APPENDIX J

Ohio EPA Comments and Responses

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Ohio Environmental Protection Agency

John R. Kasich, Governor
Mary Taylor, Lt. Governor
Craig W. Butler, Director

January 26, 2017

Mr. Mark Leeper
Army National Guard Directorate
ARNGD-ILE Clean Up
111 South George Mason
Arlington, VA 22203

Re: US Army Ravenna Ammunition Plt RVAAP
Remediation Response
Project records
Remedial Response
Portage County
267000859030

Subject: Approval of Response to Comments on "Draft Phase III Remedial Investigation Report for Wet Sediment and Surface Water at Load Line 12 for the Former Ravenna Army Ammunition Plant (RVAAP)" Document, (Work Activity No. 267-000859-030)

Dear Mr. Leeper:

The Ohio Environmental Protection Agency (Ohio EPA) received the Response to Comments for the RVAAP-12 Load Line 12 Draft Phase III Remedial Investigation (RI) Report on December 14, 2016. Your responses addressed our October 24, 2016 comment letter.

We have no further comments on the Load Line 12 Draft Phase II RI report.

Sincerely,

Sue Netzly-Watkins
Division of Environmental Response and Revitalization

SN-W/nvr

cc: Gregory F. Moore, USACE, Louisville District
Nat Peters, II, USACE Louisville District
Katie Tait/Kevin Sedlak, Camp Ravenna, Newton Falls
Shreffler/Harris, Camp Ravenna, Vista Sciences Corp, Newton Falls
Kevin Jago, Leidos, Twinsburg
Jed Thomas, Leidos, Twinsburg

ec: Rod Beals, Ohio EPA, NEDO, DERR
Bob Princic, Ohio EPA, NEDO, DERR
Kelly Kaletsky, Ohio EPA, DERR, CO

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NATIONAL GUARD BUREAU
111 SOUTH GEORGE MASON DRIVE
ARLINGTON VA 22204-1373

December 12, 2016

Ohio Environmental Protection Agency
DERR-NEDO
Attn: Ms. Sue Netzly-Watkins
2110 East Aurora Road
Twinsburg, OH 44087-1924

Subject: Ravenna Army Ammunition Plant (RVAAP) Restoration Program, Portage/Trumbull Counties, RVAAP-12 Load Line 12 Responses to Comments on the Revised Draft Phase III Remedial Investigation Report (Work Activity No. 267-000-859-030)

Dear Ms. Netzly-Watkins:

The Army appreciates your time and comments (dated October 24, 2016) on the Revised Draft Phase III Remedial Investigation Report for Wet Sediment and Surface Water at RVAAP-12 Load Line 12. Enclosed for your review are responses to your comments. Upon the final resolution of these responses to comments, the Army will distribute the final version of this report.

Please contact the undersigned at (703) 607-7955 or mark.s.leeper.civ@mail.mil if there are issues or concerns with this submission.

Sincerely,

Mark Leeper
RVAAP Restoration Program Manager
Army National Guard Directorate

cc: Bob Princic, Ohio EPA, NEDO
Rod Beals, Ohio EPA, NEDO
Kelly Kaletsky, Ohio EPA, CO
Kevin Sedlak, ARNG, Camp Ravenna
Katie Tait, OHARNG, Camp Ravenna
Craig Coombs, USACE Louisville
Nathaniel Peters, II, USACE Louisville
Kevin Jago, Leidos
Jed Thomas, Leidos
Gail Harris, Vista Sciences Corporation

Subject: Ravenna Army Ammunition Plant (RVAAP) Restoration Program, Portage/Trumbull Counties, RVAAP-12 Load Line 12 Responses to Comments on the Revised Draft Phase III Remedial Investigation Report (Work Activity No. 267-000-859-030)

Section 4. Site Assessments, Removal Actions, Investigations, and Data Assembly

1) Figure 4-3. The process to identify Chemicals of Potential Concern at RVAAP shows the evaluation of the Area of Concern (AOC) in three steps. One step is a background screen, second step is a frequency of detection screen, and third step is an essential nutrient screen. The decision to remove sediments and surface water due to "infrequent" detections may be due to too few data points. The detected constituent may be reasonable based on historical use of the AOC. The exposure unit or decision unit may be too large. It is premature to remove a detection from further analysis because it does not show up in a downstream sample.

   Army Response: Comment noted. As expanded upon in Section 4.5.2.3 and 7.1.2, only analytes (with exception of explosives and propellants) detected in less than 5% of the discrete samples are screened out from further consideration if the sample population consists of 20 or more samples. The issue of having too few data points is rectified by specifying that the frequency of detection screen applies only if a minimum of 20 samples is within a data population. This process is specified in the FWCUG Report and as revised in the Position Paper for Human Health CUGs, which was approved by the Ohio EPA.

   As indicated in the document, no frequency of detection screening was performed for surface water or wet sediment at Load Line 12 because fewer than 20 discrete samples were available for any of the data sets.

2) In 4.3.2.2 Nature and Extent of Contamination, it notes that Figure 4-4 presents sediment and surface water locations that exceed current screening criteria. However, Figure 4-4 label indicates the figure contains all LL 12 Remedial Investigation (RI) sample locations.

   Army Response: Agree. The title for Figure 4-4 will be changed to “Load Line 12 Map Showing Historical and PBA08 RI Wet Sediment and Surface Water Sampling Locations - Former RVAAP/Camp Ravenna”.

Section 6.0 Table 6-5 Summary of AT123D Modeling Results

3) The table references the "Resident Farmer Adult Facility Wide Cleanup Goal (FWCUG)". According to the USACE September 2013 Technical Memorandum of Land Uses and FWCUG, Section III, there are two land representative receptors for unrestricted land use and military land use for RVAAP: Resident and National Guard Trainee.

   Army Response: Agree. The table will be revised to use “Resident” instead of “Resident Farmer”.

4) Figure 6-3 indicates Contaminant Migration Chemical of Potential Concern (CMCOCs) identified for further Weight of Evidence Evaluation based on AT1230 Modeling. These areas should be carried forward. Maximum concentrations are reflected and no lateral extent is noted.

It is our understanding that the ground water monitoring wells in LL 12 will be sampled in the near future. Depending on data results from these wells, further evaluation of both soils and sediments may be warranted. However, it is your conclusion from modeling information submitted with this Remedial Investigation (RI) which predicts there should not be an issue. If the ground water data show that there may be impacts to ground water, additional assessment may be needed.

Army Response: Clarification. The purpose of Figure 6-3 is to present "CMCOCs Identified for Further Weight-of-Evidence Evaluation Based on AT123D Modeling". The areas and CMCOCs are carried forward in a weight-of-evidence evaluation presented in Section 6.5: Evaluation to Identify CMCOCs.

This evaluation provides a chemical-specific assessment of the modeling results. This assessment includes, for each Contaminant Migration Chemical of Concern (CMCOC), an evaluation of model inputs and potential conservatism, past and current groundwater concentrations, and sediment and groundwater concentrations relative to background and/or human health exposure criteria. This assessment concluded that there are no CMCOCs present in sediment expected to negatively impact groundwater beneath the source or at the downstream receptor location.

The Army acknowledges that if upcoming groundwater sampling events at Load Line 12 show that there may be new and unanticipated impacts to groundwater or increasing contaminant trends, additional assessment may be needed.

Human Health Risk Assessment Comments: Surface Water

5) Section 7.2.6, Page 7-20 uses the rationalization that, "Because the cobalt and lead concentrations in only a few samples exceed drinking water levels and this limited shallow surface water is not a potential source of residential drinking water, cobalt and lead are not identified as Chemicals of Concern (COCs) for potential remediation for surface water".

This statement is not consistent with how Ohio water quality standards are applied.

a) Risk decisions should be made on exposure point concentrations (EPCs) that can be compared to standards not excluded because only a few samples are over the standards

b) Other exposure pathways must be considered besides potable drinking pathways; such as recreational (swimming, fishing, wading, etc.). instead, Ohio EPA's Human Health Non-drink Surface Water Criteria should be used as an alternative standard to the drinking water standards to evaluate potential risk to residential human receptors, in order to justify not identifying these constituents as COCs for potential remediation in surface water.

Army Response: Clarification. The surface water EPCs for cobalt and lead are used to compare against the Resident Receptor FWCUG in Section 7.2.4.3. The text cited on Page 7-20 is given as further consideration and weight-of-evidence (WOE) as to why cobalt and lead are not a risk to the RVAAP Resident Receptor.

FWCUGs are not available for lead or cobalt. The USEPA tap water health advisory of 0.015 mg/L is used for evaluation of lead, and 12 of 14 samples within the HHRA dataset were below this value. The USEPA tap water RSL at HQ=1 of 0.006 mg/L is used for evaluation of cobalt, and 11 of 14 samples within the HHRA dataset were below this value.

Regarding exposure pathways, the Army and Ohio EPA agreed to assess the Resident Receptor to evaluate Unrestricted (Residential) Land Use. The exposure parameters specified for the Resident Receptor are presented in the FWHHRAM. These exposure parameters are comparable to those used to calculate USEPA health advisory and tap water RSLs (e.g., daily consumption of 2 L of water along with dermal and inhalation exposure during daily household water use). These Residential tap water values were used for comparison against the chemical concentrations identified in surface water and calculated EPCs. We agree the Ohio EPA's Non-drink Surface Water Criteria would be excellent for use in the WOE, unfortunately Ohio Surface Water Criteria are not available for lead or cobalt. In the absence of non-drinking water criteria, the WOE relies on pointing out that these small water bodies will not be used as potable water sources and the magnitude of the exceedances of potable water screening levels is small [i.e., the maximum detected concentrations (MDCs) of both lead and cobalt are < 3x the tap water values] and infrequent.

6) Section 7.2.6, Page 7-20 makes the assessment that the polyaromatic hydrocarbons (PAHs) detected in surface water are from other sources (a combination of Paris Windham road runoff and Atlas Scrap Yard) based on the placement of the sample (LL 12-308) within a boxed culvert up-gradient from LL 12. This reasoning seems logical for LL 12 given the location of the sample; however, the sample should not be discounted as being affected by Atlas Scrap Yard, because "samples collected at Atlas Scrap Yard immediately upgradient of this location reported lower PAH concentrations. Considering LL12-308 is receiving runoff not only from Atlas but also from the road, it is plausible the concentrations would be higher but that Atlas is potentially contributing to the detections.

Army Response: Agree. Text revised as below. Similar revisions will be made in the document to ensure Atlas Scrap Yard is not discounted as a potential contributing source.

Sample location L12-308 is a concrete box culvert upgradient of Load Line 12 that receives runoff from Paris-Windham Road. This sample location also receives runoff from Atlas Scrap Yard, which is anticipated to have remediation for PAHs [although the samples collected at Atlas Scrap Yard (i.e., ASYss-027M and ASYsb-063) immediately upgradient of this location reported lower PAH concentrations]. Thus the PAH concentrations at sample location L12-308 are the result of runoff from the road and possibly from the adjacent Atlas Scrap Yard.

Human Health Risk Assessment Comments: Active Area Channel Exposure Unit Sediment

7) Table G-8 identifies benzo(a)pyrene (BaP) as being detected in 5 out of 6 sediment samples, and with an exposure point concentration (0.41 mg/kg; MDC) in exceedance of the Residential Facility-Wide Clean Up Goal (FWCUG) for sediment (0.221 mg/kg). As presented, the data indicate-the COC should be carried through into a Feasibility Study (FS). As an alternative risk evaluation, the BaP data could be re-evaluated with the data collected in areas only affected by the LL 12 CERCLA release

(i.e., omit the LL 12-308 data collected up-gradient from the load line and down-gradient from Paris Windham Road) to determine a more representative EPC from the historical activities at LL 12.

Army Response: Agree. Following the established HHRA process, since the BaP EPC (0.41 mg/kg) exceeds the FWCUG (0.221 mg/kg), this Remedial Investigation Report provides a weight-of-evidence discussing BaP in Section 7.2.6 Identification of COCs for Potential Remediation. This WOE includes the re-evaluation of data collected in areas only affected by the LL 12 CERCLA release (i.e., omitting the LL 12-308 data) and concluded that BaP is not a COC requiring remediation, given:

1) All five remaining sediment samples (omitting L12-308) within the HHRA dataset had BaP concentrations below the Resident Receptor FWCUG of 0.221 mg/kg.
2) The only sample exceeding the Resident Receptor FWCUG (L12-308) is adjacent to and immediately downstream of a main roadway (Paris-Windham Road) and an AOC anticipated for remediation of BaP (Atlas Scrap Yard). Because the concentrations in all other samples are less than the FWCUG, BaP is not recommended for remediation.

8) The current data and evaluation support retaining silver as a COC for an FS, because the EPC (397 mg/kg; MDC) exceeds the residential FWCUG for sediment (386 mg/kg). While section 8.5 states silver was only detected above the residential FWCUG in one sample out of 6, the provided EPC is in exceedance of the developed FWCUG. Additionally, the Ravenna background value is 0 mg/kg (Table G-8), implying the detections are site-related. However, the 95% Upper Confidence Level (UCL) provided is 1.16E+14 (Table G-8), which appears to be a software error. It is suggested the 95% UCL be re-calculated. If the re-calculated 95% UCL cannot be used as the EPC, more data could be collected to support an additional exposure point concentration calculation.

Army Response: Clarification. The UCL reported in Table G-8 is correct. This high UCL is an artifact of a high variance (with results of ND, 0.078, 0.28, 2,8, 70.5, and 397 spanning almost 4 orders of magnitude) and small sample size (6 samples). The MDC was at sample location L12-213 collected in 2000 and is only slightly above the Resident Receptor FWCUG at HQ=1 (386 mg/kg).

To further evaluate potential risk to the Resident Receptor and evaluate the EPC, an additional sample (L12-310) was collected in 2011 very near location L12-213 to confirm the previous exceedance of the FWCUG. The sample from location L12sd-310 had an estimated silver concentration of 70.5J mg/kg. The HHRA conservatively includes the 2000 sample with a concentration of 397 mg/kg. However, if the results at the 2011 sample location L12-213 replaced this data point, the MDC would be reduced to 70.5 mg/kg. Consequently, the HHRA concluded that silver in the Active Area Channel does not pose a risk to the Resident Receptor.

As noted previously, it is the preference of the Army (and has been standard practice in the RVAAP IRP program) to compare media concentrations to FWCUGs to identify COCs then make the decision in this RI stage of the process whether or not a chemical needs to proceed forward and require remediation. Silver was not recommended for remediation because: the EPC is the MDC and all other concentrations are much lower; the MDC is only slightly above the FWCUG (397 mg/kg compared to 386 mg/kg at a hazard quotient of 1) even when using an extremely conservative

FWCUG that assumes daily exposure in a residential yard; and the MDC is from a sample collected in 2000, wherein a nearby sample collected in 2011 indicated a concentration of 70.5J mg/kg at this location. Therefore, silver is not recommended for remediation.

Human Health Risk Assessment Comments: Former Settling Pond Exposure Unit

9) As stated in Section 5.0: Nature and Extent: The nature and extent of wet sediment and surface water site-related chemicals (SRCs) in environmental media at LL 12 is determined using analytical data results obtained during the 1996 Phase I RI, 2000 Phase II RI, 2001 Upper and Lower Cobbs Pond RI, and 2010 and 2011 PBA08 RI. However, the frequency of detections provided in Tables G-3 and G-8 are 1/1, while figure ES-1 and the tables in Section 4.0 identify four additional samples collected in the former settling pond. Therefore, it appears only the PBA08 data were used when determining risk from the sediments in the former settling pond, which is not consistent with the other EUs. For example, the maximum reported silver detection in sediment in the active area channel EU (Table G-2) is the detect from the 2000 data set (Table 4-4), indicating the data collected outside of the PBA08 assessment were used in the active channel area sediment risk assessment. The data should be used consistently to evaluate the EUs; include the historical data in the evaluation of the sediments in the former settling pond.

Army Response: Clarification. Of the samples collected from the Former Settling Pond, samples L12sd-051(d), L12sd-052(p), and L12sd-053(p) were excluded from the HHRA since they were collected in 1996 during the Phase I RI and deemed no longer representative because site conditions at LL12 changed significantly following that investigation (building demolition, excavation/grading). This is consistent with the datasets for the other EUs. The remaining two samples are L12-238 collected in 2000 during the Phase II RI and L12-307 during the 2010 PBA08 RI. The locations of these two samples are nearly identical and, as with the other EUs, the more recent 2010 sample was used in the HHRA.

Ecological Risk Assessment

10) Section 7.3.3.6, Page 7-46 "Magnitude of Ecological Screening Value (ESV) Exceedance": The section misplaces language from Ohio EPA's Ecological Guidance. The language quoted is meant for soil media, while the section is discussing sediment data. The language is "if only minor exceedances are detected and other evidence can substantiate, a claim can be made that some or all of the site-associated soils have not been impacted and no additional ecological investigation in soils is warranted". This may not be appropriate for all ecological settings involving sediment, because the overlying surface water will have a different effect on chemical transport than what would happen during a release to the soil. As stated in section 3.3.5 of the ecological guidance regarding sediments in lentic and lotic surface water bodies, chemicals that exceed screening benchmark values or where screening values are not available in the hierarchy are to be retained as Chemicals of Ecological Potential Concern (COEPCs).

Army Response: Clarification and agree. It is acknowledged that the specified language is from the soil section and not the sediment section of Ohio EPA's Ecological Risk Guidance. While it may not always apply, considerations for soil are often assumed to be applicable to sediment, especially in the

case of ditches or intermittent surface water. Although the guidance specifically cites soil, it is reasonable to consider magnitude of exceedance for sediment, as it is not the only line of evidence used for dismissal of sediment COPECs in Section 7.3.3.6. Please also see the next comment response concerning other mitigating information presented in the ERA from the Ravenna Army Ammunition Plant Facility-Wide Biological and Water Quality Study (November, 2005).

In addition, this approach was included to comply with the ERA guidance materials agreed to amongst the Army and Ohio EPA in September 2011. Specifically, in the "List of Possible Evaluation and Refinement Factors for Inclusion in the Unified Ecological Risk Assessment Process for PBA08 Remedial Investigations", one of the refinement factors was "Magnitude of ESV exceedance (ratios of ESV to chemical concentration)".

As it is reasonable to consider magnitude of exceedance for sediment and to consider previously approved guidance materials, it is recommended that Section 7.3.3.6 remain as presented.

11) The Level II Ecological Risk Assessment (aka Step 3A) discussed throughout Section 7.3.3.6 and summarized on page 7-54, indicates a few COPEC in the surface water and Active Channel Area sediments in exceedance of ecological screening levels (ESV) which require further evaluation. While there have been improvements in concentrations between the 2000 and the PBA08 sampling events, copper, silver, and chromium are still present in sediment above ESV and Ohio EPA Sediment Reference Values (SRV). Additionally, aluminum, copper, and lead are detected in surface water above their respective ESVs (no Outside Mixing Zone Average "OMZA" available). Finally, nitrate is detected 2.1 times above the MCL (no ESV value available) in the West Ditch. However, for COEPCs that are not persistent, bioaccumulative and toxic, a qualitative survey of the health of the habitat and ecological populations can be used to demonstrate compliance with ecological risk. This information may be present in the Ravenna Army Ammunition Plant Facility-Wide Biological and Water Quality Study (November, 2005); this document should be used to demonstrate ecological risk does not require a Feasibility Study, as applicable.

Army Response: Clarification. The 2003 Facility-wide Biological and Water Quality Study (USACE 2005a) is referenced in the text. Results from one stream sampling location (S-8) and two of the ponds (Upper Cobbs Pond and Lower Cobbs Pond) that were sampled in the FWBWQS and in the vicinity and downstream of Load Line 12 were used to demonstrate lack of ecological risk. These details are presented in Section 7.3.2.3 (pages 7-35 to 7-39). The overall FWBWQS results also are summarized on page 7-56 with respect to Step 3A, noting the following: "The results indicated that both Upper Cobbs Pond and Lower Cobbs Pond are not currently affected by contamination from activities that occurred at Camp Ravenna when it was in operation. Thus, off-site migration of contamination from Load Line 12 does not appear to be a concern."

12) In Table H-10, The US EPA Region 5 ecological screening level for polychlorinated biphenyls (PCBs) (59.7 ug/kg) can be used as the ESV for PBC-1254 instead of listing the ESV as "no ESV".

Army Response: Agree. The ESV for PCBs (59.8 ug/kg) will be added to the table for PCB-1254 and the text will be revised to reflect this change. Please note that the USEPA Region 5 ESV is 59.8 ug/kg and not the 59.7 ug/kg indicated in the comment.

General Risk Assessment Comments

13) Arsenic can be removed from the non-cancer Sum of Ratios (SOR) calculations (Table G-10), because it is established in Section 7.2.6: Identification of COCs for Potential Remediation that arsenic sediment concentrations are in line with Ohio sediment background concentrations.

Army Response: Clarification. In the step-wise process, Table G-10 provided the non-cancer SOR calculations discussed in Section 7.2.4.2 Identification of COCs for Unrestricted (Residential) Land Use. Section 7.2.6 further evaluates COCs identified in the evaluation steps, including the step presented in Section 7.2.4.2, to determine if remediation is required.

Accordingly, COCs eliminated in Section 7.2.6 should not be removed from Table G-10 that was established in the preceding Section 7.2.4.2.

14) In reviewing the Human Health Risk Assessment (HHRA), it became clear the "average" concentrations provided in the table are not the 95% Upper Confidence Limit (UCL) of the arithmetic mean, which are used as an alternative EPC. This was discovered when the arsenic and cobalt sediment EPC provided for the active area channel in Table G-9 were not the same "averages" reported in Table G-2. Per the FWHHRAM, the EPC is the maximum detected value or the 95% UCL in a HHRA, and thus the average has little meaning in the human health risk assessment. Thus, the average should either be omitted from the HHRA tables, or meaning of the term "average" should be clarified in the HHRA tables, with a revised column heading or table footnote to better streamline the risk assessment review. Also, the report sheets from the software (usually ProUCL) used to calculate the 95% UCLs need to be submitted for review and to have as part of the public record.

Army Response: Agree. The average concentrations presented in Tables G-1 to G-5 and G-8 are the sample averages for the data set and are not used for the EPCs presented in Tables G-5 to G-10. Rather, the EPCs are 95% UCL on the arithmetic mean or the MDC because of the uncertainly associated with estimating the true population average.

The presentation of the average concentrations in Tables G-1 to G-5 and G-8 are provided consistent with previously approved RI Reports. These average concentrations are not used as the EPC and are not referenced within the HHRA, rather they are simply part of the standard presentation of summary statistics (frequency of detection, min, max, average). The 95% UCLs were calculated using the equations specified in the RVAAP's Facility Wide Human Health Risk Assessor Manual.

Accordingly, the following footnote has been added to Tables G-1 to G-5 and G-8:

"The Average Result concentration presented in this table is the arithmetic average. This average concentration is not equivalent to the EPC used in the HHRA."

ProUCL was not used, rather they were generated by SAS. Consequently, there are no spreadsheets showing calculations to include in the report.

Executive Summary

15) Revisions to the Executive Summary are recommended to address the comments noted above. As noted, some statements in the executive summary are inconsistent with the information provided in the report sections.

Army Response: Agree. Revisions to the document will be reflected in the Executive Summary.

Ohio Environmental Protection Agency

John R. Kasich, Governor
Mary Taylor, Lt. Governor
Craig W. Butler, Director

October 24, 2016

Re: US Army Ravenna Ammunition Plt RVAAP
Remediation Response
Project records
Remedial Response
Portage County
267000859030

Mr. Mark Leeper
Chief (Acting)
Cleanup and Restoration Branch
Army National Guard Directorate
111 South George Mason Drive
Arlington, VA 22204

Subject: Comments on the "Draft Phase III Remedial Investigation Report for Wet Sediment and Surface Water at Load Line 12 for the Former Ravenna Army Ammunition Plant (RVAAP)" Document

Dear Mr. Leeper:

Below are the Ohio Environmental Protection Agency's (Ohio EPA's) comments from the review of the Revised Draft Phase III Remedial Investigation for Load Line 12 (LL12) Wet Sediment and Surface Water. LL12 has undergone previous assessments, evaluations and removals. This evaluation is a focused evaluation of existing data collected from LL12. This document requires incorporation of the comments below and resubmittal to Ohio EPA prior to approval.

Section 4. Site Assessments, Removal Actions, Investigations, and Data Assembly

1) Figure 4-3. The process to identify Chemicals of Potential Concern at RVAAP shows the evaluation of the Area of Concern (AOC) in three steps. One step is a background screen, second step is a frequency of detection screen, and third step is an essential nutrient screen. The decision to remove sediments and surface water due to "infrequent" detections may be due to too few data points. The detected constituent may be reasonable based on historical use of the AOC. The exposure unit or decision unit may be too large. It is premature to remove a detection from further analysis because it does not show up in a downstream sample.

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2) In 4.3.2.2 Nature and Extent of Contamination, it notes that Figure 4-4 presents sediment and surface water locations that exceed current screening criteria. However, Figure 4-4 label indicates the figure contains all LL12 Remedial Investigation (RI) sample locations.

Section 6.0 Table 6-5 Summary of AT123D Modeling Results

3) The table references the "Resident Farmer Adult Facility Wide Cleanup Goal (FWCUG)". According to the USACE September 2013 Technical Memorandum of Land Uses and FWCUG, Section III, there are two land representative receptors for unrestricted land use and military land use for RVAAP: Resident and National Guard Trainee.

4) Figure 6-3 indicates Contaminant Migration Chemical of Potential Concern (CMCOCs) identified for further Weight of Evidence Evaluation based on AT123D Modeling. These areas should be carried forward. Maximum concentrations are reflected and no lateral extent is noted.

   It is our understanding that the ground water monitoring wells in LL12 will be sampled in the near future. Depending on data results from these wells, further evaluation of both soils and sediments may be warranted. However, it is your conclusion from modeling information submitted with this Remedial Investigation (RI) which predicts there should not be an issue. If the ground water data show that there may be impacts to ground water, additional assessment may be needed.

Human Health Risk Assessment Comments: Surface Water

5) Section 7.2.6, Page 7-20 uses the rationalization that, "Because the cobalt and lead concentrations in only a few samples exceed drinking water levels and this limited shallow surface water is not a potential source of residential drinking water, cobalt and lead are not identified as Chemicals of Concern (COCs) for potential remediation for surface water".

   This statement is not consistent with how Ohio water quality standards are applied.

   a) Risk decisions should be made on exposure point concentrations (EPCs) that can be compared to standards not excluded because only a few samples are over the standards

   b) Other exposure pathways must be considered besides potable drinking pathways; such as recreational (swimming, fishing, wading, etc.). Instead, Ohio

EPA's Human Health Non-drink Surface Water Criteria should be used as an alternative standard to the drinking water standards to evaluate potential risk to residential human receptors, in order to justify not identifying these constituents as COCs for potential remediation in surface water.

6) Section 7.2.6, Page 7-20 makes the assessment that the polyaromatic hydrocarbons (PAHs) detected in surface water are from other sources (a combination of Paris Windham road runoff and Atlas Scrap Yard) based on the placement of the sample (LL12-308) within a boxed culvert up-gradient from LL12. This reasoning seems logical for LL12 given the location of the sample; however, the sample should not be discounted as being affected by Atlas Scrap Yard, because "samples collected at Atlas Scrap Yard immediately upgradient of this location reported lower PAH concentrations. Considering LL12-308 is receiving runoff not only from Atlas but also from the road, it is plausible the concentrations would be higher but that Atlas is potentially contributing to the detections.

Human Health Risk Assessment Comments: Active Area Channel Exposure Unit Sediment

7) Table G-8 identifies benzo(a)pyrene (BaP) as being detected in 5 out of 6 sediment samples, and with an exposure point concentration (0.41 mg/kg; MDC) in exceedance of the Residential Facility-Wide Clean Up Goal (FWCUG) for sediment (0.221 mg/kg). As presented, the data indicate- the COC should be carried through into a Feasibility Study (FS). As an alternative risk evaluation, the BaP data could be re-evaluated with the data collected in areas only affected by the LL12 CERCLA release (i.e., omit the LL12-308 data collected up-gradient from the load line and down-gradient from Paris Windham Road) to determine a more representative EPC from the historical activities at LL12.

8) The current data and evaluation support retaining silver as a COC for an FS, because the EPC (397 mg/kg; MDC) exceeds the residential FWCUG for sediment (386 mg/kg). While section 8.5 states silver was only detected above the residential FWCUG in one sample out of 6, the provided EPC is in exceedance of the developed FWCUG. Additionally, the Ravenna background value is 0 mg/kg (Table G-8), implying the detections are site-related. However, the 95% Upper Confidence Level (UCL) provided is 1.16E+14 (Table G-8), which appears to be a software error. It is suggested the 95% UCL be re-calculated. If the re-calculated 95% UCL cannot be used as the EPC, more data could be collected to support an additional exposure point concentration calculation.

Human Health Risk Assessment Comments: Former Settling Pond Exposure Unit Sediment

9) As stated in Section 5.0: Nature and Extent: The nature and extent of wet sediment and surface water site-related chemicals (SRCs) in environmental media at LL12 is determined using analytical data results obtained during the 1996 Phase I RI, 2000 Phase II RI, 2001 Upper and Lower Cobbs Pond RI, and 2010 and 2011 PBA08 RI. However, the frequency of detections provided in Tables G-3 and G-8 are 1/1, while figure ES-1 and the tables in Section 4.0 identify four additional samples collected in the former settling pond. Therefore, it appears only the PBA08 data were used when determining risk from the sediments in the former settling pond, which is not consistent with the other EUs. For example, the maximum reported silver detection in sediment in the active area channel EU (Table G-2) is the detect from the 2000 data set (Table 4-4), indicating the data collected outside of the PBA08 assessment were used in the active channel area sediment risk assessment. The data should be used consistently to evaluate the EUs; include the historical data in the evaluation of the sediments in the former settling pond.

Ecological Risk Assessment Comments

10) Section 7.3.3.6, Page 7-46 "Magnitude of Ecological Screening Value (ESV) Exceedance": The section misplaces language from Ohio EPA's Ecological Guidance. The language quoted is meant for soil media, while the section is discussing sediment data. The language is "if only minor exceedances are detected and other evidence can substantiate, a claim can be made that some or all of the site-associated soils have not been impacted and no additional ecological investigation in soils is warranted". This may not be appropriate for all ecological settings involving sediment, because the overlying surface water will have a different effect on chemical transport than what would happen during a release to the soil. As stated in section 3.3.5 of the ecological guidance regarding sediments in lentic and lotic surface water bodies, chemicals that exceed screening benchmark values or where screening values are not available in the hierarchy are to be retained as Chemicals of Ecological Potential Concern (COEPCs).

11) The Level II Ecological Risk Assessment (aka Step 3A) discussed throughout Section 7.3.3.6 and summarized on page 7-54, indicates a few COPEC in the surface water and Active Channel Area sediments in exceedance of ecological screening levels (ESV) which require further evaluation. While there have been improvements in concentrations between the 2000 and the PBA08 sampling

events, copper, silver, and chromium are still present in sediment above ESV and Ohio EPA Sediment Reference Values (SRV). Additionally, aluminum, copper, and lead are detected in surface water above their respective ESVs (no Outside Mixing Zone Average "OMZA" available). Finally, nitrate is detected 2.1 times above the MCL (no ESV value available) in the West Ditch. However, for COEPCs that are not persistent, bioaccumulative and toxic, a qualitative survey of the health of the habitat and ecological populations can be used to demonstrate compliance with ecological risk. This information may be present in the Ravenna Army Ammunition Plant Facility-Wide Biological and Water Quality Study (November, 2005); this document should be used to demonstrate ecological risk does not require a Feasibility Study, as applicable.

12) In Table H-10, The US EPA Region 5 ecological screening level for polychlorinated biphenyls (PCBs) (59.7 ug/kg) can be used as the ESV for PBC-1254 instead of listing the ESV as "no ESV".

General Risk Assessment Comments

13) Arsenic can be removed from the non-cancer Sum of Ratios (SOR) calculations (Table G-10), because it is established in Section 7.2.6: Identification of COCs for Potential Remediation that arsenic sediment concentrations are in line with Ohio sediment background concentrations.

14) In reviewing the Human Health Risk Assessment (HHRA), it became clear the "average" concentrations provided in the table are not the 95% Upper Confidence Limit (UCL) of the arithmetic mean, which are used as an alternative EPC. This was discovered when the arsenic and cobalt sediment EPC provided for the active area channel in Table G-9 were not the same "averages" reported in Table G-2. Per the FWHHRAM, the EPC is the maximum detected value or the 95% UCL in a HHRA, and thus the average has little meaning in the human health risk assessment. Thus, the average should either be omitted from the HHRA tables, or meaning of the term "average" should be clarified in the HHRA tables, with a revised column heading or table footnote to better streamline the risk assessment review. Also, the report sheets from the software (usually ProUCL) used to calculate the 95% UCLs need to be submitted for review and to have as part of the public record.

Executive Summary

15) Revisions to the Executive Summary are recommended to address the comments noted above. As noted, some statements in the executive summary are inconsistent with the information provided in the report sections.

Sincerely,

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