lead facility was constructed to produce copper. EPA, USS Lead Record of Decision at 7 (Nov. 2012).

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 facility contracted significantly during the 1980s and 1990s. The DuPont facility is undergoing corrective action under federal RCRA authorities.

Similarly, in the 1990s, USS Lead began a cleanup of its facility under state and federal RCRA programs. In the early 2000s, as part of RCRA corrective action at the facility, the scope of investigation was expanded somewhat beyond the facility's boundaries into OU1.

In 2007, responsibility for further investigation was transferred from EPA's RCRA program to its Superfund program. Limited sampling was performed in 2007, resulting in the 2008 removal of contaminated soils from several residential properties. In April 2009, EPA placed the Site on the NPL. EPA performed its remedial investigation of OU1 from June 2009 to June 2012.[9, 10]

EPA's completed remedial investigation identified lead and arsenic in soil as the contaminants of concern for OU1. Based on that investigation and on the corresponding feasibility study, EPA issued its Record of Decision for OU1 in November 2012. The remedy selected in the ROD was as follows:

- Excavation of soil that contains lead or arsenic in concentrations that exceed the Remedial Action Levels (for residential areas, the RALs are 400 ppm lead and 26 ppm arsenic); 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.

[9] To date, it appears that soil contamination in the former USS Lead facility has largely been remediated through RCRA corrective action. Pursuant to a 2017 Administrative Settlement Agreement and Order on Consent between EPA and USS Lead, however, remaining contamination in OU2—that is, in the soil and in the groundwater under the entire Site—will be the subject of a remedial investigation beginning in early 2018. A proposed plan, public comment period, and record of decision for OU2 will follow that investigation.

[10] In 2011, EPA performed additional soil removal actions at several residential properties in OU1 based on sampling data collected during the remedial investigation.

Consistent with the ROD and pursuant to a consent decree with two potentially responsible parties, from November 2014 to August 2016, EPA performed remedial design activities in Zones 1 and 3. Remedial design activities in Zone 2 began in August 2016 and is ongoing. Based on these remedial designs, EPA started remediation work in both Zones 2 and 3 in the fall of 2016 and continued that work throughout 2017.[11] As of December 2017, EPA has remediated 289 properties consistent with the ROD. Additional work will continue in 2018 and thereafter.[12]

III. EXPLANATION OF SIGNIFICANT DIFFERENCES AND NO CHANGE IN THE REMEDY SELECTED

A. Explanation of the Significant Differences

EPA estimated that it would cost $22.8 million to remediate Zones 2 and 3 based on data generated during the remedial investigation and feasibility study. *See* App. B at Table 1. The principal assumptions underlying the original estimate were: (1) the number of contaminated properties; (2) the size of those properties; (3) the extent of contamination at those properties; and (4) the per unit cost of various tasks involved in remediation. The original cost estimate was based on a sample size of 7.4% of properties in OU1.

At this time, approximately 90% of the properties in Zones 2 and 3 have been sampled. Based on the results of this sampling, EPA has determined that the number of properties requiring remediation, the size of those properties, and the extent of contamination at those properties are all greater than what was originally estimated. These changes have increased the total estimated volume of contaminated soil to be excavated from approximately 47,000 cubic yards to approximately 88,000 cubic yards. This increased quantity of soil correspondingly increased the construction management costs and the contingency costs and required a longer duration for remediation and oversight than originally estimated. In addition, based largely on more up-to-date engineering estimates, EPA has determined that the per unit cost of various tasks involved in remediation is greater than what was originally estimated. For example, the estimated rate for excavating and replacing one cubic yard of contaminated soil increased from $115 to $471.

As a result of these major factors, the estimated cost to implement the selected remedy in Zones 2 and 3 is now $84.9 million. The Z2&3 ESD Technical Memorandum included as Appendix B provides a full explanation of the significant differences between the original and current cost estimate.

[11] Soil remediation work in Zone 2 in 2016 and 2017 was performed pursuant to EPA's removal authorities. However, that work was performed consistent with and after issuance of the ROD.

[12] Work in Zone 1 has been put on hold. *See* Note 1.

B. No Change in the Remedy Selected

In the 2012 ROD, EPA evaluated two remedial alternatives in addition to the one selected: (1) on-site soil cover plus institutional controls (Alternative 3); and (2) excavation to native sand plus off-site disposal (Alternative 4B).[13]

Alternative 3: Consistent with its determination in the ROD and upon further review, EPA has concluded that capping hundreds of residential yards and then implementing institutional controls poses a number of technical, legal, and administrative difficulties. Among the technical challenges is the difficulty of developing effective, property-specific cap designs and grading. Capping would also result in significant topographic changes to the property, compared to the current remedy which restores properties to their existing use. These caps would require extensive operation and maintenance by individual property owners. Further, institutional controls required by a capping remedy would involve significantly greater restrictions and monitoring requirements that would burden the owners' and tenants' use of their property. Finally, capping is inconsistent with EPA's preference for remedies that include treatment, which permanently and significantly reduces the toxicity, mobility, or volume of hazardous substances.

Based on general community reactions at the July 25, 2012 public meeting held for the proposed plan and on extensive community engagement since then, EPA expects poor community acceptance of this alternative. Poor community acceptance could make it more difficult for EPA to secure access to implement the remedy and could significantly increase costs. Finally, 289 properties in Zones 2 and 3 have already been remediated pursuant to the preferred remedy selected in the ROD; it would be inappropriate and unfair for EPA to subject the owners and residents of properties that have not yet been remediated to a different, more burdensome remedy.

Alternative 4B: The increased costs described above would proportionally increase the cost of Alternative 4B. Therefore, the reasons set forth in the ROD for not selecting Alternative 4B still apply at this time.

IV. SUPPORT AGENCY COMMENTS

The Indiana Department of Environmental Management supports this ESD.

V. FIVE YEAR REVIEWS

If this remedy results in hazardous substances, pollutants, or contaminants remaining on-site above levels that allow for unlimited use and unrestricted exposure, EPA will review the remedy no less often than every five years from the start of construction to ensure that the remedy is, or will be, protective of human health and the environment.

VI. AFFIRMATION OF STATUTORY DETERMINATIONS

[13] As required by law, EPA also evaluated a "no action" alternative. That alternative remains inappropriate in light of the contamination that exists in Zones 2 and 3.

The remedy selected in the 2012 ROD remains fundamentally unaltered, and the statutory determinations made in the ROD still apply. The significant change to the remedial action is an increase in the cost due primarily to an increase in the estimated volume of contaminated soil and an increase in the per unit costs of the remediation work.

The remedy will continue to be protective of human health and the environment and will comply with federal and state requirements that are legally applicable or relevant and appropriate to the remedial action. The remedy remains technically feasible, cost-effective and satisfies the requirements of CERCLA and the NCP.

VII. PUBLIC PARTICIPATION AND THE ADMINISTRATIVE RECORD

EPA noticed a proposed version of this ESD on December 12, 2017. Subsequently, EPA held a 60-day public comment period that ran from December 18, 2017, to February 16, 2018. EPA also described the proposed ESD at a public meeting in East Chicago on January 20, 2018, and solicited formal comments at a public hearing on February 15, 2018. Approximately 23 people (not including media and EPA personnel) attended the public hearing and 4 people provided comments. EPA also received 8 written comments. A summary of those comments and EPA's responses are included as Appendix C. The complete set of comments and the transcript from the public hearing are also included with Appendix C and can also be found in the Administrative Record for the Site.

Pursuant to NCP § 300.435(c)(i), EPA will publish a brief description of this ESD in the local newspaper. An electronic copy of this ESD will also be available online at: https://www.epa.gov/uss-lead-superfund-site.

Pursuant to NCP § 300.825(a)(2), this ESD will become part of the Administrative Record file for the site. The Administrative Record for the response actions related to the site is available for public review at the following locations:

East Chicago Public Library
2401 East Columbus Drive
East Chicago, IN 46312

East Chicago Public Library
1008 West Chicago Avenue
East Chicago, IN 46312

The Administrative Record file and other relevant reports and documents are also available for public review at the EPA Region 5 office at the following location:

EPA Region 5 Records Center
77 West Jackson Boulevard – 7th Floor
Chicago, IL 60604

Hours: Monday to Friday: 8:00 am – 4:00 pm

Finally, the Administrative Record is available online at: https://www.epa.gov/uss-lead-superfund-site.

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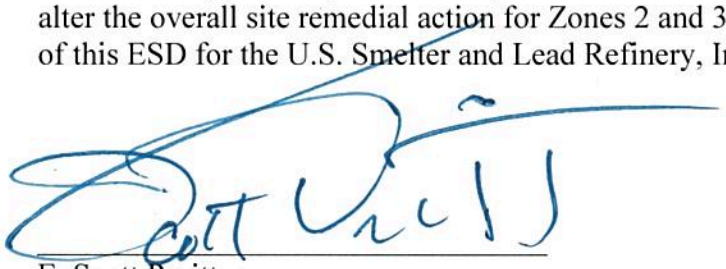
VIII. AUTHORIZING SIGNATURE

EPA has determined that the changes to the estimated cost of the remedy for the U.S. Smelter and Lead Refinery, Inc. Superfund Site provided in this ESD are significant but do not fundamentally alter the overall site remedial action for Zones 2 and 3 of OU1. Therefore, I approve the issuance of this ESD for the U.S. Smelter and Lead Refinery, Inc. Superfund Site.

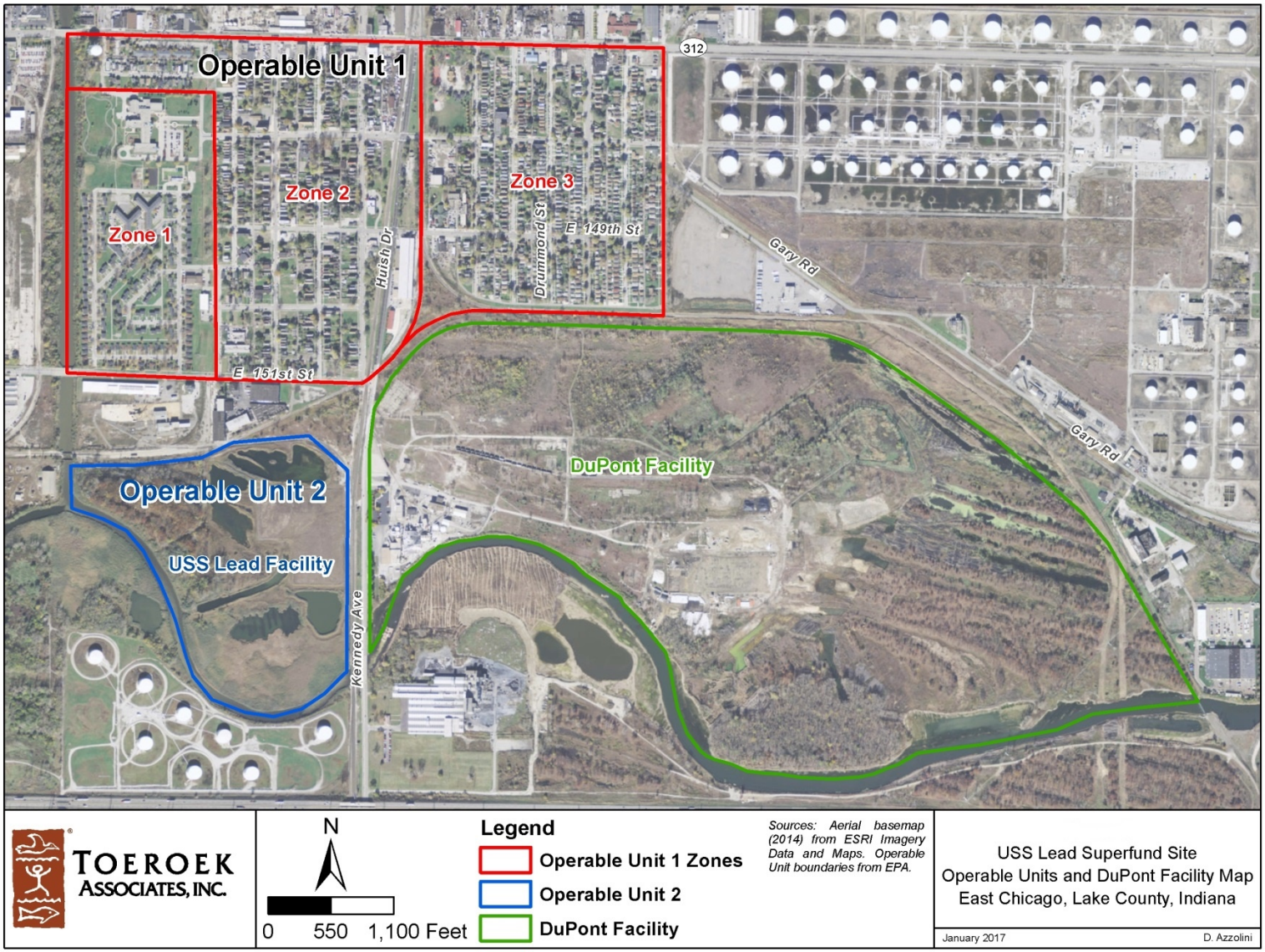


E. Scott Pruitt
Administrator

4-20-18
Date

APPENDIX A

MAP OF USS LEAD SUPERFUND SITE



APPENDIX A: USS Lead Superfund Site Operable Units, Zones, and DuPont Facility

APPENDIX B

TECHNICAL MEMORANDUM: FINAL COMPARISON OF ORIGINAL COST ESTIMATE AND CURRENT COST ESTIMATES FOR ZONES 2 AND 3 OF OU1

REMEDIAL ACTION CONTRACT 2
REGION 5

TECHNICAL MEMORANDUM:

COMPARISON OF ORIGINAL AND CURRENT COST ESTIMATES FOR REMEDIAL ACTION IN ZONES 2 AND 3 OF OPERABLE UNIT 1

U.S. SMELTER AND LEAD RESIDENTIAL AREA SUPERFUND SITE
EAST CHICAGO, LAKE COUNTY, INDIANA

Prepared for:
U.S. ENVIRONMENTAL PROTECTION AGENCY
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Date Submitted:	December 4, 2017
EPA Region:	5
Work Assignment No:	327-TATA-0528
Contract No:	EP-S5-06-02
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EXECUTIVE SUMMARY

This technical memorandum was prepared to compare estimated costs to remediate all properties in Zones 2 and 3 at the USS Lead site as estimated in the 2012 Feasibility Study, with a current cost estimate based on current remedial designs. The 2012 FS costs were estimated based on limited sampling conducted during the remedial investigation and on then-assumed unit rates for conducting various remediation tasks. The current estimated costs are based on a much more precise estimate of the total number of properties that will require remediation and volumes of contaminated soils present at each property, based on remedial design sampling conducted from 2014 to 2017, and on updated cost assumptions for the unit rates for the various tasks. The 2012 FS estimated that remediating all contaminated properties in Zones 2 and 3 would cost approximately $22.8 million. The current estimate to remediate all properties in Zones 2 and 3 is $84.9 million.

The principal underlying causes for the disparity between costs estimated in 2012 and current estimates are differences in quantities of contaminated soils that need to be removed and replaced and differences in unit rates. Specifically:

- Estimated quantities of soils that require remediation have nearly doubled from 47,250 cubic yards estimated in the 2012 FS to a current estimate of 88,300 cubic yards.
- Estimated unit rates such as costs to excavate and backfill each cubic yard of soil have increased significantly from the FS to the current estimate based on more labor-intensive excavation, higher wages paid to laborers, and a higher level of oversight than assumed for the FS.
- The increased quantity of soils to be remediated increased construction management costs and required a longer duration of remediation and oversight.
- Contingency costs across all tasks increased with the increased volume of soil and higher unit rates.

1.0 INTRODUCTION

SulTRAC received Work Assignment 327-TATA-0528 under Contract Number EP-S5-06-02 to compare estimated costs to remediate properties in Zones 2 and 3 of the U.S. Smelter and Lead Refinery, Inc. Superfund Site (USS Lead Site or Site), East Chicago, Lake County, Indiana that were presented in the Feasibility Study (SulTRAC 2012a) with current estimates using updated quantities and unit rates based on RD sampling conducted to date and revised engineering estimates. The Feasibility Study compared estimated costs for three areas within Operable Unit 1 (OU1) for four different remedial alternatives considered (SulTRAC 2012a). This Technical Memorandum only considers costs associated with the selected alternative (Alternative 4A – Excavation of Soil Exceeding RALs + Off-Site Disposal + *Ex Situ* Treatment Option).

A total of eighty-eight properties were sampled during the RI in a rough grid pattern at a frequency of two to three properties per block to provide spatial coverage of the entire site. The FS and Record of Decision (ROD) (EPA 2012) for the site divided operable unit 1 (OU1) into the northwestern, southwestern, and eastern geographic areas, based on similar incidence and levels of contamination in these areas. In 2014, after the FS was completed, OU1 was divided into three different geographic areas designated as Zones 1, 2, and 3. In 2014, SulTRAC reallocated the costs for the three *areas* identified in the FS into costs

associated with the three *zones*. Estimated costs to remediate all properties within OU1 were simply divided into different geographical groups between the FS and 2014. Total estimated costs for the three *areas* identified in the FS are equal to total estimated costs for the three *zones* identified in 2014, except for rounding errors.

The ROD estimated total remediation costs of $29.9 million for the northwestern, southwestern, and eastern areas. These same costs of $29.8 million were reallocated to Zones 1, 2, and 3 in 2014. (The $100,000 difference between the total estimated costs included in the ROD and the reallocated 2014 costs is due to rounding.) Because the remedial alternative for Zone 1 (the West Calumet Housing Complex) is currently being reviewed and possibly modified, this discussion is limited to Zones 2 and 3.

Based on the costs from the three areas presented in the ROD as reallocated to the three zones in 2014, a total cost of $22.8 million was estimated to remediate Zones 2 ($13.4 million) and Zone 3 ($9.4 million) (Table 1). These costs will subsequently be called the "original" costs. Tables 2, 3, and 4 show the basis for the original cost estimates. Based on an original estimate of 512 properties that require remediation in Zones 2 and 3, a per property remediation cost of approximately $44,500 per property was estimated.

This memorandum has been prepared to identify differences between the original estimated costs and current estimated costs to remediate properties in Zones 2 and 3, and to explain the basis for the differences. Major cost categories to remediate Zones 2 and 3 as originally estimated and as currently estimated are presented below.

Cost Estimates to Remediate Zones 2 and 3
USS Lead Superfund Site
East Chicago, Indiana

	2012 Feasibility Study	Current Cost Estimate	Cost difference
Pre-remedial design sampling	$1,500,000	$3,900,000	$2,400,000
Remedy construction	$15,000,000	$59,400,000	$44.400,000
Engineering and Construction Management	$2,400,000	$7,400,000	$5,000,000
O&M	$ 62,000	$ 62,000	$0
Contingency	$3,800,000	$14,100,000	$10,300,000
Total Estimated Cost	$22,800,000	$84,900,000	$62,100,000

Note: Individual costs do not sum to total costs due to rounding.

2.0 BASIS FOR ORIGINAL COST ESTIMATE

As part of the Feasibility Study, estimated costs to remediate properties under remedial alternative 4A were derived from the estimated number of yards to be remediated and various components of the remedy including (1) costs to sample and prepare remedial designs for each property, (2) costs to excavate contaminated soils, (3) costs to transport and dispose (T&D) of contaminated soils, (4) costs to backfill excavated areas, (5) costs to restore properties, (6) contractor oversight costs, (7) engineering and construction management, and so on.

RI sampling and RD sampling was based on "yards," defined as individual remediation units that consisted of front or back yards at typical residential properties, quadrants at larger properties, and other individual

units such as side yards, gardens, and areas where soil was relocated. Sampling results from the RI showed little correlation in contamination in front yards, back yards, and quadrants at a single property. Consequently, remediation costs were estimated based on individual yards, rather than individual properties.

Pre-remedial design sampling: Anticipated costs to sample each property were estimated based on the number of properties to sample, and past experience sampling properties during the RI. Estimated analytical costs assumed that samples would be analyzed by CLP laboratories or X-ray fluorescence, and that a small number of samples would be submitted to a private laboratory for TCLP analyses. The original estimate assumed that approximately 14 hours per property would be required to secure access and collect five-point composite samples from all of the yards at a particular property. A pre-remedial design sampling cost of $1.5 million was originally estimated.

Remedy construction: Remedy construction costs to remediate all properties in Zones 2 and 3 that were anticipated to require remediation were estimated by identifying each step in the remedial process, estimating unit rates and the number of units to execute that step, and summing the costs associated with each step to derive a total cost. Soil excavation costs, T&D costs, and backfill costs were based on the estimated volume of soil to be removed and replaced with clean fill, which was calculated using the estimated number of yards that would require remediation, the average size of the yards, and the percentage of yards that would require remediation to 6-, 12-, 18-, and 24-inches, based on sampling 88 of 1195 properties in Zones 1, 2, and 3 (7.4%) (see Tables 2 and 3).

The estimated volumes of soil and areas of each yard were multiplied by unit rates for various components of the remedy such as excavation of contaminated soils, backfill placement, topsoil placement, and restoration by seeding or installing sod over backfilled areas. Unit rates for each of the major components of the remedial process that were used for the original cost estimate are shown in Table 1. Descriptions of tasks included in each unit rate are detailed in Table 4. Unit rates presented originally were typically assigned based on engineering judgement or by project experience at other residential soil remediation sites such as the Jacobsville site in Evansville, Indiana.

Remedial contractor oversight costs were accounted for both as a subtask within “Remedy Construction” labeled “Contractors Oversight, Health and Safety, and Quality Control”, and as part of “Engineering and Construction Management”. Costs of $35,000 per month for 22 months were estimated for Contractor's Oversight, Health & Safety, and Quality Control. Based on unit rates used, this corresponds with 2 personnel providing remedial contractor oversight.

A total remedy construction cost of approximately $15 million was estimated to remediate all properties in Zones 2 and 3 based on estimated quantities derived from the RI sampling and estimated unit rates.

Engineering and construction management: Costs for preparing remedial designs, procuring a remedial contractor, onsite construction management, and reporting were estimated at a rate of $35,000 per month plus 10% of construction cost for a total $2.4 million. A total duration of 22 months was estimated to remediate an estimated 512 properties in Zone 2 and 3 with 2 more personnel providing remedial contractor oversight (these were in addition to the two oversight personnel providing oversight under the remedy construction task).

Operations and maintenance: A cost of $62,000 was originally estimated to conduct unspecified operations and maintenance (O&M) and five-year remedy reviews in Zones 2 and 3.

Contingency: A contingency of 20% of anticipated sampling costs, remedy construction costs, engineering and construction management costs, oversight and reporting, and O&M costs was added to the project subtotal cost to cover contingencies. The estimated contingency cost amounted to $3.8 million.

Based on the costs discussed above, a total project cost of $22.8 million was originally estimated to remediate all Zone 2 and 3 properties.

3.0 CURRENT COST ESTIMATES

Current cost estimates are based on units, unit rates, and cost assumptions that were updated based on current pricing and much more extensive RD sampling. The current cost estimate presented in Table 1 incorporates both the currently estimated units (such as volume of soil to be remediated) and current unit rates (such as cost to excavate and backfill each cubic yard of soil) and are based on current remedial designs and current unit rates. Current unit rates were derived in small part from actual incurred costs but predominantly from the Engineer's Estimate of the most recent remedial design report (SulTRAC 2017).

Specifically, SulTRAC provides a detailed Engineer's Estimate with each group of remedial designs submitted to the EPA for the USS Lead Site. The most recent RD document (SulTRAC 2017) submitted to EPA in September of this year included remedial designs for 94 Zone 3 properties and, in Appendix E, it included total estimated costs to remediate those 94 properties. That "Engineer's Estimate" is attached to this technical memorandum as Appendix A.

From the Engineer's Estimate, the total costs and units (i.e. yards, cubic yards, square yards) to remediate 94 Zone 3 properties were used as a basis to develop the new unit rates used in this document. To simplify the comparison between the more detailed cost categories used in the Engineer's Estimate to the less detailed categories used in the original cost estimate, each cost category from the Engineer's Estimate was mapped to a cost category used in the original estimate as detailed in Table 4. For example, to derive the new unit rate for Contaminated Soil Excavation and Backfilling, total estimated costs for 6 categories from the Engineer's Estimate (Excavation [mechanical], Excavation [manual], Backfill Placement, Topsoil Placement, Gravel Placement, and Geotechnical Testing) were summed ($4,883,711) and divided by the total cubic yardage being excavated from the 94 properties (10,362 yd^3), to derive a new unit rate of $471/$yd^3$ for Contaminated Soil Excavation and Backfilling. Current unit rates for all categories from the original cost estimate and their derivations are detailed in Table 4.

Pre-remedial design sampling: SulTRAC has sampled 966 properties in Zones 2 and 3 and has incurred actual costs of $2.8 million to sample these properties. The actual sampling cost was derived by adding costs expended under the field investigation / data acquisition task (Task 3), sample analysis acquisition (Task 4), analytical support / data validation (Task 5), data management (Task 6), and project management (Task 1) of work assignments (WA) 198, 308, and 320 from May 2015 to the present. Through October 2017, SulTRAC has expended $2.8 million including $430,000 in travel costs, subcontractors, and other direct costs, and approximately $2.4 million and 29,000 hours of labor to obtain access, sample, and manage resulting data for 966 properties in Zones 2 and 3 (approximately $2,900 per property).

111 properties remain to be sampled, due to lack of access from the owner of record. Thirteen of these properties were not sampled because the property owner refused access. Assuming that SulTRAC samples the remaining 98 properties and incurs the same estimated cost per property to sample them, additional sampling costs of approximately $282,000 are anticipated. Therefore, a total cost of approximately $3.1 million is estimated to sample all properties in Zones 2 and 3.

Contract laboratory program (CLP) laboratory costs of approximately $876,500 have been incurred to date, as reported by EPA on November 28. These actual laboratory costs have been included along with sampling costs to derive a total estimated pre-remedial design sampling cost of $3.9 million in the current cost estimate.

Remedy construction: Remedy construction costs to remediate all properties in Zones 2 and 3 that are expected to require remediation are presented as "Current cost estimate" in Table 1. To date, SulTRAC has sampled approximately 966 of the 1,077 properties in Zones 2 and 3 (90%). The total number of properties in Zones 2 and 3 decreased from the original count of 1,153 to the current count of 1,064 for several reasons including combining adjacent parcels with common ownership into single properties, zoning changes, and not counting properties where the owners refused to allow sampling or remediation. Based on sampling conducted to date, 713 of the 966 properties sampled in Zones 2 and 3 (74%) are known to require remediation. If 74% of the 98 properties that have not yet been sampled also require remediation, 72 additional properties and a total of 785 properties in Zones 2 and 3 will require remediation.

Current estimated costs presented in Table 1 are based on (1) volumes of soil to be removed, which are known much more precisely based on RD sampling of 90% of properties in Zones 2 and 3 than the original costs, which were based on sampling only 7.4% of properties, and (2) current estimated unit rates, which are based on a much more detailed cost estimate prepared for a recent remedial design document (SulTRAC 2017).

Using the limited sampling conducted during the RI, SulTRAC estimated that approximately 47,250 cubic yards (CY) of soil in Zones 2 and 3 would require excavation, disposal, and replacement with clean fill. Based on the much more extensive sampling conducted during the remedial design (RD), SulTRAC now estimates that a total of 88,300 CY of soil in Zones 2 and 3 will require excavation, disposal, and replacement with clean fill, about double the original estimate. The 88,300 CY consists of approximately 69,700 CY of soil estimated for the 713 properties currently known to need remediation plus an estimated 18,600 CY of soil for the remaining 98 properties that have not yet been sampled. (Note: many of the properties that have not yet been sampled are commercial properties and railroad rights-of-way and therefore the average property size for these properties is considerably larger than the average size of the sampled properties.)

Treatment and disposal costs for the updated estimate are based on actual costs incurred of $40 per ton, as reported by EPA on November 27. Remedial designs provide volume of soil to be excavated and disposed of, but disposal of this material is priced in tons. For the purposes of estimating costs here, volume is converted to weight using density of the material, which depends on variables such as water content, soil composition, and inclusion of foreign materials such as bricks, debris, and slag. A disposal cost of $40 per ton and density conversion of 1.15 tons per cubic yard resulted in the disposal cost of $46 per cubic yard used for this cost estimate.

Based on updated units and unit rates, the remedy construction task for all properties in Zones 2 and 3 is now estimated at $59.4 million.

Engineering and construction management: The original engineering and construction management cost category included remedial design costs and as well as procurement, contractor oversight and reporting costs. Thus, we include estimates for these costs in the current estimate.

- **Remedial design costs:** To date, SulTRAC has prepared remedial designs for approximately 500 properties in Zones 2 and 3, at a cost of approximately $380,000 ($760 per remedial design). This estimated cost to prepare remedial designs was calculated by adding the costs incurred under the Pre-final/Final design task (Task 11) of WAs 198, 308, and 320 from May 2015 to the present. Assuming that a total of 785 remedial designs will need to be prepared at a cost of $760 per remedial design, a total of approximately $600,000 is estimated to prepare remedial designs for all properties in Zones 2 and 3 that may ultimately require remediation. These costs were included in engineering and construction management unit costs.
- **Procurement, contractor oversight and reporting costs**: The Engineer's Estimate for 94 Zone 3 properties (SulTRAC 2017) included estimated costs to procure a remedial contractor, provide remedial oversight, and prepare a remedial action report. As noted above, remedial oversight costs appear in two locations in the original cost estimate: as a "Contractor's Oversight, Health and Safety, and Quality Control" subtask included in the "Remedy Construction" task and separately in the "Engineering and Construction Management" task. SulTRAC assigned the Engineer's Estimate subtasks to the Contractor's Oversight task or the Remedy Construction task as shown in Table 4. Because the original construction management costs were estimated on a monthly rate, SulTRAC divided the Engineer's Estimate totals by the seven months expected to complete the 94-property remedial project to derive an equivalent monthly rate for the current cost estimate that could be compared to the original cost estimate. The total duration to complete remediation of all properties in Zones 2 and 3 is now expected to be 48 months. This duration was estimated by prorating the 14 months of work required in 2017 to remediate 229 Zone 2 and 3 properties (16.4 properties per month) to derive the 48-month period required to remediate all 785 properties that are expected to require remediation.

Contingency: A contingency cost of $14.1 million is estimated for the project, based on 20% of the remedial design sampling costs, remedy construction costs, and oversight and reporting costs for Zones 2 and 3.

Institutional controls and operations and maintenance costs: Institutional controls and O&M costs are a relatively minor component of the total cost for the remedy and were not updated.

4.0 COMPARISON OF ORIGINAL COST ESTIMATE WITH CURRENT COST ESTIMATE

Based on the original cost estimate, which was prepared using the very limited RI sampling and estimated unit rates, and the current cost estimate, which is based on the much more detailed RD sampling and a much more detailed evaluation of unit rates using updated material, equipment, and labor costs, a cost difference of $62.1 million was identified. The basis for this cost difference is detailed below:

Pre-remedial design sampling: Estimated costs to conduct predesign sampling have increased by approximately $2.4 million between the original and current estimates, as shown in Table 1. The original estimate assumed a cost of $1,315 to sample each property, for a total cost of $1.5 million to sample all properties in Zones 2 and 3. A cost of $3.9 million is now estimated to sample all properties in Zones 2 and 3 as described under pre-remedial design in Section 3.

Increases in sampling and analysis costs from the original estimate were caused by several factors, including:

- Sampling deeper than originally assumed: The original estimate assumed that sampling would cease when zones of refusal were encountered; In fact, sampling at the majority of properties was advanced to 2.5 feet below ground surface using the much more labor-intensive pry bars, pick axes, and in some cases, a subcontracted mechanical excavation contractor.
- Use of contract laboratory program (CLP) laboratories instead of X-ray fluorescence (XRF) field instruments to measure lead and arsenic content of soil samples from Zone 2: To achieve more rapid turn-around time for individual samples so that work in Zone 2 could begin together with work in Zone 3, and to avoid delays associated with generating a complete data set to create an XRF correction factor, SulTRAC sent all samples from Zone 2 and selected samples from Zone 3 to CLP laboratories for analysis, at costs of $790,000 and $86,500, respectively. CLP laboratory costs were not included in the FS cost estimate.
- Use of private laboratories and third-party data validators: To achieve more rapid analytical turn-around time, SulTRAC sent selected samples to a private laboratory. SulTRAC incurred costs of approximately $92,000 to analyze samples and validate data that was not included in the original cost estimate.
- Data management: To make data available to the various stakeholders in the project, SulTRAC conducted intensive data management activities, including entering all field data in field tablet computers, the SCRIBE database, and a Geoportal and producing numerous graphics.

Remedy Construction: Estimated costs for remedy construction have increased by approximately $44.4 million between the original and current estimates, as shown in Table 1. These differences are driven primarily by a difference in the estimated volume of soil to be remediated and the increased unit rates for soil excavation and backfill.

The differences between original and current estimates of soil volumes that require remediation are shown in Table 3. Using the limited sampling conducted during the RI, SulTRAC originally estimated that approximately 47,250 cubic yards (CY) of soil in Zones 2 and 3 would require excavation, disposal, and replacement with clean fill. Based on the much more extensive sampling conducted during the remedial design (RD), SulTRAC now estimates that a total of 88,300 CY of soil in Zones 2 and 3 will require excavation, disposal, and replacement with clean fill, about double the original estimate.

The primary reasons for the increase in estimated soil volume are that the average estimated size of the yards to be remediated has increased, the estimated number properties requiring remediation has increased, and the estimated depth of required remediation at these properties has increased from the original estimates.

- **Average size of yards:** As shown in Table 2, the average yard sizes originally used to estimate costs were smaller than the current estimated excavation areas used for the current estimated costs. The properties sampled during the Remedial Investigation were selected to achieve an even spatial distribution of properties throughout OU1 rather than on anticipated contaminant concentrations or the size of the property. For the original estimate, only those properties that were sampled were considered when estimating the average yard size.

  Average yard size for residential properties increased from 1,254 ft^2 to 1,406 ft^2 in Zone 2 and from 900 ft^2 to 1,512 ft^2 in Zone 3. The increase in yard size between the original and current estimates was caused by using a much larger sample size (90% of properties sampled for current estimate vs. 7.4% of properties sampled used for original estimate) and to some degree by combining adjacent parcels with common ownership into single properties for the RD.

  Yard size estimates for commercial properties used in the original estimate were biased low because some larger properties (including utility corridors and commercial properties) were not considered during the Feasibility Study, although this effect was mitigated to some extent by including the parks that were sampled.

- **Number properties requiring remediation:** The estimated number of Zone 2 and Zone 3 properties requiring remediation increased from 512 to 785 (494 in Zone 2 and 291 in Zone 3). This increase was caused by a higher incidence of contamination detected during the more comprehensive sampling of the RD (90% of properties) than the RI (7.4% of properties).

- **Depth of required remediation:** The original estimate assumed that a small percentage of the properties would require remediation to deeper soil intervals. For example, it was originally assumed that 4% of the residential properties in Zone 2 and 3% of the residential properties in Zone 3 would require remediation to 24-inches. Based on the much more extensive RD sampling, SulTRAC now estimates that 17% of the residential properties in Zone 2 and 14% of the residential properties in Zone 3 will require remediation to 24-inches (see Table 3).

- **Unit rates:** The estimated unit rates for activities such as preconstruction activities, excavation and backfill, and oversight have increased significantly between the FS and current estimates. Causes for this increase include:

  - Labor costs from 2012 were updated based on 2017 prevailing wage requirements (original labor costs were not based on prevailing wages);
  - Changes in material and equipment costs from 2012 to 2017;
  - Inclusion of manual excavation that was not considered in the formulation of the original cost estimate;
  - The original oversight costs assumed four persons would provide oversight (split between construction management and remedy construction), current estimates assume that a team of seven persons will provide remedial construction oversight.

Engineering and construction management: Estimated engineering and construction management costs have increased by approximately $5.0 million between the original and current estimates, as shown in Table 1. Estimated engineering and construction management costs are based on 10% of estimated remedy

construction costs, plus an estimated duration of the project multiplied by a monthly construction oversight cost. Most of the cost difference between the original and the current estimate is the result of the increased remedy construction cost. The expected increase in project duration from 22 months to 48 months accounts for about $140,000 of the cost difference.

5.0 SUMMARY

The disparity between the original cost estimate and the current estimate is accounted for primarily by a difference in quantities of contaminated soils that need to be removed and replaced and differences in unit rates. The principal underlying causes that have increased costs are:

- Estimated volumes of soils that require remediation have increased substantially. The original excavation volume was based on a small sample size of 7.4% of properties and the current estimate is based on much more robust RD soil sampling of 90% of properties in Zones 2 and 3. The RD sampling has shown that more yards require remediation than were originally estimated, and the contaminated intervals are larger and deeper than anticipated.
- Estimated unit rates such as costs to excavate and backfill each cubic yard of soil have increased significantly based on higher wages paid to laborers, a higher level of oversight, and manual excavation that was not considered originally.
- The increased quantity of soils to be remediated increased construction management costs and also required a longer duration of remediation and oversight.
- Contingency costs across all tasks increased with the increased volume of soil and higher unit rates.

6.0 REFERENCES

SulTRAC 2012a. "Feasibility Study, US Smelter and Lead Refinery Superfund Site, Lake County, Indiana." June 20.

SulTRAC 2012b. "Remedial Investigation Report, U.S. Smelter and Lead Refinery Superfund Site, Lake County, Indiana." June 20.

SulTRAC 2017. "Draft Remedial Design for 94 Zone 3 Properties, U.S. Smelter and Lead Residential Area Superfund Site East Chicago, Lake County, Indiana." September.

U.S. EPA 2012. "U.S. Smelter and Lead Refinery, Inc. Superfund Site, Operable Unit 1, East Chicago, Lake County, Indiana, Record of Decision." November.

Table 1
Original Cost Estimate vs Current Cost Estimate
USS Lead
East Chicago, Indiana

			Unit Rates	Unit Rates	Number of Units			Number of Units				Original Cost Estimate			Current Cost Estimate			
			2012 FS	Current [1]	Original cost estimate			Current cost estimate			Difference [2]							Difference [3]
Estimate Category		**Units**			**Zone 2**	**Zone 3**	**Total**	**Zone 2**	**Zone 3**	**Total**		**Zone 2**	**Zone 3**	**Total**	**Zone 2**	**Zone 3**	**Total**	
PRE-REMEDIAL DESIGN SAMPLING																		
Sample Collection Labor & Other Direct Costs	Total Properties * Rate	Total Properties	$1,315	$2,873	639	514	1,153	594	470	1,064	(89)	$840,700	$676,000	$1,516,700	$1,706,562	$1,350,310	$3,056,872	$1,540,172
Contract laboratory program (CLP) laboratory costs [4]		Lump sum													$790,000	$86,500	$876,500	$876,500
Pre-remedial Design subtotal												**$841,000**	**$676,000**	**$1,500,000**	**$2,500,000**	**$1,400,000**	**$3,900,000**	**$2,400,000**
REMEDY CONSTRUCTION																		
Preconstruction Activities [5]	Yards Requiring Remediation * Rate + Flat Cost of $144,000 per Zone	Unremediated Yards	$83	$1,530	626	479	1,105	991	479	1,470	365	$196,000	$180,000	$376,000	$1,516,834	$732,385	$2,249,219	$1,873,219
Site Preparation and Design Agreements	Estimated Total Area * Rate	Total Area (sq yd)	$7.50	$5.59	96,698	66,796	163,494	163,050	99,813	262,862	99,369	$730,000	$500,000	$1,230,000	$911,447	$557,953	$1,469,400	$239,400
Institutional Controls	$5,000 Lump Sum Per Zone	Zones	$5,000	$5,000	1	1	2	1	1	2	-	$5,000	$5,000	$10,000	$5,000	$5,000	$10,000	$0
Contaminated Soil Excavation and Backfilling	Estimated Total Volume * Rate	Total Volume (cu yd)	$115	$471	28,093	19,157	47,250	55,647	32,642	88,288	41,038	$3,231,000	$2,203,000	$5,434,000	$26,209,547	$15,374,272	$41,583,819	$36,149,819
Contaminated Soil Transportation and Disposal	Estimated Total Volume * Rate	Volume (cu yd)	$79	$46	28,093	19,157	47,250	55,647	32,642	88,288	41,038	$2,219,000	$1,513,000	$3,732,000	$2,559,743	$1,501,521	$4,061,265	$329,265
Soil Barrier for Soil Below 24 inches		Total Area (sq yd)		$1.35				34,240	20,961	55,201		$2,000	$1,000	$3,000	$46,225	$28,297	$74,521	$71,521
Property Restoration	Estimated Total Area * Rate	Total Area (sq yd)	$21	$15	96,698	66,796	163,494	163,050	99,813	262,862	99,369	$2,036,000	$1,407,000	$3,443,000	$2,445,745	$1,497,190	$3,942,934	$499,934
Contractor's Oversight, Health & Safety, Quality Control	Duration in Each Zone * Rate	Months	$35,000	$125,407	13	9	22	31	17	48	26	$455,000	$315,000	$770,000	$3,887,617	$2,131,919	$6,019,536	$5,249,536
Construction Subtotal												**$8,900,000**	**$6,100,000**	**$15,000,000**	**$37,600,000**	**$21,800,000**	**$59,400,000**	**$44,400,000**
ENGINEERING & CONSTRUCTION MANAGEMENT	Duration in Each Zone * Rate + 10% of Construction Subtotal + $760 per design	Months	$35,000	$18,993	13	9	22	31	17	48	26	$1,435,000	$995,000	$2,430,000	$4,681,420	$2,701,785	$7,383,205	$4,953,205
OPERATIONS AND MAINTENANCE												$35,000	$27,000	$62,000	$35,000	$27,000	$62,000	$0
Project Subtotal												**$11,200,000**	**$7,800,000**	**$19,000,000**	**$44,800,000**	**$26,000,000**	**$70,800,000**	**$51,800,000**
20% Contingency	20% of Project Subtotal											$2,240,000	$1,560,000	$3,800,000	$8,960,000	$5,200,000	$14,160,000	$10,360,000
Project Total												**$13,400,000**	**$9,400,000**	**$22,800,000**	**$53,800,000**	**$31,200,000**	**$84,900,000**	**$62,100,000**

[1] - All values are taken from the last column in Table 4
[2] - Difference in number of units between original and current estimates
[3] - Cost difference between original and current estimate
[4] - Contract laboratory costs were not included in original estimate, current cost estimate includes actual costs for CLP analytical services and data validation
[5] - Preconstruction activities: A flat cost of $144,000 for mobilization and project plans used in original estimate was not prorated to per property unit rate

Note: Values in this table have been rounded

Table 2
Remedial Soil Areas and Volumes Based on Depth
USS Lead
East Chicago, Indiana

Original Estimate

	Number of Yards	Property type	% Yards Requiring Remediation	Yards Requiring Remediation	Properties Requiring Remediation	Average Excavation Area per Yard (sq ft)	Total area requiring remediation (sq ft)	Total area by property type (sq ft)	Total volume by property type (cu yd)
Zone 2									
Residential	1,154	Residential	53%	612	306	1,254	767,448	767,448	24,332
Park/school/church	28	Commercial	50%	14	4	7,345	102,830	102,830	3,761
Industrial/commercial/easement	220		0%	-	-	984	-		
Zone total	*1,402*			*626*	*310*		*870,278*		*28,093*
Zone 3									
Residential	974	Residential	41%	399	182	900	359,100	359,100	11,104
Park/school/church	12	Commercial	67%	8	2	10,026	80,208	242,064	8,053
Industrial/commercial/easement	96		75%	72	18	2,248	161,856		
Zone total	*1,082*			*479*	*202*		*601,164*		*19,157*
TOTAL	**2,484**			**1,105**	**512**		**1,471,442**		**47,250**

Current Estimate

	Number of Yards	Property type	% Yards Requiring Remediation	Yards Requiring Remediation	Properties Requiring Remediation	Average Excavation Area per Yard (sq ft)	Total area requiring remediation (sq ft)	Total area by property type (sq ft)	Total volume by property type (cu yd)
Zone 2									
Residential	1,366	Residential	68%	934	465	1,406	1,246,167		
Park/school/church	72		40%	29	13	2,644	58,463	1,304,630	47,280
Industrial/commercial/easement	120	Commercial	24%	29	16	4,367	162,816	162,816	8,367
Zone total	*1,558*			*991*	*494*		*1,467,447*		*55,647*
Zone 3									
Residential	948	Residential	46%	434	272	1,512	644,691		
Park/school/church	13		38%	5	2	18,588	34,772	679,463	23,440
Industrial/commercial/easement	109	Commercial	36%	39	17	5,276	218,850	218,850	9,202
Zone total	*1,070*			*479*	*291*		*898,314*		*32,642*
TOTAL	**2,628**			**1,470**	**785**		**2,365,760**		**88,288**

*Totals may not reflect counts due to rounding

Table 3
Removal Volume Estimates Based on Depth of Impacted Soil
USS Lead
East Chicago, Indiana

Original Estimate

	Total Area Requiring Remediation (sq ft)	Percent RAL Exceedances 0-6"	Volume 0-6 inches (cu yd)	Percent RAL Exceedances 0-12"	Volume 0-12 inches (cu yd)	Percent RAL Exceedances 0-18"	Volume 0-18 inches (cu yd)	Percent RAL Exceedances 0-24"	Volume 0-24 inches (cu yd)	Total Volume (cu yd)
Zone 2										
Residential	767,448	42%	5,898	49%	13,786	6%	2,430	4%	2,218	24,332
Park/school/church	102,830	31%	590	50%	1,910	10%	577	9%	684	3,761
Industrial/commercial/easement	-	0%	-	0%	-	0%	-	0%	-	-
Zone Total	*870,278*									*28,093*
Zone 3										
Residential	359,100	44%	2,925	48%	6,384	5%	998	3%	798	11,104
Park/school/church	80,208	36%	538	53%	1,579	6%	258	5%	285	2,660
Industrial/commercial/easement	161,856	35%	1,052	54%	3,240	7%	621	4%	480	5,393
Zone Total	*601,164*									*19,157*
TOTAL	**1,471,442**									**47,251**

Current Estimate

	Total Area Requiring Remediation (sq ft)	Percent RAL Exceedances 0-6"	Volume 0-6 inches (cu yd)	Percent RAL Exceedances 0-12"	Volume 0-12 inches (cu yd)	Percent RAL Exceedances 0-18"	Volume 0-18 inches (cu yd)	Percent RAL Exceedances 0-24"	Volume 0-24 inches (cu yd)	Total Volume (cu yd)
Zone 2										
Residential	1,246,167	36%	6,781	30%	12,606	17%	10,408	17%	15,082	44,878
Park/school/church	58,463	18%	122	24%	495	41%	1,134	18%	651	2,402
Industrial/commercial/easement	162,816	13%	280	13%	1,490	35%	2,271	39%	4,326	8,367
Zone Total	*1,467,447*									*55,647*
Zone 3										
Residential	644,691	34%	3,770	34%	7,056	18%	5,309	14%	6,723	22,858
Park/school/church	34,772	80%	529	20%	53	0%	-	0%	-	582
Industrial/commercial/easement	218,850	38%	1,292	38%	2,610	8%	1,126	15%	4,173	9,202
Zone Total	*898,314*									*32,642*
TOTAL	**2,365,760**									**88,288**

*Totals may not reflect counts due to rounding

Table 4
2012 FS and 2017 RD Cost Estimate Unit Rate Comparison
USS Lead Site
East Chicago, Indiana

2012 Feasibiliy Study Cost Estimate Unit Rates			94 Zone 3 Properties Remedial Design Cost Estimate				Current Rates[1]
Category	Description	Unit Rates	Category	Total Cost	Lumped Total Cost	Units	
PRE-REMEDIAL DESIGN SAMPLING							
Sample Labor	Labor for sampling and access agreements. Assumes access agreements needed for all properties.	$1,134 per property	Sample labor and ODCs [2]	NA	NA	NA	$2,873/property [2]
ODCs	CLP/TCLP samples and equipment transportation	$181 per property					
REMEDY CONSTRUCTION							
Preconstruction Activities	Mobilization & Demobilization, preconstruction Plans, Coordination with residents	$144,000 + $83/yard	Mobilization	$292,530	$313,710	205 yards in 94 properties	$1,530/yard
			Demobilization	$21,180			
Site Preparation and Access	Erosion control, utility locates, site prep, and documentation of yard conditions (including agreements with residents)	$7.5/sq. yd.	Pre-construction Assessment	$147,470	$147,470	26,391 sq yd	$5.59/sq. yd.
Institutional Controls	Institutional Control Monitoring Plan (not dependent on number of ICs)	$5,000/zone	NA	NA	NA	NA	-
Contaminated Soil Excavation and Backfilling	Excavation of impacted soil, backfill with clean soil, and topsoil	$115/cu. yd.	Excavation (Mechanical)	$2,329,558	$4,883,711	9,621 cu yd mechanical + 741 cy yd manual = 10,362 cu yd	$471/cu. yd.
			Excavation (Manual)	$411,098			
			Backfill Placement	$876,681			
			Topsoil Placement	$924,889			
			Gravel Placement	$204,884			
			Geotechnical Testing	$136,600			
Contaminated Soil Transportation and Disposal	Transportation & Disposal for haz and non-haz	$79/cu. yd.	Contaminated Soil Transportation and Disposal [2]	NA	NA	NA	$46/cu. yd. [3]
Soil Cover	Visible barrier for small percentage of properties with impacted soil below 24" (snow fence)	$4,000/site	High Visibility Barrier	$7,597	$7,597	5,627 sq yd	$1.35/sq. yd.
Property Restoration	Restoration of grass and any removed plantings	$21/sq. yd.	Mulch Placement	$15,704	$402,823	26,391 sq yd	$15/sq. yd.
			Sod Placement	$146,639			
			Seed Placement	$0			
			Watering	$87,850			
			Trees	$2,372			
			Shrubs	$22,650			
			Stumps	$7,924			
			Miscellaneous Landscaping	$15,604			
			Property Close-Out	$104,080			
Contractor's Oversight, Health & Safety, Quality Control	22 mo @ 35000/mo.	$35,000/mo.	Office rental expense	$21,600	$877,850	7 months	$125,407/mo.
			Field Startup activities	$16,400			
			Remediation Oversight	$768,600			
			Air Sampling	$52,250			
			Soil Sampling	$19,000			
ENGINEERING & CONSTRUCTION MANAGEMENT	Onsite construction Quality Assurance plus design, procurement, construction management, and reporting	$35,000/mo. + 10% const subtotal	Procurement	$33,250	$132,950	7 months	$18,993/mo. + 10% const subtotal +
			Plan generation	$22,500			
			Plan review	$10,800			
			Community relations	$7,950			
			Close out activities	$58,450			
			Remedial Design [2]	NA	NA	NA	$760/remedial design [4]
OPERATIONS AND MAINTENANCE	Cost of 3 5-year reviews prorated across the three zones	Flat rates					Flat rates

[1] - Except for the three unit costs highlighted in pale green, the rates in this column are derived from the "Engineer's Estimate of Remediation Costs" attached to SulTRAC's September 2017 Remedial Design Document. The Engineer's Estimate of Remediation Costs is attached to this Technical Memorandum as Appendix A.

[2] - Pre-remedial design sampling costs were prorated based on actual incurred costs of approximately $2.8 million to sample 966 properties, as described in Section 3.0

APPENDIX B: ATTACHMENT 1

Engineer's Cost Estimate

Originally included as Appendix E in SulTRAC *Draft Remedial Design for 94 Zone 3 Properties, U.S. Smelter and Lead Residential Area Superfund Site East Chicago, Lake County, Indiana* (Sept. 29, 2017)

DESCRIPTION OF ENGINEER'S ESTIMATE OF REMEDIATION COSTS

SUBJECT: Engineer's Estimate of Remediation Costs for 94 Properties in Zone 3 of Operable Unit 1 of the U.S. Smelter and Lead Refinery, Inc. Superfund Site

FROM: Rik Lantz, SulTRAC Project Manager

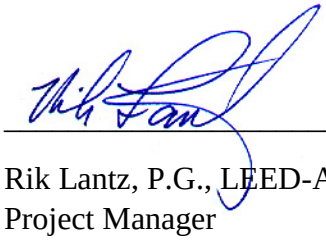
TO: Sarah Rolfes / Tim Drexler
Remedial Project Managers
EPA Region 5

DATE: 12/4/2017

The attached Engineer's Estimate of Remediation Costs describes SulTRAC's estimate for remediating 94 properties in Zone 3 of Operable Unit 1 of the U.S. Smelter and Lead Refinery, Inc. Superfund Site.

This Engineer's Estimate was prepared by Chris Ore, P.E. in September 2017, and was originally provided to EPA on September 29, 2017 as Appendix E to a set of 94 draft remedial designs for Zone 3 properties. It is the most up-to-date cost estimate we have prepared. It is included separately here because unit rate cost estimates from this Engineer's Estimate have been used in the *Technical Memorandum: Comparison of Original Cost Estimates and Current Cost Estimates for Zones 2 and 3 of OU1*.

The attached Engineer's Estimate was prepared consistent with the Statement of Work for Remedial Design (OU1) dated January 28, 2016.



Rik Lantz, P.G., LEED-AP
Project Manager
SulTRAC

Engineer's Estimate of Remediation Costs

The costs for remediation of 94 properties (including excavation and transportation, restoration, and oversight) within USS Lead Zone 3 was estimated as $6,770,000. Based upon discussion with EPA this estimate assumes, oversight of the remediation will be performed by a primary contractor, and the remediation activity will be performed by a subcontractor. Costs were estimated using applicable Davis Bacon wages and SulTRAC's experience with similar remediation projects.

This cost estimate has been prepared in accordance with the Statement of Work for Remedial Design (OU1) dated January 28, 2016. Assumptions have been made regarding the number of remediation crews and site workers, rate of production, and labor costs. Actual costs may vary from this cost estimate due to these or other factors. A detailed breakdown of the estimated costs, including descriptions of assumptions, is attached.

Subcontractor Costs

	Bid Item	Unit	Unit Price	Est. Qty	Extended Price
1	Mobilization	each	$292,530	1	$292,530
2	Pre-construction Assessment	each	$1,569	94	$147,470
3	Excavation (Mechanical)	yds^3	$242	9,621	$2,329,558
4	Excavation (Manual)	yds^3	$555	741	$411,098
5	Backfill Placement	yds^3	$304	2,888	$876,681
6	Topsoil Placement	yds^3	$228	4,064	$924,889
7	Gravel Placement	yds^3	$60	3407.4	204884
8	Mulch Placement	yds^3	$196	80	$15,704
9	Geotechnical Testing	each	$332	266	$136,600
10	High Visibility Barrier	ft^2	$0.15	50645.2	7596.78
11	Sod Placement	ft^2	$0.61	242,277	$146,639
12	Seed Placement	ft^2	0	0	0
13	Watering	each	$935	94	$87,850
14	Trees	each	$791	12	$2,372
15	Shrubs	each	$139	125	$22,650
16	Stumps	each	$1,132	17	$7,924
17	Miscellaneous Landscaping	each	$166	94	$15,604
18	Property Close-Out	each	$1,107	94	$104,080
19	Demobilization	each	$21,180	1	$21,180
				Total Subcontractor Cost	$5,755,311

Oversight Contractor Costs

Procurement	$33,250
Plan Generation	$22,500
Plan Review	$10,800
Community Relations	$7,950
Office Rental Expense	$21,600
Field Startup Activities	$16,400
Remediation Oversight	$768,600
Air Sampling	$52,250
Soil Sampling	$19,000
Close-Out Activities	$58,450
Total Oversight Costs	$1,010,800

Subcontractor Costs	$5,755,311
Contractor Costs	$1,010,800
Total Costs	$6,766,111

Davis Bacon Wages, Lake County, Heavy Category

Personnel	Group	Hourly Base Rate	Fringe	Employee Hourly Rate[1]	Sub. Hourly Rate[2]	Overtime Base Rate	Fringe	Employee Overtime Rate[1]	Sub. Overtime Rate[2]
Operator	1	$40.50	$32.00	$72.50	$91	$60.75	$32.00	$92.75	$116
Laborer	1	$30.24	$15.63	$45.87	$58	$45.36	$15.63	$60.99	$77
Driver	1	$32.29	$24.38	$56.67	$71	$48.44	$24.38	$72.82	$91

Notes:

1) DBA wages paid to the employee. General Decision Number: IN170001 09/08/2017 IN1

2) Marked up subcontractor hourly rate (Assumed factor of ~1.25)

Non Davis Bacon Personnel	Hourly Rate (loaded)
Program Manager	$120.00
Project Manager	$110.00
Foreman	$90.00
Quality Control Manager (QCM)	$80.00
Health & Safety Officer (HSO)	$80.00
Agreement Coordinator	$65.00
Office Support	$60.00

Personnel are assumed to be exempt employees and paid straight time for hours over 40/week

94	Properties to be Remediated
111.4	cubic yards average volume soil per property
740.57	manual excavation cubic yards
9620.95	mechanical excavation cubic yards

5 excavation, 3 backfill crews total

1700	cubic yards per month - approximate excavation rate of Jacobsville remediation contractor utilizing average of 4 excavation crews and five 10 hour days
2200	cubic yards per month assumed USS Lead with shorter transportation time and extra crew
21	assumed weeks to complete remediation of 93 USS Lead Zone 3 properties (5.25 months)
7	months total project duration including mobilization/setup and project close-out, estimated April through October

1 - Mobilization

Prepare Plans: Site specific plans include work plan, sampling and analysis plan, health and safety plan, transportation plan, environmental protection plan, and quality control plan

Staff	Hours	Cost
Program Manager	20	$2,400
Project Manager	60	$6,600
Foreman	80	$7,200
Quality Control Manager	40	$3,200
Health & Safety Officer	40	$3,200
Office Support	160	$9,600
Total Labor	400	$32,200
Plan Reproduction & Shipping Costs		$1,000
Total Plan Generation Costs		$33,200

1 - Mobilization (Continued)

Rental Items	Unit Price	Units	Total
Office Trailer[1]	$1,800	7 months	$12,600
Trailer Delivery	$4,500	1 lump sum	$4,500
Utility Connection	$3,500	1 lump sum	$3,500
Electric Service	$400	7 months	$2,800
Internet Service	$100	7 months	$700
Chain Link Fence[2]	$2,700	7 months	$18,900
Fence Setup	$500	1 lump sum	$500
Conex Box[3]	$600	7 months	$4,200
Conex Delivery	$300	1 lump sum	$300
Portable Toilets[4]	$1,600	7 months	$11,200
Project Signage	$1,000	1 lump sum	$1,000
Drinking Water	$200	7 months	$1,400
Office Supplies	$250	7 months	$1,750
Office Furniture	$250	7 months	$1,750
		Total Cost	$65,100

Notes:

No cost is anticipated for usage of lot for trailer placement (McCook and 149th) or material staging area (Chemours). Equipment will be stored at one of these locations with overnight security.

1) Assumes 3 office trailers (based on previous setup at McCook & 149th) at $600/mo each
   Assumes rental of 1,000 ft of chain-link security fence, around trailer & equipment yard. Dimensions: 6 ft
2) H x 12 ft L panels and 2 gates
3) Assumes 2 Connex boxes at $300/each/month
4) Assumes 6 portable toilets and two hand-wash stations at $200/each/month

A group of key personnel are anticipated to mobilize to the site one week prior to the start of excavation activity to perform office and staging area setup tasks.

Office and Staging Area Setup, Equipment Mobilization

Personnel	#	Hourly Rate	Hours	Total
PM	1	$110	20	$2,200
Foreman	1	$90	40	$3,600
Operator	1	$91	40	$3,640
Laborer	2	$58	40	$4,640
Delivery Charges		Delivery		Total
Excavator	5	$150	Each	$750
Skidsteer	4	$150	Each	$600
Dump Truck	18	$150	Each	$2,700
			Total	$18,130

1 - Mobilization (Continued)

Site Security During Non-Working Hours

Security presence is anticipated during non-working hours for the full duration of temporary office usage (April to October). Security personnel are anticipated to rotate and not be subject to overtime pay. Subcontractor staff are anticipated to work M-F schedule, and will not be present on weekends.

Security Costs	Hourly Rate	Hours Onsite	Days Onsite	Cost
Weekdays	$50	14	147	$102,900
Weekends	$50	24	58	$69,600
Holidays	$50	24	3	$3,600
			Total Cost	$176,100

Total Mobilization Costs	
Plans	$33,200
Rentals	$65,100
Delivery / Setup	$18,130
Security	$176,100
Total	**$292,530**

2 - Pre-Construction Property Assessment and Property Owner Agreement

One agreement coordinator will work to complete restoration agreements with property owners and document pre-existing conditions after plan approval beginning two weeks prior to the start of excavation activity. Restoration agreement meetings will continue until all agreements are signed. Agreement coordinator will assist in resolving property owner and resident issues that arise during remediation, and will provide pre-excavation photos to restoration crews. The agreement coordinator will have a company or rental vehicle (14 weeks)

One office support personnel will assist the agreement coordinator with documentation management. Support related to other tasks will also be provided to project manager and/or superintendant, including utility notification, payroll, invoicing, etc. (14 weeks)

Pre-Construction Property Assessment Costs				
Personnel	Hourly Rate	Hours per week	Total Weeks	Cost
Agreement Coordinator	$65	50	14	$45,500
Office Support	$60	50	14	$42,000
Transportation Expenses	Monthly Rate		Total Months	Cost
Rental Vehicle	$900	per month	3.5	$3,150
Fuel for Rental Vehicle	$120	per month	3.5	$420
Surveying Expenses	Topographic Survey		Properties	Cost
Pre-Construction Survey	$600	per prop.	94	$56,400
			Total Cost	$147,470
			Number of Properties	94
			Cost per Property	$1,569

3 - Excavation (Mechanical) and Transportation & 4 - Excavation (Manual) and Transportation

Although manual excavation is more time-consuming, and therefore more expensive, manual and mechanical excavation will be performed concurrently. Therefore total excavation costs have been estimated, and a higher proportion of these costs has been assigned to the manual excavation portion

Each Excavation Crew is generally anticipated to consist of 1 operator, 2 laborers, and 2 truck drivers (five crews). Laborers will move between crews if needed at more manual labor-intensive properties.

Labor						
Personnel	#	Hourly Rate	Overtime Rate	Hours per Week	Number of Weeks	Cost
Operator	5	$91	$116	50	21	$504,000
Laborer	10	$58	$77	50	21	$648,900
Driver	10	$71	$91	50	21	$787,500
Project Manager[1]		$110	$110	20	21	$46,200
Superintendant[1]		$90	$90	60	21	$113,400
QCM[1]		$80	$80	60	21	$100,800
HSO[1]		$80	$80	55	21	$92,400
Surveying Expense			Topographic Survey		Properties	Cost
Post-Excavation Survey			$300	per prop.	94	$28,200
					Total	$2,321,400

Notes:

1) All time for QCM and HSO has been appliad to excavation task.

Equipment				
Type	Equipment Onsite	Cost per month	Duration (months)	Cost
Excavator	5	$1,800	5.25	$47,250
Dump Trucks	10	$1,900	5.25	$99,750
Pickup Trucks[1]	9	$1,000	5.25	$47,250
Trailers	5	$500	5.25	$13,125
Materials				
Description	Unit Price	Units		Cost
Fuel[2]	$3.00	59,850	gallons	$179,550
Plastic Sheeting	$25	200	rolls	$5,000
T-posts	$3	800	posts	$2,400
High-vis fencing[3]	$0.15	72,874	ft^2	$10,931
Safety signage	$350	20	signs	$7,000
Misc. hand tools	$3,000	1	lump sum	$3,000
Wheelbarrows	$2,000	1	lump sum	$2,000
Safety Supplies	$2,000	1	lump sum	$2,000
			Total	$419,256

Notes:

1) Included trucks for PM, foreman, QCM, and HSO

2) Estimated fuel consumption of 40 gal/day per dump truck, 25 gal/day for excavator, and 5 gal/day for pickup

3) High visibility fencing will also be needed to place around excavation boundaries and prevent unauthorized access, as well as placement at the bottom of some excavations. Upper bound of total; less may be required

3 - Excavation (Mechanical) and Transportation & 4 - Excavation (Manual) and Transportation (Continued)

Estimated Excavation Volumes	
Mechanical	9,621.0
Manual	740.6
Total Volume	10,361.5
Mechanical % Vol.	92.9%
Manual % Volume	7.1%
Mechanical % Cost[1]	85.0%
Manual % Cost[1]	15.0%

Excavation Cost	
Labor	$2,321,400
Equipment and Materials	$419,256
Total	$2,740,656
Total % of Cost Mechanical	$2,329,558
Total % of Cost Manual	$411,098
Mechanical cu yd excavated $	$242.13
Manual cu yd excavated $	$555.11

1) As manual excavation is more labor intensive, a higher proportion of cost per cubic yard excavated is attributed to manual excavation than mechanical

5 - Backfill Placement

Each backfill crew is generally anticipated to consist of 1 operator, 2 laborers, and 2 truck drivers (three crews). One additional operator and skid-steer are anticipated to be required at the staging area to accept deliveries, load backfill into trucks, and manage the backfill stockpile. Two laborers are anticipated to work as the punch-list crew and uninstall/reinstall fences, repair damages, etc. Half of the project duration is anticipated to be attributable to backfill placement, compaction, and testing (10 weeks)

Labor						
Personnel	#	Hourly Rate	Overtime Rate	Hours per Week	Number of Weeks	Cost
Operator	4	$91	$116	50	11	$211,200
Laborer	6	$58	$77	50	11	$203,940
Driver	6	$71	$91	50	11	$247,500
Surveying Expense			Topographic Survey		Properties	Cost
Post-Backfill Survey			$300	per prop.	94	$28,200

Equipment					
Type	Equipment Onsite	Cost per month	Duration (months)	Cost	
Skidsteer	4	$1,800	2.5	$18,000	Skidsteer will be used for spreading and compaction of backfill. Vibratory plate compactor will be used for compaction of backfill near foundations and where skidsteer cannot access.
Dump Trucks	6	$1,900	2.5	$28,500	
Pickup Trucks	4	$1,000	2.5	$10,000	
Trailers	5	$500	2.5	$6,250	trailers include dump trailer and equipment trailers
Materials[2]					
Description	Unit Price	Units		Cost	
Backfill	$20	2,888.3	yd^3	$57,766	
Fuel[1]	$3.00	20,075	gallons	$60,225	1) estimated fuel consumption = 40/gal day dump truck, 25 gal/day skidsteer, and 5 gal/day pickup (plate compactor negligible)
Plate Compactor	$800	2	compactor	$1,600	
Safety signage	$350	5	signs	$1,750	
Misc. hand tools	$1,500	0.5	lump sum	$750	
Wheelbarrows	$1,000	0.5	lump sum	$500	
Safety Supplies	$1,000	0.5	lump sum	$500	
			Total	$185,841	

5 - Backfill Placement (Continued)

Estimated Backfill Volume	
Backfill (yd^3)	2,888
Cost per yd^3	$303.53

Backfill Cost	
Labor	$690,840
Equipment and Materials	$185,841
Total	$876,681

6 - Topsoil Placement

Topsoil placement will be similar to backfill placement. Total equipment costs have been split 50/50 between backfill and topsoil.

Labor						
Personnel	#	Hourly Rate	Overtime Rate	Hours per Week	Number of Weeks	Cost
Operator	4	$91	$116	50	11	$211,200
Laborer	6	$58	$77	50	11	$167,690
Driver	6	$71	$91	50	11	$247,500
Surveying Expense			Topographic Survey		Properties	Cost
Post-Topsoil Survey			$300	per prop.	94	$28,200

subtracted mulch, shrub, landscaping etc. hours from total laborer hours

Equipment				
Type	Equipment Onsite	Cost per month	Duration (months)	Cost
Skidsteer	4	$1,800	2.5	$18,000
Dump Trucks	6	$1,900	2.5	$28,500
Pickup Trucks	4	$1,000	2.5	$10,000
Trailers	5	$500	2.5	$6,250
Materials[2]				
Description	Unit Price	Units		Cost
Topsoil	$35	4,063.6	yd^3	$142,224
Fuel[1]	$3.00	20,075	gallons	$60,225
Plate Compactor	$800	2	compactor	$1,600
Safety signage	$350	5	signs	$1,750
Misc. hand tools	$1,500	0.5	lump sum	$750
Wheelbarrows	$1,000	0.5	lump sum	$500
Safety Supplies	$1,000	0.5	lump sum	$500
			Total	$270,299

Skidsteer will be used for spreading and compaction of topsoil. Vibratory plate compactor will be used for compaction of backfill near foundations, under trees, and where skidsteer cannot access.

1) estimated fuel consumption = 40/gal day dump truck, 25 gal/day skidsteer, and 5 gal/day pickup (plate compactor negligible)

Estimated Topsoil Volume	
Topsoil (yd^3)	4,064
Cost per yd^3	$228

Topsoil Cost	
Labor	$654,590
Equipment and Materials	$270,299
Total	$924,889

7 - Gravel Placement

Very little gravel is anticipated to be placed, based on review of pre-existing conditions. Equipment and personnel are expected to be already be present on-site for backfill placement while gravel is placed.

Labor				
Personnel	#	Hourly Rate	Hours	Cost
Operator	1	$91	2	$182
Laborer	1	$58	2	$116
Driver	1	$71	2	$142
Materials				
	Unit Price	Units		Cost
Gravel	$60	3,407 yd^3		$204,444
			Total Cost	$204,884
			Cost per yd^3	$60.13

8 - Mulch Placement

Mulch will be agreed with property owner in the Restoration Agreement. Mulch is anticipated to be placed below trees where sod is not expected to survive and in flowerbeds. 80 yd^3 of mulch has been input for estimation purposes. Mulch is expected to be purchased in bulk and placed by laborers using a pickup truck with an associated trailer (this equipment is included in backfill/topsoil)

Labor				
Personnel	#	Hourly Rate	Hours	Cost
Laborer	2	$58	94	$10,904
Materials				
	Unit Price	Units		Cost
Geotextile	$0.10	12,000 ft^2		$1,200
Mulch	$45	80 yd^3		$3,600
			Total Cost	$15,704
			Cost per yd^3	$196

9 - Geotechnical Testing

In-place field density testing requires a representative Proctor test to determine laboratory maximum density, and a minimum of 2 field tests conducted at each lift placed in the 18-24", 12-18", and 6-12" depths. The testing firm usually charges by the hour, with a minimum charge (e.g. 3 hours) rather than by the test, so geotechnical testing costs are highly dependent upon subcontractor work procedures.

A minimum of 266 in-place field density tests will be required based on the designs (65 six-inch-lifts tested). 41 front or back yards have an excavation depth of 24", 39 yards are 18", and 65 yards are 12". Both the front and back yard or full four quads will be remediated at 53 properties. An average of 10 tests (5 lifts) will be performed per testing event. Each testing event is estimated at $500.

Geotechnical Tests (Subcontracted)			
Type	Units	Unit Price	Cost
Proctor and gradation test	6	$600	$3,600
In-place field density	266	$500	$133,000
		Total Cost	$136,600
		Cost per test	$332

10 - High Visibility Barrier

High visibility barrier will be used at the bottom of excavations with a depth of 24 inches where contamination is present below this depth, and over the roots of trees and shrubs within the excavation area where the full excavation depth was not achieved. Fencing will be used to the extent feasible as excavation perimeter fencing prior to being placed at the bottom of the excavation.

High Visibility Barrier			
Description	Unit Price	Units	Cost
High-vis barrier[2]	$0.15	50,645 ft^2	$7,597

11 - Sod Placement

Assumed alternate/subcontracted sod placement crew

Labor				
Personnel	#	Hourly Rate	Hours	Cost
Laborer	6	$58	240	$83,520
Materials				
	Unit Price	Units		Cost
Sod[1]	$0.25	242,277 ft^2		$60,569
Sod staples	$0.15	1,000 each		$150
Sod knife	$10	20 each		$200
Roller	$200	2 each		$400
Equipment				
Type		Cost per day	Days	Cost
Pickup Truck		$50	24	$1,200
Trailer		$25	24	$600
			Total Cost	$146,639
			Cost per ft^2	$0.61

1) 2% increase to sod square footage applied to account for cutting end pieces to fit yard

12 - Seed Placement

No costs are included for seed placement. If seed is applied, a reduction in sod costs is expected.

13 - Watering

It is anticipated that the remediation subcontractor will use the water from the residence for most watering activity. Two months of residential water bills will be reimbursed (estimated at $200). Sod will be maintained for 30 days after placement. 1 laborer will work full-time for **20** weeks to travel to residences, setup hoses, and perform watering. For vacant lots, it is assumed that these will be scheduled in the same time period to minimize the need for rental of a water truck. One water truck driver will work full time for 4 weeks to water the lots and other properties as needed.

Labor						
Personnel	#	Hourly Rate	Overtime Rate	Hours per Week	Number of Weeks	Cost
Laborer	1	$58	$77	40	20	$46,400
Driver	1	$71	$91	40	4	$11,360

Materials			
	Unit Price	Units	Cost
Water	$200	94 properties	$18,800
Hoses	$60	4 each	$240
Fuel	$3.00	750 gallons	$2,250
Equipment			
Type	Cost per month	Months	Cost
Pickup Truck	$1,000	6	$6,000
Water Truck	$2,800	1	$2,800

Watering Cost	
Labor	$57,760
Equipment and Materials	$30,090
Total	$87,850
Number of properties	94
Total	$935

14 - Trees

Most trees present in Zone 3 (202 trees) are expected to remain in place, and manual excavation of soil within the drip zone will be performed. 11 trees have a diameter of less than 4 inches and are expected to be removed and replaced. Watering will be performed concurrent with sod, under the watering line item.

Labor				
Personnel	#	Hourly Rate	Hours	Cost
Laborer	2	$58	4.5	$522
Materials				
	Unit Price	Units		Cost
Tree	$150	12	each	$1,800
Stakes/ Lines	$50.00	1	lump sum	$50
			Total Cost	$2,372
			Cost per tree	$791

15 - Shrubs

All shrubs have conservatively been estimated to be removed and replaced. Some property owners are expected to request the shrub(s) stay in place. Shrub removal is expected to take place during the excavation. Watering will be performed concurrent with sod, under the watering line item.

Labor				
Personnel	#	Hourly Rate	Hours	Cost
Laborer	2	$58	125	$14,500
Materials				
	Unit Price	Units		Cost
Shrub	$50	163	each	$8,150
			Total Cost	$22,650
			Cost per shrub	$138.96

16 - Stump Removal

36 stumps and associated roots will be cleared and grubbed. Removal may or may not occur on different days.

Labor				
Personnel	#	Hourly Rate	Hours	Cost
Laborer	2	$58	14	$1,624
Equipment				
	Unit Price	Units		Cost
Chainsaw	$25	36	days	$900
Grinder	$150	36	days	$5,400
			Total Cost	$7,924
			Cost per stump	$1,132

17 - Miscellaneous Landcaping
Miscellaneous perennial flowers/bulbs, garden edging, etc.

Labor				
Personnel	#	Hourly Rate	Hours	Cost
Laborer	2	$58	94	$10,904
Materials				
	Unit Price	Units		Cost
Misc	$50	94 properties		$4,700
		Total Cost		$15,604
		Cost per property		$166

18 - Property Closeout

The agreement coordinator will document post-restoration conditions and meet with property owners to sign completion agreements after the sod maintenance period is complete. Coordinator will work with punch list crew to resolve issues.

One office support personnel will assist the agreement coordinator with documentation management and the QCM with As-Built preparation. (QCM is anticipated to generate draft As Built as part of normal duties accounted for in excavation line item). Support related to other tasks will also be provided to project manager and/or superintendant, including utility notification, payroll, invoicing, etc. (16 weeks)

Property Close-Out Costs				
Personnel	Hourly Rate	Hours per week	Total Weeks	Cost
Agreement Coordinator	$65	50	16	$52,000
Office Support	$60	50	16	$48,000
Transportation Expenses	Monthly Rate		Total Months	Cost
Rental Vehicle	$900	per month	4	$3,600
Fuel for Rental Vehicle	$120	per month	4	$480
			Total Cost	$104,080
			Number of Properties	94
			Cost per Property	$1,107

19 - Demobilization

The office area and associated rental items will be returned to the rental companies. A small group of key personnel will remain on-site to facilitate removal of items and return of the office/staging area to pre-existing conditions.

Rental Items	Unit Price	Units	Total
Trailer Removal	$3,000	1 lump sum	$3,000
Fence Removal	$500	1 lump sum	$500
Conex Removal	$300	1 lump sum	$300
Excavator Removal	$150	4 each	$600
Skidsteer Removal	$150	4 each	$600
Dump Truck	$150	14 each	$2,100

Labor				
Personnel	#	Hourly Rate	Hours	Total
PM	1	$110	20	$2,200
Foreman	1	$90	40	$3,600
Operator	1	$91	40	$3,640
Laborer	2	$58	40	$4,640

Total Demobilization Costs	
Removal	$7,100
Labor	$14,080
Total	$21,180

Contractor Personnel	Hourly Rate (loaded)
Program Manager	$120
Project Manager	$110
Field Team Leader	$80
Oversight Personnel	$60
Office/Clerical Support	$45

Procurement

Contractor will prepare RFP, conduct pre-bid meeting, review bids, and award subcontract.

Staff	Staff	Hourly Rate	Hours	Cost
Prepare RFP				
Program Manager	1	$120	5	$600
Project Manager	1	$110	40	$4,400
Office/Clerical Support	1	$45	10	$450
Conduct Pre-Bid Meeting				
Project Manager	1	$110	20	$2,200
Office/Clerical Support	1	$45	10	$450
Review Bids				
Program Manager	1	$120	5	$600
Project Manager	3	$110	60	$19,800
Office/Clerical Support	1	$45	10	$450
Award Subcontract				
Program Manager	1	$120	10	$1,200
Project Manager	1	$110	20	$2,200
Office/Clerical Support	1	$45	20	$900
			Total Labor	$33,250

Plan Generation

Contractor will need to prepare Work Plan, Sampling and Analysis Plan, Health and Safety Plan, and Quality Assurance Plan

Staff	Hourly Rate	Hours	Cost
Program Manager	$120	10	$1,200
Project Manager	$110	40	$4,400
Field Team Leader	$80	80	$6,400
Oversight Personnel	$60	160	$9,600
Office/Clerical Support	$45	20	$900
		Total Labor	$22,500

Plan Review

Contractor will review plans generated by the Subcontractor

Staff	Hourly Rate	Hours	Cost
Program Manager	$120	5	$600
Project Manager	$110	20	$2,200
Field Team Leader	$80	40	$3,200
Oversight Personnel	$60	80	$4,800
		Total Labor	$10,800

Community Relations

Three community meetings with 30 hours for preparationa nd attendance per meeting are assumed

Staff	Hourly Rate	Hours	Cost
Program Manager	$110	60	$6,600
Office/Clerical Support	$45	30	$1,350
		Total Labor	$7,950

Office Rental Expense

Rental of a local office space for oversight personnel is anticipated for a period of 7 months.

	Unit Price	Units	Total
Office Rental	$1,600	7 months	$11,200
Office Utilities	$500	7 months	$3,500
Internet Service	$100	7 months	$700
Office Supplies	$250	7 months	$1,750
Office Furniture	$250	7 months	$1,750
Shipping Expenses	$150	7 months	$1,050
Field Logbooks	$20	30 each	$600
Digital Cameras	$150	7 each	$1,050
		Total	$21,600

Contractor is anticipated to have 2 personnel onsite for two weeks when plans are approved for office setup and property owner agreements (FTL and agreement oversight). 10 oversight field staff are anticipated for 5.25 months during remediation (FTL, oversight for agreements, documentation, one oversight per excavation crew and one oversight per 2 backfill crews). Two oversight personnel are anticipated for 1 month during project close-out (FTL and one agreement oversight). Staff are anticipated to be staffed from CH2M Chicago office. Rental cars will be provided, but not lodging/per-diem. Staff are anticipated to work 55 hours/week.

Field Startup Activities

Staff	Staff	Hourly Rate	Hours per week	Duration (weeks)	Cost
Field Team Leader	1	$80	55	2	$8,800
Oversight Personnel	1	$60	55	2	$6,600
				Total Labor	$15,400

Travel Expenses	Units	Cost (per week)	Duration (weeks)	Cost
Rental Car	2	$200	2	$800
Fuel	2	$50	2	$200
			Travel Costs	$1,000

Total Field Startup Costs	$16,400

Remediation Oversight

Staff	Staff	Hourly Rate	Hours per week	Duration (weeks)	Cost
Project Manager	1	$110	20	21	$46,200
Field Team Leader	1	$80	55	21	$92,400
Oversight Personnel	9	$60	55	21	$623,700
				Total Labor	$716,100

Travel Expenses	Units	Cost (per week)	Duration (weeks)	Cost
Rental Car	10	$200	21	$42,000
Fuel	10	$50	21	$10,500
			Travel Costs	$52,500

Total Remediation Oversight Costs	$768,600

Air Sampling

Oversight personnel will collect air samples, manage sampling data, and prepare for shipment to the laboratory during the course of normal remediation oversight responsibilities.

Equipment	Unit Price	Units	Duration	Total
Particulate Monitor	$1,000	5	5.25 months	$26,250
GilAir Plus	$300	12	5.25 months	$18,900
Calibrator	$250	4	5.25 months	$5,250
			Total	$50,400

	Unit Price	Units	Total
Air Sample Cassettes	$60	10 boxes	$600
Air Sample Analysis	$25	50 samples	$1,250
		Total	$1,850

Total Air Sampling Costs	$52,250

Soil Sampling

Oversight personnel will collect backfill and topsoil samples for laboratory analysis (est. 20 samples). Hours have been assumed to be in additon to the normal oversight responsibilities.

Staff	Staff	Hourly Rate	Hours / Sample	Samples Collected	Cost
Project Manager	1	$110	1	20	$2,200
Field Team Leader	1	$80	1	20	$1,600
Oversight Personnel	1	$60	2	20	$2,400
				Total Labor	$4,000

	Unit Price	Units	Total
Soil Sample Analysis	$650	20 samples	$13,000
Sampling supplies	$25	20 lump sum	$500
Shipment supplies	$25	20 lump sum	$500
Overnight delivery	$50	20 each	$1,000
		Total	$15,000

Total Soil Sampling Costs	$19,000

Close-Out Activities

Staff	Staff	Hourly Rate	Hours per week	Duration (weeks)	Cost
Field Activities					
Field Team Leader	1	$80	55	4	$17,600
Oversight Personnel	1	$60	55	4	$13,200
				Total Labor	$30,800

Travel Expenses	Units	Cost (per week)	Duration (weeks)	Cost
Rental Car	2	$200	4	$1,600
Fuel	2	$50	4	$400
			Travel Costs	$2,000

Staff	Hourly Rate	Hours	Cost
Remedial Action Report			
Program Manager	$120	5	$600
Project Manager	$110	20	$2,200
Field Team Leader	$80	40	$3,200
Oversight Personnel	$60	80	$4,800
Office/Clerical Support	$45	10	$450
Remediation Complete Letter Preparation and Delivery			
Oversight Personnel	$60	240	$14,400
		Total Labor	$25,650

Total Closeout Costs	$58,450

APPENDIX C

RESPONSIVENESS SUMMARY

RESPONSIVENESS SUMMARY

This Responsiveness Summary provides a summary of the public comments that the United States Environmental Protection Agency (EPA) received regarding a proposed Explanation of Significant Differences (ESD) to document the significant increase in cost between the estimated cost of the remedy selected in the 2012 Record of Decision (ROD) for Zones 2 and 3 of Operable Unit 1 (OU1) at the U.S. Smelter and Lead Refinery, Inc. Superfund Site (Site) and the current estimated cost of the remedy for those two Zones. This Responsiveness Summary also provides EPA's responses to those comments, developed in consultation with the Indiana Department of Environmental Management (IDEM).

I. Outcome of Review of Public Comments and State Consultation

After carefully reviewing and considering all public comments submitted during the public comment period, EPA, in consultation with IDEM, signed the ESD. The public comments did not result in changes to EPA's evaluation and determination of the cost estimates for the Site. Therefore, the cost estimates presented in the proposed ESD remain the same and are unchanged in this final version.

II. Background and Community Involvement

Lead and arsenic are found in the soil in OU1 of the Site. EPA began soil remediation work in both Zones 2 and 3 in the fall of 2016 and continued work through 2017. Additional remedial work will occur in 2018 and thereafter. In 2016 and 2017, EPA performed soil remediation work pursuant to a consent decree that was negotiated with two potentially responsible parties, an Administrative Settlement Agreement and Order on Consent that was negotiated with four potentially responsible parties, and its own authorities. In 2018 and thereafter, further remedial work will be performed under the consent decree and a Unilateral Administrative Order (UAO). The UAO was issued to six potentially responsible parties. All soil remediation work is consistent with the 2012 ROD.

Due to public interest in the Site, EPA solicited public comments on the ESD. On December 12, 2017, EPA published notice of the proposed ESD in one local newspaper in both Spanish and English. EPA also mailed an information sheet titled "Notice of Public Comment Opportunity USS Lead Superfund Site" to approximately 580 recipients. That information sheet summarized the ESD and indicated the different opportunities for the public to comment. On December 19, 2017, EPA also updated the administrative record for the Site, available both online at https://www.epa.gov/uss-lead-superfund-site and at two local repositories.[1]

EPA held a 60-day public comment period that ran from December 18, 2017 through February 16, 2018. On January 20, 2018, EPA answered questions about the proposed ESD at a public meeting at the former Carrie Gosch Elementary School in East Chicago. On February 15, 2018, EPA answered more questions and took formal comments at a public hearing at the Robert A. Pastrick

[1] This was the sixth update to the administrative record. The administrative record was established on January 22, 2008, and is updated concurrent with new decision documents and enforcement actions.

Library in East Chicago. Approximately 23 people (not including media and EPA personnel) attended the public hearing. Written comments were submitted to EPA by mail, email, and through an online form available on the Site website.

III. Comments and Responses

EPA received eight written comments from a variety of individuals and organizations, including: two resident property owners; an interested individual; the Community Strategy Group; We the People; the East Chicago Calumet Coalition Community Advisory Group, the Abrams Environmental Law Clinic at the University of Chicago Law School and the Northwestern Pritzker School of Law Environmental Advocacy Clinic; and Chemours Company FC LLC. Four people provided EPA with verbal comments at the public hearing. It should be noted that a number of comments discussed matters beyond the scope of this ESD. Notwithstanding, EPA has included responses to those comments as part of this Responsiveness Summary.

Copies of all the comments received (including the verbal comments reflected in the transcript of the public meeting) are included as attachments to this Responsiveness Summary and will be added to the administrative record. EPA carefully considered each comment while developing this Responsiveness Summary.

That said, this Responsiveness Summary does not repeat verbatim each individual comment. Rather, the comments are summarized with respect to the type of issue raised. EPA has further organized this Responsiveness Summary to follow three broad themes identified in the comments, including:

1. Site investigation (Comments #1-11)
2. Implementation of other site response actions (Comments #12-23)
3. Alternative remedies (Comments #24-29)

The remainder of this Responsiveness Summary contains a summary of the comments received and EPA's responses to those comments, in consultation with IDEM.

Comment #1: Several commenters argue neither the 7.4% of properties sampled during the Remedial Investigation nor the approximately 90% of properties currently sampled provide a data set robust enough for proper remedy selection.

Response to Comment #1: This ESD addresses only revised cost estimates for Zones 2 and 3 for the remedy selected in the ROD, not the remedy selection process itself. As such, any comments on that process are beyond the scope of this ESD. Notwithstanding, a response to this comment is provided below.

Sampling conducted as part of the remedial investigation and feasibility study (RI/FS) was conducted in a grid pattern at a frequency of two to three properties per block across the site in order to provide adequate spatial coverage. The purpose of the RI/FS was not to determine the full scope of the contamination—that is the purpose of Remedial Design sampling. Rather, "[t]he

purpose of the remedial investigation is to collect data necessary to adequately characterize the site for the purpose of developing and evaluating effective remedial alternatives."[2] To that end, the RI/FS generated enough data to ascertain the contaminants of concern,[3] decide that remedial action was necessary, and select an effective remedy.[4]

At this time, EPA has sampled 971 out of 1,077 (approximately 90%) properties in Zones 2 and 3.[5] The data generated from this large percentage of properties—which include some of the largest tracts in the site (*i.e.*, local parks)—provides additional confirmation that EPA selected the correct remedy in 2012. Specifically, EPA now knows the approximate size of each of those properties and the depth of contamination to be remediated. While the volume of contamination is greater than originally anticipated, the qualitative nature of the contamination is the same—lead and arsenic in soil—and so the practical considerations related to remedy selection are unchanged.

Further, even if the volume of contamination at the remaining, unsampled properties differs from EPA's projections which are based on currently available data, the total volume of soil at the unsampled properties is much smaller than the total volume of soil already sampled.

Comment #2: Several commenters state that EPA's conceptual site model for contamination does not account for slag which was used as fill, particularly at depth, to level out the natural dune and swale topography of the site. As such, these commenters argue EPA's selected remedy accounts for neither the direct exposure risk to residents nor the possibility of re-contamination of the soil via groundwater by contaminant sources at depth.

Relatedly, these commenters expressed concern that the RI/FS did not include an evaluation of groundwater and they believe that groundwater contamination may require EPA both to address groundwater directly and to revisit again the selected soil remedy.

Response to Comment #2: This ESD addresses only revised cost estimates for Zones 2 and 3 for the remedy selected in the ROD, not the remedy selection process itself. As such, any comments on that process are beyond the scope of this ESD. Notwithstanding, a response to this comment is provided below.

EPA's selected remedy for OU1 is consistent both with the *Superfund Lead-Contaminated Residential Sites Handbook* and with remedies selected at similar residential lead sites across the country. Importantly, the selected remedy does not depend on whether the source of contamination is fill or aerial deposition. Rather, the remedy was selected based on the risk of exposure to lead faced by residents. As discussed in the *Lead Handbook*, the typical activities of children and adults

[2] 40 C.F.R. § 300.430.

[3] *See* EPA, USS Lead Remedial Investigation Report 93-94 (June 2012).

[4] *See generally*, EPA, USS Lead Record of Decision (Nov. 2012) (hereinafter, ROD).

[5] EPA has been unable to secure access to complete sampling at the remaining 10% of properties, but continues its efforts to do so.

in residential properties do not extend below a 12-inch depth, and excavation down to 24 inches is generally protective of even atypical activities.[6] The remedy selected removes contamination that exists down to 24 inches below ground surface and thus is protective of direct exposure risk. Sampling during the RI/FS also confirmed that native sand (which is readily identifiable) is not contaminated. That native sand layer would not be clean if contaminated materials were co-located with native sand or located at depths below native sand (because those contaminated materials would be mixed in with the native sand).

In addition, evidence does not support a reasonable risk of re-contamination by groundwater. Lead toxicity characteristic leaching procedure (TCLP) tests—which are used in part to measure the concentration of lead leaching from the soil—have been conducted on several soil samples collected throughout the site and results indicate that contaminated soil does not readily leach metals into the groundwater. These test results are consistent with groundwater sampling results in Zone 1. Specifically, because an industrial facility previously operated in Zone 1, the median soil-lead content in the top 24 inches of Zone 1 is 3,550 mg/kg (or parts per million).[7] Contamination is also present below 24 inches in Zone 1. As such, if lead were readily leaching into the groundwater, EPA would expect to find high levels of groundwater contamination beneath Zone 1. However, preliminary groundwater monitoring well data in Zone 1 shows an average lead content of approximately 88 µg/L (or parts per *billion*).[8] Based on these results, EPA does not believe lead is readily leaching into the groundwater.

Further, because lead is present in such low quantities in the groundwater, EPA does not believe that groundwater contamination poses a meaningful risk of re-contaminating the soil. This is consistent with sampling results referenced above indicating that native sand is clean—that sand would not be clean if groundwater were a source of contamination.

Results from previous studies performed at the site indicate similar results for arsenic. As with lead, concentrations of arsenic in groundwater were so low relative to the soil cleanup standard that EPA does not anticipate a meaningful risk of re-contamination. EPA is planning to confirm the results of those studies this spring and will incorporate sampling results into future decisions.

Finally, EPA is in the process of beginning the RI/FS for OU2 of the site, which includes all groundwater beneath the entire site. At the conclusion of the RI/FS, EPA will issue a proposed plan to address contamination that poses an unacceptable risk to human health or the environment.

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[6] *See* EPA, Superfund Lead-Contaminated Residential Sites Handbook, OSWER 9285.7-50 37 (2003) (hereinafter, *Lead Handbook*)

[7] By comparison, in Zone 3 the median concentration of lead in the top 24 inches is only 200 mg/kg.

[8] Preliminary data comes from temporary and permanent groundwater monitoring wells installed by the engineering consultants performing the Zone 1 demolition. While this data is informative, EPA will confirm these results as part of the groundwater remedial investigation.

Comment #3: Several commenters argue that EPA must complete a comprehensive investigation of the entire site—including of all properties and all groundwater—before it can properly select a unified remedy that addresses all sources of contamination and avoids the risk of re-contamination.

Response to Comment #3: This ESD addresses only revised cost estimates for Zones 2 and 3 for the remedy selected in the ROD, not the remedy selection process itself. As such, any comments on that process are beyond the scope of this ESD. Notwithstanding, a response to this comment is provided below.

This comment is similar in nature to Comments #1 and #2. As such, the public should refer to the Responses to Comments #1 and #2 which state, in short, that (1) EPA had enough information at the time of the ROD to select the appropriate remedy for the soil contamination; (2) EPA has actually selected the appropriate remedy for the soil contamination; (3) any groundwater contamination that might exist is unlikely to re-contaminate soils; and (4) a groundwater remedy, if necessary, will be separately identified as part of the RI/FS and ROD process for OU2.

EPA has been and continues to be sensitive to the need to balance comprehensive site investigation and remedy selection with a timely cleanup of contamination that poses the highest level of ongoing risk to residents. Indeed, consistent with the mandates of the NCP, it is "clearly within EPA's discretion to decide how to balance the need for prompt, early actions, against the need for definitive site characterization. . . . Further, a bias for action is consistent with EPA's long-standing policy of responding by distinct operable units at sites as appropriate, rather than waiting to take one consolidated response action."[9]

Accordingly, EPA determined that since groundwater at the site is not a source of drinking water, residents faced the greatest and most immediate risk of exposure from contamination in the soil. As a result, EPA focused its investigative, enforcement, and cleanup resources towards addressing the soil contamination first. EPA is confident in its approach—a speculative and hypothetical risk of re-contamination is far outweighed by the risks associated with delaying the cleanup of the identified source materials.

Comment #4: Several commenters argue that no remedy will be protective unless and until all contamination from the DuPont facility is removed, because these commenters believe that groundwater contamination from the DuPont facility will re-contaminate soils in the residential neighborhood.

Response to Comment #4: This ESD addresses only revised cost estimates for Zones 2 and 3 for the remedy selected in the ROD, not the remedy selection process itself. As such, any comments on that process are beyond the scope of this ESD. Notwithstanding, a response to this comment is provided below.

Pursuant to its RCRA authorities, EPA plans to issue a Final Decision for the DuPont facility. The Final Decision will describe the corrective action work needed to prevent the off-site migration of

[9] 55 Fed. Reg. 8,666, 8,703-04.

contaminants from the DuPont facility, and to prevent the risk of re-contamination of the residential neighborhood, if any.

At this time, EPA has not identified a risk of soil re-contamination due to groundwater contamination from the DuPont facility. EPA will perform additional sampling to confirm the earlier determinations made to this effect. In addition, EPA is performing a remedial investigation of the groundwater beneath the site which will determine, among other things, if and to what extent contamination from the DuPont facility is contaminating the groundwater. At the conclusion of the RI/FS, EPA will issue a proposed plan to address any such contamination that threatens human health and the environment. If EPA determines that the corrective action work at the DuPont facility is not protective, EPA will propose a plan that is protective.

Comment #5: One commenter asked what the site Hazard Ranking System (HRS) score would have been if exposure pathways other than soil (i.e., air, groundwater, and surface water exposure) were included.

Response to Comment #5: This ESD addresses only revised cost estimates for Zones 2 and 3 for the remedy selected in the ROD, not the NPL listing process. As such, any comments on that process are beyond the scope of this ESD. Notwithstanding, a response to this comment is provided below.

The Hazard Ranking System is the principal mechanism EPA uses to place sites on the National Priorities List (NPL). To that end, the HRS is a screening mechanism intended to measure relative risk, not absolute risk. Because it is only a screening mechanism, the HRS is not intended to provide a comprehensive assessment of possible exposure risks at a site.

Based on the information available to EPA in 2009, EPA determined that there was sufficient cause to place the USS Lead site on the NPL and so additional scoring information was not required nor generated. That said, the OU1 RI/FS further characterized soil contaminants, evaluated alternative remedies, and provided EPA with sufficient information to select a remedy. Similarly, the ongoing OU2 RI/FS will characterize groundwater contaminants and evaluate an array of remedies, as necessary. The outcomes of the OU1 RI/FS and the OU2 RI/FS do not depend on the HRS score.

Comment #6: One commenter provided extensive comments regarding the physical and hydrogeological characteristics of the aquifer and groundwater beneath the site.

Response to Comment #6: This ESD addresses only revised cost estimates for Zones 2 and 3 for the remedy selected in the ROD for Operable Unit 1. It does not address Operable Unit 2, which includes groundwater beneath the site. As such, any comments on Operable Unit 2 are beyond the scope of this ESD. Notwithstanding, a response to this comment is provided below.

As part of the OU2 RI/FS, EPA will determine the extent of groundwater contamination beneath the site and the potential for re-contamination of Operable Unit 1 due to any such groundwater

contamination. The physical and hydrogeological properties of the neighborhood will be considered as part of that process.

Comment #7: One commenter asked if another ESD would be required to address groundwater contamination in OU1.

Response to Comment #7: No. Groundwater beneath the entire site is included as part of Operable Unit 2. At the conclusion of the OU2 RI/FS, EPA will issue a proposed plan to address any such contamination that threatens human health and the environment. After public comment on that plan, EPA will select a remedy for any groundwater that may pose an unacceptable risk in a separate OU2 ROD. So a ROD—not an ESD—will be issued for OU2, which includes groundwater under OU1.

Comment #8: Several commenters state that EPA's Superfund program and RCRA program need to coordinate the cleanup of the site.

Response to Comment #8: This ESD addresses only revised cost estimates for Zones 2 and 3 for the remedy selected in the ROD. As such, comments such as this one are beyond the scope of this ESD. Notwithstanding, a response to this comment is provided below.

EPA's Superfund Division and RCRA program have coordinated and will continue to coordinate on matters related to the site.

Comment #9: One commenter argues that EPA has not adequately investigated potential asbestos contamination at the site that may have been generated by the demolition of former industrial manufacturing facilities.

Response to Comment #9: This ESD addresses only revised cost estimates for Zones 2 and 3 for the remedy selected in the ROD, not the remedy selection process itself. As such, any comments on that process are beyond the scope of this ESD. Notwithstanding, a response to this comment is provided below.

To date, EPA has not identified any potential asbestos containing material at the site related to the demolition of the former industrial facility. However, if EPA does identify any such material, EPA will take steps to appropriately handle and dispose of such material. In fact, EPA personnel have previously identified asbestos containing material at one property in Zone 3 that appeared to be related to private renovations at that property. That material was properly handled and disposed. Similarly, asbestos containing material that was used in the construction of the West Calumet Housing Complex (and so also unrelated to the former industrial facility) was identified and properly disposed prior to the ongoing demolition work.

Comment #10: One commenter argues that EPA did not adequately investigate the migration or transformation of contaminants by microorganisms or other biological processes and the effect that this might have on the community.

Response to Comment #10: This ESD addresses only revised cost estimates for Zones 2 and 3 for the remedy selected in the ROD, not the remedy selection process itself. As such, any comments on that process are beyond the scope of this ESD. Notwithstanding, a response to this comment is provided below.

Based on its observations of the site and experiences at other sites, EPA has no basis to believe that microorganisms or other biological processes present a meaningful risk of exposure to contamination.

Comment #11: One commenter argues that delaying sampling of groundwater, fill material, and indoor contamination leaves residents vulnerable to exposure.

Response to Comment #11: This ESD addresses only revised cost estimates for Zones 2 and 3 for the remedy selected in the ROD, not the implementation of other response actions by other administrative mechanisms. As such, any comments on those response actions are beyond the scope of this ESD. Notwithstanding, a response to this comment is provided below.

EPA determined that lead soil contamination posed the most immediate risk of exposure to residents, so EPA devoted its resources to addressing that source first. Based on information currently available, exposure due to groundwater contamination is not as imminent as exposure due to soil contamination because all site residents are connected to the municipal water system, and private wells are not in use. Exposure to infill in yards is either being addressed consistent with the ROD, or exists at depths where no exposure pathway is present. Indoor dust is being addressed after excavation work is performed. Notwithstanding, EPA is working to identify and remediate other sources of contamination at the site.

That said, this comment highlights the tension between EPA's decision to move forward with the soil remedy first and the commenters' views that EPA should have comprehensively studied the site and issued a unified remedy. Unfortunately, EPA cannot perform all site work on the same time table, much less simultaneously. If EPA were to wait for the groundwater sampling to be completed before issuing a remedy, that would leave soil contamination in place for a longer period of time. Instead, as stated above, EPA opted to address the greatest risk of exposure first.

Comment #12: Several commenters argue that EPA is required to propose a ROD amendment addressing both the increased cost of the soil remediation and the interior sampling and cleaning work.

Response to Comment #12: First, it is important to understand when an amendment to the ROD is necessary and when an explanation of significant differences will suffice. Sometimes new information arises during the remedial design or action phase of a Superfund cleanup that

necessitates changes to the remedy selected in the ROD. Depending on the scope of the changes, the National Contingency Plan ("NCP") provides EPA with two options:

1. If "the differences in the remedial or enforcement action . . . significantly change but do not fundamentally alter the remedy selected with respect to scope, performance, or cost," then EPA may simply publish "an explanation of significant differences."[10]
2. However, if "the differences in the remedial or enforcement action . . . fundamentally alter the basic features of the selected remedy with respect to scope, performance, or cost," then EPA must propose an amendment to the ROD (subject to public comment).[11]

EPA interprets its regulations to mean that "the appropriate threshold for amending a ROD is when a fundamentally different approach to managing hazardous wastes at a site is proposed."[12] As explained in more detail below, that is not the case here.

By contrast, "[w]here [a] new requirement would affect a basic feature of the remedy, such as timing or cost, but not fundamentally alter the remedy specified in the ROD (i.e., change the selected technology), the lead agency . . . need[s] to issue an explanation of significant differences announcing the change."[13] As such, a significant change in cost alone requires only an ESD.

Second, it is important to clarify the scope of the remedy selected in the Record of Decision. The selected remedy specified in the ROD addresses Operable Unit 1. An operable unit "is a discrete action that compromises an incremental step toward comprehensively addressing site problems. . . . Operable units may address geographical portions of a site [or] specific site problems . . . ." [14] Although, for ease of communication, EPA generally refers to the Calumet neighborhood as OU1, OU1 is actually a specific site problem, that is "residential yards contaminated with lead and arsenic."[15] Yards are the risk management unit in OU1.[16] Each individual property consists of one or more yards (typically a front and back yard), and EPA has set cleanup standards for contamination in those yards.

Because the ROD addresses only contamination in "yards," the ROD does not address contamination that is *not* in "yards." Accordingly, the ROD does not address contamination in groundwater (not a yard), which is instead being addressed as part of OU2. Similarly, the ROD does not address soil contamination below impermeable barriers such as streets, sidewalks, and buildings (which are also not yards). Indeed, that is why EPA is amending the ROD—and not

[10] 40 C.F.R. § 300.435(c)(2)(i).

[11] 40 C.F.R. § 300.435(c)(2)(ii).

[12] 55 Fed. Reg. 8,666, 8,771 (Mar. 8, 1990).

[13] *Id.* at 8,772.

[14] *See* 40 C.F.R. § 307.14.

[15] EPA, USS Lead Record of Decision 4 (Nov. 2012) .

[16] *Id.* at 4 n.1.

issuing an ESD—with respect to Zone 1. There, the demolition of the West Calumet Housing Complex will eliminate not only "yards" but also the impermeable concrete barriers (e.g., slabs, streets, sidewalks) that served as a protective barrier to exposure.

Finally, this means that the ROD does not address indoor dust contamination in residences (since, again, residences are not yards). That is why the Fourth and Fifth Amendment to the Action Memorandum for the site address "lead and arsenic contaminated dust within some of the residences in Zones 2 and 3" and include requirements for separate, indoor work plans. In short, the ROD addresses a very specific medium for contamination.

Commenters suggest that not only the cost but also the approach to managing hazardous waste at the site has changed. As set forth earlier, this is not the case. Because the ROD only addresses contamination in yards, the technology selected in the ROD—excavation and disposal—is still the technology being implemented at the site.[17] That the work requires more hand digging than originally contemplated does not change the underlying technology (indeed, some amount of hand digging was considered in the Feasibility Study). Nor does the identification of additional soil volume change EPA's approach to managing that soil. EPA agrees that if it had changed its approach to managing wastes at the site (e.g., by utilizing a previously-rejected disposal method, as in *United States v. Burlington Northern*, 200 F.3d 679 (10th Cir. 1999)), a ROD amendment would have been required. However, no such change in methods is involved here, and EPA's documentation at this site is consistent with both EPA's and the federal courts' interpretation of when an ESD is appropriate.[18]

All of this is to say that, even though EPA is addressing other sources of contamination through other administrative decision documents:

1. The source of contamination addressed in the ROD—lead and arsenic in residential yards—has not changed;
2. The remedy selected for that contamination has not changed; and
3. Only the estimated cost has changed.

Therefore, an ESD is the appropriate mechanism by which to document these increased costs.[19]

[17] Nor have there been incremental or "piecemeal" changes to the remedy which, when taken in aggregate, result in a fundamental change. Again, the ROD only addresses contamination in yards; other sources of contamination are addressed by other decision documents and other remedies.

[18] *See United States v. P.H. Glatfelter Company*, 768 F.3d 662 (7th Cir. 2014) (finding an ESD to be the appropriate means for documenting a significant cost increase that did not otherwise change the remedy).

[19] It should be noted that while EPA is not required to solicit public comments for ESDs, here, EPA did so anyway due to public interest in the site.

Comment #13: Several commenters argue that EPA's decision to perform the interior sampling and cleaning work through its removal program improperly limits public participation in the cleanup process.

Response to Comment #13: This ESD addresses only revised cost estimates for Zones 2 and 3 for the remedy selected in the ROD. As such, comments such as this one are beyond the scope of this ESD. Notwithstanding, a response to this comment is provided below.

EPA is not required to use its remedial authorities (as opposed to removal authorities) to address indoor dust contamination. EPA has discretion, as circumscribed by CERCLA and the NCP, to determine which authorities are best suited to address threats to human health or the environment. Here, EPA determined that it was most appropriate to use its removal authorities to implement the indoor sampling and cleaning work at the site.

As discussed in the Third, Fourth, and Fifth Amendments to the Action Memorandum for the site, the indoor work is being implemented as a time-critical removal action. EPA's memorandum on the *Use of Non-Time Critical Removal Authority in Superfund Response Actions* (February 14, 2000) helps inform when removal authorities—particularly time-critical removal authorities—are appropriate. That memorandum states that generally, "where a site presents a relatively time-sensitive, non-complex problem that can and should be addressed relatively inexpensively, EPA would normally address the problem by use of removal authority."[20]

Although timeliness, complexity, and cost are not individually dispositive, EPA determined that the requirements of the indoor removal actions were consistent with these factors. First, EPA needed to start the indoor work on a short timeframe, both to respond to residents' concerns at the West Calumet Housing Complex, and to synchronize that work with the soil remediation work that was beginning in Zones 2 and 3. Second, cleaning indoor dust does not require a complex remedy. Third, the cost associated with each indoor sampling and cleaning is modest.

Finally, it should be noted that removal authorities may be appropriate even for expensive and complex response actions, where "the added time needed to comply with the remedial requirements . . . would be unacceptable." Given both the immediate need to synchronize the indoor work with the soil excavations and the community's interest in having work begin as soon as possible, EPA determined that a time-critical removal action was the best mechanism for performing the indoor work.

One commenter argues that remedial and removal work are the same at this site, as evidenced by EPA's use of removal authorities to perform soil work in Zone 2. This is also incorrect. As required by the NCP, the Zone 2 soil removal work implemented the same standards set forth in the ROD in order to "ensure an orderly transition from removal to remedial response activities."[21]

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[20] EPA, *Use of Non-Time Critical Removal Authority in Superfund Response Actions* 4 (February 14, 2000), *available at* https://semspub.epa.gov/work/HQ/174826.pdf..

[21] 40 C.F.R. § 300.415(g). *See also* 40 C.F.R. § 300.415(d) ("Removal actions shall, to the extent practicable, contribute to the efficient performance of any long-term remedial action with respect to the release concerned.")

However, because the soil removal work was authorized not by the ROD but by the Fifth Amendment to the Action Memorandum, EPA only excavated properties that met removal program criteria: either high contamination in the top 6 inches of soil or sensitive populations residing at the property.[22] More to the point, without detracting from EPA's remedial authority to address those properties, EPA did not believe it could expedite the soil excavation work in Zone 2 to coincide with the work in Zone 3 without using its removal authorities. So again, in the interest of accelerating the cleanup and in line with the community's concerns, EPA determined that a time-critical removal action was the best administrative mechanism to address high-priority Zone 2 properties in 2017.

All of that said, at bottom EPA understands this comment to be about public participation in remedy selection, in remedy implementation, and in the everyday goings on of a community. To be clear, EPA understands the importance of public participation. That is why EPA holds so many public meetings, maintains a regular, physical presence on site, meets one-on-one with residents, provides online resources for learning more about the site, and operates a dedicated hotline for questions and concerns (to name just some of EPA's outreach efforts). EPA has made it abundantly clear that the public does not need a formal comment period to contact EPA with questions and concerns, and EPA has taken steps to address such questions and concerns as have been received. Further, EPA will investigate and consider any information received that it believes reasonably calls into questions its remedial decisions. In short, EPA is already actively engaged with the community and will continue to engage with the community as work progresses.

Comment #14: Several commenters argue that EPA has implemented incremental changes to the ROD which, when taken in aggregate, require a ROD amendment.

Response to Comment #14: As discussed in the Response to Comment #12, the ROD only addresses contamination in yards and EPA's approach to managing contamination in yards in Zones 2 and 3 and has not changed.[23] As discussed in the Response to Comment #13, EPA has discretion to determine which authorities are most appropriate to use to address other sources of contamination. EPA does not incrementally modify the ROD when it uses other authorities, decision documents, and remedies to address contamination not in yards.

Comment #15: One commenter states that EPA should be more transparent and forthcoming with regards to its ongoing work at the USS Lead site.

Response to Comment #15: EPA has endeavored to be as transparent as possible with regards to work at the USS Lead site. EPA has hosted several public meetings for this site, as well as a

[22] *See* EPA, Action Memorandum – Fifth Amendment from Margaret M. Guerriero, Acting Director, EPA Region 5 Superfund Division, to Barry Breen, Acting Assistant Administrator, EPA Office of Land and Emergency Management 15-16 (Mar. 14, 2017) (hereinafter, Fifth Amendment).

[23] EPA's approach may change for Zone 1, but again, that will be addressed with a ROD amendment.

number of open houses for both residents and other government agencies and departments. At all of these events, EPA has held public Q&A sessions and made its project managers available for one-on-one discussions. Several of these public meetings have coincided with EPA enforcement efforts, so that EPA can answer questions about those enforcement efforts contemporaneously with their implementation.

Further, project managers and community involvement coordinators are also regularly in the community and available for questions. EPA has operated a site hotline where residents can call in with questions and concerns. More than just putting the administrative record online, EPA has made available online block-level sampling and historical information.

Finally, this ESD, too, is part of EPA's efforts at transparency. The ESD and associated documentation show EPA's current thoughts with regard to the soil remedy. Though not required by regulations, EPA held a Q&A session and public hearing for this ESD, and generally solicited public comments. And notwithstanding the limited scope of this ESD, EPA has addressed as many of the comments as possible.

Comment #16: One commenter requested that EPA hold future community meetings at other proposed locations including the Martin Luther King Community Center and local churches.

Response to Comment #16: This ESD addresses only revised cost estimates for Zones 2 and 3 for the remedy selected in the ROD for Zones 2 and 3, not the community involvement process. As such, any comments about the community involvement process are beyond the scope of this ESD. Notwithstanding, a response to this comment is provided below.

EPA is committed to engaging with the community at locations that are convenient for and generally accessible to the public. To date, the former Carrie Gosch Elementary School has best met these criteria. However, EPA will certainly consider alternate locations, particularly if the former school becomes unavailable.

Comment #17: One commenter argues that EPA must do more to address resident concerns than merely comply with the statute, Record of Decision, and Consent Decree.

Response to Comment #17: EPA cannot legally act outside the scope of its statutory authority and must comply with its own regulations and with consent decrees entered in federal court.

That said, EPA is committed both to its mission to protect human health and the environment and to working with residents to address their concerns. To date, EPA and its contractors have devoted over 260,000 work hours to the site. Further, EPA has held numerous public meetings and information sessions where it has made available several project managers and community involvement coordinators for both group and one-on-one discussions. EPA has coordinated with other local, state, and federal agencies and made them available to the public at open houses. In addition to the site hotline and various online resources, EPA has maintained a consistent physical

presence at the site during construction seasons. In short, EPA has gone above and beyond its statutory and regulatory requirements to engage with the community.

Comment #18: Several commenters requested that EPA explain why Zones 1, 2, and 3 were subdivided as they are, and why funding for work in Zone 2 was not included as part of the 2014 consent decree.

Response to Comment #18: This ESD addresses only revised cost estimates for Zones 2 and 3 for the remedy selected in the ROD, not enforcement decisions or documents. As such, any comments on the subdivision of OU1 or the scope of the 2014 consent decree are beyond the scope of this ESD. Notwithstanding, EPA includes here a response to this comment.

Consent decrees are negotiated documents that require the agreement of all parties. There are two Defendants to the consent decree: Atlantic Richfield and DuPont. The former Anaconda facility—which EPA claims defendant Atlantic Richfield is a successor to—operated within the footprint of Zone 1. The DuPont facility operated immediately south of Zone 3. By mid-2014, EPA (with IDEM), Atlantic Richfield, and DuPont could not reach an agreement that included Zone 2 in the consent decree.

As a result, EPA was faced with the following alternatives: (1) litigate and hope for a result that included all three zones; (2) continue to try to negotiate a consent decree that included Zone 2; or (3) complete a partial consent decree. The first two alternatives would have delayed the cleanup even longer. The third alternative enabled the Remedial Design work to start as soon as the consent decree was approved. EPA chose alternative 3 in order to expedite that work.

Critically, under alternative 3 EPA reserved its rights to pursue Atlantic Richfield and DuPont (as well as any other PRPs) at a later time for the Zone 2 work. In fact, in 2017, after further negotiations, Atlantic Richfield and DuPont agreed to an administrative settlement under which they would help pay for work in Zone 2 that year. Further, in 2018 Atlantic Richfield and DuPont agreed to comply with a Unilateral Administrative Order ("2018 Z2 Soil UAO") to perform the Zone 2 work going forward. Importantly, because of the 2017 administrative settlement and the 2018 Z2 Soil UAO, more PRPs are now participating in the cleanup of the site.

In any event, regardless of the mechanism being used, EPA has always been committed to remediating Zone 2. In 2016 and 2017, EPA performed work concurrently in both Zones 2 and 3, ultimately remediating 131 properties in Zone 2 and 158 properties in Zone 3. EPA expects work in both zones to continue at similar paces during the 2018 construction season.

As to the specific boundaries of each zone, the land in Zone 1 has a materially different owner and operational history than the land in Zones 2 and 3. As between Zones 2 and 3, the DuPont property is immediately south of Zone 3 and the Indiana Harbor Belt railroad provided a simple feature by which to draw the line. That said, EPA does not view contamination at Zone 2 properties as qualitatively different from contamination at Zone 3 properties, and so is remediating the two zones in the same manner.

Comment #19: One commenter expressed concern that Zone 2 was excluded from the Consent Decree. This commenter also states that the administrative settlement agreement under which work was performed in Zone 2 in 2017 reflects "flawed calculations" in the ROD.

Response to Comment #19: This ESD addresses only revised cost estimates for Zones 2 and 3 for the remedy selected in the ROD, not the enforcement mechanisms used to implement the selected remedy. As such, any comments on enforcement are beyond the scope of this ESD. Notwithstanding, a response to this comment is provided below.

The Response to Comment #18, above, explains the exclusion of Zone 2 from the Consent Decree.

EPA has always been committed to remediating Zone 2. Indeed, without an agreement in place in 2016, EPA spent federal dollars to sample and begin remediation work in Zone 2 alongside remediation work in Zone 3. The 2017 Z2&3 Administrative Settlement also provided funding for work primarily in Zone 2, and the 2018 Z2 Soil UAO provides a mechanism for the remaining soil remediation work in Zone 2 to proceed apace Zone 3.

This ESD is intended to correct the cost estimate included with the ROD and so also addresses other incorrect estimates and assumptions about the volume of contamination and unit cost of remediation at the site.

Finally, as a point of clarification, neither the Consent Decree nor any of the administrative settlements are remedy decision documents: they are enforcement documents that only implement and/or fund selected remedies. As such, these enforcement documents *should* reflect decisions made in the ROD or Action Memorandum. Notably, though, all of these enforcement documents ensure that work can proceed even if the volume and unit cost estimates are initially incorrect.

Comment #20: One commenter states that EPA must be able to provide information on several community demographics and demographic trends, including the total population of the site, the number of children at the site, the number of elderly at the site, the number of tenants and property owners at the site, and the number of businesses at the site.

Response to Comment #20: This ESD addresses only revised cost estimates for Zones 2 and 3 for the remedy selected in the ROD, which does not depend on community demographics. As such, any comments on community demographics are beyond the scope of this ESD. Notwithstanding, a response to this comment is provided below.

EPA estimates that there are approximately 2,500 people living in Zones 2 and 3. EPA does not have specific demographic information for that population. However, EPA selected a remedy for the site based on the potential exposure risk faced by vulnerable populations such as young children and pregnant women. The selected remedy applies to all residences at the site, which means that it is protective of all such vulnerable populations, regardless of whether they number in the tens or hundreds. Further, because EPA selected a remedy that protects the most vulnerable

populations, the selected remedy is also protective of less vulnerable populations. EPA's remedy is protective regardless of whether a person is a tenant or a homeowner.

Comment #21: One commenter argued that EPA should perform interior sampling and cleaning work at all properties, not just at properties which require soil remediation.

Response to Comment #21: This ESD addresses only revised cost estimates for Zones 2 and 3 for the remedy selected in the ROD, not the removal actions authorized by the Fifth Amendment to the Action Memorandum. As such, any comments on those removal actions are beyond the scope of this ESD. Notwithstanding, a response to this comment is provided below.

EPA has limited statutory authority to address indoor contamination. Indoor lead dust that might be tracked in from contaminated outside soil is difficult to distinguish from indoor lead dust produced by other lead sources that EPA has no legal authority under CERCLA to abate, including lead-based paints, certain household products, etc.

EPA believes it has a reasonable basis to assert that elevated levels of indoor lead dust at a residence can be traced to site-related contamination when there are also elevated levels of lead soil contamination in the soil of the property. However, where lead contamination in the soil of a property is not present above EPA cleanup levels, EPA does not at this time believe it can perform interior cleanup work. Indeed, interior sampling data confirms that only about half of the properties with contaminated soil had contaminated interiors.

That said, EPA has provided residents of the site with information on steps they can take to reduce their risk of exposure to lead dust, including wiping off shoes and leaving them by the door and regularly cleaning the inside of homes.

Comment #22: One commenter asserted that EPA's interior sampling and cleaning program is not sufficiently protective because it does not conform with EPA or HUD standards for triggering lead-paint abatement. The commenter further asserted that if it had, the cost of the cleanup would be even greater.

Response to Comment #22: This ESD addresses only revised cost estimates for Zones 2 and 3 for the remedy selected in the ROD, which did not include the interior removal actions authorized by the action memoranda, as amended, for the site. As such, any comments on the cleaning program are beyond the scope of this ESD. Notwithstanding, a response to this comment is provided below.

At the outset, it's important to stress that EPA's indoor cleaning work is not lead-paint abatement work. Lead-paint abatement is intended to address hazards associated with lead-based paint; by contrast, EPA's indoor sampling and cleaning work is intended to address site-related indoor lead dust. The purpose of EPA's indoor cleaning program is (1) to identify whether there is a meaningful risk of exposure to lead contamination stemming from site-related contamination, and (2) to take steps to reduce that risk of exposure.

Lead-paint abatement is performed after a certified lead inspector determines there is a risk of lead exposure due to lead-based paint. To make this determination, lead-paint inspectors typically conduct XRF screenings of walls, evaluate the integrity of the paint, and may collect samples of flaking paint chips.

By comparison, EPA does not have enough information to conclude that all residents with soil contamination face a risk of lead exposure due to site-related indoor dust. Indeed, indoor sampling data confirms that only about half of all residences with contaminated soil also have indoor contamination. As a result, EPA must first determine that there is a risk of lead exposure due to site-related indoor dust before EPA performs indoor cleaning work.

To determine the risk of lead exposure, EPA collects vacuum samples and analyzes the concentration of lead (expressed in parts per million or ppm) present in the dust. EPA uses lead concentration instead of lead loading because EPA uses the IEUBK model to determine risk of exposure, and the IEUBK model only accepts concentration as an input, not loading.

Unlike EPA's indoor cleaning work, lead-paint abatement can generate large quantities of lead dust that must be captured and cleaned to prevent contamination of the residence. Because of this, after the abatement work is performed, lead loading (expressed in $\mu g/ft^2$) is measured to ensure that lead dust generated during the abatement work has not been left behind, and that the residence is safe for occupancy. Per EPA regulations, the lead-paint abatement clearance level for floors is 40 $\mu g/ft^2$. Again, the clearance sampling is not taken before the abatement to determine risk of exposure to lead-paint—that is what the lead inspection does.

EPA also takes samples after performing an indoor cleaning ("efficacy sampling"). However, EPA's indoor cleaning work does not generate lead-contaminated dust. As such, EPA's efficacy sampling is only intended to provide a performance benchmark for EPA's work to ensure that it has been implemented correctly. The post-cleaning screening levels used for EPA's efficacy sampling reflect a reasonable limit of cleanliness that can be achieved by cleaning efforts; as long as the loading rates remain below those post-cleaning screening levels, a re-cleaning is not required.

EPA has elected to use the lead and arsenic loading standards developed during the World Trade Center (WTC) cleanup as the post-cleaning screening level at the site. The WTC standard for floors is 25 $\mu g/ft^2$ for lead and 36 $\mu g/ft^2$ for arsenic, which means that it is in fact stricter than the lead-paint abatement clearance standard. EPA determined that it was appropriate to use the WTC standards because the WTC indoor cleanup also addressed indoor dust contamination that did not result from lead-based paint.

There has been some confusion as to why EPA's pre-cleaning screening level is expressed in ppm and its post-cleaning screening level in $\mu g/ft^2$. The numbers are different because they serve different purposes; they are not meant to be compared. To restate: EPA's pre-cleaning screening level is used as part of a risk assessment, and EPA's risk model uses concentration (expressed as ppm) as its input. Once risk has been determined, EPA's efficacy sampling (measured in loading and expressed in $\mu g/ft^2$) is used to ensure that cleanings are effective. Loading takes into account

the mass of dust left behind. Concentration is not measured again because no additional risk assessment is necessary.

In summary, this comment incorrectly assumes that EPA's indoor work and general lead-paint abatement should operate on the same standards. EPA is not performing lead-paint abatement and lead-paint abatement addresses a different risk, so the work cannot be directly compared. Put another way, it cannot be said that EPA's indoor work deviates from the lead abatement standard because the lead abatement standard is not the baseline. Rather, based on risk modelling and cleanup work performed at the World Trade Center, EPA has developed a site-specific sampling and cleaning protocol to reduce the risk of exposure to lead dust and protect human health.

Finally, EPA agrees that the cost of the indoor sampling and cleaning work add to the total cost of remediating the site. However, those costs were excluded from this ESD because the ROD does not address indoor dust contamination. For more details, please refer to the Response to Comment #21.

Comment #23: Several commenters argue that the ESD does not accurately capture the full cost of remediating the USS Lead site because the OU2 RI/FS has not yet been completed and because the ESD does not account for the cost of the indoor sampling and cleaning work. Further, one commenter argues that EPA should have requested more money as part of the ESD.

Response to Comment #23: The commenters are correct that the ESD does not capture the full cost of remediating the USS Lead site. However, the ESD is not intended to capture all costs. Instead, it addresses only cost changes in Zones 2 and 3 for the soil excavation remedy selected in the ROD. The indoor sampling and cleaning work and the groundwater investigation were not part of the 2012 ROD. As such, costs associated with those actions have been intentionally excluded.

That does not mean that the indoor work and groundwater investigation are not occurring. On the contrary, the groundwater remedial investigation is currently being performed pursuant to a 2017 administrative settlement, and the remaining indoor work will be performed pursuant to one of two 2018 Unilateral Administrative Orders.

For clarification: An ESD, like the ROD it is associated with, does not include any mechanisms for funding. An ESD cannot compel potentially responsible parties to provide funding. It cannot even compel EPA to provide funding. In this case, it simply describes the estimated cost of soil remediation work in Zones 2 and 3 of the USS Lead site. Funding and work are provided and performed pursuant to other instruments.

Comment #24: One commenter argues that EPA should evaluate remedies based on efficiency, effectiveness, and permanence.

Response to Comment #24: This ESD addresses only revised cost estimates for Zones 2 and 3 for the remedy selected in the ROD, not the remedy selection process itself. As such, any

comments on that process are beyond the scope of this ESD. Notwithstanding, a response to this comment is provided below.

EPA is required to evaluate possible remedial alternatives according to nine criteria prescribed by the National Contingency Plan at 40 C.F.R. § 300.430(e)(9). Those criteria include: (1) overall protection of human health and the environment; (2) compliance with applicable or relevant and appropriate standards; (3) long-term effectiveness and permanence; (4) reduction of toxicity, mobility or volume; (5) short-term effectiveness; (6) implementability; (7) cost; (8) state acceptance; and (9) community acceptance. Criteria #1-2 are threshold criteria; #3-7 are balancing criteria; #8-9 are modifying criteria.

As part of the 2012 remedy selection process, EPA used these nine criteria to evaluate several possible remedies for the site, including "no action" (Alternative 1), capping with institutional controls (Alternative 3), excavation of soils down to 24 inches (Alternative 4A), and excavation of soils down to native sand (Alternative 4B).[24] Ultimately, EPA determined that Alternative 4A satisfied the threshold criteria and best balanced the remaining decision criteria. More details can be found in the Record of Decision, available online and as part of the administrative record for the site.

Comment #25: One commenter argues EPA should instead implement Alternative 4B (excavation of contaminated materials down to native sand) because the groundwater remedial investigation may prove that Alternative 4B is more cost effective.

Response to Comment #25: This ESD addresses only revised cost estimates for Zones 2 and 3 for the remedy selected in the ROD, not the remedy selection process itself. As such, any comments on that process are beyond the scope of this ESD. Notwithstanding, a response to this comment is provided below.

As described in the Responses to Comments #2 and #4, EPA does not believe that recontamination of surficial soils by potentially contaminated soils at depths is likely, and so Alternative 4B is still not cost effective. However, EPA is investigating the effects of groundwater contamination as part of the OU2 RI/FS and will make a remedy decision at the end of the RI/FS.

Comment #26: One commenter argues that EPA would have considered other remedial options in the 2012 proposed plan and ROD if it had correctly estimated the cost of the soil remediation work at that time.

Response to Comment #26: According to EPA's *Lead Handbook*:

[24] EPA rejected a remedy which called for only institutional controls (Alternative 2) because it determined that remedy was not protective. EPA also rejected *in-situ* chemical stabilization (Alternative 5), because there was insufficient evidence that such a remedy would be effective in the long term.

> Currently, there are only two remedial actions that generally are considered to be protective, long-term (not interim) remedial actions at residential properties: (1) excavation of contaminated soil followed by the placement of a soil cover barrier and (2) placement of a soil cover barrier without any excavation of contaminated soils. Excavation followed by the placement of a soil cover is the preferred method and is strongly recommended at sites with relatively shallow contamination, such as many smelter sites. In most cases, excavation and placement of a soil cover should be performed whenever the specific conditions of a site do not preclude it. For example, it may not be feasible to fully excavate a very large site cost-effectively, therefore capping, also considered to be protective may be more appropriate. The advantage of the preferred method is that it is a permanent remedy in terms of removal of lead from areas where children may be exposed.[25]

EPA considered both a capping remedy and two excavation remedies in the Record of Decision and ultimately selected the current excavation remedy after comparing each alternative against the nine evaluation criteria.[26] Despite the cost increase, for the reasons described here and in the ESD, EPA still would select an excavation remedy over a capping remedy at this site even with the current cost estimate.

Comment #27: One commenter argued that EPA's selected remedy is inconsistent with EPA's preference for permanent remedies.

Response to Comment #27: This ESD addresses only revised cost estimates for Zones 2 and 3 for the remedy selected in the ROD for Zones 2 and 3, not the remedy selection process itself. As such, any comments on that process are beyond the scope of this ESD. Notwithstanding, a response to this comment is provided below.

While the Superfund Amendment and Reauthorization Act (SARA) of 1986 expresses a preference for permanent remedies (i.e., treatment) over containment and removal remedies at Superfund sites, EPA made clear in the *Lead Handbook* that for residential lead sites capping or excavation and disposal are the preferred options. Nevertheless, EPA assessed the soil cleanup alternatives against the evaluation criterion "reduction of toxicity, mobility, or volume through treatment." Other evaluation criteria, such as cost, short-term effectiveness, long-term effectiveness, and implementability, were also considered and resulted in EPA selecting the current remedy.

EPA considered *in-situ* treatment (Alternative 5) as part of the 2012 Feasibility Study, but screened it out because of uncertainty related to the long-term effectiveness of the remedy. This is consistent with the *Lead Handbook*, which states that "[s]everal treatment technologies are currently under

[25] *See* EPA, Superfund Lead-Contaminated Residential Sites Handbook, OSWER 9285.7-50 38 (2003).

[26] *See* 40 C.F.R. § 300.430(e)(9).

development to reduce the bioavailability of soil lead, but have not yet been proven to be protective in the long-term."[27]

Finally, while SARA expresses a broad preference for treatment solutions, treatment solutions may not always be cost-effective, practical, or even available. As stated above, the *Lead Handbook* recognized this when it stated that excavation and capping are the "only two remedial actions that generally are considered to be protective, long-term (not interim) remedial actions at residential properties."

Comment #28: One commenter argued that because of the significant increase in cost, EPA should now consider washing soils and other similar remedies.

Response to Comment #28: As discussed in the Response to Comment #26, per EPA guidance, excavation and capping are the "only two remedial actions that generally are considered to be protective, long-term (not interim) remedial actions at residential properties."

To elaborate, EPA has successfully implemented soil washing at only a small number of sites, due to technical difficulties and high costs associated with the technology. In fact, between 1982 and 2005, soil washing was only implemented at 6 out of 977 sites, and at only 2 out of 229 sites where heavy metals were the contaminant of concern.[28] None of the 6 sites chosen were residential cleanup sites. Further, soil washing is more effective with organic wastes; washing has only limited effectiveness for addressing lead in soil.[29]

Some sites initially selected soil washing as the primary remedy, only to determine during implementation that cleanup targets could not be achieved or that the costs were prohibitively high.[30] In fact, EPA Region 5 selected a soil washing remedy at the United Scrap Lead site in Ohio, only to later modify the remedy due to technical and cost issues associated with the technology.[31]

Additionally, none of the 6 sites where soil washing was implemented were residential sites. This is in part because soil washing is more practical at former facilities where a soil washing facility can be built on-site and the prolonged excavation of the soils does not interfere with everyday use. EPA cannot practically implement such a remedy here because delays associated with the soil

[27] *Lead Handbook* at 38. Note that most treatment options would leave more lead in the soil—lower bioavailability means that greater amounts of lead in the soil will result in the same risk profile.

[28] EPA, Treatment Technologies for Site Cleanup, Annual Status Report 3-11 (12th ed. 2007).

[29] *See* EPA, Superfund Engineering Issue – Treatment of Lead-Contaminated Soils 2-3 (April 1991).

[30] *See* EPA, Treatment Technologies for Site Cleanup, Annual Status Report Appendix D (12th ed. 2007). Sites where a soil washing remedy was discontinued include (but is not limited to): Myers Property, NJ; Moss-American, WI; GE Wiring Devices, PR; Cape Fear Wood Preserving, NC; and Gould, Inc., OR.

[31] EPA, United Scrap Lead ROD Amendment (June 10, 1997) (amending the 1988 ROD).

washing would substantially slow down remediation efforts in the community and further inconvenience residents. Therefore, for this USS Lead residential cleanup, soil washing would have to be conducted at an off-site location.

Finally, cost increases at this sit e are largely driven by the increased volume of soil and the increased unit cost of excavating and replacing that soil in yards. Because soil washing would have to be conducted off-site for the USS Lead residential cleanup this option faces the same (and possibly greater) excavation and restoration costs as the current remedy. Further, although increased soil volume increases the total cost of disposal, EPA does not believe there has been a meaningful change in the unit cost of disposal. Because soil washing would have to be conducted as an off-site treatment alternative to disposal, this means that soil washing is no more cost effective now than it was at the time of the original cost estimate.

Comment #29: One commenter argued that due to the significant increase in cost, EPA should consider permanent relocation of residents as a remedy.

Response to Comment #29: As discussed in the Response to Comment #26, per EPA guidance, excavation and capping are the "only two remedial actions that generally are considered to be protective, long-term (not interim) remedial actions at residential properties." However, due to repeated inquiries regarding a relocation remedy, a brief explanation of EPA's consideration of the matter is provided below. In short, though, EPA has not included an assessment of permanent relocation because such a remedy at this site would be clearly inconsistent with EPA policy.

Under EPA's *Interim Policy on the Use of Permanent Relocation as Part of Superfund Remedial Actions*, OSWER Directive 9355.0-71P (June 30, 1999), "EPA's preference is to address the risks posed by contamination by using well-designed methods of cleanup which allow people to remain safely in their homes and businesses." Permanent relocation is a rare and complicated remedy selected only under certain conditions, such as when (1) homes must be destroyed to effectively implement a remedy, (2) residences cannot be decontaminated to levels acceptable for human health, (3) the remedy would require unreasonable use restrictions, or (4) a necessary temporary relocation would exceed one year.

None of these criteria are present at the site. Specifically:

1. EPA can safely implement the remedy around existing structures (which actually serve to cap contamination and prevent exposure).
2. EPA has sampling data indicating that it can effectively remediate interior dust contamination.
3. The use restrictions proposed in the ROD are not especially onerous and are consistent with EPA practice.
4. No residents have been temporarily relocated for more than a year.

Put another way, EPA is not considering permanent relocation because a simpler, effective, and less disruptive remedy, which EPA has extensive experience implementing, is available.

In addition, there are a number of practical concerns that make permanent relocation a poor remedy choice for this site. First, there is no indication that there is widespread community interest in a permanent relocation. On the contrary, many residents of the West Calumet Housing Complex were unhappy about being forced to leave their homes. Second, permanent relocation would be extremely disruptive to the community. Permanent relocation would only be available to those properties that are still contaminated and would effectively hollow out the neighborhood, leaving a number of vacant properties behind. Further, large losses in population can affect the availability of various services to the community. The closure of the former Carrie Gosch Elementary School is the best example, but local groups and organizations that rely on a robust community would also suffer greatly. Finally, permanent relocation is neither a permanent solution nor less expensive because it does not address the contamination that would still remain at the site.

The exception to the approach of remediating lead-contaminated soil while residents remain in place at a residential lead site is the Tar Creek Superfund Site in Ottawa County, Oklahoma. However, despite comparisons to that site made by some community members, the facts at that site contrast strongly with the facts here. The Tar Creek site was part of a former mining area and extensive contamination waste resulting from those operations remained on site. For example, 200-foot-high piles of waste tailings ("chat") were scattered throughout the site, totaling over 31 million cubic yards of waste alone. Additional waste included chat bases, lead tailings, smelter waste, and airborne deposition of materials blown off from all of these sources. Remediation of these wastes was anticipated to take place over the course of decades, with revenue generated from the sale of the chat defraying cleanup costs. Remediation was also anticipated to include substantial use restrictions, such as week-long barricading of streets and extensive shutdown of local utilities. Notwithstanding these conditions, EPA determined that the requirements imposed by the Uniform Relocation Act (URA) would result in considerable time and expense and in fact proposed an in-place, dig and haul remedy similar to the one at this site. It was not until Congress exempted the site from the URA that EPA opted to relocate the residents.[32]

By contrast, the estimated total volume of soils to be excavated from the Zones 2 and 3 is only 88,000 cubic yards. Excavation work in Zone 3 is largely expected to be completed by the end of the 2018 construction season, and excavation work in Zone 2 is expected to be completed by the end 2020. EPA does not anticipate extensive use restrictions at the USS Lead site comparable to those that would have been required at Tar Creek. Finally, the USS Lead site has not been exempted from complying with URA requirements, and even if it were, permanent relocation would still not be cost-effective.

In summary, permanent relocation at the USS Lead site would be inconsistent with EPA policy and prior EPA practice and have serious negative consequences for the community.

[32] *See generally*, EPA, Explanation of Significant Differences for the Record of Decision: Tar Creek Superfund Site Operable Unit 4 (Apr. 2010), *available at* http://www.kdheks.gov/treece/download/Tar_Creek_OU4_Final_ESD_Signed_April_13_2010.pdf. Prior to this URA exemption, Congress also allocated specific federal funding to the site to help implement a state-run buyout program.

APPENDIX C: ATTACHMENT 1

Transcript of February 15, 2018 Public Hearing

In The Matter Of:

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

RE: ESTIMATED INCREASED CLEANUP COSTS

USS LEAD SUPERFUND SITE

February 15, 2018

BOSS REPORTERS

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

PUBLIC MEETING

RE: ESTIMATED INCREASED CLEANUP COSTS

USS LEAD SUPERFUND SITE

at

PASTRICK BRANCH LIBRARY

1008 W. Chicago Avenue, East Chicago, Indiana

Thursday, February 15, 2018

5:30 o'clock p.m.

Reported by: Pamela S. Owen, CSR, RPR
Illinois License No. 084-002294
Notary Public, Lake County, IN

BOSS REPORTERS
& VIDEOCONFERENCING
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APPEARANCES

ON BEHALF OF THE U.S. ENVIRONMENTAL PROTECTION AGENCY:

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ALSO PRESENT:

Cheryl Vaccarello, Tetra Tech

Members of the Public

INDEX

Supplements: Larry Davis Supplement No. 1 and Larry Davis Supplement No. 2 attached.

MS. POPE: Hello, everybody. Thank you for coming to the meeting tonight, the hearing. My name is Janet Pope, and I'm the community involvement coordinator for the USS Lead Site.

Tonight this meeting is about the Explanation of Significant Difference, and that's all that the meeting is about. Any other questions regarding anything else concerning the site will not be addressed at this meeting. This is only about the ESD; okay?

Another thing that I would like to remind people is we are in a Public Comment Period for the ESD. Tomorrow is actually the last day of the Public Comment Period. Now, you can stand up. When we get to the Public Comment Period in this hearing, you can give it orally. We have sheets back there. You can write them down on the sheets in the back. You can also email them to me. But remember, it ends tomorrow; okay?

When we get to the Public Comment Period, I'll take back over, I'll let you know what the rules are at that time; okay?

So we have -- Sarah Rolfes is going to

come up, and we have Leo here as well. Sarah's going to come and do the presentation on the ESD; okay?

MS. ROLFES: Okay. So this evening we're here to discuss the Explanation of Significant Differences, as Janet said earlier. It was proposed in December, and it's docu-- it's to document an estimated cost increase to implement the remedy in Zones 2 and 3 of the USS Lead Site.

Now, an ESD documents significant but not fundamental changes to remedial actions after a Record of Decision has been issued. So ESDs are used for changes that affect features of a remedy. So they don't actually change the cleanup approach itself. So it affects features like timing and cost. So this ESD documents an estimated increase in cost.

Okay. So in 2012, we did a cost estimate for the remedy for Zones 2 and 3, and that estimate was $22.8 million. The current cost estimate described in the ESD is 84.9 million. Again, I want to reiterate that the remedy that was chosen, the cleanup approach, is not changing, just the estimated cost to implement

that remedy.

The original cost estimate completed in 2012 was based on samplings that were conducted as part of the Remedial Investigation Phase. Approximately 7 percent of the properties in Zones 2 and 3 were sampled. Now, this sampling was designed to provide spacial coverage across the entire site. We do sampling as parts of an RIFS to design the remedy, to determine the remedy, and issue a ROD.

So now we're in the Remedial Design Phase and the Remedial Action Phase. So now we've sampled over 90 percent of properties in Zone 2 and 3. This sampling is different from RIFS sampling. This sampling we conduct at each property to determine if that property needs to be cleaned up and how much of that property needs to be cleaned up.

So given all this new data, our assumptions that were used to calculate the cost have changed. One of those assumptions is the volume of soil that needs to be cleaned up. The volume has increased. It went from 47,000 cubic yards in 2012 to over 88,000 cubic yards now. So why has that number changed? There's

three factors. They're all listed here (indicating).

The number of properties increased. We estimated about 580 were needed to be cleaned up in 2012. Now that number is over 750.

The average size of those yards also has increased. So with that small sample set, the properties were smaller. Now we sampled over 90 percent; the yard average size is larger.

Also, the extent of contamination has changed. So for instance, in 2012 we estimated that 4 percent of properties in Zone 2 would need to be excavated to 24 inches. Now that number is 17 percent. So the estimates that we did in 2012, we underestimated them for each integral.

Some additional factors that have led to the increased cost include updated construction management and oversight costs. This is largely due to a larger volume. Since we have more soil to take off site, it's going to take us longer to do it, and we need more people on site.

The cost to complete the excavation has also increased. One of these is due to more

hand digging we've had to do in the yards, as well as utilities. We didn't anticipate having to do hand digging. We anticipated we could use a large excavator and do it very quickly. Now it's a little bit slower, so that cost has increased.

Additionally, our new cost estimate includes the 2017 prevailing wage numbers.

So all of these factors together have led to an increased cost estimate, going from 22.8 million to 84.9 million.

And I do want to the stress that the actual implementation of the remedy hasn't changed. We're doing everything the same, just our estimated cost has increased.

Leo?

MR. CHINGCUANCO: So you might have heard me say this at some other public meetings in the past, but I just want to reiterate that the ESD is -- clarifies how much the cost of the remedy will be, but the ESD itself is not a funding mechanism. It doesn't provide money to EPA, and there's not a commitment for money under the ESD to do this work.

That said, EPA has other enforcement

mechanisms in place. It has a Consent Decree from 2014, and it has two unilateral orders out right now that will implement this work. But since it's a common misconception that, you know, EPA now says that there's a remedy for $80 million, EPA must have a pot of $80 million that it must, you know, be able to do whatever it wants with, I just want to be clear that that's not the case.

Right -- the companies, essentially, for Zone 3, give us money on a rolling basis for specifically this work. And under the UAOs, the companies will be performing the work themselves. So even though the value of that work might come out to something like 40 or $50 million, all of those costs will be paid directly by the companies when they hire a contractor to do the work.

So just, again, we don't have $80 million as a result of this ESD.

MS. POPE: Okay. So actually, that really concludes what we have about -- what we have about the ESD. So at this time, we'd like to open the floor for general questions. So if you have a question, we'd like you to stand up

so the -- because this meeting is being recorded. We have a stenographer here, so she's going to be recording the whole meeting.

Okay. So if you have any questions about the ESD at this time, if you could stand up and ask your question, and Sarah and Leo will answer your questions.

Could you stand up?

REMONSTRATOR: Yes, I believe the numbers are -- from 2012 to 2017, the cost to excavate and replace a cubic yard of soil went from $115 to $471. Could you explain why that cost increased over four fold in five years?

MS. ROLFES: Sure. The number -- the 115 cubic yards that was included in the 2012 estimate did not include the prevailing wage. So these new numbers are much higher due to that and also the type of excavation that we're doing. When we estimated the 115 cubic yard, we estimated we'd be able to use a backhoe. That goes much quicker. Now we have several guys that need to hand dig around utilities and backyards; it's much slower. So both of those factors together make that cost increase.

REMONSTRATOR: Thank you.

REMONSTRATOR: Hi, I'm Thomas Frank. I recognize that this is an adjustment on the cost of the project and not any -- there is no change -- no fundamental changes in the definition or scope. I'm concerned about the other issues that we're finding, perhaps with the hydrology of the area and issues like that as well. Is there an opportunity to have the EPA readdress those issues in terms of the cost as well?

We've asked the EPA to do a hydrology study, and we don't know if that is being encompassed in this.

MS. ROLFES: I'm going to have Tim talk for a second because Tim is actually dealing more with the groundwater investigation; he knows more about that than me.

MR. FISCHER: Yeah. I know there are a lot of -- there's a lot of new information you guys have brought up at other meetings previously and the information that you were going to share with the agency. We do have an ongoing remedial investigation related to groundwater at the site, and so those issues will be addressed as part of the groundwater

investigation.

This relates strictly to the soil.

REMONSTRATOR: So this is not reflective of any of that additional, perhaps, cost coming forward?

MR. FISCHER: Right.

REMONSTRATOR: Okay.

MS. ROLFES: Yeah, this is only, again, with the soil for Zone 2 and Zone 3.

REMONSTRATOR: Okay.

REMONSTRATOR: My question -- Maritza Lopez with the CCCAG, Zone 3, life-long resident. The reason -- my question is, is part of this increase due to, also, with the remedial you're finding in Zones 2 and 3? Because back in 2012, paperwork assumed it was airborne, and now you're finding further contamination. Is part of that including also the indoor testing that you're including into this cost?

MS. ROLFES: No. This is only for soil.

REMONSTRATOR: Okay.

MS. ROLFES: Only for soil. And again, this is largely due to when we did the RI, we only sampled 7 percent of the properties so we

could determine a remedy. Now we've sampled over 90 percent, so that's why the volume has increased; we had more properties to sample.

MS. POPE: Any more questions?

REMONSTRATOR: I know that you were originally slated to test all the properties at the early stages before the RAD -- or the ROD was issued, and then you only investigated 80 properties at first. Have you done the testing on all the properties at this point, every single property in Zones 1, 2, and 3?

MS. ROLFES: We've only sampled over 90 percent. We're still missing access at some of those properties, and we're trying to get access. We've actively been calling them -- calling them, knocking on doors, sending out mailings. So right now, we're still at over 90 percent.

REMONSTRATOR: Okay.

REMONSTRATOR: Is the ESD also increasing the time frame as well as the money, or --

MS. ROLFES: No. This is only money.

REMONSTRATOR: Could you repeat the question, please?

MS. ROLFES: She asked if this ESD also

increased the time frame. And I said, no it's only an increase in cost.

REMONSTRATOR: Thank you.

MS. POPE: Any other questions?

REMONSTRATOR: What is the average cubic yard unit taken out of every property?

MS. ROLFES: Every property is different. You mean the depth or how much volume from each property?

REMONSTRATOR: Well, you should have an average of what -- the number of properties and how much cubic yards --

MS. ROLFES: Well, it really depends. I mean, because some of the properties are very small, and some include three or four lots of them. So, you know, on average, we take about 12 inches from each property. On average. Some are only 6 and some are 24.

REMONSTRATOR: I live in the area, so I understand that you have smaller lots, bigger lots. But if you add all the lots and all the excavation that is done, you should have an average per lot; right?

MS. ROLFES: Correct.

REMONSTRATOR: Okay. So what is the

amount that you're pulling out, and what does it cost per the property?

MS. ROLFES: I have a cost per cubic yard in this. I mean, I have an average cost per property.

MR. CHINGCUANCO: About $65,000.

MS. ROLFES: It depends. It's about 60, 65,000. But that's for everything. That's not just for the excavation. That's for, you know, restoration and everything. So about 60, 65,000.

REMONSTRATOR: The last time you gave us an estimate of 50,000. Now it's gone up to 65?

MS. ROLFES: That's on average. Sixty, 65 is probably the highest. We say it is 60, 65.

REMONSTRATOR: Okay.

REMONSTRATOR: Hi. Bill Emerson, Lake County Surveyor. I just had a question on the location of those properties, the 785, and how -- if one property may not test -- you know, may not have a significant amount of lead in the soil, and then -- although it's an area you tested, but do you have like a map of -- of the properties, how they're laid out and what the 785 -- probably not with you now, but is

this available?

MS. ROLFES: We have a viewer online, and you can look at it block by block.

REMONSTRATOR: Okay.

MS. ROLFES: But we won't give out anything like property specifics because that's, you know, identifiable information. We don't give that out.

REMONSTRATOR: Okay. Thank you.

REMONSTRATOR: Hi. I'd like to know, are you guys going to complete the remediation at all in Zone 2?

MS. ROLFES: So this year we have at least -- we have the PRPs on board to do the construction and remediation in Zone 2. We haven't set a schedule yet for how many properties, but we anticipate that they'll at least get a hundred because we did over a hundred last year. That's what we're hoping for. So we're thinking that it will take two, maybe three years to complete Zone 2. That's our schedule.

REMONSTRATOR: So how can someone get to the top of the list?

MS. ROLFES: I suppose, you know, we could

talk. We would move priority properties to the front of the list. But other than that, you know, if there's extenuating circumstances, you might talk to the construction managers when we start meetings this spring. But, you know, we generally only move people to the front of the list if they've been considered a priority property.

REMONSTRATOR: Yeah, that's what I'm talking about. If someone is sick, you know what I mean, and they need their property taken care of, you know what I mean, before someone that doesn't have a medical problem or a health problem.

MS. ROLFES: Sure. We can talk.

REMONSTRATOR: Okay.

MS. ROLFES: That would be great.

REMONSTRATOR: When is the comment period over?

MS. ROLFES: It ends tomorrow.

REMONSTRATOR: Okay.

REMONSTRATOR: Yeah, I was curious. You're doing dust removal on the interior of houses. Why wasn't that included as part, and why aren't the Administrative Orders being

included as part of the Estimated Significant Difference since that is cleanup money or removal money that's being spent on the Superfund Site? Why aren't all these other costs being included?

MR. CHINGCUANCO: I think there's two things to unpack there. Well, I guess, could you clarify what you mean by the Administrative Orders? Do you mean that separate from the UAOs which were just issued or --

REMONSTRATOR: My understanding is that the interior dust removal is being done under the Administrative Orders; is that correct?

MR. CHINGCUANCO: Yes, but so is the soil cleanup in Zone 2.

REMONSTRATOR: Well, that's because Zone 2 was left out of the Consent Decree.

MR. CHINGCUANCO: Yes.

REMONSTRATOR: Uh-huh.

REMONSTRATOR: Yeah, we still are not happy about that either, but why aren't these other costs and other actions that weren't originally proposed that are now undergoing being included as part of the Explanation of Significant Difference?

MR. CHINGCUANCO: Sure. So the Explanation of Significant Difference is essentially a footnote to the Record of Decision that was issued in 2012. And the Record of Decision only covered the soil at the site, where the Record of Decision did not include a discussion of interior dust. And that's just a function of the -- the remedial work that we're doing there.

Now, in 2016, as you know, we issued several action memoranda; and again, in 2017 that expanded EPA's authority to do work at the site, to the interior work. Now, those other authorities that are being used have a different, essentially, decision documentation process. And since -- essentially, to maintain consistency with the work that we did in 2016 and 2017 as part -- for the indoor work, it didn't make sense for us to fold back into the remedial process that we have now.

So the ESD is a function of the process that we use to decide a cleanup for the soil. Because we did not go through that same process for the indoor work, it was through our Removal Program, and was considered essentially more

time critical, the ESD doesn't address that.

REMONSTRATOR: Can I follow that up, please? Yeah. So why didn't you, instead of issuing an estima-- or Explanation of Significant Difference, amend the Record of Decision to include these new actions?

MR. CHINGCUANCO: It wasn't necessary. Essentially, we already have -- because the soil remedy was selected in the Record of Decision and there was a cost increase, it wasn't necessary to issue an ESD that said because the interior work was covered under our removal authorities, and there hasn't been any change to that, again, it was -- there's no need for us to document the -- you know, well, the lack of changes that have gone on because of that. Essentially, it would be redundant for us to do -- to issue another decision document for the interior work at this point because we already have one and nothing has changed.

REMONSTRATOR: Yeah, well, I -- except that cuts the public out of the process.

MR. CHINGCUANCO: I mean, our goal has been to engage the public as much as possible,

and, you know, to solicit your feedback through as many avenues as possible. That said, you know, I think a lot of EPA authorities don't always include the kind of public engagement that the public always wants; but, you know, there are other, again, mechanisms and venues where your input can be brought to our attention.

REMONSTRATOR: Thank you.

MS. POPE: Any other questions? Because what we can do is if there are no other questions, we can go into our Public Comment Period, and that's when -- at the Public Comment Period, you get up, you make a few -- oh, sorry (retrieving microphone). We can go into our Public Comment Period. At the Public Comment Period, you get up, and you state your name, you spell your last name, and you just make your comment. At that time, EPA does not respond to your comment. Instead, those comments are responded to in what we call a Responsiveness Summary, which is usually available in four to six weeks.

So if there are no more questions and you'd like to start the Public Comment Period,

we can do that at this time. Are there any more questions?

REMONSTRATOR: Zachary Dong. I'd like to ask -- you mentioned about a two or three expected -- about two or three years to clean up Zone 2. What about Zone 3? Do you have an estimate for time?

MS. ROLFES: Zone 3 we anticipate we'll finish this year. We might have a few outstanding properties, but we'll finish this year.

REMONSTRATOR: Thank you.

REMONSTRATOR: We're in Zone 3. You haven't got our property yet.

MS. ROLFES: We haven't started scheduling for this year yet. We're going to start that in March.

REMONSTRATOR: Okay.

MR. CHINGCUANCO: And just to be clear, the reason it's taking longer in Zone 2, as opposed to Zone 3, is that there are more properties in Zone 2 that need remediation. We're cleaning about the same number of properties in each zone each year. There's only so fast we can go; but, yeah, that's just

sort of --

REMONSTRATOR: No, you're not.

MR. CHINGCUANCO: -- that we face.

REMONSTRATOR: You're not doing -- you're not doing it equally. You're doing more properties in Zone 3 than you are in Zone 2.

MS. POPE: Okay. So thank you for your comment. So with that, we're going to the Public -- if there are no more questions, we'll move to the Public Comment Period. And as I said, you know, we'll go by number. You've got numbers when you came in the door, and you'll stand, and you'll, you know, give your name. You'll spell your last name, and then you will give your public comment. And again, at that time, we won't be responding to those comments. They'll be responded to in what we call a Responsiveness Summary, which will probably be available in four to six weeks; okay?

So if there are no more questions, whoever has number one, if you could stand up, and you can come up to the podium. If you want the mic, you can have the mic, and you can give your comment.

REMONSTRATOR: Thank you. Larry Davis,

D-A-V-I-S. So there will always be significant differences so long as the U.S. EPA continues to make decisions concerning the USS Lead Superfund Site in a piecemeal manner.

Now, this goes clear back to the original scoring of the site for the NPL. The groundwater migration pathway, the soil exposure pathway, and the drinking water threat, and the human food chain threat, the surface water pathways were not scored as part of the hazard ranking system HRS evaluation, and this set a pattern. So the failure to comprehensively investigate all exposure pathways and determine the full extent of contamination led to a flawed conceptual site model, and that was only based upon aerial deposition and surface water migration. So this ignored probable sources of potential contamination from fill historically used throughout the area to develop the Duneland Swale Landscape and wetland areas adjacent to the Grand Calumet River following the establishment of the local lead industries in East Chicago, Indiana.

It also ignores known groundwater

contamination in the Calumet Sand Aquifer, which is a dynamic water table aquifer that is directly, hydraulically connected to Lake Michigan, that drinking water threat that U.S. EPA didn't score and continues to ignore.

And it's 75 percent quartz. Now, quartz is chemically inert. So 75 percent of the soils in this area basically have zero natural attenuation to hold or stop contaminants flowing through.

So the Calumet Sand Aquifer has a very low ability to naturally attenuate contaminants such as metals pollution, offers little resistance to the flow and spread of contamination throughout the aquifer once groundwater contamination is occurring, and the average horizontal conductivity is listed at 60 feet per day.

As mentioned, only 7 percent of the properties were sampled during the remedial investigation, and that directly contributed to today's Explanation of Significant Differences.

U.S. EPA has not determined whether or not sources of contamination lie buried deeper within the Superfund Site, and you need look no

further than the site next door, which is the DuPont site, at the soil borings for the well logs, for the monitoring wells and isometric wells. Those show a layer cake of sand and waste disposal; okay? Dumps upon dumps. So the assumption that EPA has hit native sand when doing cleanups --

MS. POPE: Thirty seconds.

REMONSTRATOR: -- is flawed because there are numerous instances of this type of fill in the area.

So the significant costs have increased to $471 a cubic yard. The cost of excavating and replacing one cubic yard of contaminated soil at the US Lead Superfund Site has now reached the level of what a permanent remedy that would require the removal and reclamation of toxic metals from the soil would cost per yard. So we're paying a price that would actually remedy -- a permanent remedy to remove the metals from the soil permanently, both here in this area and the soil being disposed of off site, and it would eliminate the public health threat. But instead, we're getting zero recovery and zero reduction of the toxic

threat, even though we're paying now at a rate of what it would cost to actually create a permanent remedy.

Thank you.

MS. POPE: Thank you, Mr. Davis.

Number two. Number two?

(No response.)

MS. VACCARELLO: I guess they pass.

MS. POPE: Okay. Number three.

REMONSTRATOR: My name is Maritza Lopez again. I'm a resident -- life-long resident of Zone 3 and chairing the CCCAG, which is known as East Chicago Calumet Coalition Commission that encompasses -- the board is made up from residents of the complete Superfund Site.

The -- my concern having to do with this ROD and essence of the organization is the fact that -- and I'm going to read this for you: The Explanation of Significant Difference must consider in the context of the history of EPA's work at the USS Lead Site. EPA's original Remedial Investigation Feasibility Study included an incomplete assessment of the site. That's one of the biggest concerns because right now, with the cost that you're spending

to clean and increasing the cost, you could have chose a better protective measure for all of us and ensure the depth and done accurate testing. Now we're going back. Now we're at the ground studies going into place.

And the indoor testing, that actually took into place when the residents asked for that on September 24th of 2016 in a meeting at Riley Park. 'Cause at that time, Tom O'Connell said he was going to check into a pilot program.

And what's bothersome, if the residents would have not risen up, this pilot program would have not taken place in both Zones 2 and 3. It would not have begun the cleanup that -- that they start testing inside. Then they started realizing that airborne status has changed, how it was stipulated in the original Consent Decree.

The assumption really hurt us because many of us are contaminated, our homes, inside, with led, arsenic, cadmium, and who knows what else. So we have to be very careful into the plan that was chosen. And I was one that stated openly four times the amount isn't sufficient for me to safeguard as a resident because the

health tests haven't been done, the health risk assessment haven't been done, full cleanup hasn't been done. If there's seepage coming into the homes, guess what, you're going to have to come back and reclean -- did you account for that -- until that process is taken care of.

These are actual costs that should not be given to the property owner, the renter, or the resident. We are not held accountable; the responsible parties are. And the fact that we have been waiting these umpteen decades and being contaminated, really, personally feeling, I feel you should have requested even more, because you're covering the soil remediation, but the rest of the stuff is not truly taken care of. Groundwater study's just beginning. We don't know about the seepage contaminants coming in on that.

MS. POPE: Thirty seconds.

REMONSTRATOR: So with that being said, there's going to be additional costs coming, and we're not going to be fully protected.

And with that, I leave you. And I did leave fliers on the table. Please get it.

Indiana Legal Aid is giving assistance to anybody affected or contaminated with lead in the Superfund Site. Please grab it. They're meeting at Friendship Church and at North Township Trustee's Office. Please pass the word. Thank you.

MS. POPE: Number four.

(No response.)

MS. POPE: Number four?

(No response.)

MS. POPE: Number five.

(No response.)

MS. POPE: Number six.

REMONSTRATOR: Thanks. Thomas Frank, F-R-A-N-K. I just have one comment, very simple, is: To address the Explanation of Significant Difference does not address a fundamental change in the scope of the project, especially when the characterization of the Superfund Site had not been completed early in the process. I think we need to re-scope the project to include hydrology and the other impacts that we are discovering through the public process.

And that's really it. Thank you.

MS. POPE: Number seven.

(No response.)

MS. VACCARELLO: No seven. Eight is the last number.

MS. POPE: Number eight.

(No response.)

MS. VACCARELLO: (Inaudible).

MS. POPE: That was it?

MS. VACCARELLO: Uh-huh.

MS. POPE: Is there anyone who wants to give a public comment but did not get a number? You want to do a public -- is there anyone?

(No response.)

MS. POPE: No one?

REMONSTRATOR: Perhaps you should give more time, since you've got an hour and a half and you cut people off.

REMONSTRATOR: Yeah.

MS. POPE: Okay. Again, is there anyone who did not get a number, and you would like to do a public comment? Is there anyone?

(No response.)

MS. POPE: No?

(No response.)

MS. POPE: Is there anyone here that has a

question? Besides Larry.

So could you stand up, and we'll go back to the Q-and-A session briefly, and -- so Sarah and Leo, could you come back up?

REMONSTRATOR: Very briefly, Richard Morrisroe, M-O-R-R-I-S-R-O-E.

Where do we email any comments? I presume we have till close of business tomorrow to email them, and what is that email address?

MS. POPE: Okay. You can email your comments to me. Last name Pope, P-O-P-E, Janet@EPA.gov. We also have public comment sheets in the back. You can write them and submit them now. You could also, again, email them to me or email them to the web page. You can also do it there. The Public Comment Period ends tomorrow.

Yes, we do have a public comment portal on our website, so you can go to the USS Lead website. And on that website you can submit comments that way as well. Okay?

Come on, Larry.

REMONSTRATOR: So EPA has said that they are going to address the DuPont off-site contaminated groundwater in the residential

area under Superfund instead of the RCRA corrective action process. Is that going to require another Explanation of Significant Difference?

MR. FISCHER: Well, we actually have an operable unit associated with the Superfund Site that is specific to groundwater that we have not selected a remedy for. That's the Operable Unit 2, groundwater operable unit. So once we conduct the investigation, we will determine if any action is necessary for the area underneath the neighborhood and the USS Lead Site, and we will make a remedial decision at that -- at that point. So it won't be any ESD or a ROD amendment. It will be a brand-new ROD for that operable unit.

And then, yes, you're right, there's ongoing work associated with the RCRA program on the Chemorous facility. And, you know, there's some coordination that we'll have to do with respect to what they're doing on that property and in the neighborhood, and we will sort that out when the time comes, when we select the remedy.

REMONSTRATOR: So how are you ensuring

that the remedy you selected for Operable Unit 1, the residential area, is not incompatible with what you're going to have to do to address the Operable Unit 2, the lead smelter site and site-wide groundwater?

MR. FISCHER: You mean incompatible in terms of technology or -- 'cause, I mean, it's --

REMONSTRATOR: Its selection. Since you've only decided to go down 2 feet maximum --

MR. FISCHER: Uh-huh.

REMONSTRATOR: -- you know, in most cases, you have to remove the source of the groundwater contamination in order to prevent it from continuing to contaminate the groundwater.

MR. FISCHER: And that is something that we will assess as part of the Operable Unit 2 investigation.

REMONSTRATOR: How are you ensuring that there's not any incompatibility?

MR. FISCHER: I guess I don't completely understand, but we will look for sources of groundwater contamination. To the extent that

there are sources that we can identify, we will take actions to remove or treat those sources.

REMONSTRATOR: And if those sources happen to be deeper than 2 feet?

MR. FISCHER: Yeah, because the soil cleanup is designed to protect residents, prevent exposure to the contaminated soil, it's a different objective than finding sources of groundwater contamination and eliminating those.

REMONSTRATOR: It seems inefficient to not address the entire site in its entirety to begin with.

MR. FISCHER: Yeah, I understand your comment. We divided the site up into two different operable units. We don't anticipate, really, any complication associated with implementing the OU-2 remedy after the OU-1 remedy or at the same time. So thank you.

REMONSTRATOR: Thank you.

REMONSTRATOR: If I could follow up on that.

MS. POPE: Excuse me. Excuse me, everybody. Now, this is supposed to be an ESD meeting. I understand you have questions

regarding other things with the site. You know, really, I do understand that. But we are going to have a meeting in the spring that's going to address those issues as well. So, you know, we may not have the people that you need here to answer those questions. So, you know, bear with us; okay?

Okay. Go ahead.

REMONSTRATOR: Thank you. I appreciate that. I appreciate, Larry, your questions, because now I'm just asking for a clarification.

The -- DuPont is being pushed into a Superfund program that's going to be connected to Operative Unit 2? Is that what I'm hearing? Or is it going to be something completely separate --

REMONSTRATOR: No.

REMONSTRATOR: -- from this --

MS. ROLFES: The DuPont site is under RCRA, and it will stay under RCRA.

REMONSTRATOR: So there is no marriage with Operative Unit 2.

MS. ROLFES: Correct. There's some coordination between Superfund and RCRA because

we're dealing with the groundwater contamination outside of the RCRA site.

REMONSTRATOR: Right.

MS. ROLFES: So there's internal coordination.

REMONSTRATOR: Yeah. Thank you.

MS. ROLFES: Yes.

REMONSTRATOR: Off-site groundwater.

MS. POPE: Anybody else have any questions?

REMONSTRATOR: I do.

MS. POPE: Yes. Come on.

REMONSTRATOR: My question is: What prevented EPA from amending this for us? Really, to allow us to -- the opportunity, further, by allowing an amendment to this ROD on the legal basis? What prevented that?

MR. CHINGCUANCO: Right. No. We're halfway through implementing the remedy, and we think it's the correct remedy, and it hasn't changed. You know, I understand, obviously, that there -- you know, some people believe that the wrong remedy was selected, but EPA has gone through the process it has of remedy selection --

THE REPORTER: "Gone through the process of?"

MR. CHINGCUANCO: Remedy selection to produce the remedy that we have now. And that hasn't changed, and nothing about the fact that the cost has gone up affects our thinking as to whether or not we selected the correct remedy. We still think that we've selected the correct remedy, even with the cost increase.

REMONSTRATOR: Does it still leave a window of opportunity? I just -- you know, I hear what residents bring, and those are main concerns. Does it bring a win-- is EPA open to a window of opportunity of considering amendment? Let's put it that way. From this point forward. And I understand what you have done, but should --

MR. CHINGCUANCO: EPA has a five-year review process of a Superfund site, which means that at least once every five years, we will evaluate the remedies that we've put in place to see whether or not it's still protected. Right? So if we get a lot of new information from the community that says, you know, you dug up 2 feet out of all these yards, but it turns

out that's actually not enough to protect us from the contamination in the soil, you know, we might have to revisit the remedy at that time. And if it were large, fundamental change, then there would, I guess, be a ROD amendment process at that time.

I don't think we think that's going to happen; but, you know, in theory, there is a mechanism. If it really turned out that we had messed this up and that the remedy we selected was completely wrong, and we find that out, you know, we'll come back and fix it.

REMONSTRATOR: I just -- as long as there's a window of opportunity. I mean --

MR. CHINGCUANCO: Yeah.

MS. POPE: Are there any other questions? Yes, sir.

REMONSTRATOR: Back to the mapping question, I'm sorry, but are you going to map each property that tests positive for lead soil? I mean, my concern is that are there properties in the middle of a bunch of properties that were tested, test positive, and one that didn't in the middle. I guess I'm just curious that -- you know, make that

available or is that available?

MS. ROLFES: Again, we don't make individual maps available. Those are specific to each property owner. That's private information. But our -- if you go to our USS Lead website, we have a link to an external viewer, and we have all of the data there. It's just broken down by block.

REMONSTRATOR: Okay.

MS. ROLFES: So you can see depth of contamination for that block and, you know, number of samples collected, highest concentration, and active status of remediation on that web viewer. And that's as detailed as we'll get for the general public.

REMONSTRATOR: Okay. But based on your review, there's no, you know, areas where you'd imagine there would be lead contamination in the property, but the test came up negative for whatever reason, anything like that? It's just generally grouped into areas that are all positive?

MR. CHINGCUANCO: It's pretty randomly distributed.

MS. ROLFES: We have some houses that have

it in front and some houses that have it in back and some have it in both, and that's just the nature of the fill. It's just the nature of it.

REMONSTRATOR: Okay. Thanks.

MS. POPE: Any other questions?

(No response.)

MS. POPE: Are there any other questions?

(No response.)

MS. POPE: Are there any other questions?

REMONSTRATOR: I do.

MS. VACCARELLO: There's a question here.

MS. POPE: Question in back. Okay.

REMONSTRATOR: If you turned down to get your house cleaned inside, could you still get it done if you change your mind? They did the yard and -- but they didn't --

MS. ROLFES: Yes. If you're interested, I'd love to talk to you afterwards and get your address, and we can sign you up. We're actually trying to actively call everyone that denied it to see if they'll let us do it again. So that would be great.

REMONSTRATOR: Thank you.

MS. POPE: Any other questions?

(No response.)

MS. POPE: No other questions?

(No response.)

MS. POPE: Is there anyone that wants to give a public comment at this time that did not get a chance to do so the first time? Is there anyone that would like to give a public comment at this time?

(No response.)

MS. POPE: Okay. So what we'll do -- then we're finished with the hearing. We're finished.

REMONSTRATOR: What if we want to give an additional comment?

MS. POPE: How long you talking about, Larry?

REMONSTRATOR: Half a page?

MS. POPE: Can you -- you can actually submit that page to the court reporter.

REMONSTRATOR: I want to submit it too, but it's for the public here.

MS. POPE: Well, it will be in the Responsiveness Summary. They'll have a chance to read it.

REMONSTRATOR: Yeah, I'd rather have them

hear it tonight. I don't understand why people are being limited when you got an extra hour.

MS. POPE: Is there anybody here that did not get a chance to submit a public comment that would like to do so now?

(No response)

MS. POPE: Okay, Larry. 'Cause you know I was going to stay on you.

REMONSTRATOR: Hey, Larry, I didn't videotape it. Can you go back to the beginning?

MS. POPE: Come on, Larry.

REMONSTRATOR: Not long at all.

MS. POPE: Okay. Go ahead.

REMONSTRATOR: All right. So two points I want to make: Some of these metals we're talking about are strategic metals that the United States is short on; okay? One of them is antimony, both present at the DuPont site and the USS Lead Site. And we're doing nothing to recover these metals, even though they are strategic metals that we're going to be short -- 26,187 short tons of; okay? These metals have economic value.

So if we were -- at this price --

actually, at half of the price we're paying, we could be recovering these valuable metals, we could have a marketable -- which would reduce the cost further, which means you could actually clean it all up, not just 2 feet. You could remove the sources of the groundwater contamination without being incompatible with the remedies you've selected. You're paying for that; okay? So that's the first point.

The second point is a list of questions that EPA needs to answer to the public; okay? So how much contamination, both volume and concentration, of hazardous and toxic contaminants are being left behind in the community in total?

How much contamination, both volume and concentration, of hazardous and toxic contaminants are being disposed of in the off-site community in total?

How many people currently live on the US Superfund Site -- USS Lead Superfund Site?

How many children currently live on the USS Lead Superfund Site?

How many elderly persons currently live within the USS Lead Superfund Site?

How many people are tenants, renters, within the USS Lead Superfund Site?

And how many property owners are there within the USS Lead Superfund Site?

How many businesses and institutions are within the USS Lead Superfund Site?

And what are the historical and current trends in those demographics just cited concerning the community affected by the USS Superfund Site?

And most importantly, how does the U.S. EPA plan to prevent the next generation of children from being impacted by the remaining hazardous and toxic contamination within the community?

U.S. EPA needs to comprehensively investigate and map the full extent, breadth and depth, of hazardous and toxic contamination within the USS Lead Superfund Site from all sources of contaminants and then reevaluate any significant differences in determining whether or not the current removal actions and selected remedial activities are effective over the long term in protecting human health and environment and meet the requirements of the Superfund

Amendments and Reauthorization Act to achieve a permanent remedy.

Thank you.

REMONSTRATOR: All right. That sounds good to me.

MS. POPE: Is there -- is there anyone else?

REMONSTRATOR: No. I just wanted to comment what he just said made a whole lot of sense to me. Because there's no sense in half doing something and you're not cleaning up the problem.

And like he said, we might not be here, but do we expect our kids to be here? Do we expect to still have a city called East Chicago in 25 years, in 50 years? What will it look like? Will it be any people in this Superfund Site area, or will we all be, I mean, gone?

REMONSTRATOR: Dead and gone.

REMONSTRATOR: And our kids' -- our kids' kids are gone. Our kids are gone. Nobody's here.

So what are we looking for? What is our goal? And so we have to look deeper than what we're looking. We have to do more than what

we're doing in order to just make sure that the lead is gone, not just put a bandage on a gaping wound.

I agree with him.

MS. POPE: Thank you for your comment.

Is there anyone else that would like to give a public comment?

(No response.)

REMONSTRATOR: Cookies and coffee?

MS. POPE: (Indicating).

REMONSTRATOR: Me? You don't want to hear what I got to say.

MS. POPE: Yes, I do. We really would like to hear what you have to say. This is your chance to say it. Sure.

REMONSTRATOR: Yep, considering it ain't gonna do no good anyway.

REMONSTRATOR: We'd like to hear it. I'd like to hear it.

REMONSTRATOR: My only main concern is Zone 2. Like we get nothing over there. I mean, seeing as how Zone 2 -- 1 and 2 was the one that bust this all wide open. You know what I'm saying? If it wasn't for us, nobody would know about what they have. But we're on

the back burner. You're focusing over there on Zone 3. Brings back memories of how, back in my day, we couldn't even go over there; okay? So now you put all your focus over there, and none in Zone 2.

So it bothers me, and it bothers the residents. Why we always on the back burner? We have more lead and contamination over there in Zone 2 than they do over there.

REMONSTRATOR: Huh-uh.

REMONSTRATOR: We have more children over there in Zone 2 than they do over there.

I'm glad I got to vent.

MS. POPE: Thank you for your comments.

REMONSTRATOR: To cherry-pick on that, can we get a commitment from the EPA to hold their meetings in Zone 2 at the Martin Luther King Center now that Carrie Gosch is no longer available to you?

MS. POPE: Oftentimes, because that's city property, they denied us access to it. But we can try again. But I have tried to get there.

REMONSTRATOR: There's also churches we could supply you with that we have meetings --

MS. POPE: Yeah, Sherry shared that with

me earlier this week, so we'll be looking into that as well.

REMONSTRATOR: Thanks.

MS. POPE: Is there any other questions? Just trying, because, you know, it's till 7:30, and I want people to, you know, get the questions answered. I want you to be sure to make your comments because they are going to be going in a record here. So, you know, this is the chance to do it.

(No response.)

MS. POPE: Going once.

(No response.)

MS. POPE: Going twice.

(No response.)

REMONSTRATOR: Bingo.

MS. POPE: Okay. Gone. We'll be -- we'll stick around till 7:30. We'll stick around till 7:30. If you have any individual questions that you'd like to ask, like on a one-on-one, we'll stay till 7:30.

Okay. Thank you all for coming, so much. Public Comment Period ends tomorrow. Get your comments in. Thank you.

(Public hearing concluded at

6:26 p.m.)

--oo0oo--

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
PUBLIC MEETING
RE: ESTIMATED INCREASED CLEANUP COSTS
USS LEAD SUPERFUND SITE
at
PASTRICK BRANCH LIBRARY
1008 W. Chicago Avenue, East Chicago, Indiana
Thursday, February 15, 2018
5:30 o'clock p.m.

REPORTER'S CERTIFICATE

I, PAMELA S. OWEN, CSR, RPR, and Notary Public for the County of Lake, State of Indiana, do hereby certify that I reported in machine shorthand the foregoing proceedings had in the above-entitled matter, at the time and place herein before set forth; and I do further certify that the foregoing transcript, consisting of forty-nine (49) typewritten pages, is a true and correct transcript of my said stenographic notes.

Signed this 19th day of February, 2018.

PAMELA S. OWEN, CSR, RPR
IL Lic. No. 084-002294
Notary Public, Lake County, IN
My Commission Expires: 8/1/24

D

APPENDIX C: ATTACHMENT 2

Written Public Comments Submitted to EPA

COMMENT 1

[redacted]

Name: [redacted]
Email: [redacted]
Phone: [redacted]
Comment:

EPA's initial investigation was Very, Very Inaccurate for the following reasons:

1. Tested only 7% of properties [Not enough affected properties]
2. Assumed, Assumed, Assumed that our contamination was ONLY Airborne back in 2012 upon the consent decree so the estimated remediation costs were going to be a fast quick fix based on assumptions rather than accurate testing, accurate sampling and accurate data.
3. EPA would have stayed with their original findings of not for the residents rising in up-roar on September 24, 2016 at the EPA Public meeting for Zones 2 & 3 at Riley Park. The residents in this specific meeting forced EPA Region V to institute a indoor lead & arsenic dust testing pilot program as too the pilot groundwater study. None of these programs were even considered for Zones 2 & 3. Resident's raised-up against the EPA's soil remediation processes too.
4. The newly Addition of interior dust is great. As a Resident, This newly Addition of indoor dust, I know, it is a "FUNDAMENTAL CHANGE". What do fundamental changes do? Any fundamental changes require an Amendment to the ROD. Also, upon the initial cost analysis, another "FUNDAMENTAL CHANGE" would be, in the soil remediation portion, EPA failed to account for actual digging around gas, electrical and plumbing lines with a shovel. This shoveling and having to go deeper than expected is a "FUNDAMENTAL CHANGE" which too adds another factor for an AMMENDMENT TO THE ROD. If indoor dusts testing and clean-up are done properly, the cost would cost even more.
5. EPA had a complete Misunderstanding of contamination

If EPA would have tested & analyzed accurately, coordinated with engineering experts, would have not prolonged remediation for a total of now going 5 years they wouldn't be in the predicament they are in now. EPA keeping in their original clean-up plan is ineffective now due to the fact, it is not effective to protect the public safety based on the level of original planning. The now present costs requested for this ROD, ARE NOT THE FULL COSTS. Partial clean-up is uncalled for and base on this increase in costs known at time, I know as a resident, EPA may have presented different cost-effective and better remedial action alternative plan altogether.

I want and demand EPA to implement an AMMENDMENT TO THE ROD because what has taken place IS A "FUNDAMENTAL CHANGE". We too have to take into account the [RCRA – DuPont] groundwater Study because they have confirmed that RCRA is co-mingling with Superfund of which those expenses in the Zone 3 and portions of Zone 2 are NOT accounted for in this ROD. This too [co-mingling of contamination] is a "FUNDAMENTAL CHANGE". EPA also needs to acknowledge that they failed the residents by not including the RCRA [DuPont] as part of the Superfund initially of which they need to retract and institute the necessary corrective measures to do so since it does fall under their jurisdiction and not that of Congress. It is now

more imperative, otherwise the community. Residents, and environment are not protected at all and accurate remedial actions cannot be coordinated.

AMEND THE ROD!

[redacted]: Lifelong Resident of Zone 3

COMMENT 2

COMMUNITY STRATEGY GROUP

Name: Thomas Frank
Email: [redacted]
Phone: [redacted]
Comment:

The Community Strategy Group and Calumet Lives Matter believe there is enough evidence to acknowledge a need for fundamental changes in the remedy to manage the hazardous waste at the OU1 site. The nearly 400% increase in costs from $22.8 million to the current estimate of $84.9 million in less than 5 years reflects a significant failure to understand not only the scope of the project but also sorts of issues present in the USS Lead Superfund Site. This seriously brings the credibility of the 2012 ROD as a working document into question. We believe this can be explained by the fact that the EPA never followed its own recommendations in the RI to test all the properties before moving forward with the ROD.

The original cost estimate was based on a sample size of only 7.4% of properties in OU1 and at this time only 90% of the properties in Zones 2 and
3 have been sampled. Neither the ROD nor the ESD includes the need for a comprehensive hydrology study, a groundwater migration study, complete characterization of the infill, water testing or the need to clean inside homes leaving. The delay in testing has left residents,newborns and elderly vulnerable to exposure and with an incomplete understanding of the threats.
By not acknowledging the need for a new remedy the ESD significant elements of the management of the remediation of the USS Lead Superfund Site is being done by exception and off the books.

It is also our concern that zone 2 was neglected by the original consent decree causing additional delays in characterization and testing and leaving residents, newborns and elderly vulnerable to exposure and an incomplete understanding of the threats. The Administrative order by which the EPA managed to receive funds for zone 2 clean up appears to reflect the same flawed calculations used in the ROD.

The Community Strategy Group
Thomas Frank
Rev. Cheryl Rivera
Sheilah Garland

Calumet Lives Matter
Sherry Hunter

COMMENT 3

WE THE PEOPLE

Name: Juan Fernandez
Email: [redacted]
Phone: [redacted]
Comment:

02/16/2018
From: We The People for East Chicago, Inc.
Re: ROD Comment

Dear EPA

We are We the People for East Chicago. I am Juan Fernandez co-founder of We The People and president of our Organization. if your agency would have had a thorough plan for the clean-up instead of ASSUMING it was only airborne we might haven't had to submit this comment .Now, that we (THE Community), have no faith in E.P.A. regarding absolutely looking out for our best interest, we are where we are at now. Hopefully, we can work together in a more TRANSPARENT productive manner from this day forward. With all due respect, we hope that E.P.A. realizes "We The People" will be making sure to hold the companies that have poisoned our community accountable and we (the residents) will hold your agency accountable and expect full TRANSPARENCY from your department..

Some of the flaws E.P.A. has made with the ROD

With around 1,500 properties and businesses in zone 1,2,&,3, ONLY TESTED 7% of these properties and that is unacceptable.

To first state that it was "only airborne" rather then accurately testing shows us residents you were not looking out for our short & long term health riskrisks.

The EPA showed a complete lack of mindset and not truly caring of the contaminations effects affecting residents in The Superfund Site.

We The People find great concerns that this ROD is not addressing the contaminants from RCRA comingling with Superfund per DuPont public hearing on January 10 2018 which EPA RCRA said " these matters need to discussed with The EPA Superfund Team" we deem that to be unacceptable!

Our demands from The Environmental Protection agency are:

1.EPA needs to develop a coordinated short and long term plan rather than continuing to piecemeal it all together and constantly changing

2. EPA needs to fully investigate all exposure pathways from all sites, and sources including air, water, (both surface and ground) etc to determine full extent of contamination to enable a proper remediation plan and costs.

From all sources.

3. EPA NEEDS. to be more direct and forthright in their responses to questions rather than at times looking like deer caught in headlights.

4.EPA NEEDS to have a clear and well articulated plan of action with all associated costs for the entire Superfund site and not just properties here and there

5.EPA NEEDS to AMEND the ROD ASAP due to it being fragmented based on all New additional changes and findings occuring in 2016 to present!!!

6. EPA NEEDS to start showing some sincere genuine concern for all residents vs, just doing what needs to be done for the crossed T's and dotted I's of the law and Consent Decree and Record of Decision

Electronically Signed

Board of Directors
Mr. Juan Fernandez: E.C. Resident (Past Resident of Zone 1) Mrs. RosaMaria Rodriguez: E.C. Resident Mr. Carlyle E. Edwards: E.C. Resident Ms. Maritza Lopez: E.C. Resident (Lifelong Resident of Zone 3)

Author of approved WTPFEC Comment: Mr. Juan Fernandez Co-author of approved WTPFEC Comment: Mr. Carlyle E. Edwards

COMMENT 4

[redacted]

Name: [redacted]
Email: [redacted]
Phone: [redacted]
Comment:

Can you explain why you did not consider these changes to the ROD "Fundamental Changes".

1. EPA failed to thoroughly study the site when preparing the ROD in 2012 and that led to the severe underestimation of the contamination at the site and the associated costs. EPA may have considered a totally different alternative if it knew in 2012 how much this approach would have costed.

2. EPA should have considered the interior lead and arsenic dust assessment and abatement as a change to the remedy. If it did, it would have determined that the remedy has been fundamentally changed and it should amend the ROD—either due to the interior dust issue alone or the dust issue when combined with the other cost and scope related changes.

3. EPA's piecemeal approach to looking at the changes inappropriately minimizes the changes at the site.

COMMENT 5

[redacted]

Janet Pope,
Community Involvement Coordinator,
U.S. EPA Region 5,
Superfund Division (SI-6J),
77 W. Jackson Blvd.,
Chicago, IL 60604-3590
(312) 353-0628
< pope.janet@epa.gov >

RE: Explanation of Significant Differences USS Lead Superfund Site, East Chicago, Indiana

USS Lead Explanation of Significant Differences (ESD)

There will always be significant differences so long as U.S. EPA continues to make decisions concerning the USS Lead Superfund Site in piecemeal manner…

This has been true from the beginning starting with the USS Lead Superfund Site's Hazard Ranking System (HRS) score.

"The HRS is the -primary way of determining whether a site is to be included on the National Priorities List (NPL), the Agency's list of sites that are priorities for long-term evaluation and remedial response, and is a crucial part of the Agency's program to address the identification of actual and potential releases." – U.S. EPA, December 14, 1990 Federal Register

"The ground water migration pathway, the soil exposure pathway, and the drinking water threat and human food chain threat of the surface water pathway were not scored as part of this Hazard Ranking System (HRS) evaluation. These pathways/components were not included because a release to these media does not significantly affect the overall site score and because the environmental threat component of the surface water migration pathway and the air pathway produce an overall site score well above the minimum required for the site to qualify for inclusion on the National Priorities List (NPL). These pathways are of concern to EPA and may be evaluated during future investigations."

See: [https://semspub.epa.gov/work/05/633063.pdf] 'HRS Documentation Record – Review Cover Sheet' U.S. EPA, September 2008

So what astronomical HRS score would the USS Lead Superfund Site reach if the ground water migration pathway, the soil exposure pathway, and the drinking water threat and human food chain threat of the surface water pathway were accurately scored as part of this Hazard Ranking System (HRS) evaluation?

More importantly, how would a comprehensive understanding of the full extent of contamination from the air to the land and the water, including groundwater; significantly affect not only the associated costs of cleanup but also the cleanup's effectiveness and permanence?

"An HRS score for a site is determined by evaluating four pathways:

Ground water migration;

Surface water migration (composed of the three threats — drinking water, human food chain, and environmental);

Soil exposure (composed of two threats — resident population and nearby population); and

Air migration."

See: [https://semspub.epa.gov/work/HQ/189159.pdf] 'The Hazard Ranking System Guidance Manual' U.S. EPA, EPA 540-R-92-026, November 1992

Besides ignoring established guidance documents, by leaving out significant exposure pathways, U.S. EPA embarked on an arbitrary piecemeal process that would lead to today's Explanation of Significant Difference (ESD) and will continue to fail to address the full extent of the contamination surrounding the USS Lead Superfund Site…

U.S. EPA's failure to comprehensively investigate all exposure pathways and determine the full extent of contamination lead to a Flawed Conceptual Site Model based only upon Aerial Deposition and Surface Water migration.

This ignored probable sources of potential contamination from fill historically used throughout the area to develop the Dune & Swale landscape and wetland areas adjacent to the Grand Calumet River following the establishment of the local Lead industries in East Chicago. Indiana.

It also ignores known groundwater contamination in the Calumet Sand Aquifer which is a dynamic water table aquifer that is directly hydraulically connected to Lake Michigan – that drinking water threat that U.S. EPA didn't score and continues to ignore.

That sand in the Calumet Sand Aquifer is mostly Quartz sand…

"All the sand deposits, whether wind or water laid, have very similar strength properties, are not plastic, and serve as excellent groundwater carriers."

"The sand units vary in mineralogy and, to a lesser degree, in grain size and shape. The most abundant sand-size mineral is quartz, which constitutes about 75 percent by weight of the sand -mineral suite."

See: [https://scholarworks.iu.edu/dspace/bitstream/handle/2022/241/SR11.pdf.txt;jsessionid=156CD21380DE1821526CC03D2F254189?sequence=3] 'Environmental Geology of Lake and Porter Counties, Indiana – An Aid to Planning ' by EDWIN J. HARTKE, JOHN R. HILL, and MARK RESHKIN, ENVIRONMENTAL STUDY 8, DEPARTMENT OF NATURAL RESOURCES GEOLOGICAL SURVEY SPECIAL REPORT 11

"Quartz is a compound of one part silicon and two parts of oxygen, Silicon dioxide, SiO_2."

"At room temperature, SiO_2 in all modifications is almost inert and does not react with most other substances. Even at moderately high temperatures silica is chemically very stable."

See: [http://www.quartzpage.de/gen_chem.html] 'The Quartz Page – Chemical Properties'

"The horizontal hydraulic conductivity of the Calumet aquifer within Lake County has been estimated by Rosenshein and Hunn (1968) to range from 10 to 130 ft/d and to average 60 ft/d (table 6).

The hydraulic conductivity of the aquifer also was estimated from an aquifer test at a well 1,300 ft northeast of the Midco I site (fig. 5). Calculated values of horizontal hydraulic conductivity ranged from 47 to 63 ft/d and averaged 53 ft/d (Geosciences Research Associates, Inc., 1987). A 15:1 ratio of horizontal to vertical hydraulic conductivity was estimated from the aquifer test.

Other estimates of horizontal hydraulic conductivity in local areas within the aquifer have ranged from less than 1 ft/d to 180 ft/d (table 6)."

See: [https://pubs.usgs.gov/wri/1992/4115/report.pdf] 'Geohydrology and Water Quality of the Calumet Aquifer, in the Vicinity of the Grand Calumet River/Indiana Harbor Canal, Northwestern Indiana' by JOSEPH M. FENELON and LEE R. WATSON, INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT and U.S. GEOLOGICAL SURVEY, Water-Resources Investigations Report 92-4115, 1993

Because of the above factors, the Calumet Sand Aquifer has a very low ability to "naturally attenuate" contaminates such as metals pollution and offers little resistance to the flow and spread of contamination throughout the aquifer once groundwater contamination is occurring…

In other words, one way or another, the bulk of any unaddressed groundwater contamination of the Calumet Sand Aquifer will end up in Lake Michigan – the drinking water source for millions of people…

And given the dynamic nature of the water table within the Calumet Sand Aquifer its rise and fall will saturate and leach contaminates from any buried Hazardous & Toxic wastes that lie within the aquifer's ebb and flow directly into the groundwater.

The only way to prevent this is to completely identify all sources of contamination and recover, reclaim, recycle, and/or treat or destroy those sources of contamination.

According to the Explanation of Significant Differences (ESD) provided by U.S. EPA:

"…EPA determined that the actual volume of contaminated soil that needs to be excavated is greater than what was originally estimated" and,

""EPA has determined that the number of properties requiring remediation, the size of those properties, and the extent of contamination at those properties are all greater than what was originally estimated. These changes have increased the total estimated volume of contaminated soil to be excavated from approximately 47,000 cubic yards to approximately 88,000 cubic yards."

This is not surprising given that only 7.4% of the properties were sampled in Operable Unit 1 (OU1), the residential section of the USS Lead Superfund Site, during U.S. EPA's Remedial Investigation (RI) from June 2009 to June 2012.

Although U.S. EPA acknowledge “other sources of contamination from the USS Lead facility” such as “slag from the blast furnace was routinely placed in piles on the ground and left exposed to the elements” at the USS Lead Superfund Site it fails to account for the total volume of Hazardous & Toxic wastes that were generated at each facility over its lifetime of production and the fate of those wastes – including whether or not any of these wastes were used as fill within nearby communities.

By only taking shallow samples, U.S. EPA has not confirmed the true extent of contamination beneath OU1, the residential section of the USS Lead Superfund Site. U.S. EPA has not determined whether or not sources of contamination lie buried deeper within the Superfund Site.

One only has to examine soil boring logs taken next door at the DuPont Site that indicate a historic layer-cake of solid waste disposal practices and locations interspersed with layers of sand descending underground…

Thus U.S. EPA’s assumption that native sand has been reached when sand is encountered during cleanups without any comprehensive deeper sampling for contamination is naive at best given the industrial nature of the surrounding area and its historical use of waste for infill for development and known solid waste disposal practices in the area over time.

By selecting a remedy for OU1, the residential section of the USS Lead Superfund Site, that limits removal of sources of contamination to 24 inches, U.S. EPA assures that unknown quantities of contaminated soils and potential sources of contamination will persist long into the future demonstrating the significant difference between a full and permanent cleanup and a temporary and impermanent remedy that will result in future generations of chronic toxic exposures…

U.S. EPA’s emphasis upon short-term remedy cost and whether a remedy is more or less burdensome is misplaced and instead should emphasize the efficiency, effectiveness, and permanence of any remedy in completely detoxifying all of the contamination present – which is the lowest cost remedy in the long-term.

Given the huge potential for rapid migration of contaminates through the Calumet Sand Aquifer, and given the known groundwater contamination from both the USS Lead Superfund Site and the DuPont Site next door, Five Year Reviews are not adequate to ensure any remedy, other than clean closure, is protective of human health and the environment.

Will U.S. EPA’s inclusion into the USS Lead Superfund Site of off-site contaminated groundwater in OU1, the residential section of the USS Lead Superfund Site, from the DuPont Site result in another Explanation of Significant Difference?

As further illustration of the inadequacy of the USS Lead Superfund Site’s Conceptual Site Model and selected Remedy, even though the Air Dispersion model of contamination for the USS Lead Superfund Site was recognized long ago, U.S. EPA only recently (2016) discovered dust contamination indoors in homes at levels as high as 32,000 mg/kg or ppm Lead and 880 mg/kg or ppm Arsenic inside a residence on the Superfund Site. It seems that whenever U.S. EPA finally gets around to testing for contamination in East Chicago, Indiana they have very little trouble finding it near adults and children.

Interior Dust Removals are being done under U.S. EPA's Removal Authorities and are not considered part of this ESD. This represents even more significant differences of cost in total dollars spent on cleanup at the USS Lead Superfund Site that are not addressed by this ESD… Why not?

U.S. EPA states that; "In 2014, OU1 was subdivided into three geographic "zones": Zones 1, 2, and 3" but provides no rational explanation on why the residential area of OU1 of the USS Lead Superfund Site must be subdivided – leaving Zone 2 out of the Consent Decree's cleanup plans and recently requiring U.S. EPA to issue Unilateral Administrative Orders in order to provide further cleanup in Zones 2 & 3. This is also not included in this ESD. Why not?

According to U.S. EPA "…the estimated rate for excavating and replacing one cubic yard of contaminated soil increased from $115 to $471."

At this level, the costs of excavating and replacing one cubic yard of contaminated soil at the USS Lead Superfund Site has now reached a level of what a permanent remedy that would require the removal and reclamation of the toxic metals from the soil would cost per yard… Yet that is not what is being provided to the community affected by the USS Lead Superfund Site or to the community hosting the disposal site...

For example, the Federal Remediation Technologies Roundtable has shown that: "The cost of soil washing decreases significantly with increasing volume (for the table shown it decreases from $142 to $53 per cubic yard, which makes soil washing much more cost effective for large projects (FDTR 2006)."

Another cost comparison point would include the costs of permanent relocation of residents where it is determined that such permanent relocation is cost effective or may be necessary to protect health or welfare versus current remedial costs and lack of permanence given the large amounts of contamination left behind within the community…

See: [http://www.geoengineer.org/education/web-based-class-projects/geoenvironmental-remediation-technologies/soil-washing?start=6] 'Soil Washing Costs'

All of this money spent and exactly zero reduction in the overall long-term toxicity of approximately 88,000 cubic yards of contaminated soil to be excavated and disposed of in another community.

The volume of the contaminated soil is actually increased due to mixing with sand and other materials to dilute and buffer the concentrations in the toxic soil in order to pass a leach test for disposal off-site in a landfill. But the total amount of toxic metals will remain unchanged as this so-called treatment offers zero percent recovery of any strategic or valuable metals…

What would the significant difference be in cost if strategic and valuable metals were recovered instead of just gathered up and reburied?

How significant could be the long-term threat reduction for public health be if toxic metals were permanently removed and recovered, reclaimed, or recycled instead?

According to U.S. EPA; "…excavation to native sand plus off-site disposal (Alternative 4B)" "The increased costs described above would proportionally increase the cost of Alternative 4B. Therefore, the reasons set forth in the ROD for not selecting Alternative 4B still apply at this time."

However U.S. EPA having not comprehensively addressed contamination in the USS Lead Superfund Site including the contaminated groundwater and its source(s) of contamination cannot continue to dismiss Alternative 4B as it may in fact prove to be a cost effective remedy that is consistent with the National Contingency Plan and the only effective way to stop further contamination of the groundwater and ultimately Lake Michigan given the site conditions.

U.S EPA has not adequately investigated the following within the USS Lead Superfund Site:

Potential Asbestos contamination from the demolition of former industrial manufacturing facilities;

Deeper Buried Solid &Hazardous Wastes (See: DuPont Example of "Native Sand" layer cake of Dumps upon Dumps throughout the soil column)

The potential for rapid migration of contaminates through the sandy soils and Calumet Sand Aquifer;

The potential for uptake of contaminates into plants and trees and subsequent fate of these contaminates within the community;

The impacts of migrating groundwater and its residues when evaporation takes place;

The active migration and or transformation of contaminates via microorganisms or other biological processes and the subsequent fate of these contaminates within the community;

U.S. EPA needs to be able to answer the following questions:

How much contamination (volume and concentration) of Hazardous & Toxic contaminates are being left behind in the community in total?

How much contamination (volume and concentration) of Hazardous & Toxic contaminates are being disposed of in the off-site community in total?

How many people currently live within the USS Lead Superfund Site?

How many children currently live within the USS Lead Superfund Site?

How many elderly persons currently live within the USS Lead Superfund Site?

How many people are tenants within the USS Lead Superfund Site?

How many property owners are there within the USS Lead Superfund Site?

How many business and institutions are there within the USS Lead Superfund Site?

What are the historical and current trends in the above demographics concerning the community affected by the USS Lead Superfund Site?

How does U.S. EPA plan to prevent the next generation of children from being impacted by the remaining Hazardous & Toxic contamination within the nearby community?

U.S. EPA needs to comprehensively investigate and map the full extent, breath & depth, of the Hazardous & Toxic contamination within the USS Lead Superfund Site from all sources of contaminates and then reevaluate any significant differences in determining whether or not the current removal actions and selected remedial activities are effective over the long-term in protecting human health and the environment and meet the requirements of the Superfund Amendments and Reauthorization Act to achieve a permanent remedy.

See: [https://www.epa.gov/sites/production/files/2015-02/documents/rod_guidance.pdf] 'A GUIDE TO PREPARING SUPERFUND PROPOSED PLANS, RECORDS OF DECISION, AND OTHER REMEDY SELECTION DECISION DOCUMENTS' U.S. EPA, EPA 540-R-98-031, July 1999

See: [https://semspub.epa.gov/work/HQ/100000349.pdf] 'Superfund Remedy Report 15th Edition' U.S. EPA, EPA-542-R-17-001 July 2017

See: [https://www.epa.gov/sites/production/files/2015-06/documents/leadcontam_sites.pdf] 'Superfund Engineering Issue – Treatment of Lead-Contaminated Soils' U.S. EPA, EPA 540-2-91-009, April 1991

See: [https://nepis.epa.gov/Exe/ZyPDF.cgi/10002SYY.PDF?Dockey=10002SYY.PDF] 'Fact Sheet A Citizen's Guide to Soil Washing'

See: [https://clu-in.org/download/remed/542r02004/arsenic_report.pdf] 'Arsenic Treatment Technologies for Soil, Waste, and Water' U.S. EPA, EPA 542-R-02-004, September 2002

See: [https://igws.indiana.edu/LakeRim/GrandCalGroundwaterInjuryReport.pdf] 'Surface-Water and Ground-Water Hydrology and Contaminant Detections in Ground Water for a Natural Resource Damage Assessment of the Indiana Harbor Canal and Nearshore Lake Michigan Watersheds, Northwestern Indiana' by David A. Cohen, Theodore K. Greeman and Paul M. Buszka, Administrative Report Prepared for the U.S. Department of the Interior, U.S. Geological Survey, U.S. Fish and Wildlife Service, Region 3, June 2002

See: [https://pubs.usgs.gov/wri/1995/4253/report.pdf] 'Geohydrology, Water Levels and Directions of Flow, and Occurrence of Light-Nonaqueous-Phase Liquids on Ground Water in Northwestern Indiana and the Lake Calumet Area of Northeastern Illinois' by Robert T. Kay, Richard F. Duwelius, Timothy A. Brown, Frederick A. Micke, and Carol A. Witt-Smith, U.S. GEOLOGICAL SURVEY Water-Resources Investigations Report 95-4253, 1996

Fenelon JM, Watson LR. 1993. Geohydrology and water quality of the Calumet aquifer, in the vicinity of the Grand Calumet River/ Indiana Harbor Canal, northwestern Indiana. Indianapolis (IN): US Geological Survey Water-Resources Investigations Report 92-4115. 151 p.

Greeman TK. 1995. Water levels in the Calumet aquifer and their relation to surface-water levels in northern Lake County, Indiana, 1985–92. Indianapolis (IN): US Geological Survey Water-Resources Investigations Report 94-4110. 61 p

See: [https://www.in.gov/dnr/water/files/Lake_County_UNC_AQSYS_map.pdf] 'Unconsolidated Aquifer Systems of Lake County, Indiana' Indiana Department of Natural Resources

COMMENT 6

[redacted]

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RE: Explanation of Significant Differences USS Lead Superfund Site, East Chicago, Indiana – Supplemental Information

Superfund Background – Some Things Never Change…

What problems that can be detailed about the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), known also as Superfund, process can also be said about the Resource Conservation and Recovery Act (RCRA) Corrective Action (CA) process only it seems to be even worse when it comes to permanent cleanups and public participation processes in decision making concerning remedial actions within the local community…

Front and center is the fact that U.S. EPA is not adhering to the requirements of the Superfund Amendments and Reauthorization Act (SARA) which requires U.S. EPA to give preference to and use permanent solutions and alternative treatment technologies "to the maximum extent practicable" with "reductions in volumes, mobility, and toxicity" of the wastes.

"…certain kinds of action are inconsistent with permanence, including any form of land disposal or containment, and any use of engineering or institutional controls, including long term monitoring for releases. All of these mean:

1) Site hazardous material remains hazardous;

2) There is uncertainty about releases of hazardous material and, therefore, risks to health and environment; and

3) There are a host of uncontrollable possible future events which might compromise the effectiveness of the protection."

"…OTA disagrees with the notion that land disposal or engineering or institutional controls provide a "degree of permanence." What varies is the level of protection provided by different cleanup technologies and methods, not the degree of permanence." – U.S. Congress, Office of Technology Assessment

U.S EPA is mired in an inefficient and bloated squandering of Superfund dollars through a short-term Contractor driven "Toxic Merry-Go-Round" of Removal and Containment Actions verses the law's requirement to use innovative treatment technologies to achieve permanent long-term remedies…

"Moving hazardous waste from one hole in the ground to another is the non-solution that was behind SARA's preference for permanent cleanup." – U.S. Congress, Office of Technology Assessment

The intent of United States Congress under SARA highlighted "the importance of permanent remedies and innovative treatment technologies in cleaning up hazardous waste sites" "with reductions toxicity, mobility, or volume of cleanup wastes."

The U.S. EPA, under SARA Section 121 is required to "take into account:"

– "long-term uncertainties associated with land disposal;"

– "short and long-term potential for adverse health effects from human exposure;" and

– "future remedial action costs if the alternative remedial action in question were to fail."

SARA states that U.S. EPA shall:

1) "Select a remedial action that . . . utilizes permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable," and,

2) If this is not done, "publish an explanation as to why a remedial action involving such reductions in the toxicity, mobility, or volume of the hazardous substance, pollutant, or contaminant was not selected."

So the intent of Congress is clear that dumping of toxic and/or hazardous substances is an unacceptable risk to human health and the environment and should require treatment of wastes prior to land disposal…

"…use of better, but often more expensive technologies, is limited by decision makers who are overly cautious, have poor information, or are primarily interested in minimizing front-end costs." – U.S. Congress, Office of Technology Assessment

"Impermanent remedies, which provide less protection than permanent ones and do not assuredly meet cleanup goals, are often selected purely because they are cheaper in the short run; in the long run they are very likely to be more expensive." – U.S. Congress, Office of Technology Assessment

A few indicator compounds, used to represent all site contaminants for risk assessment, may be inappropriate for technology evaluation because physical and chemical properties may differ from the way health effects vary. The result can be a poor technology choice. Also, site sampling may be insufficient to detect hot spots of contamination that would facilitate using limited treatment to cut cleanup costs. In addition, groundwater monitoring may not be reliable." – U.S. Congress, Office of Technology Assessment

"What does a permanent cleanup mean to an ordinary person? It means that more studies, tests, and cleanup will not be needed, unless the most unexpected and unpredictable event occurs.

In terms of safety, permanence means that people living near Superfund sites do not have to worry about exposure to toxic chemicals left in their community.

People understand that some sites are very complicated and that new information obtained during the cleanup process may force significant changes.

But people rightly lose confidence when they are told it is safe and effective to leave toxic waste in the ground and cover it up with soil, or to bury untreated toxic chemicals in a landfill, or to let groundwater slowly flush contaminants into a river." – U.S. Congress, Office of Technology Assessment

"Cost-benefit thinking allows nearly any kind of cleanup decision to be rationalized and undermines the environmental goals of Superfund. Cost-benefit reasoning backs up the selection of impermanent remedies because of excessive flexibility in cleanup goals." – U.S. Congress, Office of Technology Assessment

"Impermanent remedies results in: "Spending on cleanup remedies which are unlikely to be permanent, leading to more spending in the long term for re-cleanups and perhaps posing exposures, risks, and damage to health and environment." – U.S. Congress, Office of Technology Assessment

"Organic hazardous substances can be destroyed by supplying enough energy to break chemical bonds, such as through incineration or biological activity, and through chemical reactions, such as dechlorination, ultraviolet photolysis, wet air oxidation, and supercritical water oxidation. Materials containing toxic metals can be treated to recover the metals, converting them back into their original commercially valuable form. Even some organic hazardous substances can be recovered and sold commercially; recovery of oil from refinery waste sludges and contaminated soils is commercially available through various solvent extraction processes, Acidic or alkaline wastes can be chemically neutralized. Asbestos can be classified. Therefore, in terms of scientific principles, destruction, recovery, or some form of chemical conversion are treatment approaches that produce permanent cleanups." – U.S. Congress, Office of Technology Assessment

The following is a possible hierarchy of Preferred cleanup technologies and methods:

Class I: Destruction or Recovery-Actual destruction of hazardous organic substances to irreversibly eliminate the source of the problem. Examples: thermal, biological, and some chemical treatments (e.g., dechlorination). Recovery of pure metals or chemicals suitable for commercial use.

Class II: Separation Followed by Destruction – Technologies which separate hazardous from nonhazardous materials. Examples: extraction or stripping of volatile chemicals from soil or groundwater, gas venting, soil washing and flushing, precipitation, and carbon absorption of contaminants from groundwater.

Class III: Stabilization – Any form of chemical fixation, stabilization, and solidification which cannot assure actual destruction of all hazardous components. There are numerous commercial forms which vary according to the materials mixed with the hazardous material. In some cases there are claims that organic molecules are permanently altered by the process, but this has not been well documented scientifically. Effectiveness and reliability for toxic metals are well proven.

Class IV: Engineering Controls – A variety of methods can restrict the movement of contaminants or exposure to them. Although such methods are not permanent, they can recontrol a site by: 1) imposing physical barriers (e.g., slurry walls, landfill caps and liners, leachate or groundwater pumping); 2) keeping water away from hazardous material (e.g., diversion ditches, soil and plastic covers, storage vaults); and 3) keeping people away from hazardous material (e.g., fences, caps, and soil covers). Techniques in this

class must be assessed routinely for failure or deterioration of materials. Repair and maintenance, as well as less than 100 percent effectiveness, pose unavoidable uncertainties. Onsite re-disposal of hazardous material, followed by engineering controls, provides more reliability than applying controls to hazardous material in their original condition (e.g., buried waste or taminated soil).

Class V: Institutional Controls – These depend on people and organizations to deal indirectly with hazardous contaminants by controlling exposures to them or by detecting the need for further action (e.g., restrictive deeds; alternate water supplies; relocation of residents; periodic monitoring, testing, or inspection). Unavoidable uncertainties result from:

l) potential failures of people or institutions to adequately fund or implement the controls, and

2) possible changes in the original cleanup objectives without public accountability.

Class VI: Natural Treatment – Any onsite or no-action approach which depends on a natural form of treatment being effective over the long-term (comparable to time over which hazardous properties persist) for expected but inevitably uncertain site conditions and future land and water use. Includes: natural biodegradation, chemical breakdown or decay of hazardous molecules, adsorption to soil. Dilution and dispersion of hazardous Substances into the environment which produce "safe" concentrations maybe considered by some people as natural treatment or attenuation." – U.S. Congress, Office of Technology Assessment

Russell E. Train, former EPA Administrator, stated the importance of permanent cleanups: ''Haunting Superfund is the nightmare of spending millions to clean up a site, then discovering the cleanup is far from permanent."" – U.S. Congress, Office of Technology Assessment

SARA requires U.S. EPA to give preference to and use permanent solutions and alternative treatment technologies "to the maximum extent practicable"

Numerous U.S. Congress Office of Technology Assessment (OTA) and Government Accountability Office (GAO) Reports on RCRA and CERCLA that detail deficiencies and offer solutions for protecting people and our environment from Hazardous & Toxic Wastes have been produced over the last 30 years:

See: [https://www.princeton.edu/~ota/disk2/1988/8803/880301.PDF] 'U.S. Congress, Office of Technology Assessment, Are We Cleaning Up? 10 Superfund Case Studies – Specia] Report, OTA-ITE-362 – Washington, DC: U.S. Government Printing Office, June 1988, Library of Congress Catalog Card Number: 88-600545'

See: [http://ota.fas.org/reports/8907.pdf] 'Coming Clean: Super fund's Problems Can Be Solved… – Special Report OTA-ITE-433 – U.S. Congress, Office of Technology Assessment, Washington, DC: U.S. Government Printing Office, October 1989, Library of Congress Catalog Card Number 89-600751'

See: [https://babel.hathitrust.org/cgi/pt?id=mdp.39015019135998;view=1up;seq=5] 'Assessing Contractor Use In Superfund – A Background Paper of OTA's Assessment on Superfund Implementation – Special Report, OTA-BP-ITE-51 – U.S. Congress, Office of Technology Assessment, Washington, DC: U.S. Government Printing Office, January 1989, Library of Congress Catalog Card Number: 89-600700'

See: [http://ota.fas.org/reports/8422.pdf] 'Protecting the Nation's Groundwater from Contamination – Vol. I, Special Report OTA-O-233 – U.S. Congress, Office of Technology' Assessment, Washington, DC: U.S. Government Printing Office, October 1984, Library of Congress Catalog Card Number 84-601126'

See: [http://ota.fas.org/reports/8734.pdf] 'Wastes in Marine Environments – Special Report OTA- 0-334 – U.S. Congress, Office of Technology' Assessment, Washington, DC: U.S. Government Printing Office, April 1987, Library of Congress Catalog Card Number 87-619813'

See: [http://ota.fas.org/reports/9225.pdf] 'Managing Industrial Solid Wastes From Manufacturing, Mining, Oil and Gas Production, and Utility Coal Combustion, Background Paper OTA-BP-O-82 – U.S. Congress, Office of Technology' Assessment, Washington, DC: U.S. Government Printing Office, March 1992, ISBN 0-16 -036116-8'

See: [http://ota.fas.org/reports/8117.pdf] 'Nonnuclear Industrial Hazardous Waste: Classifying for Hazard Management, NTIS order #PB82-134305 – U.S. Congress, Office of Technology' Assessment, Washington, DC: U.S. Government Printing Office, November 1981, Library of Congress Catalog Card Number 81-600170'

See: [http://ota.fas.org/reports/9116.pdf] 'Dioxin Treatment Technologies – Background Paper OTA-BP-O-93 – U.S. Congress, Office of Technology Assessment, Washington, DC: U.S. Government printing Office, November 1991'

See: [http://ota.fas.org/reports/8323.pdf] 'Technologies and Management Strategies for Hazardous Waste Control, NTIS order #PB83-189241 – U.S. Congress, Office of Technology' Assessment, Washington, DC: U.S. Government Printing Office, March 1983, Library of Congress Catalog Card Number 83-600706'

See: [http://ota.fas.org/reports/8625.pdf] 'Serious Reduction of Hazardous Waste: for Pollution Prevention and Industrial Efficiency, OTA-ITE-317 NTIS order #PB87-139622 – U.S. Congress, Office of Technology' Assessment, Washington, DC: U.S. Government Printing Office, September 1986, Library of Congress Catalog Card Number 86-600571'

See: [http://ota.fas.org/reports/9515.pdf] 'Environmental Technology: Analysis of Selected Federal R&D Programs, Background Paper OTA-ITC-155 – U.S. Congress, Office of Technology' Assessment, Washington, DC: U.S. Government Printing Office, July 1995'

See: [https://frtr.gov/] 'Federal Remediation Technologies Roundtable (FRTR)'

See: [https://books.google.com/books?id=bxZSAAAAMAAJ&pg=PA1&lpg=PA1&dq=Office+of+Technology+Assessment+reports+Superfund&source=bl&ots=a8WxxsVwT9&sig=RnX3L2pBm11mbK6dZzy2FFqLIOY&hl=en&sa=X&ved=0ahUKEwjU_Lart9HSAhUp6oMKHcj7CnkQ6AEISTAJ#v=onepage&q=Office%20of%20Technology%20Assessment%20reports%20Superfund&f=false] 'The Superfund Innovative Technology Evaluation Program – Progress and Accomplishments Fiscal Year 1990 – A Fourth Report to Congress, EPA/540/5-91/004 United States Environmental Protection Agency Superfund Innovative Technology Evaluation (SITE) September 1991'

See: [http://iipdigital.usembassy.gov/st/english/article/2006/04/20060421162126lcnirellep0.6585766.html?CP.rss=true#axzz4bdMVG9M5] 'U.S. Superfund Program Pioneers Hazardous Waste Remediation – Corporate polluters pay for more than 70 percent of cleanup costs' by Cheryl Pellerin, April 21, 2006

See Also: [http://ota.fas.org/reports/8104.pdf] 'Assessment of Technologies for Determining Cancer Risks From the Environment, NTIS order #PB81-235400 – U.S. Congress, Office of Technology' Assessment, Washington, DC: U.S. Government Printing Office, June 1981, Library of Congress Catalog Card Number 81-600081'

COMMENT 7

EAST CHICAGO / CALUMET COALITION

February 16, 2018

Ms. Janet Pope, Community Involvement Coordinator
U.S. Environmental Protection Agency, Region 5, Superfund Division (SI-6J)
77 West Jackson Boulevard
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Re: Comments on Proposed Explanation of Significant Differences for the USS Lead Superfund Site located in East Chicago, Lake County, Indiana

The East Chicago Calumet Coalition Community Advisory Group, the Abrams Environmental Law Clinic at the University of Chicago Law School, and the Northwestern Pritzker School of Law Environmental Advocacy Clinic respectfully submit these comments regarding the United States Environmental Protection Agency's (EPA's) Explanation of Significant Differences (ESD) for the USS Lead Superfund Site located in East Chicago, Lake County, Indiana (USS Lead Site). All three organizations and/or persons associated with them have been working to improve environmental and public health conditions at and surrounding the USS Lead Site since July 2016.

I. Introduction

The ESD must be considered in the context of the history of EPA's work at the USS Lead Site. EPA's original remedial investigation and feasibility study included an incomplete assessment of the site—where it only tested 7% of the properties—and generated inaccurate information about the extent of the contamination across Operable Unit 1. The flawed investigations and incomplete findings impeded EPA's ability to act sooner to protect residents from high levels of lead and arsenic exposure and to prevent the incidence of elevated blood lead levels, and associated health consequences, in children and other residents living at the USS Lead Site. These inadequacies also led to the major underestimation of the costs of this remedy, where the cost of the remedy mushroomed from the estimated $22.8 to $84.9 million. Indeed, if EPA had conducted an appropriately thorough investigation at any point during the more than 20 years that EPA knew of contamination at the site, and certainly before the remedy was selected in the 2012 Record of Decision (ROD), it may have developed or selected different remedial alternatives, with potentially substantially different outcomes for residents.

With regard to EPA's evaluation of the post-ROD changes, this comment makes two points. First, EPA omits a new activity—interior lead and arsenic dust assessment and abatement—that on its own and when combined the increased costs laid out in the ESD, substantially alters the cost, scope and performance of the remediation plan in the ROD. Accordingly, EPA should consider these fundamental changes and amend the ROD. EPA did not discuss the interior lead and arsenic dust cleanup in the ROD, and instead focused on the exterior

soil work. But now, EPA is undertaking interior lead and arsenic dust cleanup work, which was recorded only in a March 2017 Administrative Settlement. We commend EPA for undertaking the critical and necessary work of interior lead and arsenic dust abatement.[1] Although EPA claims that it is appropriate to exclude the indoor lead and arsenic dust cleanup from the ESD because it is considered a removal action, it contradicts this omission when it includes the Zone 2 exterior soil work (that it also considers removal) into this ESD. Second, by preparing this ESD now, and omitting substantial changes[2] to the "cleanup plan," EPA's piecemeal approach necessarily underestimates the changes to the ROD. EPA should proceed now by amending the ROD to reflect the fundamental changes.

II. EPA incorrectly issued an ESD here because EPA has made fundamental changes to the remediation plan that require an amendment to the ROD instead.

A. Legal Standard

If there are post-ROD changes to the remedy, then EPA is required to evaluate those changes to determine whether they are significant or fundamental and then take proscribed actions based on that determination. If there is a *significant change* to the scope, remedy, or cost of the remedy laid out in the ROD, EPA must publish an ESD; if there has instead been a *fundamental change* to the basic features of the remedy in the ROD with respect to the scope, performance, or cost, the lead agency must instead make an amendment to the ROD. *See* CERCLA § 117(c); NCP §§ 300.435(c)(2)(i), 300.825(a)(2), 300.435(c)(2)(ii)(A)–(H); *see also* EPA, *A Guide to Preparing Superfund Proposed Plans, Records of Decision, and other Remedy Selection Decision Documents* (July 1999) ("EPA Guide"), online at https://www.epa.gov/sites/production/files/2015-02/documents/rod_guidance.pdf. The language of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and guidance documents issued by EPA provide the direction for procedures that lead agencies must take if remediation measures differ from the remediation plan agreed to by the parties in a ROD.

[1] We must point out that EPA's protocol for the interior dust testing and abatement is based on protocol that is not sufficiently protective in two major ways. First, it only involves properties where exterior excavation has been completed, even though dust from surrounding contaminated homes and excavations is almost certainly in all the homes at the Site. Dust certainly was tracked from properties with highly contaminated soil into homes which do not have soil levels triggering removal. Second, the standards being used as action levels do not match EPA's or HUD's standards for triggering lead abatement. If EPA had undertaken the lead and arsenic dust testing and abatement properly, the costs would have been even greater.

[2] EPA also omitted the forthcoming changes to the Zone 1 cleanup plan, which EPA has indicated will likely require a ROD amendment on its own. ESD, *1 n.1.

EPA's guidance documents explain what is meant by changes in scope, performance and cost. The scope of the remedy includes, for example, the type of treatment or containment technology, the physical area of the response, remediation goals to be achieved, and the type and volume of wastes to be addressed. Performance includes the treatment levels to be attained and the long-term reliability of the remedy. Cost covers how much money the change is expected to require.

EPA's guidance documents also offer direction on the difference between significant and fundamental changes. Significant changes are those that alter a component of the remedy without fundamentally altering the cleanup approach. As examples, a large increase in volume of remediated soil, the cost of the remedy, a change in the disposal location, and a change in secondary technology are all significant changes. Fundamental changes instead involve an appreciable alteration in the scope, performance, or cost. A change in the primary treatment method, a change from containment to treatment, a technical impracticability waiver, or a change in community preference for the remediation plan are all examples of fundamental changes. Fundamental changes can also result from an "aggregate of nonsignificant or significant changes." *See* EPA Guide at *7-1.

Courts have required lead agencies to propose ROD amendments where the lead agency has altered the remedy with respect to scope and cost. The Tenth Circuit held in a 1999 case that a 61 percent cost increase, accompanied by a change in the nature of the remedy, fundamentally altered the remedy and required a ROD amendment. *See United States v. Burlington Northern*, 200 F.3d 679, 694 (10th Cir. 1999). Part of the remediation plan there involved pumping sludge into rail cars to then be transported and treated. *Id*. at 693. The lead agency realized that some of the sludge and debris had adhered to liners that were in the railcars, and some of it had solidified into tar heels that could not be pumped out of the cars. *Id* at 694. This resulted in the lead agency having to transport additional boxes of liners, and the EPA decided to incinerate (instead of recycle) the tar heels and the additional boxes of liners. *Id.* These changes resulted in half of the sludge being incinerated, when the parties had initially rejected incinerating the sludge, and it increased the costs of the remediation plan by about 61 percent. *Id*. The court held that the EPA should have proposed an amendment for the cost increase associated with the additional materials, and for the sludge incineration. Without these amendments, the court explained, the public and other Potentially Responsible Parties (PRPs) were excluded from the decision-making process. *Id*.[3]

[3] Courts have not required the EPA to amend the ROD where only a portion of the remediation plan was altered. *See, e.g., United States v. P.H. Glatfelter Company*, 768 F.3d 662, 671–72 (7th Cir. 2014) (explaining that a change in one basic feature of the remedy—like a change in timing or cost, without a fundamentally altered remediation plan in the ROD—typically requires the lead agency to issue an ESD instead of an amendment to the ROD).

B. Changes to cost, scope and performance at the USS Lead Site constitute fundamental changes, and necessitate an amendment to the ROD.

Here, because the cost, scope and performance of the remedy changed, EPA should have revised the ROD. In the ROD, EPA did not discuss the interior lead and arsenic dust cleanup, but rather focused exclusively on the exterior soil work. But, now, EPA is undertaking interior lead and arsenic dust cleanup. The change in remedy, combined with the cost increase explained in the ESD and the cost increase associated with the interior lead and arsenic dust clean up, constitutes a fundamental change.

- **Cost:** The costs for the USS Lead Superfund Site cleanup have increased by 279 percent—from $22.8 million to $84.9 million. The 279 percent cost increase does not include the additional cost from the interior lead and arsenic dust cleanup. The March 2017 Administrative Settlement Agreement and Order on Consent[4] (March 2017 ASAOC) explains that the cost of implementing the response work in the ASAOC will be roughly $9.5 million. *See* March 2017 ASAOC at *24. This includes all Zone 2 and 3 ASAOC Response costs, which involve the indoor lead and arsenic dust abatement but also other work included in the ASAOC. Thus the total incremental costs for the increased work in the area covered by the ROD—for both the increased number of homes and depth of exterior soil work and the interior lead and arsenic dust cleanup and other work in the ASAOC—is even greater than stated in the ESD.[5]

- **Scope and Performance:** The addition of the interior lead and arsenic dust cleanup to the activities at Operable Unit 1 should be considered a change to the scope and performance that merits an amendment to the ROD. EPA does not provide an adequate explanation for not considering the addition of interior lead and arsenic dust in its analysis. EPA omits the interior lead and arsenic dust cleanup from the activities discussed in the ESD because EPA deems those activities to be "removal."[6] But, EPA includes in its analysis of post-ROD

[4] The March 2017 Administrative Settlement Agreement and Order on Consent (ASAOC) is available online at https://semspub.epa.gov/src/document/05/935710.

[5] It is noteworthy that EPA explicitly explains that it would not have chosen a different remedy now than it did in 2012. It is unclear what additional alternatives EPA may have considered if it knew in 2012 that this project would cost $84.9 million. It is possible that EPA could have achieved a better, more permanent remedy for the same cost, yet it did not consider them. Considering that EPA considers costs as one factor in evaluating proposed alternatives, it is difficult to know how this proposal would have been understood at the time that EPA issued the ROD.

[6] In the ESD, EPA clearly states that the "ESD [ ] does not include costs associated with indoor response actions. Those actions were performed pursuant to EPA's *removal*, not remedial, authorities." *See* ESD, *1 n.1 (emphasis added).

changes other work that elsewhere EPA had labeled removal, and the interior lead and arsenic dust cleanup is work being done in Zones 2 and 3 that is directly linked to the exterior contamination.[7] These activities are directly connected. EPA determined that for all residences where soil remediation is required, it will offer to test for indoor lead and arsenic. *Id*. It will then offer to clean the inside of residences where the indoor sampling indicates that the dust in the home exceeds risk-based screening criteria. *Id*. at *18. In its administrative settlement documents and its Action Memorandum Amendments, EPA treated the interior and exterior cleanup action the same. *See* Action Memorandum – Fourth Amendment, p. 15; *see* Action Memorandum – Fifth Amendment, *17.[8] It is not logical to treat them differently here, meaning to include some activities but to exclude interior lead and arsenic dust cleanup.

As stated, the EPA guidance documents clearly explain that a fundamental change can also result from an "aggregate of nonsignificant or significant changes." *See* EPA Guide at *7-1. Incremental changes, spread out and between various documents, still constitute changes to the remedy and should be addressed by EPA in a ROD amendment. When EPA implements a series of changes—even a set of individually modest changes— over time without presenting them in aggregate, EPA deprives the PRPs and the public of the ability to review potential changes to the ROD. Courts recognize the importance of including the public and affected parties into the remediation decision-making process. In *P.H. Glatfelter Co.*, the court noted that EPA adopted its interpretation of fundamental and significant differences in an attempt "to develop an administrative process which balances the public's continuing need for information about, and input into, post-ROD remedial action decisions, with the lead agency's need to move forward expeditiously with design and implementation of the remedy after fundamental decisions have been made in the ROD." 768 F.3d at 673 (quoting 55 Fed. Reg. at 8773).

Here, by changing the remedy set forth in the ROD incrementally over a period of time, EPA is preferencing its own administrative process over the public's right to information and participation. One could reasonably infer that EPA is using administrative channels to avoid amending the ROD and including public input into its own decision-making process.

As discussed, EPA's original, incomplete assessment of the site, where it only tested 7% of the properties, generated inaccurate information about the extent of the contamination across Operable Unit 1. Had the EPA conducted an initial, proper assessment and analysis of the site,

[7] Indeed, under its own plan, EPA is currently only doing the interior dust assessment at sites that it has determined require exterior excavation. See, note 5, supra, for a discussion of our concerns about this approach and the standards being used to evaluate interior lead and arsenic dust.
[8] Both Action Memoranda are available online at https://semspub.epa.gov/src/document/05/935710, as Appendices G and F.

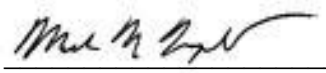
the amount estimated for the work may have been different, and comparing the proposal that was selected and implemented to the other remediation proposals may have resulted in the parties choosing a different remediation plan or strategy. The EPA's under-testing may have resulted in funds being spent inefficiently, and had the testing been conducted more thoroughly, residents may have been able to have a greater proportion of their properties thoroughly remediated.

III. Conclusion

Members of the East Chicago Community Advisory Group, the Abrams Environmental Law Clinic, and the Environmental Advocacy Center appreciate the opportunity to submit these comments and urge EPA to consider proposing a ROD amendment for the changes listed in the proposed ESD as well as in the March 2017 ASAOC and other EPA documents.

Sincerely,

Steering Committee Members Maritza Lopez, Lori Locklear, Tara Adams, and Akeeshea Daniels
On behalf of the
East Chicago Calumet Coalition Community Advisory Group
USS Lead Site
East Chicago, Indiana



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COMMENT 8

THE CHEMOURS COMPANY FC, LLC

K&L GATES

February 15, 2018

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Via Email & First Class Mail

Ms. Janet Pope
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U.S. Environmental Protection Agency
Region 5
77 West Jackson Blvd. (SI-6J)
Chicago, IL 60604-3590

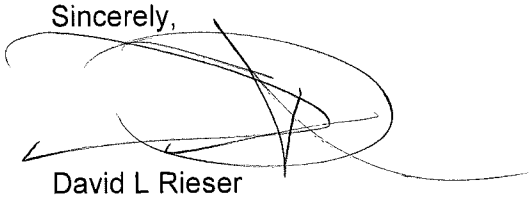
Re: U.S. Smelter and Lead Refinery, Inc. Superfund Site
Explanation of Significant Differences

Ms. Pope:

I am writing on behalf of the Chemours Company FC LLC ("Chemours") in response to the Proposed Explanation of Significant Differences ("ESD") for the above Site dated December, 2017. As a long time participant in this Site, Chemours is painfully aware that Site costs have increased dramatically from those which were originally predicted in the ROD in 2012, While Chemours has no comment on EPA's recitation of the costs or on its decision to issue this ESD, Chemours should not be deemed to have waived any arguments or claims that the costs expended by EPA at the Site are not reasonable or not consistent with the National Contingency Plan. Despite its lack of comment on the costs described in the ESD, Chemours reserves all of its rights to contest any demand for direct or indirect removal or remedial costs by EPA pursuant to the 2014 Consent Decree, the 2017 Administrative Settlement Agreement and Order on Consent or generally under CERCLA Section 107 (42 U.S.C. 9607).

Please advise if you have any questions.

Sincerely,



David L Rieser