UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
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CHICAGO, IL 60604-3590

958211

April 29, 2020

To: Timothy R. Barber, ERM

From: 4/29/2020

X Leslie J Patterson

Leslie Patterson
Remedial Project Manager
Signed by: LESLIE PATTERSON

Subject: Comments on the January 2020 *Remedial Investigation Report*
U.S. Smelter and Lead Refinery, Inc. Superfund Site, East Chicago, IN
Administrative Settlement Agreement and Order on Consent V-W-17-C-013

The U.S. Environmental Protection Agency (EPA), in consultation with the Indiana Department of Environmental Management has completed its review of the document referenced above. Pursuant to Section IX of the Administrative Settlement Agreement and Order on Consent V-W-17-C-013 (ASAOC), EPA disapproves the Remedial Investigation (RI) Report as submitted. EPA finds that the environmental sampling and remedial investigation activities to date, as planned in the July 2018 RI/FS Workplan and RI/FS Field Sampling Plan, and documented in the RI Report, are insufficient to fulfill the requirements of RI sampling outlined in 40 CFR Section 300.430(b). Specifically, the sampling appears inadequate to characterize the extent and source(s) of contamination, contaminant fate and transport, and threats to human health and the environment, as detailed in the comments below. In addition, it is unclear if the data presented in the RI Report provide adequate basis to develop and evaluate remedial alternatives.

EPA has determined pursuant to 18(c) of the ASAOC, that additional investigation and site characterization activities are needed beyond the additional data collection activities described in Section 9 of the RI Report. EPA requires U.S. Smelter and Lead Refinery, Inc. (USS Lead) to submit revised or amended RI/FS Planning Documents, described in Task 1.2.2 of the SOW to the ASAOC referenced above, to address the attached comments in the "Comment for revised RI/FS Planning Documents" column. In accordance with Exhibit A of the SOW, revised RI/FS Planning Documents (Work Plan, Field Sampling Plan, Quality Assurance Project Plan, and Health and Safety Plan) are due 30 days from receipt of this notice. If the QAPP and Health and Safety Plan are adequate for the additional planned data collection, a statement to that effect may be provided instead of revising those documents.

While Section 9 of the RI identifies the need for additional data, it does not provide the date USS Lead made this determination. Paragraph 18(a) of the ASAOC states, "If at any time during the RI/FS process, Respondent identifies a need for additional data, Respondent shall submit a memorandum documenting the need for additional data to EPA's Remedial Project Manager

within 15 days after identification." When providing the revised RI/FS Planning Documents mentioned above, include the date when USS Lead determined the need for additional sampling. If during future additional data collection proposed in the revised RI/FS Planning Documents, USS Lead again identifies the need for additional sampling, EPA expects timely notification of this identification and recommends that USS Lead submit a Site Characterization Technical Memorandum that provides interim results, synthesizes them into the overall understanding of the site, and outlines plans for follow-up sampling as an appropriate way to comply with the requirement.

After RI sampling is completed, EPA requires USS Lead to amend the RI Report in accordance with the newly-collected data and the attached comments. A revised RI Report must be submitted within 60 days of your receipt of the last set of validated analytical data collected. All of the enclosed comments in the "Comment for revised RI Report" column that remain relevant, given the additional sampling, must be addressed. If all comments are not adequately addressed, EPA may exercise its right to modify the document and provide the revised document to you for implementation or to direct you to make specified modifications to the document.

If you have any questions concerning this matter, or would like to discuss the attached comments in detail, please contact me at (312) 886-4904 or USS Lead's legal counsel may contact Cathleen Martwick at (312) 886-7166.

Comments

Com-ment	Docu-ment	Section/ Tbl./ Fig.	¶	PDF Page #	Doc. Page #	Sentence	Comment for revised RI Report	Comment for revised RI/FS Planning Documents
1	RI	General		--	--	--	The RI (including the HHRA and BERA) should be a comprehensive and stand-alone document. Include results of evaluations previously conducted as part of the Work Plan, as appropriate for the RI.	N/A
2	RI	ES		3	--	--	Include an Executive Summary, consistent with the outline presented in Task 4: OU2 RI Report of the RI/FS SOW.	N/A
3	RI	Acronyms		7	--	--	Delete the "Baseline" before HHRA.	N/A
4	RI	--		10-80	--	--	There are no page numbers in the text portion of the document after the acronyms list, which may be confusing if the documented is printed. Include page numbers in the report footers.	N/A
5	RI	1.3.2	j.	14	--	1st	For clarification, after "ASAOC" add text "; in RI, paragraphs g to i above"	N/A
6	RI	1.3.2	t. and u.	15	--	--	Suggest adding a footnote to provide an update on whether the USEPA has verified the extent of capture, and whether USEPA has identified a path for human exposure to unsafe amounts of lead and arsenic from groundwater.	EPA is not aware of an institutional control preventing use of groundwater. If there is one, it should be mentioned in the RI/FS planning documents as the basis for not considering groundwater consumption as an exposure pathway. If there isn't, then groundwater consumption needs to be considered.
7	RI	1.3.3.1	2nd	16	--	1st	A figure of the Former USS Lead Facility buildings constructed in the early days of operation overlain with RI soil, sediment, surface water, and groundwater results may provide additional insight into sources for elevated metals in soil, sediment, surface water, and groundwater.	Included this figure in the planning documents so that additional source delineation sampling can be evaluated.

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8	RI	1.3.3.3		17	--	Interim measures at the USS Lead Facility included removal of the baghouse dust and bags piles and offsite disposal, removal of the slag piles and disposal/storage at the CAMU, demolition and storage at the CAMU of the USS Lead Facility's production plant structures, and removal and storage at the CAMU of soil and sediments with lead concentrations greater than 1,200 mg/kg, which was the Indiana regulatory limit for industrial property uses in the 1990s. The estimated volume of lead-bearing waste contained in the CAMU is 284,000 cubic yards (DAI 2004). Figure 1.3-2 of this RI Report shows the areas remediated and is based on information provided in Geochemical Solutions (2004).	Additional discussion and details regarding the interim action(s) would be helpful, including additional text describing these actions. For example, when were these interim measures completed and who performed them? Was this part of one interim action, or were there separate actions? What depths were excavated? What material (i.e., offsite clean fill or onsite materials) was used for backfill shown on Figure 1.3-2? If Areas B and C were not backfilled, what actions were taken in these areas? What happened to the fuel tanks? Additional historic figures would be useful, such as those provided in Appendix B (Historic Facility Maps) of the Work Plan. Ideally, the features shown on these figures would be incorporated into one or more RI figure. See comment 2b from "EPA Comments on Preliminary Data Review USS Lead OU2 dated July 15, 2019."	N/A
9	RI	1.3.4		17	--	As dictated in the approved permit, groundwater monitoring consists of the biannual collection of groundwater samples from the six exterior CAMU monitoring wells (MW10, MW15, MW18, MW21, MW23, and MW25), and three downgradient wells (MW7, MW8, and MW12).	Given that a groundwater divide crosses the facility, clarify in the text what constitutes "downgradient wells". Additionally, other wells at the Facility are exterior CAMU wells than the six that are referenced; please clarify.	Integrate and visually present all hydrologic data to date to characterize the hydrology of the site.
10	RI	1.3.4	3rd	17	--	In addition, four downgradient CAMU wells (MW10, MW18, MW23, and MW25) are analyzed for volatile organic compounds (VOCs) annually.	These four wells were referenced previously as "exterior CAMU monitoring wells"; provide the appropriate description in the text. Also, in the RI text. discuss current groundwater conditions within OU1 in more detail, including installation of wells.	N/A
11	RI	1.3.4	4th	17	--	--	Add a sentence explaining that ECHA-MW-12 was to be sampled as part of the RI but could not be found, as captured in footnote 5 in Tables 2.3-1 and 2.5-1. Also add on pdf page 41, Section 3.2.7, 1st paragraph, 2nd sentence.	N/A

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12	RI	1.3.4		18	--	The RI/FS ASAOC indicates that Lake Michigan, instead of groundwater is currently used as a source for drinking water for the OU1 residents and that USEPA has not yet identified a path for human exposure to unsafe amounts of lead and arsenic from the Site groundwater (see Paragraph "u" in Section 1.3.2 of this RI Report).	Although the residents generally use city water sourced from Lake Michigan, EPA was unable to identify an ordinance in place for the City of East Chicago prohibiting the use of groundwater for potable uses or irrigation. Several surrounding communities had ordinances in place. If it cannot be demonstrated that an ordinance is in place, the drinking water pathway would be considered complete and would need to be evaluated as part of the risk assessment to provide the basis for implementing institutional controls, such as an ordinance. Consider deleting the comma for clarity.	See comment #6 for revised RI Planning Documents above.
13	RI	1.3.4	5th	18	--	Last	Add the USEPA action levels used for the dust samples.	N/A
14	RI	2.2		18	--	ERM used the US Department of Agriculture (USDA) Web Soil Survey area mapping tool to identify soil types present across the Site.	Provide the results of this mapping in a visual format, such as a figure.	According to Section 5.1 of the FSP, the following were supposed to be used: National Wetland Inventory (NWI) data, the National Hydrography Dataset (NHD), soil survey data for Lake County, land cover, land use, topographic maps, and aerial photography. What is described in the RI Report appears to be an unapproved departure from the FSP. Include in the revised FSP an accuarate description of how soil types were/will be determined and include a figure generated by the USDA mapping tool.
15	RI	2.3		19	--	Lithologic logs for the 14 monitoring wells installed at the USS Lead Facility show the typical geological profile for the area (SulTRAC 2012):	It would be helpful to visualize the site-specific geology described in the text by including geological cross-sections, usually included in an RI.	Integrate and visually present the geologic data to date by including geological cross-sections to characterize the the site and assist the understanding of the potential for fate and transport of contaminants.
16	RI	2.3		20	--	At each boring location, with the exception of OU1MW1, ERM observed black, dark brown, dark yellow brown, and dark grayish brown surficial fill material with thicknesses ranging from 0.5 to 6-feet bgs. At the OU1MW5/5D well pair, the fill material appeared to be composed largely of black, gravel- and sand-sized slag.	The soil borings for OU1MW5 and OU1MW5D (Appendix B) do not indicate slag - they indicate dark brown fill material and gravelly sand, not inconsistent with other boring logs. If there is a difference between the logs or other sources of information to suggest that slag was observed, provide the additional explanation. If not, then it is not credible to conclude that OU1MW5 is in an area of localized slag. Photographs would also be helpful.	Because the source of high pH cannot be attributed based on the information provided, this is a datagap which needs to be addressed in additional sampling. If a localized source of the high pH exists, describe how two additional locations will be sufficient to delineate it in four lateral directions, and at depth. See comment #78 on RIFS Planning Documents.

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17	RI	2.4		20	--	The Site is situated within the Grand Calumet River watershed (Hydrologic Unit Code 071200030406), which is approximately 13 miles long and drains approximately 39 square miles of surface area to both Lake Michigan and the Calumet Sag Channel in Illinois.	A figure showing the Grand Calumet River watershed and the Site in relation to the watershed would be helpful, as well as the location of features discussed in this section, such as the Indiana Harbor Canal and USGS gauging stations.	N/A
18	RI	2.4	7th	21	--	Figure 2-4-2 provides daily average gauge height during a typical year (e.g., 2010).	Two different USGS gauging stations were referenced in this section. Clarify which station is used on Figure 2.4-2 in the text and on the figure title. Also, the text needs to be updated to reflect the content in the figure.	N/A
19	RI	2.5	2nd	23	--	Bullets 2-6	Add a figure showing where the degraded sanitary sewer system below the water table is located; or consider adding the sewer to Figures 2.5-2 to 2.5-5.	Add a groundwater contour figure showing where the degraded sanitary sewer system below the water table is located, and a discussion of observed groundwater flow, to assist in evaluating additional groundwater sample locations.
20	RI	2.5		24	--	Otherwise, groundwater flow within OU2 is south-southwesterly, to the Grand Calumet River.	This is contradicted by the local groundwater flow direction on Figure 2.5-5 from the Grand Calumet River onto OU2.	Add a groundwater contour figure and a discussion of observed groundwater flow to assist in evaluating additional groundwater sample locations.
21	RI	2.5		24	--	The north-south groundwater divide beneath OU1 Zone 1 disappeared as the Indiana Harbor Canal west of the Site, which was influenced by record high lake level, began acting as a losing stream and groundwater divide.	Clarify - based on Figure 2.5-5, the divide is still present, but shifted in location.	Add a groundwater contour figure and a discussion of observed groundwater flow to assist in evaluating additional groundwater sample locations.
22	RI	2.5.4	3rd	26	--	1st and 2nd	Review hydraulic conductivity values for appropriate significant digits. Also applies to Table 2.5-3.	N/A
23	RI	2.5.5		26	--	3rd bullet	The effective porosity appears high. A future grain size distribution curve analysis of a composite saturated soil sample could provide insight into the site-specific effective porosity, to determine if the estimated 30% value from the 1996 USGS reference reflects that of the OU2 Calumet Aquifer.	Incorporate a discussion of site-specific effective porosity and a plan to verify the estimated 30% value.

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24	RI	2.7		26	--	A zoning map issued by the planning department of the City of East Chicago is shown on Figure 2.7-1 (City of East Chicago 2008). The East Chicago Comprehensive Plan indicated that 66.2% of the area consisted of industrial properties and 14.5% were residential properties, with the remaining 19.3% consisting of commercial, mixed use, institutional, and other uses (e.g., open space, right-of-way, vacant, and water) (City of East Chicago 2008). The USS Lead Facility is restricted to non-residential uses via an ERC established in June 2005 (Swidler Berlin 2005). OU1 is expected to remain a mixed-use area for the foreseeable future.	Section 3.4 of RI/FS SOW from the ASAOC requires that the "Respondent shall submit a Memorandum to EPA for review and approval that evaluates the current and reasonably anticipated future land uses of the Former USS Lead Facility." The land use review requirements include evaluation of the current and reasonably anticipated future land uses of the Former USS Lead Facility. The Memorandum shall identify: (1) past uses of the Former USS Lead Facility including **title and lien information**; (2) current uses and neighboring areas; (3) **Respondent's plans for the Former USS Lead Facility following cleanup and any prospective purchasers;** (4) applicable zoning laws and **ordinance**; (5) current zoning; 6) **applicable local area land use plans, master plans and how they affect the Former USS Lead Facility;** (7) **existing local restrictions on property;** (8) property boundaries; (9) **groundwater use determinations, wellhead protection areas, recharge areas and other areas identified in the state's Comprehensive Ground Water Protection Program**; (10) flood plains, **wetland**, or endangered or threatened species; and (11) **utility rights of way**. This memorandum was not provided as part of the RI and several of the required components were not addressed, as indicated in bold text.	The SOW requires a Current and Future Land Use Technical Memorandum as an attachment of the RI, but Section 6.3.2 of the RIFS Workplan states that "No additional work will be performed related to land use.". Add a section in the workplan that incorporates the requirements of Section 3.4 of the SOW.
25	RI	2.8.1, Figure 2.8-1		27, 138	--	The approximate boundaries of these covertypes are depicted on Figure 2.8-1, and the characteristics of these covertypes are described in more detail in the following sections.	The figure was not readable in the PDF - an error occurred.	N/A
26	RI	2.9		30	--	SHAARD has inventoried 79 Historic Properties within one mile of the Site (see Table 2-2; Figures 2-6 and 2-7 of the RI/FS WP [ERM 2018a]).	Include the results from this evaluation in the RI so that it is a stand-alone and comprehensive document.	N/A

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27	RI	3.1		31	--	Soil, sediment, groundwater, and surface water sampling has been conducted at the USS Lead Facility since 1993 resulting in a historical database of sampling results. Four site-wide sampling events have been completed, as well as targeted sampling in areas where impacts were identified and remediated.	Because the year or years were not given of when the interim actions were performed, it is difficult to put these historical investigations into context regarding if they were performed before or after excavation. It is also unclear which sample results remain in place and which ones were used as part of the RI evaluation and which ones were not. Add text for clarification. If these samples were used as part of the RI evaluation, a figure or figures should be included and referenced that shows the locations. Sample depths should also be clarified or included on a table(s).	Ensure that the information in comment #27 for revised RI Report is incorporated into Section 2 (OU2 Background) of the RIFS Workplan and Section 4.1 (Currently Available Data) of the RI/FS FSP.
28	RI	3.1.2.5		33	--	Three subsurface soil samples were collected in 1997 in the former fuel tank area west of the CAMU and analyzed for VOCs, SVOCs, TPH, PCBs, and total lead.	Where is the fuel tank storage area? A map showing historic use of the facility with sample locations overlain would be helpful.	Add a map showing historic use of the facility with existing sample locations overlain to the RIFS planning documents.
29	RI	3.1.2.6		33	--	Soil contaminated with lead was removed from the wetlands and placed in the CAMU.	When did this occur? In general, clarification on when removals took place would give context to sampling.	N/A
30	RI	3.1.3		34	--	Antimony and arsenic have been detected above the Alternate Concentration Limits (ACLs) established in the Post Closure Permit and are currently present at concentrations above the IDEM SLs.	What are the respective IDEM SLs for antimony and arsenic? Are these the established screening criteria? Include appropriate Superfund site SLs in tables.	Add a table of screening levels from state and federal sources for all media to the RIFS planning documents. Appropriate screening levels to consider are available from IDEM, as well as EPA's regional screening levels (https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables), MCLs, and Region 4 Ecological Risk Assessment screening levels (https://www.epa.gov/risk/regional-ecological-risk-assessment-era-supplemental-guidance). Update the Section 4 tables in the FSP with all existing data by medium, add relevant screening levels to the tables, and identify (e.g. with highlighting, changing the color of the font, outlining, etc.) to indicate data that exceed screening levels. Provide maps/figures of soil, sediment and groundwater concentrations that visually illustrate whether samples exceed screening levels.
31	RI	3.1.3	3rd	34	--	3rd	Add the IDEM SLs used during the Phase II Environmental Assessment of the West Calumet Housing Project in Zone 1 of OU1 in 2017.	See comment #30 for revised RI/FS Planning Documents above.

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32	RI	3.1.3	3rd	34	--	4th	Add locations of the 10 temporary monitoring wells in Zone 1 of OU1 to a figure. Was the data used in the RI? What were end depths and screening intervals of the temporary wells? Analytes and results? Did any exceed IDEM SLs?	Add locations of the 10 temporary monitoring wells in Zone 1 of OU1 to a figure. Will the data be used in the RI, or were/are these data used to inform the planning of additional sampling? What were end depths and screening intervals of the temporary wells? Analytes and results? Did any exceed IDEM SLs?
33	RI	3.1.4	2nd	34	--	4th and 5th	Add the Region IV SLs used for surface water, and describe where the 2 samples were located with As and Cd above these SLs since 2015.	See #30 for revised RI Planning Documents about screening levels, and integrate a discussion of sample results to date compared with screening levels.
34	RI	3.2	1st	35	--	3rd	Define the acronyms and update the acronyms ERA to BERA.	N/A
35	RI	3.2.2; Figure 3.2-1		36	--	Figure 3.2.-1 shows the final sample locations, which were approved by USEPA prior to sampling.	Consider inset maps at a larger scale on Figure 3.2-1 to show sample locations where they are tightly clustered. Consider adding historic land use features to maps that are referenced in the text, such as "dust piles."	Provide the maps described in Comment #35 for revised RI Report in the planning documents.
36	RI	3.2.3	3rd	38	--	last	Delete "a" after "handheld".	N/A
37	RI	3.2.6	1st	40	--	Monitoring wells OU1MW1 and OU1MW2 were installed in an area anticipated to have lower lead concentrations based on the USEPA's online map of soil concentrations.	Provide numerical context for "lower lead concentrations".	N/A
38	RI	3.2.7	1st or 2nd	41	--	--	Consider adding the frequency of each groundwater analysis, as it doesn't become clear that PAHs are only sampled for 2 quarters until later.	N/A
39	RI	3.2.7; Table 3.2-5		42	--	The field parameter results for groundwater samples collected between December 2018 and August 2019 are provided in Table 3.2-5.	Several dissolved oxygen measurements read 0.00 and several turbidity measurements read 0.0. Confirm that these are accurate field measurements and not probe malfunctions or quantities not measured.	N/A
40	RI	3.2.8	2nd	42	--	1st	Change "TOC" to BTOC as listed in the Table on pdf page 22, and add to acronyms, or spell out feet below "top of casing" to not be confused with TOC defined in acronyms.	N/A

Com-ment	Docu-ment	Section/ Tbl./ Fig.	¶	PDF Page #	Doc. Page #	Sentence	Comment for revised RI Report	Comment for revised RI/FS Planning Documents
41	RI	3.2.9		43	--	The results of the analysis indicated that the material was likely a slightly weathered petroleum-based material. Based on the geographic distribution of the material, it appears to be from an offsite source and not related to the former USS Lead Facility.	Where are the results provided for the TPH, GRO, DRO, and RRO analysis? Are these sample locations shown on a figure? If so, reference the figure.	Incorporate discussion of these samples into Section 4 of the FSP, and any appropriate sections of the RI/FS workplan such as 2.1.2 and include more information on the basis for determining it is an off-site source. Does "slightly weathered" mean that there is no ongoing migration of the petroleum-based material to the site? Where would it have come from? If it contributes to human health or ecological risks, it would still need to be addressed.
42	RI	4 and/or 7	General	--	--	--	Include discussion of groundwater quality parameters (Table 3.2-5) and how these influence metal COIs; in addition, include discussions of hardness and alkalinity of the aquifer, and its impact on COI concentrations.	Include discussion of groundwater quality parameters (Table 3.2-5) and how these influence metal COIs; in addition, include discussions of hardness and alkalinity of the aquifer, and its impact on COI concentrations.
43	RI	4.1	1st	44	--	Soil and groundwater data were compared to the IDEM SLs; commercial/industrial direct contact values were used for soil, and tap water values were used for groundwater. Surface water data were compared to the USEPA Region IV SLs. The results of the historical data review are summarized below.	Present this data screening step as an appendix to the RI to show how COIs were identified; the RI should be a stand-alone document. The use of commercial/industrial values for soil and tap water values for groundwater may not be adequately protective for ecological receptors and may have resulted in some COIs being excluded from the BERA for the southern wetlands. In addition, a screening of OU2 groundwater data using ecological surface water SLs should be included in the RI to evaluate current and potential future risk from discharge of groundwater to the hyporheic zone of the on-site surface water bodies. If this was completed in a previous study, a summary of the results should be included.	See comment #30 for revised RI/FS Planning Documents on including screening levels, identifying which ones will be used, and comparing the data collected to date with them.
44	RI	4.2	General	--	--	--	Provide an overview of samples used in the RI by medium, and how many of each were collected in 2018-2019. Furthermore, before section 4.3 provide screening levels for each COI in each media to provide context for concentration ranges described in 4.3.	Confirm that the entire RI database has been uploaded to EPA Region 5's electronic database. Update the discussion of samples collected (or used from other sources) by medium, and how many of each were collected in 2018-2019.

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45	RI	4.2		45	--	This database was filtered based on the COI and sample depth (0 to 2 feet bgs) to generate the RI database.	Explain how 0 to 2 feet bgs was determined to filter the data. Additional discussion of how the data sets were chosen would be helpful, including which sampling sets (or portions of) were excavated during various actions at the Facility. This comment also applies to the last sentence of the 6th paragraph on page 72 of the PDF (Section 8), and in other instances where the 0 to 2 feet bgs was used. Utility workers may contact soil within OU2 at a depth greater than 2 feet bgs.	Filtering out data below 2 ft bgs seems inconsistent with assessing potential risk to utility workers, determining subsurface sources of groundwater contamination, and characterizing extent and magnitude of contamination. Additional information on this approach is needed in the FSP, subject to EPA approval. In addition, farther down in this paragraph, replacing nondetected data with the reporting or detection limit might be acceptable for some kinds of data analysis, but not for others. Was the approach to nondetected data described in the RIFS planning documents? Ensure the approach is consistent with EPA guidance and describe the approach that has/will be taken for specific kinds of data analysis.
46	RI	4.2	1st	45	--	6th	Add "statistical" before "data analysis".	N/A
47	RI	4.3		45-53	--	--	The RI has not fully evaluated the extent of contamination according to EPA's guidance document and in compliance with the RI/FS SOW from the ASAOC. The RI/FS SOW states that "the RI shall fully evaluate the nature and extent of hazardous substances, pollutants or contaminants and assess the risk which these hazardous substances, pollutants or contaminants present for human health and the environment." Additionally, the RI/FS SOW requires that the RI and FS reports comply with EPA guidance, including the Superfund Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA (EPA/540/G-89/004, October 1988) (RI/FS Guidance). Under Task 4, the RI "shall accurately establish OU2 characteristics such as media contaminated, extent of contamination, and the physical boundaries of the contamination."	Ensure that the discussion of data collected and reviewed to date is presented in a manner that facilitates identification of remaining data gaps to be addressed in order to fulfill the requirements of the RI. This will assist review of the additional planned sampling activities. For example, at minimum a map of contaminant concentrations in soil showing exceedences of screening levels is needed. It is unclear whether the number and distribution of samples to date is adequate given the area of OU2, how many of the samples are clustered, and the multiple purposes for which soil samples must be used (evaluate direct contact to multiple receptors, delineate sources of contamination to groundwater, etc.).

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48	RI	4.3; Tables		45-53	--	--	Data results were not compared to screening criteria for the purposes of determining the extent of contamination. A discussion should be provided in the text regarding the number of samples exceeding appropriate screening criteria, as well as the general geographic distribution of COIs (Appendix I) and trends.	See Comment #30 for revised RI Planning Documents about presenting and discussing sample results to date compared with screening levels.
49	RI	4.3.6; Figures		50-53	--	--	Groundwater concentrations were not plotted on site maps or cross-sections. No plume maps were developed, making it difficult to determine if groundwater contamination has been delineated.	Present groundwater data visually with plume contour maps in areal and cross-section formats to assist in the understanding of data already collected and the identification of data gaps.
50	RI	4.3.6.1		50-51	--	A total of 14 OU1 locations have been sampled 53 times. A total of 11 OU2 locations have been sampled 21 times.	This phrase is repeated throughout, but it is not clear why.	N/A
51	RI	4.3.6		50-53	--	--	It is confusing to refer to value ranges in the text for the minimum, maximum, and median values; it is suggested to provide clarification that these statistical values were calculated for each analyte at each well. Also consider providing and discussing condensed statistical summary tables by analyte only to give a better sense of the prevalence of certain analytes across the Site, or perhaps divided by OU1 and OU2.	N/A
52	RI	4.3.6		50-53	--	--	The text does not adequately define the nature and extent of contamination, especially related to groundwater. No distribution figures are provided for groundwater. Provide groundwater plume maps for the COIs showing exceedances of screening levels, at least for the last 4 quarters of data. Discuss the general spatial distribution of each groundwater COI in the text, including any noted trends.	Present groundwater data visually with plume contour maps in areal and cross-section formats to assist in the understanding of data already collected and the identification of data gaps. Discuss the general spatial distribution of each groundwater COI in the text, including any noted trends.
53	RI	4.3.6.2		51	--	The concentrations of antimony in OU2 wells MW5, MW7, and MW21 as well as antimony concentrations in ECHA-MW01 were particularly interesting.	Why? A clear explanation is not provided.	N/A
54	RI	4.3.6.3		51	--	A total of 10 OU1 locations have been sampled 40 times total….A total of 11 OU1 locations have been sampled 45 times total.	These two statements seem to be contradictory and are confusing. Reword for clarity, and add any potentially missing information.	N/A

Com-ment	Docu-ment	Section/ Tbl./ Fig.	¶	PDF Page #	Doc. Page #	Sentence	Comment for revised RI Report	Comment for revised RI/FS Planning Documents
55	RI	4.3.6.10	1st	53	--	last	Add the concentrations of each of the 5 PAHs detected in 1 sample each.	N/A
56	RI	5.2		54	--	For surface water and OU1 and OU2 groundwater, the potentially complete exposure pathway is dermal contact.	EPA conducted an abbreviated search and was not able to verify that the City of East Chicago has an ordinance in place prohibiting the use of groundwater for domestic uses. If there is no ordinance in place for drinking water, then the drinking water pathway should be considered and evaluated as part of the HHRA. Unacceptable risk from the drinking water pathway would form the basis for implementation of institutional controls within OU1 (e.g., groundwater use ordinance).	EPA conducted an abbreviated search and was not able to verify that the City of East Chicago has an ordinance in place prohibiting the use of groundwater for domestic uses. If there is no ordinance in place for drinking water, then the RIFS planning documents should identify that the drinking water pathway should be considered and evaluated as part of the HHRA.
57	RI	5.4		56	--	Site-specific sources of uncertainty associated with the HHRA for the USS Lead Superfund Site include the following: • Limited subsurface sediment sampling data • Limited OU1 groundwater sampling data • The assumption that OU1 residents will be exposed to the maximum concentrations of COIs in groundwater	How could these uncertainties potentially impact the data and the risk assessment?	N/A
58	RI	5		54-56	--	--	The risk assessment did not address the potential risks posed to receptors coming in contact with contaminants in groundwater and sediment in sewers, as stated in Section 3.3.2 of the RI/FS SOW.	N/A
59	RI	7.2		61-62	--	--	Contaminant characteristics of aqueous solubility and adsorption are discussed generally, but not for all COIs. Provide the solubility and Kd for each COI in a table and add a discussion in Section 7.3. Volatilization should also be addressed although generally not applicable to metals.	N/A
60	RI	7.4.1		66	--	Arsenic, lead, and antimony concentrations are relatively high in groundwater samples collected from MW7, and they do not show a decreasing trend.	Provide context for what is meant by "relatively high" concentrations.	N/A

Com-ment	Docu-ment	Section/ Tbl./ Fig.	¶	PDF Page #	Doc. Page #	Sentence	Comment for revised RI Report	Comment for revised RI/FS Planning Documents
61	RI	7.4.2		66	--	The surface water data are discussed in Section 4.3.3. Based on the results of the human health and ecological risk assessments, surface water at the Site does not present a potential risk to human health and the environment, and the surface water data do not require additional consideration under the RI/FS ASAOC.	It is suggested to plot surface water concentrations as part of Appendix O. Arsenic concentrations in surface water are as high as 610 ug/L collected from west of the CAMU. How might these surface water concentrations migrate and affect other media, including groundwater? Discuss the concentrations of surface water in comparison to the chronic ambient water quality criteria. Consider collecting more recent surface water samples to evaluate current risk.	Provide a discussion and map(s) of surface water concentrations and relate the data collected to date to contaminant transport and screening levels, such as chronic ambient water quality criteria. Provide the basis for either collecting more recent surface water samples to evaluate current risk, or determining that additional samples are unnecessary.
62	RI	7.4.4		67-71	--	--	Some of the text discussing distribution of COIs may be more appropriate in Section 4 as part of the nature and extent of contamination, or at least referenced.	N/A
63	RI	7.4.4		67	--	Antimony concentrations in groundwater are generally higher in OU2 and ECHA wells as compared to the rest of the OU1 wells. Concentrations of antimony in ECHA-MW-01 are the highest measured at the Site. Recent concentrations of dissolved antimony (2015 – 2019) are greater than 100 µg/L only in ECHA-MW-01, ECHA-MW-09, MW-21, and MW-23.	What is the basis for comparison of antimony concentrations to 100 µg/L? Appropriate screening levels should be listed in a table for context of analytical results.	See comment #30 for revised RI/FS Planning Documents about presenting screening levels and comparing data to them.
64	RI	7.4.4.2		69	--	Between 2001 and 2019 total arsenic concentrations in samples collected from MW21, located north of the CAMU and midway along its length, have ranged from 85 µg/L to 3,290 µg/L, with the maximum concentration measured in November 2011.	Please confirm these data and clarify. The graph in Figure 7.4-1b seems to suggest that the maximum arsenic concentration occurred prior to 2005.	N/A
65	RI	7.4.4.2		69	--	In general, total arsenic concentrations in samples collected from MW7 have increased over time, with concentrations between 20,000 µg/L and 23,000 µg/L between December 2018 and June 2019 (Figure 7.4-1a).	Please confirm these data and clarify. The graph in Figure 7.4-1a seems to indicate a minimum arsenic concentration below 15,000 µg/L within this time period.	N/A

Com-ment	Docu-ment	Section/ Tbl./ Fig.	¶	PDF Page #	Doc. Page #	Sentence	Comment for revised RI Report	Comment for revised RI/FS Planning Documents
66	RI	7.4.4.2		69	--	However, it is anticipated that arsenic concentrations will continue to decrease in MW21. The CAMU is under hydraulic control; therefore, the CAMU is not the source of elevated arsenic concentrations observed at MW21.	What is the source of elevated arsenic concentrations observed at MW21? Identify potential sources and contaminant transport mechanisms as part of contaminant fate and transport. Reference figures in Appendix O, if appropriate. In addition, present the results of the soil samples that delineate the arsenic hot spot responsible for the elevated arsenic in MW7 and on a map.	Include the source of elevated arsenic concentrations at MW21 in the data gap analysis in the appropriate sections of the RIFS planning documents (FSP, Section 4, workplan Section 2.12). It is difficult to assess whether the arsenic hot spots around MW7 was fully delineated. Present the hot spot data visually in a map and include depths of soil samples.
67	RI	7		71	--	--	Include subsections for transport processes and contaminant migration trends in accordance with the RI/FS SOW.	N/A
68	RI	7.4.4.3		71	--	This conclusion is corroborated by a strong correlation between dissolved iron and dissolved arsenic concentrations ($p<0.05$; data not shown).	Consider including the "data not shown" in a graph to support the correlation noted.	N/A
69	RI	7.4.4.4		71	--	As described in Section 2.3, fill material is widespread at the Site, and at the OU1MW5/5D well pair, the fill material appeared to be composed largely of black, gravel- and sand-sized slag.	See Comment #16 for revised RI Report.	See Comment #16 for revised RI/FS Planning Documents.
70	RI	8	2nd	72	--	2nd	Change the wording to reflect that four wells were installed and ECHA-MW-12 could not be found.	N/A
71	RI	8	3rd	72	--	(Paragraph)	This paragraph appears out of place. Add context why it is included here, or delete. The information was previously presented in Section 1.3.4.	N/A
72	RI	8	Several	73	--	Various sentences under each media type discussed	Add context to phrases like "elevated concentrations" or "higher" with results and by listing specific screening criteria that the media being discussed exceeded. The Groundwater summary describes trends, but lacks context of concentrations exceeding criteria.	See comment #30 for revised RI/FS Planning Documents about presenting screening levels and comparing data to them.
73	RI	8		73	--	Elevated concentrations arsenic, lead, and antimony are detected near MW7 indicating a potential local source contributing to the elevated levels of these COIs in groundwater.	Provide context for what is meant by "relatively high" concentrations.	N/A

Com-ment	Docu-ment	Section/ Tbl./ Fig.	¶	PDF Page #	Doc. Page #	Sentence	Comment for revised RI Report	Comment for revised RI/FS Planning Documents
74	RI	8		73-74	--	--	Conclusions should be revised to reflect comments previously noted in preceding sections, in particular once appropriate screening criteria are listed and extent of impacted media defined.	N/A
75	RI	8	Bullet 1	74		Elevated concentrations of antimony and lead were found in the ECHA wells suggesting a separate source of these metals in this area. We recommend the installation and sampling of two new wells to confirm the existing data and further delineate potential impacted groundwater in Zone 1 of OU1.	ECHA wells had not only elevated antimony and lead, but also arsenic, cadmium and selenium. Both total and dissolved concentrations of these metals exceeded MCLs. The source and extent of these concentrations has not been determined.	Provide plans to investigate both the source and extent of groundwater concentrations of metals. The plans must propose specific locations and the basis for selecting them. Source investigation must include soil/waste sampling, if existing data are not sufficient to characterize the source of groundwater contamination in Zone 1. Note that monitoring wells are a "low resolution" characterization technique more appropriate for monitoring over time than for delineation purposes.
76	RI	9	Bullet 2	74			See comment #66. The RI Report must present the delineation of the extent of arsenic contamination around MW7.	See comment #66. It is difficult to assess whether the arsenic hot spots around MW7 was fully delineated, and therefore whether additional sampling is necessary. Present the hot spot data visually in a map and include depths of soil samples.
77	RI	9	Bullet 3	74			The extent of arsenic contamination in groundwater around MW21 has not been delineated.	Provide plans to confirm the extent of arsenic in groundwater near MW21.
78	RI	9	Bullet 4	74	--	2nd	How will the field determination be made during well installation that no slag is adjacent to the well?	In the revised RIFS planning documents, describe how it will be determined during well installation that no slag is adjacent to the well. Explain the decisions that would follow if slag is found, such as selection of an alternate location. See also comment #16 on RI/FS Planning Documents.

Com-ment	Docu-ment	Section/ Tbl./ Fig.	¶	PDF Page #	Doc. Page #	Sentence	Comment for revised RI Report	Comment for revised RI/FS Planning Documents
79	RI	9		74-75	--	Conduct additional investigation of groundwater in Zone 1 of OU1 (the ECHA property). At the request of USEPA, USS Lead sampled three wells previously installed at the ECHA property. Elevated concentrations of antimony and lead were found in the ECHA wells suggesting a separate source of these metals in this area. It is recommended to install and sample two new wells to confirm the existing data and further delineate potential impacted groundwater in Zone 1 of OU1.	Based on extent of contamination results using appropriate screening levels and data limitations described in the HHRA, additional groundwater data (including installation of new wells) may be required in Zone 1 and other areas of OU1, too, to close data gaps. Groundwater plume maps showing current groundwater concentrations would allow strategic locations for new wells to be determined. Furthermore, wells along the north side of the former facility (MW1, MW3, MW4, MW14) have not been sampled since 2005. These are potentially downgradient of MW21 (see inset in Figure 2.5-5), which exhibited some of the highest arsenic concentrations measured in OU2 groundwater, and they are upgradient of OU1 wells. Concentrations could demonstrate that the facility is not the source of metals in groundwater within the OU1 boundary. Consider rehabilitating/redeveloping these wells prior to sampling them.	Add discussion of and plans for addressing the issues raised in Comment #79 for revised RI Report.
80	RI	Table 2.3-1		83-84	--	--	Footnote 9 on the table indicates that MW19 contains free product. However, no context is provided on the history of product in this well, what the free product is, or what the source was.	It appears that free product in MW19 was not mentioned in the RIFS planning documents. Provide additional context.
81	RI	Figure 2.3-1		130	--	--	For the wells located along the CAMU boundary, it is not clear which wells are located inside of the CAMU (presumably within the slurry wall) and which ones are located outside. Consider using an inset map with call-out labels or different color well symbols for those located on the inside of the CAMU. The same color scheme for differentiating between the interior/exterior wells would enhance the groundwater contour maps (Figures 2.5-2 through 2.5-5).	See comment #81 for revised RI Report.
82	RI	Figure 2.3-1		130	--	--	Include well ECHA-MW-12 in the figure with a note that this well could not be found.	N/A

Com-ment	Docu-ment	Section/ Tbl./ Fig.	¶	PDF Page #	Doc. Page #	Sentence	Comment for revised RI Report	Comment for revised RI/FS Planning Documents
83	RI	Figures 2.5-2 through 2.5-5		133-136	--	--	How was the location of the groundwater divide determined on these figures considering that MW21, which is located on the northern exterior of the CAMU, has a consistently higher water table elevation during the last 4 quarters of monitoring compared to MW1 and MW14?	Add groundwater contour maps to the FSP and/or FI/FS workplan, as appropriate, that address Comment #83 for revised RI Report.
84	RI	Figure 2.8-1		138	--	--	The figure is not showing completely in the pdf file.	N/A
85	RI	Figures 4.2-1 and 4.2-2		141-142	--	--	Differentiate between 2018-2019 samples collected by ERM versus historical soil and sediment samples.	Filtering out data below 2 ft bgs appears inconsistent with assessing potential risk to utility workers, determining subsurface sources of groundwater contamination, and characterizing extent and magnitude of contamination. No soil samples were used in areas outside of the facility boundary that may be used to delineate sources of contamination to groundwater. Review previously collected data from potential source areas, identify data gaps if existing data are not sufficient, and propose sampling, including soil investigations outside of the OU2/facility boundary, if necessary to perform an RI/FS on groundwater.
86	RI	Figure 4.2-3		143	--	--	This figure shows 10 SW sampling locations, however, the tables and analyses show more. Do more locations need to be added to the figure?	Ensure that the figure requested in Comment #61 for revised RI/FS Planning Documents shows of sample locations to date.
87	RI	Appendix I		287-313	--	--	The tables should include number of concentrations exceeding screening levels for each media. As described earlier, the screening levels used for the purposes of determining nature and extent of contamination in this RI should be presented.	See Comment #30 on inclusion of screening levels.
88	RI	Table I-9		288	--	--	This table is out of order from the remainder of the appendix.	N/A
89	RI	Table I-4		292-300	--	--	Provide maximum values detected, similar to other tables in Appendix I. Consider providing an additional condensed statistics table by analyte only (instead of analyte and well), which would give a better idea of the prevalence of certain analytes across the Site.	Incorporate a discussion of the range and distribution of contaminant concentrations to update the conceptual site model and provide the basis for planning additional data collection.
90	RI	Table I-7		303-311	--	--	It appears "Statistic" should be removed from the table title, as it presents results only.	N/A

Com-ment	Docu-ment	Section/ Tbl./ Fig.	¶	PDF Page #	Doc. Page #	Sentence	Comment for revised RI Report	Comment for revised RI/FS Planning Documents
91	RI	Appendix O		568-578	--	--	These figures would be more useful if screening levels were indicated and corresponded to the lower level of one numeric range shown by color. Also consider providing similar figures for surface water samples for the COIs.	See Comment #30 on inclusion of screening levels.
92	HHRA	1.2		347	2	--	Provide a brief summary of the historic waste-generating activities (and chemicals handled/managed) and the remedial actions that were conducted onsite to provide context for the chemicals currently present in onsite soil, sediment, surface water, and groundwater.	N/A
93	HHRA	1.4		348	3	--	Describe the water bodies (ponds and canal) in terms of size and water depth throughout the year. Delete the sentence "There are no activities at OU1 related to groundwater," because as is noted, cleanup of basement seepage may occur in OU1.	N/A
94	HHRA	3		350	5	3rd bullet	**a)** The SOW to the ASAOC indicates (in Section 3.3.2) that risks to nearby residential, recreational and industrial worker populations should be evaluated. However, nearby recreational and industrial worker populations are not addressed in the HHRA and should be added. **b)** No future use of offsite groundwater was assumed; however, there is no groundwater ordinance prohibiting its future use offsite. Therefore, future potable use of offsite groundwater should be evaluated in the HHRA. **c)** Describe what onsite activities trespassers are engaged in when accessing the site.	Include plans to address the risks to nearby residential, recreational and industrial worker populations. Also see Comment #6 for revised RI/FS Planning Documents.
95	HHRA	3		350	5	4th bullet	The SOW to the ASAOC indicates (in Section 3.3.2) that risks from exposure to hazardous substances in sediment in sewers and ingestion of contaminated organisms in nearby, impacted ecosystems should be evaluated. However, these exposure scenarios are not addressed in the HHRA and should be added.	Include plans to address the risks from exposure to hazardous substances in sediment in sewers and ingestion of contaminated organisms in nearby, impacted ecosystems.

Com-ment	Docu-ment	Section/ Tbl./ Fig.	¶	PDF Page #	Doc. Page #	Sentence	Comment for revised RI Report	Comment for revised RI/FS Planning Documents
96	HHRA	4		351	6	all	**a)** RAGS Part D Table 2 is missing and should be provided so that the dataset used in the HHRA is summarized and data screening is used to identify the COPCs. **b)** It is unclear why the 5 listed metals are the COIs at the site. **c)** Tables should be provided presenting the data groupings (including which samples are in each grouping) used to screen data on the RAGS Table 2s. **d)** Figures should be provided showing the sample locations (by medium) used in the HHRA. **e)** A table should be provided presenting all samples, analytes, and concentrations (including sample dates, sample depth, parent or field duplicate sample type, sample ID, concentration, validation qualifier, MDL, reporting limit) for all data included in the RAGS Table 2s.	The information requested in Comment #96 for revised RI Report has been largely requested in other comments for the revised RI/FS Planning Documents; ensure that the issues identified in Comment #96 are addressed.
97	HHRA	4		351	6	2nd sentence	Current EPA RSLs should be used to screen soil, groundwater, surface water, and sediment. However, a mixture of various screening levels were used, which is not appropriate for Superfund sites.	See Comment #30 for revised RI/FS Planning Documents.
98	HHRA	5.2		352	7	3rd bullet	Adolescent trespassers are mentioned here, whereas child trespassers are mentioned in Section 3. What is the specific age group for young trespassers?	N/A
99	HHRA	5.2		352	7	4th bullet	Young children (ages 0-6) should be included as potential receptors for contact with groundwater (and its residuals on surfaces) in basements.	Add the HHRA conceptual site model figure to the planning documents and update it to include young children as potential receptors for contact with groundwater (and its residuals on surfaces) in basements.
100	HHRA	5.3		353	8	1st bullet	**a)** Describe what activities trespassers are engaged in when onsite so that the exposure scenarios are justified. **b)** Trespassers may also contact surface water onsite, which should be added to their exposure media.	N/A

Com-ment	Docu-ment	Section/ Tbl./ Fig.	¶	PDF Page #	Doc. Page #	Sentence	Comment for revised RI Report	Comment for revised RI/FS Planning Documents
101	HHRA	5.3		353	8	2nd bullet	Residents may also contact groundwater in their basements and groundwater residuals (precipitates) that remain on basement surfaces after groundwater has receded or been removed. Include the exposure to precipitates in the SsI exposure scenario.	Residents may also contact groundwater in their basements, and residuals (precipitates) that remain on basement surfaces after groundwater has receded or been removed, which would be exposure through a subsurface intrusion scenario. Discuss this exposure scenario, add it to the HHRA CSM figure, and if necessary, provide plans for evaluating it.
102	HHRA	5.4		353	8	5th sentence	**a)** The number of data groupings for each medium, and the rationale for each grouping related to potential receptors and exposure areas, should be described. **b)** Tables should be provided presenting the data groupings (including which samples are in each grouping) used to calculate EPCs for each medium.	N/A
103	HHRA	5.4.2		353	8	1st sentence	**a)** 95% UCL concentrations should be calculated for ISM samples (and their triplicate) using the approach presented in ITRC guidance. **b)** Clarify whether ISM and discrete samples were grouped when calculating EPCs and the rationale for the decision.	N/A
104	HHRA	5.4.3		353	8	7th sentence	OU2 groundwater EPCs should be calculated based on the most recent 2 rounds of sampling from each well, assuming that 2 rounds represents seasonal variability.	N/A
105	HHRA	5.5		354	9	9th sentence	The ASAOC indicates (in Section 3.3.2) that both central tendency and RME estimates should be evaluated, yet only RME scenarios were included in the HHRA.	N/A
106	HHRA	5.5.2.2		356		Adult OU1 Resident – For the adult resident, an ED value of 20 years was selected for the RME (USEPA 2014).	Based on EPA's familiarity with the site, it is not uncommon for residents in OU1 to inherit their homes from relatives and/or occupy their home for more than 20 years. Consider extending the RME duration beyond 20 years.	N/A
107	HHRA	5.5.2.3		357	12	Adult and Older Child OU1 Resident section	An exposure frequency of 12 days/year is too low and does not account for contact with residuals remaining on basement surfaces after groundwater has receded or been removed.	Plan to address in revised approach to subsurface intrusion exposure scenario

Com-ment	Docu-ment	Section/ Tbl./ Fig.	¶	PDF Page #	Doc. Page #	Sentence	Comment for revised RI Report	Comment for revised RI/FS Planning Documents
108	HHRA	5.5.2.4		357	12	1st sentence	**a)** Add text indicating that exposure time is also applicable to dermal contact exposures with surface water and groundwater. **b)** Add the surface water and groundwater exposure times assumed for each receptor group.	N/A
109	HHRA	5.5.2.8		358	13	O&M Worker, Utility Worker, and Adult Trespasser sections	Clarify why two different skin surface area values are presented for the 3 receptor, despite the same body parts included for the 3 receptors.	N/A
110	HHRA	5.6		359	14	--	**a)** The RAGS Lead ALM Worksheet (from Appendix C of RAGS Part D) and ALM model spreadsheets are missing and should be provided for review so that input parameters (and rationale) can be reviewed. **b)** It is stated that the ALM was only used to evaluate lead exposures by adults (utility workers and O&M workers), yet ALM results are also presented for adolescent and adult trespassers in Table 1 of Section 7.2; reword for consistency. **c)** Clarify how EPA guidance for estimating intermittent exposures to lead in soil/sediment was used. **d)** The IEUBK Model should be used to evaluate child exposures to groundwater residuals on surfaces in basements and to evaluate potable groundwater exposures by offsite residents.	N/A
111	HHRA	6		360	15	4th sentence	EPA's Tier 2 source is PPRTVs; clarify whether PPRTVs are available for the chemical of potential concern.	N/A
112	HHRA	8.2		364	19	2nd sentence	The COIs for the HHRA should be identified based on the data screening presented in the RAGS Part D Table 2s.	N/A
113	HHRA	8.3		364	19	2nd sentence	Clarify why it is expected that surface soil and sediments are more impacted than subsurface soil and sediments.	Describe in the updated description of site conditions why it is expected that surface soil and sediments are more impacted than subsurface soil and sediments.
114	HHRA	10		368	23	--	Add EPA's RSLs as a reference.	N/A
115	HHRA	RAGS Table 1		410	--	OU1 Groundwater	**a)** Add children (ages 0-6) as potential receptors. **b)** Add exposures to groundwater residuals on surfaces in basements. **c)** Add a future potable use scenario.	See Comment #99 for revised RI/FS Planning Documents.

Com-ment	Docu-ment	Section/ Tbl./ Fig.	¶	PDF Page #	Doc. Page #	Sentence	Comment for revised RI Report	Comment for revised RI/FS Planning Documents
116	HHRA	RAGS Table 1		410	--	OU2 Surface Water	Ingestion of surface water is a complete exposure pathway in Figure 7.1-1. Add incidental ingestion of surface water as a potentially complete exposure pathway for trespassers and describe what activities trespassers may be involved in when onsite.	Add the HHRA conceptual site model figure to the planning documents (updated as indicated in other comments), which includes incidental ingestion of surface water as a complete exposure pathway for trespassers.
117	HHRA	RAGS Table 3.1		411	--	Footnote 3	Add reference to the footnote within the applicable cell of the table. Also, for Tables 3.1 and 3.2, add an explanation in the HHRA as to why the arithmetic mean was used for the Exposure Point Concentration for lead in soil and sediment instead of the 95th UCL of the mean.	N/A
118	HHRA	RAGS Table 4.5		420	--	Exposure frequency for O&M Worker	21 days/yr is being used to account for biannual GW monitoring, monthly CAMU inspections, quarterly well repairs, biannual maintenance activities, quarterly effluent sampling, and annual CAMU repairs. Confirm that this frequency is adequate to account for future changes in site operations or activities.	N/A
119	HHRA	RAGS Table 4.9		424	--	Body weight for adolescent trespasser for dermal exposures	Change body weight from 80 kg to 59.8 kg, consistent with the ingestion pathway.	N/A
120	HHRA	RAGS Table 4.11		426	--	Chemical concentration in groundwater	Change groundwater to surface water	N/A
121	HHRA	RAGS Table 5.1		429	--	--	**a)** Provide the equation for Footnote 2. **b)** Change the table format to RAGS Part D Table 5.1; the table is missing the target organ, uncertainty factors/modifying factors, and source for the toxicity value for each COPC.	N/A
122	HHRA	RAGS Table 5.2		430	--	--	Change the table format to RAGS Part D Table 5.2; the table is missing the target organ, uncertainty factors/modifying factors, and source for the toxicity value for each COPC.	N/A
123	HHRA	RAGS Table 6.1		431	--	--	**a)** Provide the equation for Footnote 1. **b)** Change the table format to RAGS Part D Table 6.1; the table is missing the weight of evidence and source for the toxicity value for each COPC.	N/A

Com-ment	Docu-ment	Section/ Tbl./ Fig.	¶	PDF Page #	Doc. Page #	Sentence	Comment for revised RI Report	Comment for revised RI/FS Planning Documents
124	HHRA	RAGS Table 6.2		432	--	--	Change the table format to RAGS Part D Table 6.2; the table is missing the weight of evidence and source for the toxicity value for each COPC.	N/A
125	HHRA	RAGS Tables 7.1, 7.3, 7.6, 7.8, 7.10, 7.12, 7.14		433-446	--	Exposure Point	Add the depth of exposure assumed.	N/A
126	HHRA	RAGS Table 8.3, 8.8, 8.11		452, 457, 460	--	--	**a)** Correct the name of the site. **b)** Correct the spelling of surface water.	N/A
127	HHRA	RAGS Tables 8.4, 8.12, 8.13		453, 461, 462	--	Site name	Correct the name of the site.	N/A
128	HHRA	RAGS Table 9 series		463-468	--	--	**a)** Change the format to the RAGS Part D Table 9 series; the tables are missing the target organ. **b)** In the "Exposure Point" column, add the soil and sediment depth.	N/A
129	HHRA	RAGS Tables 9.1, 9.3, 9.4		463, 465, 466	--	Exposure Medium	Change "OU1 surface water" to "OU2 surface water".	N/A
130	HHRA	RAGS Table 10 series		469-471	--	--	**a)** In the "Exposure Point" column, add the soil and sediment depth. **b)** Present exposure routes total as 1 significant figure. **c)** Only chemicals and media posing chemical-specific risk > $1x10^{-6}$ or HQ>0.1 should be presented in the table.	N/A
131	HHRA	Tables 8-11 to 8-13					These tables are labeled “East 10th Street Site, Marcus Hook, Pennsylvania”.	N/A
132	BERA	1.2		478	1	The SLERA for OU2 was largely completed as part of the Data Gaps Analysis presented in Section 4.0 in the RI/FS Field Sampling Plan (FSP) and BERA WP presented in Section 8.0 of the RI/FS WP (ERM 2018a), where it was determined based on historic sampling data that the Site-specific COIs are antimony, arsenic, cadmium, lead, and selenium.	Please see Comment #43. The use of commercial/industrial values for soil and tap water values for groundwater may not be adequately protective for ecological receptors and may have resulted in some COIs being excluded from the BERA. In addition, the RI/FS Work Plan states that soil, sediment, and surface water will be compared to USEPA Region 4 SLs in the SLERA. However, no screening of soil and sediment using the Region 4 SLs is presented.	See comment #30 for revised RI/FS Planning Documents on including screening levels, identifying which ones will be used, and comparing the data collected to date with them.

Com-ment	Docu-ment	Section/ Tbl./ Fig.	¶	PDF Page #	Doc. Page #	Sentence	Comment for revised RI Report	Comment for revised RI/FS Planning Documents
133	BERA	3.7.1		490	13	Intake doses for birds and mammals were calculated using UCL concentrations for sediment, soil and/or biota (vegetation or invertebrate tissue, as appropriate) aggregated on a site-wide basis using food web models.	Although this is an acceptable approach for BERA exposure estimates, maximum exposure estimates are usually included in the SLERA (Steps 1 and 2) per USEPA's Ecological Risk Assessment Guidance for Superfund (USEPA, 1997). Section 1.2 of the BERA states "The SLERA for OU2 was largely completed as part of the Data Gaps Analysis presented in Section 4.0 in the RI/FS Field Sampling Plan (FSP) and BERA WP presented in Section 8.0 of the RI/FS WP...". However, neither of these documents present maximum exposure risk estimates for birds and mammals.	N/A
134	BERA	4.3.1.3		493	16	Water ingestion rates table.	The water ingestion rates for muskrat and short-tailed shrew appear to be incorrect and do not match the rates presented in Attachment 2. The units for the ingestion rates appear to be incorrect also. Please correct the table.	N/A
135	BERA	5.1		495	18	Wildlife Toxicity Reference Values	The NOAEL and LOAEL values used to derive the TRVs should be included in an attachment to the BERA. The NOAEL TRVs are all less than the NOAELs used in the derivation of the Eco-SSLs. The Eco-SSLs are intentionally conservative for screening purposes; however, the TRVs presented may not be adequately protective of all wildlife receptors. For example, the mammalian NOAEL TRV for lead of 34.93 mg/kg bw/day is much higher than the NOAEL (4.70 mg/kg bw/day) used to develop the lead Eco-SSL. USEPA guidance for developing Eco-SSLs (USEPA, 2007) states that approximately 96% of the LOAEL values for mammals and 95% for birds are within a factor of 10 of the respective paired NOAEL value. The paired LOAEL value for the NOAEL used in the lead Eco-SSL is 8.90 mg/kg bw/day, which is considerably lower than the mammalian LOAEL TRV used in the BERA of 136.70 mg/kg bw/day. The TRVs used in the BERA may be acceptable, but the values used to derive them and the rationale for selection should be presented for transparency.	Provide a discussion of the basis for selection of the TRVs and a table of values.

Com-ment	Docu-ment	Section/ Tbl./ Fig.	¶	PDF Page #	Doc. Page #	Sentence	Comment for revised RI Report	Comment for revised RI/FS Planning Documents
136	BERA	6.1		497	20	Table comparing ISM data to PECs and Eco-SSLs.	The basis of the value listed for selenium 2.9 (R4), which is assumed to be a Region 4 SL, should be explained in a footnote.	N/A
137	BERA	6.1		498	21	Metals extraction results for antimony, arsenic, cadmium and lead in sediment indicates that the bioavailability of antimony and arsenic is limited: <1% to approximately 70% for antimony and approximately 2 to 75% for arsenic.	In addition to the ranges, the actual extraction results for antimony and arsenic should be presented in a table so the reader can discern in which DUs these metals are likely more bioavailable.	N/A
138	RI/BERA	6.6 (RI) and 8 (BERA)		59/505	28 (BERA)	The results of the AVS/SEM analyses, and the antimony and arsenic extraction tests, demonstrate that conditions are present in the southern wetlands that limit metal bioavailability and thus their potential to exert adverse effects to benthic invertebrates (and plants).	While this statement is true for the divalent metals cadmium and lead, the extraction tests showed that the bioavailability of antimony and arsenic ranged up to 70% and 75%, respectively. Therefore, these metals in the DUs where bioavailability is on the upper end of this range may pose potentially unacceptable risks to benthic invertebrates and/or plants. This is particularly true for arsenic because the average concentrations in each DU exceeded the PEC and Eco-SSL values by a large margin.	N/A