

Ohio Environmental Protection Agency (Ohio EPA)
And
Ravenna Army Ammunition Plant (RVAAP)
2018 Correspondences

**STATE OF OHIO
ADJUTANT GENERAL'S DEPARTMENT
CAMP JAMES A. GARFIELD JOINT MILITARY TRAINING CENTER
1438 State Route 534 SW
Newton Falls, OH 44444**

9 November 2018

Ohio Environmental Protection Agency
Division of Materials and Waste Management
Attn: Mr. Jerry Parker, Environmental Engineer
2110 East Aurora Road
Twinsburg, Ohio 44087-1924

RE: Fourth Quarter 2018 Ramsdell Quarry Landfill Quarterly Status Report, OAC Rule 3745-27-14(A)(4) – Post-closure Care of Sanitary Landfills, Camp James A. Garfield (formerly Camp Ravenna), Portage and Trumbull Counties, Ohio

Dear Mr. Parker,

On behalf of the Ohio Army National Guard (OHARNG), a Post-Closure Quarterly Inspection of the subject landfill was conducted on 9 November 2018 by Mr. Allan Brillinger from Chenega Tri-Services, LLC (see attached "Closed MSW Landfill Inspection Checklist"). In conjunction with the inspection, Jack Madved of the Portage County Combined General Health District also conducted a quarterly inspection on 8 November 2018, a copy of which will be submitted to the Ohio EPA by Mr. Madved.

The attached Closed MSW Landfill Inspection Checklist indicates that the subject Landfill is in compliance with applicable regulations contained in OAC Rules 3745-27-14(A)(1 through 7). The annual post-closure cost estimate for 2018 will be submitted prior to 1 April 2019.

If you have any further questions or require further clarification concerning this subject, please feel free to contact the undersigned at (614) 336-6568 or timothy.m.morgan.nfg@mail.mil at any time. Thank you for your time and consideration in this matter.

Sincerely,



Timothy M. Morgan
State Environmental Supervisor

cc: Katie Tait – OHARNG, Camp James A. Garfield
Brad Kline – OHARNG, Camp James A. Garfield
Kevin Sedlak – ARNG Camp James A. Garfield
Bob Princic – Ohio EPA, DERR
Nat Peters – USACE Louisville
Jack Madved – Portage County Combined Health District

Attachment: Closed MSW Landfill Inspection Checklist for Ramsdell Quarry Landfill

Closed MSW Landfill Inspection Checklist

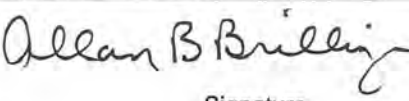
Facility Name	Ramsdell Quarry Landfill		
Address	Camp James A. Garfield, 1438 State Route 534 SW, Newton Falls, Ohio 44444		
Date	November 8, 2018	Time	11:30 AM
Inspection Representatives			
Facility	Al Brillinger (Chenega Tri-Services, LLC)		
Health District	Jack Madved, Justin Rechichar, Mary Helen Smith (Portage County Combined General Health District)		
Ohio EPA			
Other	Brad Kline (OHARNG)		

Inspection Type	Reason for Inspection	
<input checked="" type="checkbox"/> Comprehensive	<input type="checkbox"/> Required	<input checked="" type="checkbox"/> Other
<input type="checkbox"/> Focused	<input type="checkbox"/> Re-Inspection	Post-closure quarterly inspection

Is the above site being operated in compliance with the following regulations? Please mark the box in the appropriate column to denote compliance status. Marking the box in the NO column indicates that a violation has been noted. Please mark the N/A box if not applicable to this location. This checklist is not all inclusive of regulations applicable to closed municipal solid waste landfills.

Y	N	N/A		Y	N	N/A	
			3745-27-14 Post closure care of MSW Landfills				
			(A) Post-closure care activities				
X			(1) Leachate management, surface water management, explosive gas extraction and monitoring, ground water monitoring system	X			(5) Monitoring and reporting requirements of OAC 3745-27-10, 3745-27-12, 3745-76
				X			(6) Annual report
X			(2) Integrity of cap system	X			(7) Record keeping
X			(3) Repair leachate outbreaks	X			(D) Facility access: Provide access to facility for Ohio EPA and local health department inspections
X			(4) Quarterly inspections-report to Ohio EPA within 15 days				

Comments: - Weather during inspection on Nov. 8, 2018 was cloudy, 39 degrees F.
 - In reference to OAC Rule 3745-27-14(A)(1), the facility has no leachate and surface water management systems, and no explosive gas extraction and monitoring systems.
 - In reference to OAC Rule 3745-27-14(A)(1), nine groundwater monitoring wells are in place at or around the facility due to CERCLA requirements. Groundwater monitoring is done in accordance with the 10 June 2004 Director's Final Findings and Orders as part of the Facility-Wide Groundwater Monitoring Program regulated under CERCLA.
 - Annual mowing of landfill was conducted in September 2018.
 - In reference to OAC Rule 3745-27-14(A)(6), the 2018 annual post-closure cost estimate will be submitted prior to 1 April 2019. - Overall condition of landfill is very good, no issues were noted.

Allan B. Brillinger, Chenega Tri-Services, LLC		Nov. 8, 2018
Print Name of Inspector Completing Form		Signature



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

July 9, 2018

Mr. Timothy Morgan
Fort Ohio Environmental Supervisor
Camp Ravenna Joint Military Training Center
1438 State Route 534 SW
Newton Falls, OH 44444

**RE: Ramsdell Quarry Landfill
Compliance Review
Letter of Compliance
Municipal Solid Waste Landfill
Portage County
MSWL020352**

Subject: Annual Report

Dear Mr. Morgan:

On March 7, 2018, the Ohio Environmental Protection Agency (Ohio EPA), Division of Materials and Waste Management (DMWM), Northeast District Office (NEDO) received the 2017 annual operational report for the Ramsdell Quarry Landfill. The facility is located on the Camp Ravenna Joint Military Training Center, Windham Township, Portage County, Ohio.

The report was submitted in accordance with Ohio Administrative Code Rule 3745-27-14(A)(6). Based on a review of the report in accordance with the rule and all applicable information, Ohio EPA found the report to be complete and no deficiencies were noted.

Nothing in this letter shall be construed to authorize any waiver from the requirements of any applicable state or federal laws or regulations. This letter shall not be interpreted to release the Ramsdell Quarry Landfill from responsibility under Chapters 3704, 3714, 3734, or 6111 of the Ohio Revised Code or under the Federal Clean Water or Comprehensive Environmental Response, Compensation, and Liability Acts for remedying conditions resulting from any release of contaminants to the environment.

If you have any questions and/or comments, please feel free to contact me directly at (330) 963-1186 or electronically at jerry.parker@epa.ohio.gov. Future electronic submittals should be submitted via DMWM-NEDO's secure file sharing site: https://fileshare.epa.ohio.gov/filedrop/nedo_dmwm_submittals.

Sincerely,

Jerry L. Parker
Environmental Engineer
Division of Materials and Waste Management

JLP:cla

ec: Joshua Adams, Ohio EPA, NEDO, DMWM
Jack Madved, Portage County Board of Health

Project ID #8410



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

August 13, 2018

Mr. David Connolly
Army National Guard Directorate
Environmental Programs Division
ARNG-ILE-CR
111 South George Mason Drive
Arlington, VA 22204

**Re: US Army Ravenna Ammunition Plt RVAAP
Remediation Response
Project records
Remedial Response
Portage County
267000859238**

Subject: Review of the "Consumption Report for MPPEH Demolition Event 2, Time Critical Removal Action at Open Demolition Area #2 (ODA2)" at the Former Ravenna Army Ammunition Plant, Portage and Trumbull Counties, Ohio: Dated June 21, 2018 (Work Activity No. 267000859238)

Dear Mr. Connolly:

The Ohio Environmental Protection Agency (Ohio EPA), Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR) has received and reviewed the document entitled, "Consumption Report for MPPEH Demolition Event 2, Time Critical Removal Action at Open Demolition Area #2 (ODA2)" dated June 21, 2018. This document, received by Ohio EPA's NEDO on July 31, 2018, was prepared by the US Army Corps of Engineers (USACE) – Baltimore District. There are no comments from Ohio EPA.

If you have any questions or concerns, please do not hesitate to contact me at (330) 963-1235.

Sincerely,

A handwritten signature in black ink, appearing to read "Nicholas Roope", written over a horizontal line.

Nicholas Roope
Site Coordinator
Division of Environmental Response and Revitalization

NCR/nvp

ec: Nat Peters, USACE, Louisville District
Craig Coombs, USACE, Louisville District
Katie Tait/Kevin Sedlak, OHARNG RTLS
Rebecca Shreffler Chenaga
David Connolly, ARNG
Mark Johnson, Ohio EPA, NEDO DERR
Bob Princic, Ohio EPA, NEDO DERR
Tom Schneider, Ohio EPA, SWDO DERR

RECEIVED
14 AUG 2018



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

July 5, 2018

Re: **US Army Ravenna Ammunition Plt RVAAP
Remediation Response
Plans
Remedial Response
Portage County
267000859238**

Mr. David Connolly
Army National Guard Directorate
Environmental Programs Division
ARNG-ILE-CR
111 South George Mason Drive
Arlington, VA 22204

Subject: Review of the "Material Potentially Presenting an Explosive Hazard (MPPEH) Demolition Notification" at the Former Ravenna Army Ammunition Plant, Portage and Trumbull Counties, Ohio: Dated June 5, 2018 (Work Activity No. 267000859238)

Dear Mr. Connolly:

The Ohio Environmental Protection Agency (Ohio EPA), Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR) has received and reviewed the document entitled, "Material Potentially Presenting an Explosive Hazard (MPPEH) Demolition Notification" dated June 5, 2018. This document, received by Ohio EPA's NEDO on June 7, 2018, was prepared by the US Army Corps of Engineers (USACE) – Baltimore District. There are no comments from Ohio EPA. Please proceed with the actions specified in the notification form.

If you have any questions or concerns, please do not hesitate to contact me at (330) 963-1235.

Sincerely,

A handwritten signature in black ink, appearing to read "Nicholas Roope".

Nicholas Roope
Site Coordinator
Division of Environmental Response and Revitalization

NCR/nvp

ec: Nat Peters, USACE, Louisville District
Craig Coombs, USACE, Louisville District
Katie Tait/Kevin Sedlak, OHARNG RTLS
Rebecca Shreffler Chenega
David Connolly, ARNG
Mark Johnson, Ohio EPA, NEDO DERR
Bob Princic, Ohio EPA, NEDO DERR
Tom Schneider, Ohio EPA, SWDO DERR

RECEIVED
20 JUL 2018



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

August 30, 2018

Mr. David Connolly
RVAAP Restoration Program Manager
Army National Guard Directorate
National Guard Bureau
111 South George Mason Drive
Arlington, VA 22204-1373

Re: **US Army Ravenna Ammunition Plant RVAAP
Director's Authorization
Correspondence
Remedial Response
Portage County
267000859138**

Subject: Applicability of Ohio Administrative Code 3745-27-13 at the Proposed Multi-Purpose Machine Gun (MPMG) Range Buried Solid Waste Management RVAAP-05, Winklepeck Burning Grounds (267-000859-138), Former Ravenna Army Ammunition Plant/Camp Ravenna

Dear Mr. Connolly:

On Monday August 13, 2018, representatives from the Ohio Environmental Protection Agency (Ohio EPA) and the Ohio Army National Guard (OHARNG) had a conference call to discuss the construction activities for the Multi-Purpose Machine Gun (MPMG) Range at the Winklepeck Burning Grounds (WBG) Area of Concern (AOC) and the applicability of Ohio Administrative Code (OAC) 3745-27-13.

Multi-Purpose Machine Gun (MPMG) Range Construction

OHARNG plans to begin construction activities of the MPMG Range. Construction activities are planned to begin as early as Fall/Winter 2018. Construction of the MPMG Range will result in filling, grading and excavation activities on the WBG AOC. During CERCLA remedial activities conducted at WBG AOC, hazardous and solid wastes have been encountered, removed and disposed of off-property. These removal activities were conducted to address removal of soils that exceed the site-wide cleanup goals.

With the construction of the MPMG, it is anticipated that the construction activities will result in filling, grading and excavating on land where solid wastes were disposed on the WBG AOC.

Applicability of OAC 3745-27-13

Because Ohio EPA and the United States Department of the Army have a 2004 Director's Final Findings and Orders in place, the provision under OAC 3745-27-13(C)(2)(c) applies. This provision states that OAC 3745-27-13 does not apply to filling, grading, excavating, building, drilling, or mining at sites subject to either a written agreement entered into by the director with the federal government or a final order issued by the director; and under which a person will perform corrective or remedial investigation or action, ground water investigation, maintenance action to protect a remedy, or other investigation or action to abate air or water pollution or soil contamination, or to protect public health and safety under Chapter 3734, 3746 or 6111 of the Revised Code.

RECEIVED
31 AUG 2018

MPMG Range Environmental Workplan

It is Ohio EPA's understanding that OHARNG created an environmental workplan for this project. Ohio EPA requests OHARNG provide a summary of the activities planned for construction of the MPMG Range. We anticipate that the workplan describes the management of wastes that may include but are not limited to Discarded Military Munitions (DMM), Munitions Constituents (MC), Munitions and Explosives of Concern (MEC), or Unexploded Ordnance (UXO) as well as possible Contaminants, as defined in the 2004 Orders, that may be encountered during the MPMG Range construction activities.

Please make sure the environmental workplan includes:

- Map that shows the proposed layout for the MPMG range on the WBG AOC;
- Describe the proposed filling, grading excavating, building, drilling, or mining. Provide details of where cuts and fills are proposed. Ensure the existing monitoring wells are identified on the map and steps are made to ensure the monitoring wells are not damaged during the construction activities.
- Controls of air emissions, control surface water run-on/run-off, explosive and gas migration and protection of ground water.
- Waste characterization, management and disposal plan; and
- Worker safety.

ACTION ITEMS:

Ohio EPA requests you submit a copy of this environmental workplan for the MPMG Range project prior to implementing the MPMG construction on the WBG AOC. Ohio EPA's approval of this workplan is not required prior to starting this work.

Within 30 days of completion of the MPMG Range Construction, provide Ohio EPA with a summary report describing if wastes were encountered, and how they were managed and disposed. Include disposal manifests in this summary report. If wastes were encountered but remains in place, provide a figure showing the location, depth, estimated volume and nature of wastes.

Ohio EPA's Northeast District Office staff are consulting with our legal office and Central Office management staff regarding the applicability of OAC 3745-37-13(C)(2)(c) to other areas on the Ravenna Army Ammunitions Plant (RVAAP).

If you have any questions or concerns, please do not hesitate to contact me at (330) 963-1293.

Sincerely,



Mark S. Johnson Jr., Environmental Manager
Division of Environmental Response and Revitalization

MJ/nvp

ec: Kevin Sedlak, ARNG-ILE, Camp Ravenna
David Connolly, Army National Guard
Craig Coombs, USACE, Louisville District
Bob Princic, Ohio EPA, NEDO-DERR

Katie Tate, OHARNG, Camp Ravenna
Timothy Morgan, OHARNG, Camp Ravenna
Tom Schneider, Ohio EPA, SWDO-DERR
Mark Johnson, Ohio EPA, NEDO, DERR



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

June 5, 2018

LTC James Crowley
ARNG-IED
ARNG Directorate
111 South George Mason Drive
Arlington, VA 22204

Re: **US Army Ravenna Ammunition Plt RVAAP
Remediation Response
Project records
Remedial Response
Portage County
267000859029**

Subject: Approval of the "Final FY 2017 Fourth Quarter Land Use Control Inspection, RVAAP-05 Winklepeck Burning Grounds" – Camp Ravenna Joint Military Training Center at the Former Ravenna Army Ammunition Plant in Portage and Trumbull Counties, Ohio, Dated May 21, 2018 (Work Activity No. 267000859029)

Dear LTC Crowley:

The Ohio Environmental Protection Agency (Ohio EPA), Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR) has received and reviewed the document entitled, "*Final FY 2017 Fourth Quarter Land Use Control Inspection, RVAAP-05 Winklepeck Burning Grounds*," dated June 27, 2017. This document, received by Ohio EPA's NEDO on May 21, 2018, was prepared for the U.S. Army Corps of Engineers (USACE) Louisville District, by Vista Sciences Corporation.

This document was reviewed by personnel from Ohio EPA's DERR. Pursuant to the Director's Findings and Orders paragraph 39 (b), the response to Ohio EPA comments are satisfactory and the document is accepted in its final format. If you have any questions or concerns, please do not hesitate to contact me at (330) 963-1235.

Sincerely,

A handwritten signature in black ink, appearing to read "Nicholas Roope", is written over a horizontal line.

Nicholas Roope
Site Coordinator
Division of Environmental Response and Revitalization

NCR/nvp

cc: Craig Coombs, USACE, Louisville District
Shreffler/Harris, Camp Ravenna Environmental Office, Vista Sciences

ec: Mark Johnson, Ohio EPA, NEDO DERR
Bob Princic, Ohio EPA, NEDO DERR
Tom Schneider, Ohio EPA, SWDO DERR
Katie Tait/Kevin Sedlak, Camp Ravenna Environmental Office

RECEIVED
06 JUN 2018



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

April 28, 2017

Mr. Mark Leeper, P.G., MBA
Cleanup and Restoration Branch
ARNG Directorate
Environmental Programs Division
111 South George Mason Drive
Arlington, VA 22204

Re: **US Army Ravenna Ammunition Plt RVAAP
Remediation Response
Project records
Remedial Response
Portage County
267000859029**

Subject: Approval of the "Final FY 2017 Second Quarter Land Use Control Inspection, RVAAP-05 Winklepeck Burning Grounds, at the Former Ravenna Army Ammunition Plant, Ravenna, Ohio," Dated April 12, 2017

Dear Mr. Leeper:

The Ohio Environmental Protection Agency (Ohio EPA), Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR) has received and reviewed the document entitled, "*Final FY 2017 Second Quarter Land Use Control Inspection, RVAAP-05 Winklepeck Burning Grounds*," dated April 12, 2017. This document, received by Ohio EPA's NEDO on April 14, 2017, was prepared for the U.S. Army Corps of Engineers (USACE) Louisville District, by Vista Sciences Corporation.

This document was reviewed by personnel from Ohio EPA's DERR. Pursuant to the Director's Findings and Orders paragraph 39 (b), the response to Ohio EPA comments are satisfactory and the document is approved in its final format. If you have any questions or concerns, please do not hesitate to contact me at (330) 963-1235.

Sincerely,

Nicholas Roope
Site Coordinator
Division of Environmental Response and Revitalization

NCR/nvr

cc: Craig Coombs, USACE, Louisville District
Katie Tait/Kevin Sedlak, Camp Ravenna Environmental Office, Newton Falls
Shreffler/Harris, Camp Ravenna Environmental Office, Vista Sciences, Newton Falls

ec: Bob Princic, Ohio EPA, NEDO, DERR
Tom Schneider, Ohio EPA, SWDO, DERR

RECEIVED
10 MAY 2017



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

RECEIVED
3/27/2018

March 23, 2018

Mr. Mark Leeper
Team Lead
Cleanup and Restoration Branch
ARNG Directorate
111 George Mason St.
Arlington, VA 22204

Re: US Army Ravenna Ammunition Plt RVAAP
General Correspondence
Correspondence
Remedial Response
Portage County
267000859138

Subject: Final Remedial Action Completion Report for RVAAP-05 (267-000859-138)
Winklepeck Burning Grounds Former Ravenna Army Ammunition
Plant/Camp, Dated February 16, 2018, Concurrence.

Dear Mr. Leeper:

The Ohio Environmental Protection Agency (Ohio EPA) received the Final Remedial Action Completion Report for the Soil Removal Action at RVAAP-05 Winklepeck Burning Grounds.

The report outlines the recent remedial actions undertaken at Winklepeck Burning Grounds. These more recent remedial actions were conducted to prevent exposure to soil with contaminant concentrations greater than the cleanup goals at Pad 38, Pads 61/61A and Pads 66/67.

The Final Remedial Action Completion Report was submitted to also verify that the cleanup actions undertaken at Winklepeck in these areas resulted in these areas meeting the commercial/industrial land use cleanup goals.

The verification data provided to Ohio EPA show the concentrations of the COCs remaining in these areas are below the cleanup goals.

If you have any questions or concerns, please feel free to contact me at (330) 963-1201 or at susan.netzly-watkins@epa.ohio.gov.

Sincerely,

Sue Netzly-Watkins, Environmental Specialist
Ohio EPA - Division of Environmental Response and Revitalization

SN-W/nvp

cc: Kevin Sedlak, ARNG-ILE, Camp Ravenna
Katie Tait, OHARNG, Camp Ravenna
Pat Ryan, Leidos -REIMS
ec: Rod Beals, NEDO, DERR
Tom Schneider, SWDO, DERR
Brian Tucker, CO, DERR

Nat Peters, USACE Louisville
Gail Harris, Vista Sciences Corp
Craig Coombs, USACE- Louisville
Carrie Rasik, CO, DERR
Bob Princic, NEDO, DERR



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

RECEIVED
2/12/2018

February 7, 2018

Mr. Mark Leeper
Team Lead
Cleanup and Restoration Branch
ARNG Directorate
111 George Mason St.
Arlington, VA 22204

Re: US Army Ravenna Ammunition Plt RVAAP
General Correspondence
Correspondence
Remedial Response
Portage County
267000859138

Subject: January 5, 2018 Responses to Ohio EPA Comments to the Draft Remedial Action Completion Report for RVAAP-05 (267-000-859-138) Winklepeck Burning Grounds Former Ravenna Army Ammunition Plant/Camp, Dated November 17, 2017.

Dear Mr. Leeper:

The Ohio Environmental Protection Agency (Ohio EPA) received your responses to our comments to the Draft Remedial Action Completion Report for the Soil Removal Action at RVAAP-05 Winklepeck Burning Grounds.

The revisions to the text included in your November 2017 report; and appendices included in the January 5, 2018 responses to comment report addressed our comments. We look forward to receiving the final submittal.

If you have any questions or concerns, please feel free to contact me at (330) 963-1201 or at susan.netzly-watkins@epa.ohio.gov.

Sincerely,

Sue Netzly-Watkins
Environmental Specialist
Ohio EPA - Division of Environmental Response and Revitalization

SN-W/nvp

cc: Kevin Sedlak, ARNG-ILE, Camp Ravenna
Katie Tait, OHARNG, Camp Ravenna
Pat Ryan, Leidos -REIMS

Nat Peters, USACE Louisville
Gail Harris, Vista Sciences Corp
Craig Coombs, USACE- Louisville

ec: Rod Beals, NEDO, DERR
Tom Schneider, SWDO, DERR

Carrie Rasik, CO, DERR
Bob Princic, NEDO, DERR



December 4, 2018

Ohio Environmental Protection Agency
DERR-NEDO
Attn: Ms. Vanessa Steigerwald-Dick
2110 East Aurora Road
Twinsburg, OH 44087-1924

Subject: Ravenna Army Ammunition Plant (RVAAP) Restoration Program, Portage/Trumbull Counties, RVAAP-06 C Block Quarry, Comment Resolution on the Remedial Investigation/Feasibility Study Report (Work Activity No. 267-000-859-095)

Dear Ms. Steigerwald-Dick:

In response to the Ohio Environmental Protection Agency (Ohio EPA) letter dated August 14, 2018 regarding the *Revised Draft Remedial Investigation/Feasibility Study Report for Soil, Sediment, and Surface Water at RVAAP-06 C Block Quarry* (Revised Draft RI/FS Report), the Army acknowledges Ohio EPA concurrence with the following:

- 1) The previously provided Army responses to "General Comments," provided on letters dated March 8, 2018 and July 12, 2018; and
- 2) The updated potentiometric surface interpretation using current data, provided in a letter dated July 12, 2018.

The Ohio EPA's August 14, 2018 letter provided the following comment:

"Considering the historic disposal of waste directly onto the fractured bedrock in the quarry bottom, the Army has not demonstrated that the groundwater-to-surface water pathway is incomplete. Ohio EPA recommends the sampling of surface water and/or springs/seeps downgradient from and discharging into Sand Creek and Hinkley Creek as part of the demonstration."

As presented in the Revised Draft RI/FS Report, C Block Quarry is an area of concern within a quarry bottom that is 25 ft below the surrounding grade. Surface water is not a permanent feature within C Block Quarry, nor is there surface water flow from the AOC to neighboring surface water bodies. As such, the potential impact that C Block Quarry would have on Sand Creek and Hinkley Creek would be from lateral transport via groundwater.

During comment resolution of this Revised Draft RI/FS Report, Ohio EPA requested monitoring wells CBLmw-001, CBLmw-002, CBLmw-003, and CBLmw-004 be sampled for metals (including hexavalent chromium), PCBs, explosives, nitrate/nitrite, sulfate/sulfide, and pH. Accordingly, the Army collected groundwater samples from these monitoring wells in June 2018.

Subject: Ravenna Army Ammunition Plant (RVAAP) Restoration Program, Portage/Trumbull Counties, RVAAP-06 C Block Quarry (Work Activity No. 267-000-859-095)

A review of the data from the groundwater samples indicated the following:

- 1) Chromium was detected in monitoring well CBLmw-001 at 0.0044 mg/L in the primary sample and at 0.0023 mg/L in the field duplicate sample. Both concentrations are well below the USEPA MCL (0.1 mg/L). Chromium was not detected in the other three monitoring wells.
- 2) Hexavalent chromium was not detected in any of the samples.
- 3) PCBs were not detected in any of the samples.
- 4) Explosives were not detected in any of the samples.
- 5) Nitrate/nitrite – Nitrite was not detected in any of the samples. Nitrate was detected in all samples ranging from 0.37 mg/L in CBLmw-004 to 1.2 mg/L in CBLmw-002. These concentrations are below the MCL of 10 mg/L.
- 6) Sulfate/sulfide – Sulfide was not detected in any sample. Sulfate was detected in all samples ranging from 12 mg/L in CBLmw-001 to 30 mg/L in CBLmw-003. Sulfate does not have an enforceable MCL; however, these concentrations are below the secondary MCL of 250 mg/L.

Regarding pH at C Block Quarry, Table 1 presents the minimum, maximum, and average pH from monitoring wells CBLmw-001 to CBLmw-005 using field measurements collected from 2005 to 2018. Based on the potentiometric surface created using water level measurements from April 2017 (provided in a letter dated July 12, 2018), monitoring wells CBLmw-003 and CBLmw-004 are either considered upgradient of or not impacted by groundwater in C Block Quarry.

Table 1. C Block Quarry Monitoring Wells – pH Summary Statistics

Monitoring Well	Number of Samples	pH Statistics			
		Samples Less than pH = 6	Minimum (S.U.)	Maximum (S.U.)	Average (S.U.)
Upgradient or non-impacted monitoring wells					
CBLmw-003	8	8/8	4.73	5.93	5.37
CBLmw-004	9	8/9	4.93	6.78	5.64
Downgradient monitoring wells					
CBLmw-001	9	8/9	4.94	7.16	5.40
CBLmw-002	12	12/12	4.45	5.71	5.05
CBLmw-005	4	4/4	5.08	5.59	5.34

As shown, the pH is consistent among the upgradient, non-impacted, and downgradient monitoring wells. Consequently, it can be concluded that C Block Quarry is not negatively impacting the pH in groundwater at and downgradient of the site.

Using these lines of evidence, the Army does not believe sampling of surface water and/or springs/seeps downgradient from and discharging into Sand Creek and Hinkley Creek is warranted for further evaluation of C Block Quarry.

Subject: Ravenna Army Ammunition Plant (RVAAP) Restoration Program, Portage/Trumbull Counties,
RVAAP-06 C Block Quarry (Work Activity No. 267-000-859-095)

Upon your concurrence with this final resolution to comments, the Army will distribute the final version of this report. Please contact the undersigned at (703) 607-7589 or david.m.connolly8.civ@mail.mil if there are issues or concerns with this submission.

Sincerely,

 Date: 2018.12.04
14:40:38 -05'00'

Mr. David Connolly
RVAAP Restoration Program Manager
Army National Guard Directorate

cc: Mark Johnson, Ohio EPA, NEDO
Bob Princic, Ohio EPA, NEDO
Tom Schneider, Ohio EPA, SWDO
Tim Christman, Ohio EPA, CO
Al Muller, Ohio EPA, NEDO
Kevin Palombo, Ohio EPA, NEDO
Kevin Sedlak, ARNG, Camp Ravenna
Katie Tait, OHARNG, Camp Ravenna
Craig Coombs, USACE Louisville
Nathaniel Peters, II, USACE Louisville
Jed Thomas, Leidos
Gail Harris, Vista Sciences Corporation
Rebecca Shreffler, Chenega



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

August 14, 2018

Mr. David Connolly
Army National Guard Directorate
Environmental Programs Division
ARNG-ILE-CR
111 South George Mason Drive
Arlington, VA 22204

**Re: US Army Ammunition PLT RVAAP
Remediation Response
Project Records
Remedial Response
Portage County
267000859095**

**Subject: Ravenna Army Ammunition Plant, Portage/Trumbull Counties.
"Comment Resolution on the Revised Draft Remedial
Investigation/Feasibility Study Report for Soil, Sediment, and Surface
Water at RVAAP-06 C Block Quarry" Dated July 12, 2018**

Dear Mr. Connolly:

The Ohio Environmental Protection Agency (Ohio EPA) has received and reviewed the "Comment Resolution on the Revised Draft Remedial Investigation/Feasibility Study Report for Soil, Sediment, and Surface Water at RVAAP-06 C Block Quarry" for the Ravenna Army Ammunition Plant (RVAAP), Portage/Trumbull Counties. This document is dated July 12, 2018 and was received at Ohio EPA, Northeast District Office (NEDO) on July 16, 2018. Please find below Ohio EPA's comments on the Army's responses.

General Comments

All general comments have been adequately addressed.

Fate and Transport Model/Groundwater Comments

Considering the historic disposal of waste directly onto the fractured bedrock in the quarry bottom, the Army has not demonstrated that the ground water-to-surface water pathway is incomplete. Ohio EPA recommends the sampling of surface water and/or springs/seeps down-gradient from and discharging into Sand Creek and Hinkley Creek as part of the demonstration.

Ohio EPA agrees that the Army's submitted contaminant fate and transport SESOIL model supports a demonstration that soil leaching to ground water pathway is incomplete (with the possible exception of pH) pending confirmation of that model with the spring 2018 sample results for the C-Block Quarry wells (CBL-mw-001, CBL-mw-002, CBL-mw-



003, and CBL-mw-004). All of the C-Block wells (CBL-mw-001, CBL-mw-002, CBL-mw-003, CBL-mw-004, and CBL-mw-005) have historical pH measurements near or below 5, which illustrate the impacts of the disposal of acid wastes (e.g., pickle liquor and sulfuric acid) in C-Block Quarry. Ohio EPA agrees with the additional ground water sampling of C-Block Quarry referred to in the response. Ohio EPA is aware that that sampling event has been completed.

Ohio EPA agrees that the Army has adequately updated the potentiometric surface interpretation using current data in Figures 3-1 and 3-4.

Summary

The issue regarding surface water sampling must be resolved prior to approval of the RI/FS.

If you have any questions, please call me at (330) 963-1207.

Sincerely,



Vicki Deppisch
Environmental Scientist
Division of Environmental Response and Revitalization

VD/nvp

cc: Katie Tait/Kevin Sedlak, OHARNG RTLS
Craig Coombs, USACE
Rebecca Shreffler, Chenega
Josh Koch, ODH
Brian Ng, ARAQMD
David Connolly, ARNG
Nat Peters, USACE
Bob Princic, Ohio EPA, NEDO, DERR
Mark Johnson, Ohio EPA, NEDO, DERR
Tom Schneider, Ohio EPA, SWDO, DERR
Vanessa Steigerwald-Dick, Ohio EPA, NEDO, DERR
Tim Christman, Ohio EPA, CO, DERR
Al Muller, Ohio EPA, NEDO, DDAGW
Kevin Palombo, NEDO, DERR
Frederick Jones, Ohio EPA, CO, DAPC
Chris Williams, Ohio EPA, NEDO, DAPC



NATIONAL GUARD BUREAU

111 SOUTH GEORGE MASON DRIVE
ARLINGTON VA 22204-1373

July 12, 2018

Ohio Environmental Protection Agency
DERR-NEDO
Attn: Ms. Vanessa Steigerwald-Dick
2110 East Aurora Road
Twinsburg, OH 44087-1924

Subject: Ravenna Army Ammunition Plant (RVAAP) Restoration Program, Portage/Trumbull
Counties, RVAAP-06 C Block Quarry, Comment Resolution on the Remedial
Investigation/Feasibility Study Report (Work Activity No. 267-000-859-095)

Dear Ms. Steigerwald-Dick:

The Army appreciates your time to meet and discuss follow-up comments (dated May 17, 2018) on the *Revised Draft Remedial Investigation/Feasibility Study Report for Soil, Sediment, and Surface Water at RVAAP-06 C Block Quarry*. As discussed during the meeting on May 22, 2018, the Army is providing additional responses in this letter in accordance with the resolution achieved.

Upon your concurrence with this final resolution to comments, the Army will distribute the final version of this report. Please contact the undersigned at (703) 607-7955 or david.m.connolly8.civ@mail.mil if there are issues or concerns with this submission.

Sincerely,

Mr. David Connolly
RVAAP Restoration Program Manager
Army National Guard Directorate

cc: Mark Johnson, Ohio EPA, NEDO
Bob Princic, Ohio EPA, NEDO
Tom Schneider, Ohio EPA, SWDO
Tim Christman, Ohio EPA, CO
Al Muller, Ohio EPA, NEDO
Vicki Deppisch, Ohio EPA, NEDO
Kevin Palombo, Ohio EPA, NEDO
Kevin Sedlak, ARNG, Camp Ravenna
Katie Tait, OHARNG, Camp Ravenna
Craig Coombs, USACE Louisville
Nathaniel Peters, II, USACE Louisville
Jed Thomas, Leidos
Gail Harris, Vista Sciences Corporation

Subject: Ravenna Army Ammunition Plant (RVAAP) Restoration Program, Portage/Trumbull Counties, RVAAP-06 C Block Quarry (Work Activity No. 267-000-859-095)

REFERENCE PREVIOUS SUBMITTALS, COMMENTS, AND MEETINGS

For the reviewer's convenience and ease of reference, the Army provides the following timeline for comment response and resolution for the C Block Quarry RI/FS Report:

08/04/17 – The Army submitted the Revised Draft RI/FS for C Block Quarry.
11/28/17 – Ohio EPA provided comments on Revised Draft RI/FS Report.
03/08/18 – The Army submits responses to 11/28/17 comments.
05/18/18 – Ohio EPA provided feedback on the Army's 3/8/18 response letter.
05/22/18 – The Army conducted a resolution meeting with Ohio EPA.

RESPONSES TO GENERAL OHIO EPA COMMENTS, DATED 18 MAY 2018

Ohio EPA General Comment 5, feedback dated 5/18/18: Revise the text to incorporate the information provided in this comment response.

Army Response: Agree. Section 12.3.3 Remedial Design (Alternative 3) has been revised as follows:

“An RD will be developed prior to initiating remedial actions. This RD will outline construction permitting requirements; site preparation activities (e.g., staging and equipment storage areas, truck routes, and storm water controls); requirements for removing, controlling, and transporting ACM; extent of the excavation; sequence and description of excavation and site restoration activities; decontamination; and segregation, transportation, and disposal of various waste streams. Engineering and administrative controls (e.g., erosion and health and safety) will be developed during the active construction period to ensure remediation workers and the environment are protected. In addition, the RD will specify the sampling protocol and analytical methods to be used for asbestos analysis and chemical analysis of the soil.

As part of the development of the RD, the site will undergo a new, updated inspection to ensure exposed ACM is identified. Additionally, this RD will contain an Asbestos Soil Abatement Plan to outline requirements specific to the removal of ACM, including identifying key personnel and PPE, specifying air monitoring requirements, and stating the site control measures.”

Ohio EPA General Comment 8, feedback dated 5/18/18: Ohio EPA concurs with the Army's response for the RI/FS. However, an updated asbestos inspection will need to be conducted during the Remedial Design (RD) phase prior to implementation of the Remedial Action (RA). The condition and location of the observed ACM, as noted in the 2011 asbestos survey, needs to be reassessed, as eight years of weathering has most likely changed the condition, the location and ability to locate the material.

Army Response: Agree. The revision to Section 12.3.1 (Alternative 3, Remedial Design) is presented above in response to General Comment 5. Section 12.2.1 Surficial Asbestos-Containing Material Removal (Alternative 2) has been revised as follows:

Subject: Ravenna Army Ammunition Plant (RVAAP) Restoration Program, Portage/Trumbull Counties, RVAAP-06 C Block Quarry (Work Activity No. 267-000-859-095)

“Alternative 2 will include the removal of ACM that was observed on the ground surface at C Block Quarry. An estimated 10 yd³ of exposed ACM (e.g., transite/shingle and steel panels with block insulation and paper) were observed to be in surface soil at C Block Quarry. As part of the ACM removal, the site will undergo a new, updated inspection to ensure exposed ACM is identified.

The ACM will be removed by a ...”

Ohio EPA General Comment 9, feedback dated 5/18/18: Ohio EPA concurs with the Army’s response for the RI/FS. However, an updated asbestos inspection will need to be conducted during the Remedial Design (RD) phase prior to implementation of the Remedial Action (RA). Ohio EPA recommends that additional Seibert stakes be incorporated into the RD/RA phase to ensure high visibility of the barrier for site receptors.

Army Response: Agree. Text revisions to specify the updated asbestos inspections are presented in responses to Ohio EPA General Comments 5 and 8. As discussed during the 5/22/18 resolution meeting, Alternative 3 will not require land use controls such as Seibert stakes after implementation. However, Alternative 2 will have land use controls after implementation. Accordingly, Section 12.2.3 Land Use Controls has been revised as follows:

Section 12.2.3 Land Use Controls

Under this remedial alternative, the Army will implement the LUCs listed below to achieve the performance objectives for C Block Quarry:

- 1. Prevent Resident Receptor use of the site, as hexavalent chromium in soil above the residential RSL of 3 mg/kg will remain on-site.*
- 2. Prevent intrusive and digging activities, as friable ACM potentially exists in the subsurface soil.*
- 3. Install signs to enhance compliance with digging restrictions at the site.*
- 4. Installation of Seibert stakes to ensure high visibility of site boundary.*
- 5. Maintain the LUC training program.*

RESPONSES TO OHIO EPA COMMENTS PROVIDED ON 28 OCTOBER 2016

Ohio EPA reviewed the responses to the seven fate and transport model/ground water comments (FTGW Comments) and determined that the responses to three of the FTGW Comments (FTGW Comments 4, 5, and 7) are adequate. However, the comment responses to the remaining four FTGW Comments (FTGW Comments 1, 2, 3, and 6) are inadequate and remain a concern. Ohio EPA concurs that the SESOIL™/AT123D™ models utilized in the Draft RI/FS do not accurately predict contaminant migration, even for screening purposes beneath C Block Quarry given the hydrogeology. The use of the models for C-Block Quarry need to be resolved. The following are Ohio EPA comments on the FTGW are as follows:

Subject: Ravenna Army Ammunition Plant (RVAAP) Restoration Program, Portage/Trumbull Counties, RVAAP-06 C Block Quarry (Work Activity No. 267-000-859-095)

1. The Army has not adequately responded to Ohio EPA's FTGW Comments 1, 2, and 3 dated November 28, 2017, regarding the appropriateness of the SESOIL™/AT123D™ fate and transport model used in the RVAAP-06 C Block Quarry RI/FS Report given the hydrogeology beneath C Block Quarry. Considering that the response to Ohio EPA's FTGW Comment 4 dated November 28, 2017, acknowledges that the SESOIL™/AT123D™ does not accurately predict contaminant migration through a highly heterogeneous hydrogeologic system such as exists beneath C Block Quarry, the responses to Ohio EPA's, FTGW Comments 1, 2, and 3 dated November 28, 2017, are not adequate. Revise this section accordingly. Also, refer to Comment 2 below.

2. Ohio EPA concurs with the Army's response to FTGW Comment 4 and agrees that the SESOIL™/AT123D™ model does not accurately predict contaminant migration through a highly heterogeneous hydrogeologic system, such as exists beneath C Block Quarry. The geology beneath C Block Quarry consists of a thin layer of soil/unconsolidated material over fractured and weathered Homewood Sandstone. While part of the vadose zone consists of unconsolidated material/soil, most of the vadose zone is in the fractured and weathered Homewood Sandstone. According to Pfingston (2002), this area was also likely subject to blasting during quarrying. SESOIL™/AT123D™ are not appropriate screening tools to model fate and transport in bedrock (New Jersey DEP, 2014) or in non-homogeneous or fractured geologic media (Kauffman and McLane, 2015).

The Army can demonstrate potential for impact to ground water in evaluating ground water to surface water pathway by sampling the four RI wells (CBLmw-001, CBLmw-002, CBLmw-003, and CBL-004). The four aforementioned wells have not been sampled since 2013, and according to the 2016 RI Work Plan for Ground Water will need to be sampled to support the Facility-Wide Ground Water (FWGW) RI. Ohio EPA recommends that these four wells be sampled for the parameters specified in the 2016 RI Work Plan for Ground Water for C Block Quarry wells including: SVOCs, metals including hexavalent chromium, and PCBs. Considering the history, disposal practices and pH issues in the C Block, Ohio EPA recommends that these four wells also be sampled for: explosives, nitrate/nitrite, sulfate/sulfide, and pH. Further, Ohio EPA recommends that the four C Block Quarry RI wells be sampled for a minimum of two consecutive sampling events and be added to the list of wells to be sampled in 2018 in the Facility-Wide Ground Water Monitoring Addendum.

3. Ohio EPA concurs with the response to FTGW Comment 5. In the response, the Army acknowledges the fact that the SESOIL™/AT123D™ model does not take into account the direct disposal of wastes onto the weathered and fractured bedrock, as was reported to have been historically practiced in the 1950's and 1960's in C Block Quarry. Therefore, Ohio EPA recommends that the four C Block RI wells be added to the list of wells to be sampled in 2018 in the Facility Wide Ground Water Monitoring Addendum, as recommended in Comment 2 above.

4. The Army's response to Ohio EPA's FTGW Comment 6 dated November 28, 2017, is inadequate. The ground water flow interpretations in Figures 3, 3-1, 4, and 4-1 are incorrect. Ground water flow on the knob of the Homewood Sandstone was re-interpreted a number of years ago to be radial, and not as shown on the figures. Attached is the most recent April 2017 Potentiometric Map, which shows radial flow in that hydrostratigraphic unit in the vicinity of C Block Quarry. While the aforementioned flow map only shows one flow arrow, the potentiometric map shows an arced potentiometric line, which follows the contour of the Homewood Knob in the vicinity C Block Quarry, where ground water flow in the Homewood is radial. Ground water flow interpretations in the RI report need to be modified to accurately show ground water flow in the vicinity of C Block Quarry.

Subject: Ravenna Army Ammunition Plant (RVAAP) Restoration Program, Portage/Trumbull Counties, RVAAP-06 C Block Quarry (Work Activity No. 267-000-859-095)

5. The Army has adequately responded to Ohio EPA's Comment 7, dated November 28, 2017. The response indicates that the Geologic Bedrock Map (Figure 3-3) will be corrected to show the correct geologic units.

Army Response: As agreed during the 5/22/18 comment resolution meeting, Section 6 has been revised to present the C Block Quarry groundwater results and SESOIL modeling results. The previously presented AT123D model has been removed from the document. The revised Section 6 is attached to this response letter and includes a summary of additional C Block Quarry samples agreed to be collected under the FWGWMP.

To supplement the SESOIL modeling results now summarized in Section 6, Appendix E has been modified to now include the SESOIL model methodology, details, and results. The revised Appendix E is attached to this response letter.

The groundwater flow interpretations on Figures 3-1, 4-1, and all other applicable figures have been revised to reflect the groundwater elevations collected in April 2017 and the potentiometric map presented in the FWGWMP Annual Report for 2017. Revised Figure 3-1 is presented as an attachment to this response letter.

Subject: Ravenna Army Ammunition Plant (RVAAP) Restoration Program, Portage/Trumbull Counties,
RVAAP-06 C Block Quarry (Work Activity No. 267-000-859-095)

ATTACHMENT A.

C Block Quarry RI/FS Report – Revised Section 6

Subject: Ravenna Army Ammunition Plant (RVAAP) Restoration Program, Portage/Trumbull Counties,
RVAAP-06 C Block Quarry (Work Activity No. 267-000-859-095)

ATTACHMENT B.

C Block Quarry RI/FS Report – Revised Appendix E

Subject: Ravenna Army Ammunition Plant (RVAAP) Restoration Program, Portage/Trumbull Counties,
RVAAP-06 C Block Quarry (Work Activity No. 267-000-859-095)

ATTACHMENT C.

C Block Quarry RI/FS Report – Revised Figure 3-1

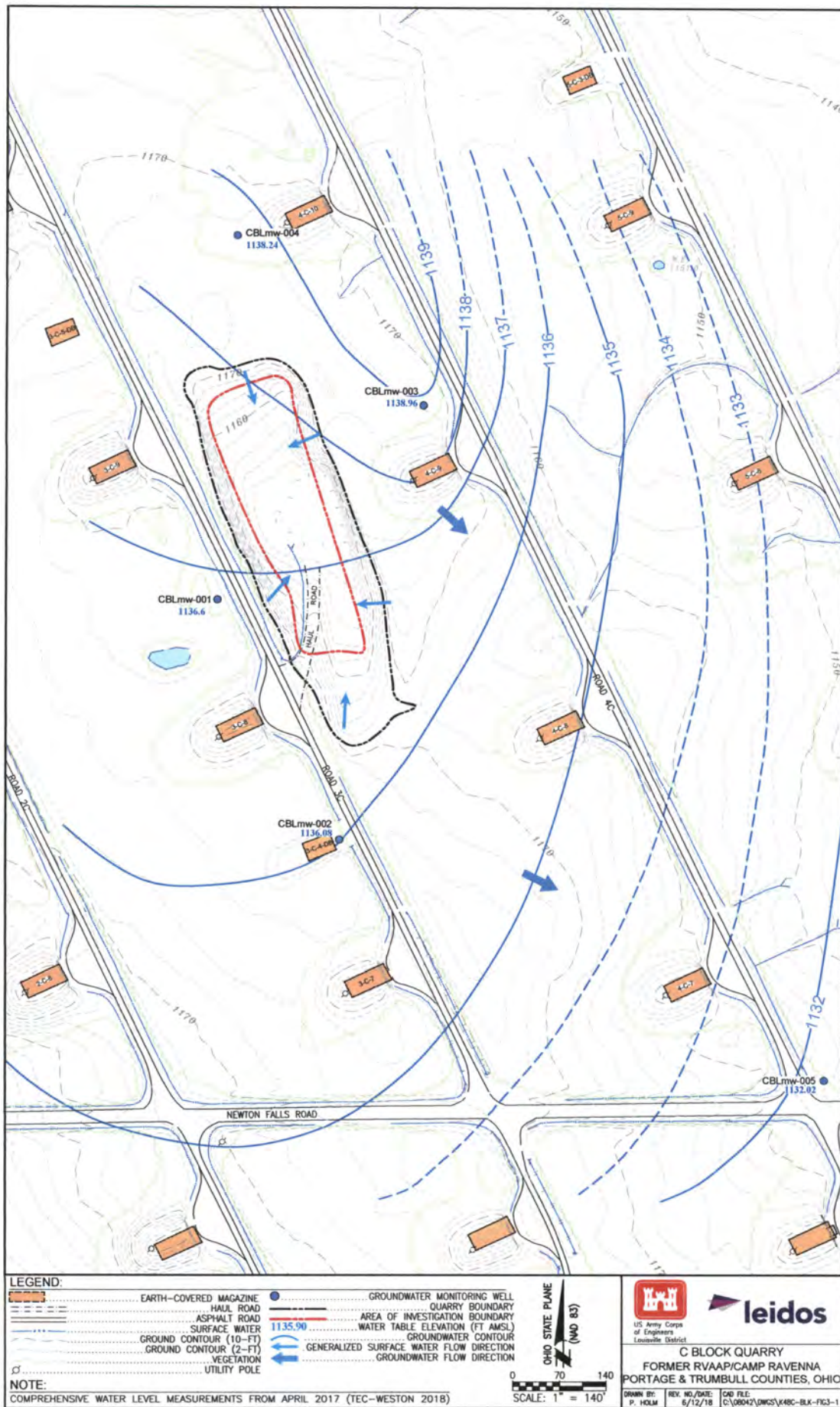


Figure 3-1. Topography, Groundwater Flow, and Surface Water Flow at C Block Quarry.

Subject: Ravenna Army Ammunition Plant (RVAAP) Restoration Program, Portage/Trumbull Counties,
RVAAP-06 C Block Quarry (Work Activity No. 267-000-859-095)

ATTACHMENT C.

C Block Quarry RI/FS Report – Revised Figure 3-1

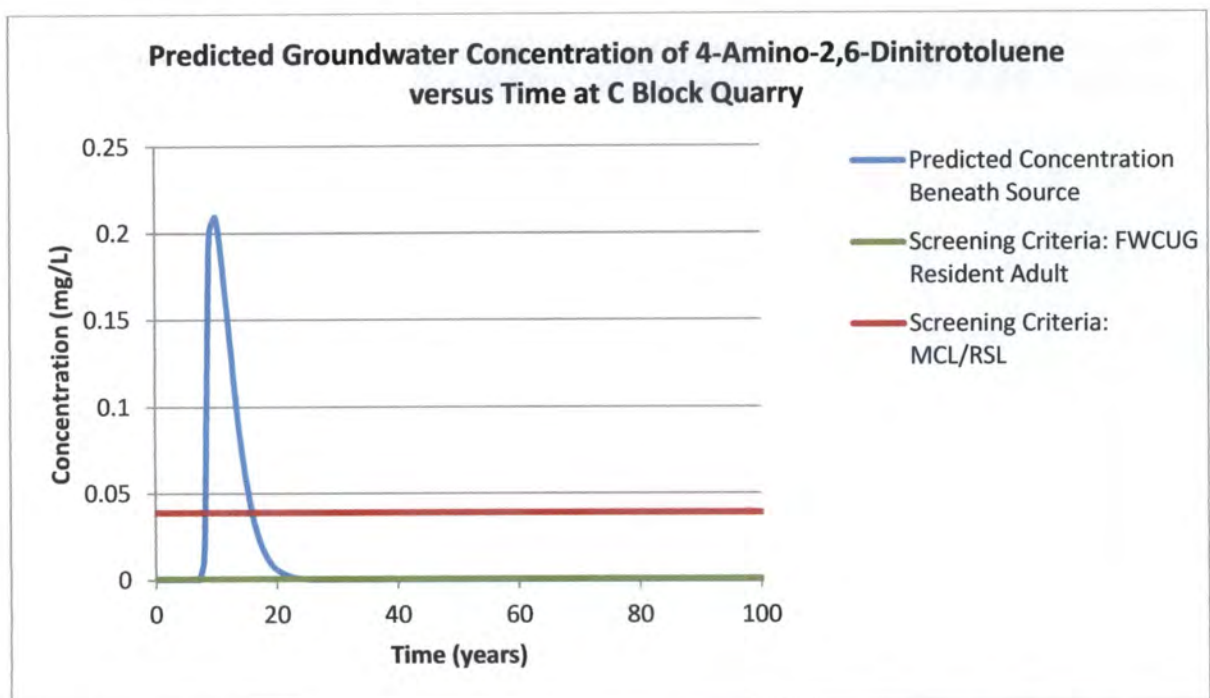


Figure E.1-7. Predicted Concentration of 4-Amino-2,6-Dinitrotoluene in Groundwater Based on SESOIL and Dilution Modeling at C Block Quarry

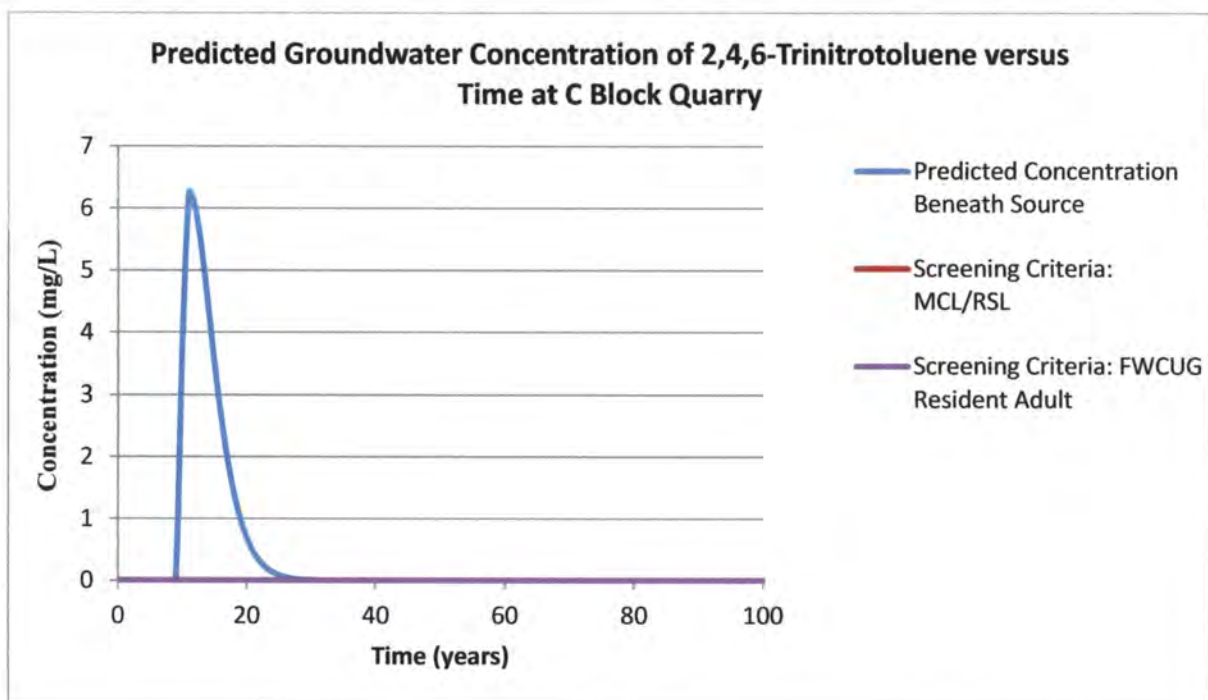


Figure E.1-5. Predicted Concentration of TNT in Groundwater Based on SESOIL and Dilution Modeling at C Block Quarry

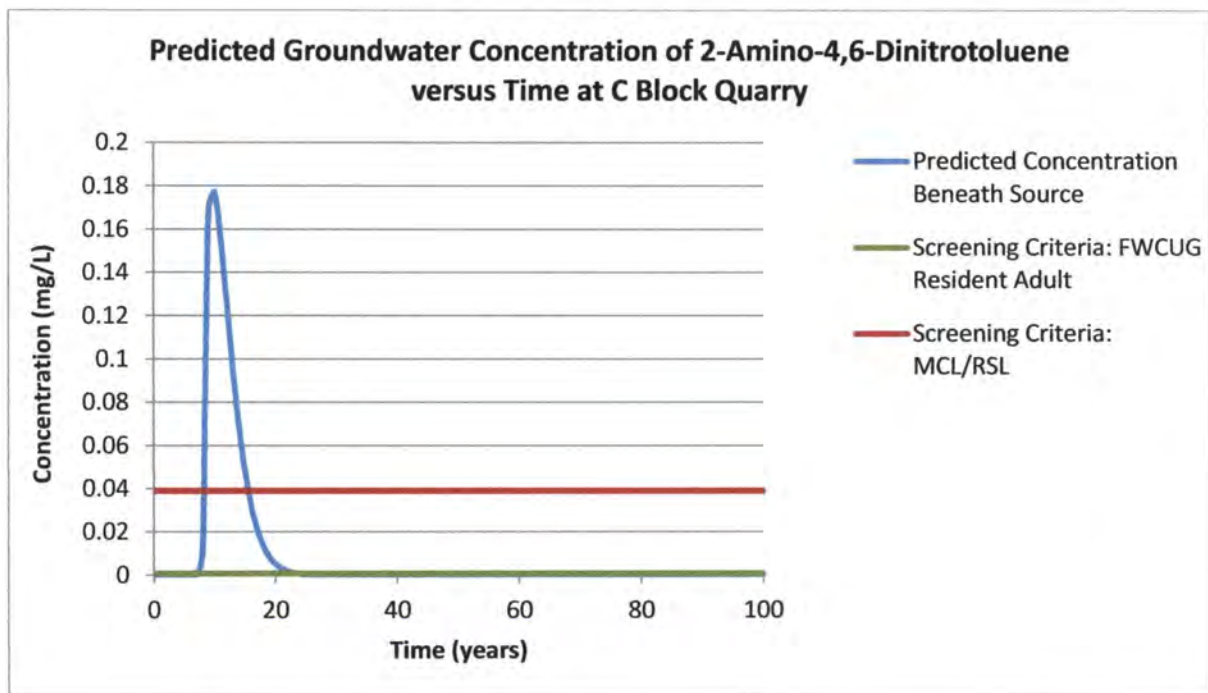
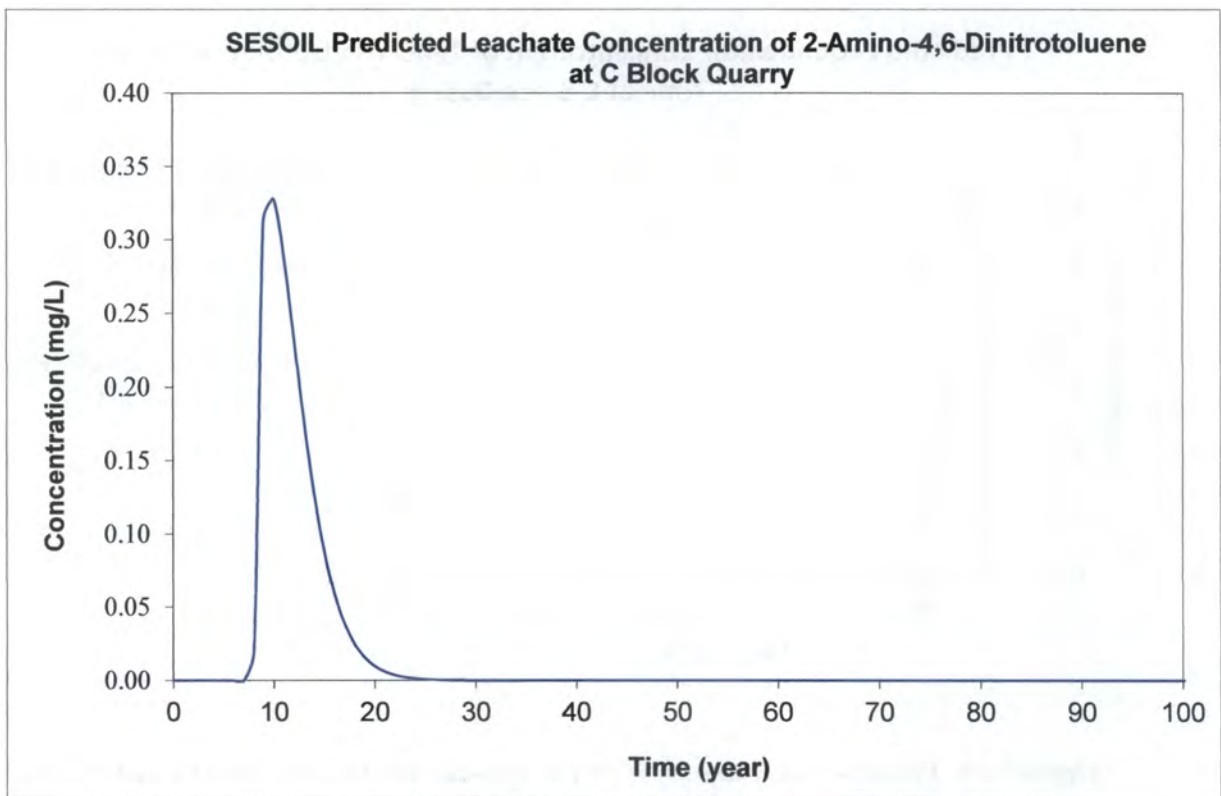
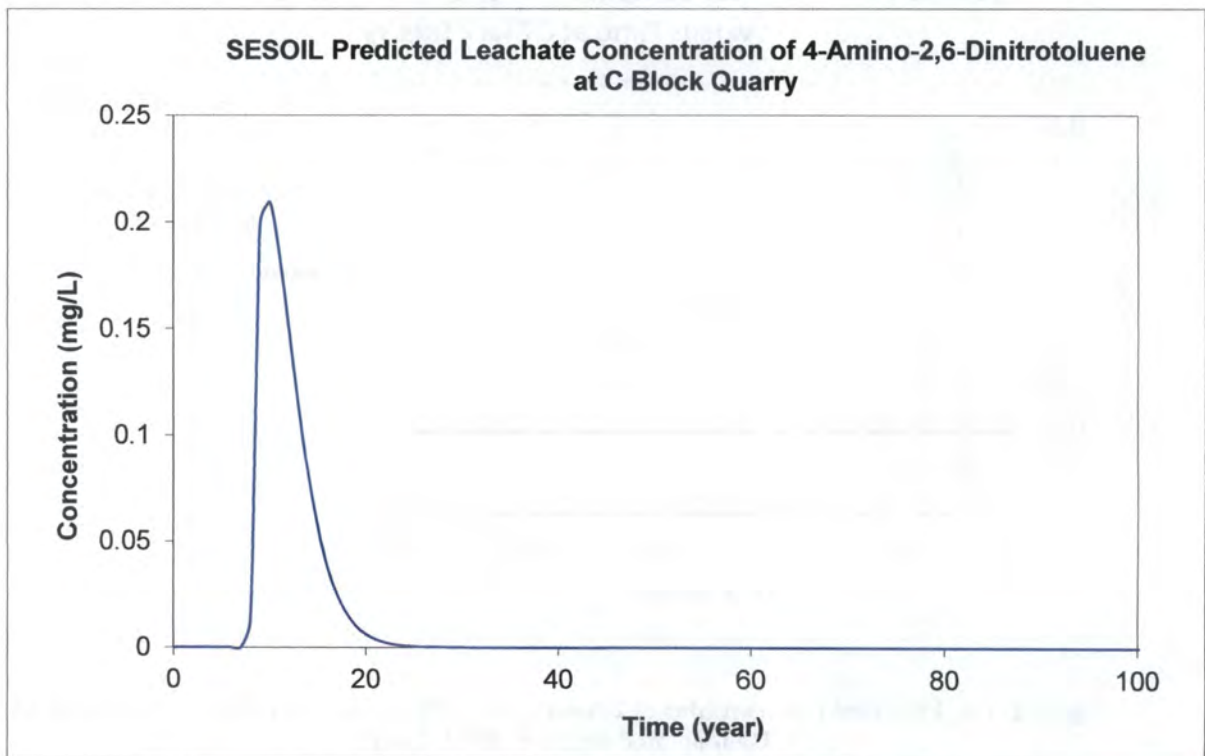


Figure E.1-6. Predicted Concentration of 2-Amino-4,6-Dinitrotoluene in Groundwater Based on Dilution Modeling at C Block Quarry



**Figure E.1-3. SESOIL Predicted Leachate Concentration at C Block Quarry –
2-Amino-4,6-Dinitrotoluene**



**Figure E.1-4. SESOIL Predicted Leachate Concentration at C Block Quarry –
4-Amino-2,6-Dinitrotoluene**

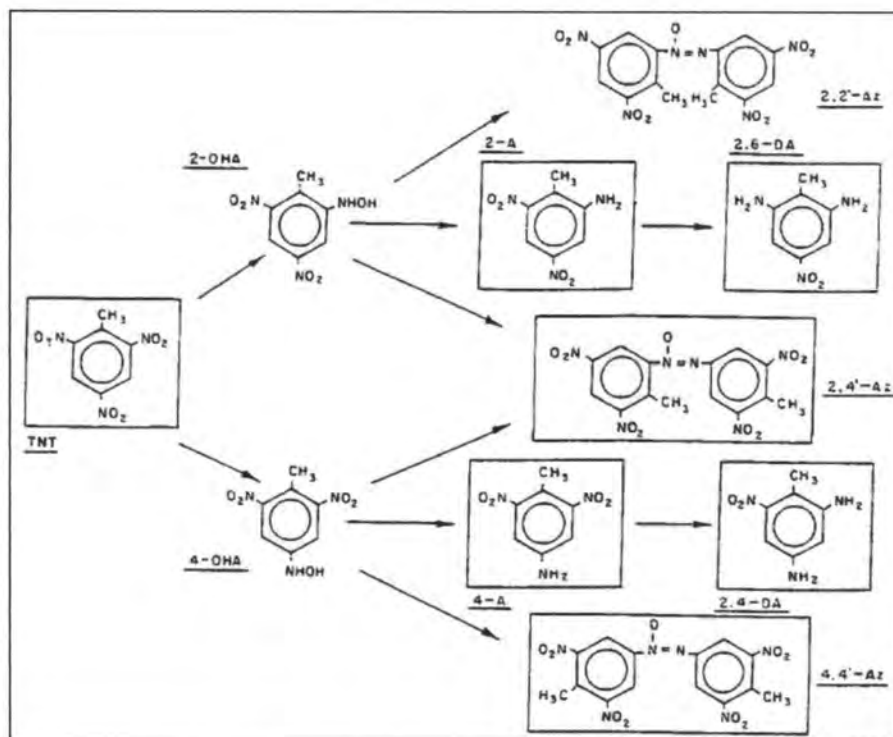


Figure E.1-1. TNT Biotransformation Pathway

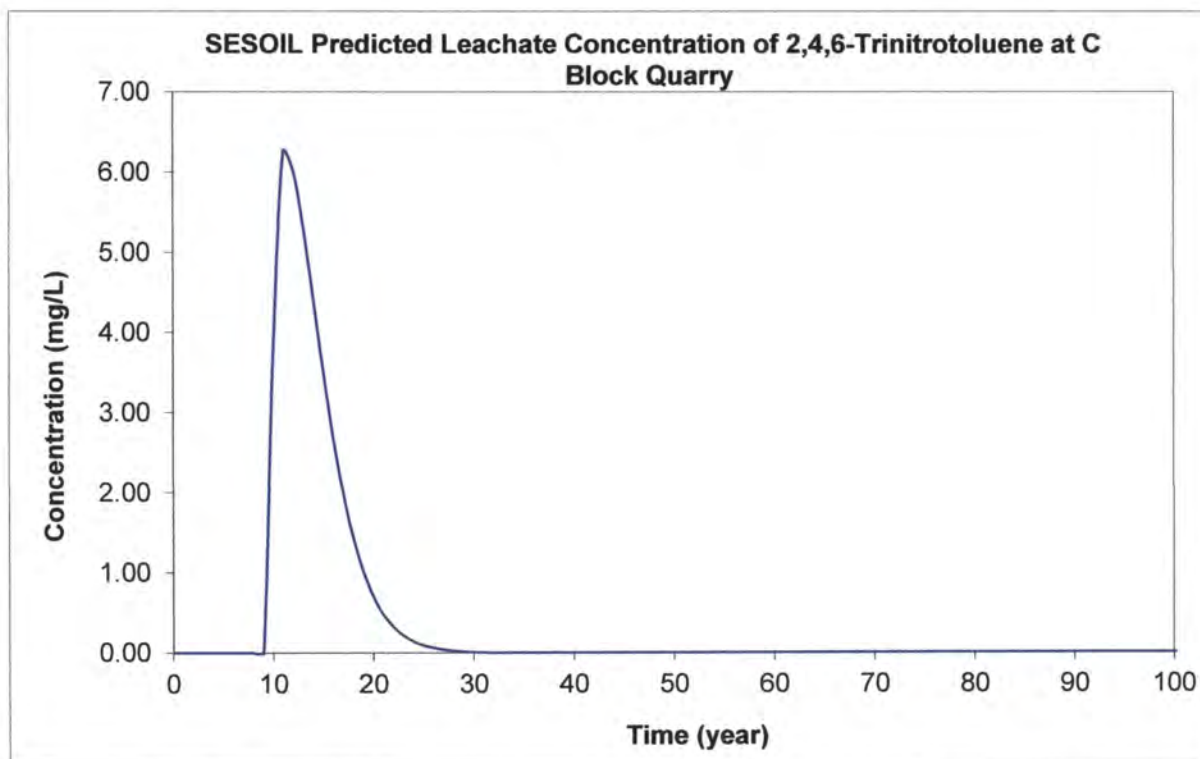
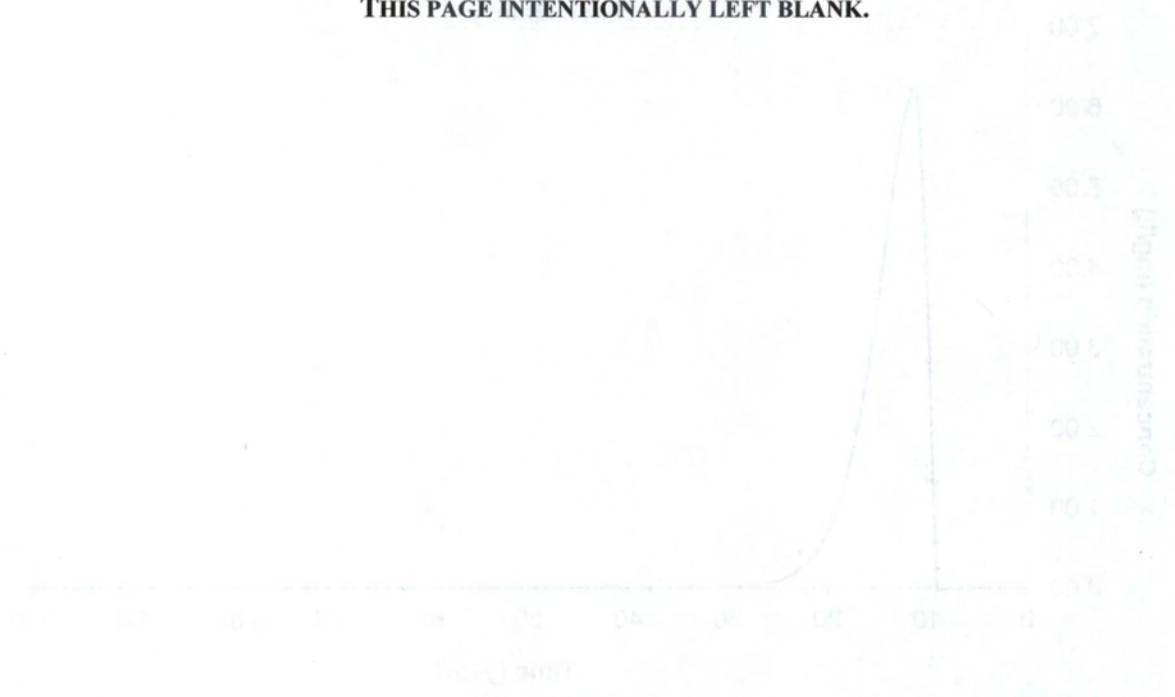


Figure E.1-2. SESOIL Predicted Leachate Concentration at C Block Quarry – TNT



THIS PAGE INTENTIONALLY LEFT BLANK.



Figures

THIS PAGE INTENTIONALLY LEFT BLANK.

Table E.1-10. Load Application Data for SESOIL Model at C Block Quarry

25-ft-Thick Vadose Zone

Analyte	Layer Number	Layer Thickness (ft)	Number of Sublayers	Sublayer Number	Concentration (mg/kg)	Purpose
2,4,6-Trinitrotoluene	1	1.5	3	1	22.0	Contaminant Loading
				2	0.0	Leaching
				3	0.0	
	2	11.5	4	1	0.0	
				2	0.0	
				3	0.0	
				4	0.0	
	3	11.5	4	1	0.0	
				2	0.0	
				3	0.0	
				4	0.0	
	4	0.5	1	1	0.0	
2-Amino-4,6-dinitrotoluene	1	1.5	3	1	0.54	Contaminant Loading
				2	0.0	Leaching
				3	0.0	
	2	11.5	4	1	0.0	
				2	0.0	
				3	0.0	
				4	0.0	
	3	11.5	4	1	0.0	
				2	0.0	
				3	0.0	
				4	0.0	
	4	0.5	1	1	0.0	
4-Amino-2,6-dinitrotoluene	1	1.5	3	1	0.64	Contaminant Loading
				2	0.0	Leaching
				3	0.0	
	2	11.5	4	1	0.0	
				2	0.0	
				3	0.0	
				4	0.0	
	3	11.5	4	1	0.0	
				2	0.0	
				3	0.0	
				4	0.0	
	4	0.5	1	1	0.0	

ft = Feet.

mg/kg = Milligrams per kilogram.

SESOIL = Seasonal soil compartment model.

Table E.1-8. Climatic Data from SESOIL for C Block Quarry

Month	Air Temp (°C)	Cloud Cover	Humidity	Albedo	Evapotranspiration* (cm/day)	Precipitation (cm)	Duration (days)	Storms per Month	Model Days in Month
October	12	0.60	0.70	0.17	0.00	6.46	0.42	5.33	30.4
November	5.22	0.70	0.75	0.24	0.00	7.4	0.53	6.67	30.4
December	-1.06	0.80	0.75	0.31	0.00	7.06	0.57	6.14	30.4
January	-2.94	0.80	0.80	0.3	0.00	7.06	0.61	5.69	30.4
February	-2.33	0.70	0.75	0.32	0.00	5.76	0.53	5.09	30.4
March	2.33	0.70	0.70	0.29	0.00	8.26	0.55	7.14	30.4
April	9.11	0.70	0.70	0.19	0.00	8.83	0.48	7.4	30.4
May	14.61	0.60	0.70	0.16	0.00	8.46	0.45	7.15	30.4
June	19.89	0.60	0.70	0.16	0.00	9.07	0.36	6.57	30.4
July	21.89	0.50	0.70	0.16	0.00	9.8	0.3	6.06	30.4
August	21.11	0.55	0.70	0.16	0.00	8.14	0.3	6.06	30.4
September	17.67	0.55	0.70	0.16	0.00	7.85	0.4	5.44	30.4

*Data calculated in SESOIL model. 0.00 indicates evapotranspiration is calculated from other climatic data. 1996 data from Youngstown, Ohio, Weather Service Office - Airport Station.

cm = Centimeter.

SESOIL = Seasonal soil compartment model.

Table E.1-9. Physical and Chemical Properties of Initial CMCOPCs Selected for SESOIL Modeling for C Block Quarry

Initial CMCOPC	Molecular Weight	Solubility (mg/L)	Reference	K _{oc} (L/kg)	Reference	HLC (atm-m ³ /mol)	Reference	Diffusion Coefficient in Air (cm ² /sec)	Reference	Biodegradation Rate (1/day)	Sample Location	Application Area (cm ²)
<i>Explosives</i>												
2,4,6-Trinitrotoluene	227.1	1.15E+02	a	2.81E+03	a	2.08E-08	a	2.95E-02	a	NA	CBLss-004M-SO	4.04E+06
2-Amino-4,6-dinitrotoluene	197.2	3.19E+02	a	2.83E+02	a	1.62E-10	a	5.61E-02	a	NA	CBLss-004M-SO	4.04E+06
4-Amino-2,6-dinitrotoluene	197.2	3.19E+02	a	2.83E+02	a	1.62E-10	a	5.61E-02	a	NA	CBLss-004M-SO	4.04E+06

*U.S. Environmental Protection Agency regional screening level generic tables June 2015; found at: <<http://www2.epa.gov/risk/risk-based-screening-table-generic-tables>>.

cm²/sec = Square centimeters per second.

CMCOPC = Contaminant migration chemical of potential concern.

HELP = Hydrologic evaluation of landfill performance.

K_{oc} = Organic carbon partition coefficient.

L/kg = Liters per kilogram.

mg/L = Milligrams per liter.

NA = Not applicable.

SESOIL = Seasonal soil compartment model.

Table E.1-7. Initial CMCOPCs Based on Arrival Time to Groundwater Table in Less Than or Equal to 1,000 Years at C Block Quarry

$$R = 1 + \frac{\rho_b K_d}{\theta_w} \quad T = L_z \theta_w R / q$$

Parameter	Symbol	Value	Unit	Note
Percolation rate	q	0.31	ft/year	Developed from HELP model from Cleveland, Ohio, weather data
Soil-water distribution coefficient	K _d	chemical-specific	L/kg	See footnotes below for references
Organic carbon distribution coefficient	K _{oc}	chemical-specific	L/kg	See footnotes below for references
Fraction organic carbon	f _{oc}	0.00067	unitless	
Water-filled soil porosity	θ _w	0.237	unitless	PBA08 RI geotechnical sample CBLSB-010-5269-SO
Bulk density (dry)	ρ _b	1.74	gm/cm ³	
Leaching zone	L _z	sample-specific	ft	Distance from last layer of soil contamination greater than background concentration to top of water table
Retardation factor	R	chemical-specific	unitless	Calculated by equation shown above
Arrival time	T	chemical-specific	year	Calculated by equation shown above

Analyte	Initial CMCOPC Sample ID	Sample Depth ^a (ft)	L _z ^b (ft)	K _d (L/kg)	Reference	K _d (L/kg)	Reference	R	T (year)	T < 1,000? from Sample Depth to Groundwater Table (Yes/No)
Metals										
Arsenic	CBLss-001M-SO	0-1	20	NA	-	2.90E+01	c	2.14E+02	3,270	No
Chromium, hexavalent	CBLsb-025-5879-SO	1-2	16.5	NA	-	1.90E+01	c	1.41E+02	1,770	No
Copper	CBLsb-010-5258-SO	1-4	17.5	NA	-	3.50E+01	c	2.58E+02	3,450	No
Lead	CBLsb-011-5263-SO	4-4.5	15	NA	-	9.00E+02	c	6.62E+03	75,800	No
Thallium	CBLss-002M-SO	0-1	14	NA	-	7.10E+01	c	5.23E+02	5,590	No
Explosives										
2,4,6-Trinitrotoluene	CBLss-004M-SO	0-0.5	25	2.81E+03	c	1.88E+00	d	1.49E+01	283	Yes
2-Amino-4,6-dinitrotoluene	CBLsb-010-5258-SO	1-4	17.5	2.83E+02	c	1.90E-01	d	2.39E+00	32	Yes
4-Amino-2,6-dinitrotoluene	CBLss-004M-SO	0-0.5	25	2.83E+02	c	1.90E-01	d	2.39E+00	46	Yes
Semi-volatile Organic Compounds										
Benz(a)anthracene	CBLsb-011-5262-SO	1-4	15.5	1.77E+05	c	1.19E+02	d	8.73E+02	10,300	No

^aThe maximum depth of an initial CMCOPC (based on the maximum depth that an analyte is detected above facility-wide background).

^bBased on each specific sample ID location and depth to water table shown in Figure 3-1.

^cU.S. Environmental Protection Agency regional screening levels generic tables June 2015; found at: <<http://www2.epa.gov/risk/risk-based-screening-table-generic-tables>>.

^dK_d value for organic chemicals calculated by multiplying K_{oc} by fraction organic carbon (f_{oc}) of 0.00067 (from PBA08 RI geotechnical sample CBLSB-010-5269-SO).

CMCOPC = Contaminant migration chemical of potential concern.

ft = Feet.

gm/cm³ = Grams per cubic centimeter.

HELP = Hydrologic evaluation of landfill performance.

ID = Identification.

K_d = Distribution coefficient.

K_{oc} = Organic carbon partition coefficient.

L/kg = Liters per kilogram.

L_z = Leaching zone.

NA = not applicable.

PBA08 RI = Performance-based Acquisition 2008 Remedial Investigation.

Bold = Initial CMCOPCs that exceed the 1,000-year travel time screen.

< = Less than.

THIS PAGE INTENTIONALLY LEFT BLANK.

Table E.1-6. Initial CMCOPCs Based on Comparison of the SRC's Maximum Concentration at C Block Quarry with a DAF of 1.85

Analyte	CAS Number	Maximum Concentration (mg/kg)	SSSL (mg/kg)	Initial CMCOPC? (Yes/No)	CMCOPC Justification	Sample ID at Maximum Concentration	Date Collected
<i>Metals</i>							
Arsenic	7440-38-2	1.90E+01	5.37E-01	Yes	Exceeds SSSL	CBLss-001M-SO	11/04/04
Chromium, hexavalent	18540-29-9	3.90E+01	1.24E-03	Yes	Exceeds SSSL	CBLsb-025-5879-SO	08/10/12
Copper	7440-50-8	2.18E+02	8.51E+01	Yes	Exceeds SSSL	CBLsb-010-5258-SO	03/22/10
Lead	7439-92-1	4.30E+01	2.59E+01	Yes	Exceeds SSSL	CBLss-002M-SO	11/04/04
Thallium	7440-28-0	3.60E-01	2.59E-01	Yes	Exceeds SSSL	CBLss-002M-SO	11/04/04
<i>Explosives</i>							
2,4,6-Trinitrotoluene	118-96-7	2.20E+01	2.78E-02	Yes	Exceeds SSSL	CBLss-004M-SO	11/04/04
2-Amino-4,6-dinitrotoluene	35572-78-2	5.40E-01	5.55E-02	Yes	Exceeds SSSL	CBLss-004M-SO	11/04/04
4-Amino-2,6-dinitrotoluene	19406-51-0	6.40E-01	5.55E-02	Yes	Exceeds SSSL	CBLss-004M-SO	11/04/04
<i>Semi-volatile Organic Compounds</i>							
Benz(a)anthracene	56-55-3	4.80E-02	7.86E-03	Yes	Exceeds SSSL	CBLsb-011-5262-SO	03/23/10
Benzo(b)fluoranthene	205-99-2	6.20E-02	7.59E-02	No	Below SSSL	CBLsb-011-5262-SO	03/23/10

CAS = Chemical Abstract Service.

CMCOPC = Contaminant migration chemical of potential concern.

DAF = Dilution attenuation factor.

ID = Identification.

mg/kg = Milligrams per kilogram.

SRC = Site-related contaminant.

SSSL = Site-specific soil screening level (generic soil screening level multiplied by the DAF of 1.85).

Bold = SRCs that exceed the SSSL.

Table E.1-5. DAF Calculation for C Block Quarry

$$DAF = 1 + \frac{(K \times i \times d)}{(q \times L)}$$

$$d = \sqrt{0.0112 \times L^2} + d_a \times \left[1 - \exp\left(\frac{-L \times q}{K \times i \times d_a}\right) \right]$$

Parameter	Symbol	Value	Unit	Note
DAF	DAF	1.85	unitless	Calculated from DAF equation shown above
Aquifer hydraulic conductivity	K	1.20E+02	m/year	Average of slug test results from MKM (2007)
Horizontal hydraulic gradient	i	2.82E-03	m/m	Determined from Figure 3-1
Percolation rate	q	9.40E-02	m/year	Developed from HELP model from Cleveland, Ohio, weather data
Source length parallel to groundwater flow	L	25.5	m	Based on average area for all ISM areas for C Block Quarry
Mixing zone depth	d	6	m	Determined from the lower value between above equation for "d" (d = 6.86 m) and d _a
Aquifer thickness	d _a	6	m	Facility-wide assumption for the aquifer presented in the Load Line 1 investigation (USACE 2003)

MKM (MKM Engineers, Inc.) 2007. *Final Characterization of 14 Areas of Concern at Ravenna Army Ammunition Plant: Characterization of C-Block Quarry*. March 2007.

USACE (U.S. Army Corps of Engineers) 2003. *Phase II Remedial Investigation Report for the Load Line 1 at the Ravenna Army Ammunition Plant, Ravenna, Ohio*. June 2003.

DAF = Dilution attenuation factor.

HELP = Hydrologic evaluation of landfill performance.

ISM = Incremental sampling methodology.

m = Meter.

Table E.1-4. Initial CMCOPCs Based on Maximum Concentration of SRCs Compared to GSSL for C Block Quarry (continued)

Analyte	CAS Number	Maximum Concentration (mg/kg)	GSSL (mg/kg)	GSSL Type (mg/kg)	Initial CMCOPC? (Yes/No)	CMCOPC Justification	Samples > SSL / Total Samples	Sample ID at Maximum Concentration	Date Collected
Phenanthrene ^a	85-01-8	8.70E-02	1.30E+01	Risk	No	Below SSL	0/ 3	CBLsb-011-5262-SO	03/23/10
Pyrene	129-00-0	9.70E-02	1.30E+01	Risk	No	Below SSL	0/ 3	CBLsb-011-5262-SO	03/23/10

^aPyrene generic SSL was used as a surrogate for benzo(*ghi*)perylene and phenanthrene.

CAS = Chemical Abstract Service.

CMCOPC = Contaminant migration chemical of potential concern.

GSSL = Generic soil screening level.

ID = Identification.

MCL = Maximum contaminant level.

mg/kg = Milligrams per kilogram.

SRC = Site-related contaminant.

SSL = Soil screening level.

Bold = SRCs that exceed the GSSL.

Table E.1-4. Initial CMCOPCs Based on Maximum Concentration of SRCs Compared to GSSL for C Block Quarry

Analyte	CAS Number	Maximum Concentration (mg/kg)	GSSL (mg/kg)	GSSL Type (mg/kg)	Initial CMCOPC? (Yes/No)	CMCOPC Justification	Samples > SSL / Total Samples	Sample ID at Maximum Concentration	Date Collected
<i>Metals</i>									
Arsenic	7440-38-2	1.90E+01	2.90E-01	MCL	Yes	Exceeds SSL	13/ 13	CBLss-001M-SO	11/04/04
Cadmium	7440-43-9	1.10E-01	3.80E-01	MCL	No	Below SSL	0/ 13	CBLsb-011-5263-SO	03/23/10
Chromium	7440-47-3	1.00E+03	1.80E+05	MCL	No	Below SSL	0/ 17	CBLss-005M-5877-SO	08/10/12
Chromium, hexavalent	18540-29-9	3.90E+01	6.70E-04	Risk	Yes	Exceeds SSL	5/ 9	CBLsb-025-5879-SO	08/10/12
Copper	7440-50-8	2.18E+02	4.60E+01	MCL	Yes	Exceeds SSL	2/ 13	CBLsb-010-5258-SO	03/22/10
Lead	7439-92-1	4.30E+01	1.40E+01	MCL	Yes	Exceeds SSL	9/ 13	CBLss-002M-SO	11/04/04
Mercury	7439-97-6	7.00E-02	1.00E-01	MCL	No	Below SSL	0/ 13	CBLss-006M-SO	11/04/04
Thallium	7440-28-0	3.60E-01	1.40E-01	MCL	Yes	Exceeds SSL	5/ 13	CBLss-002M-SO	11/04/04
<i>Explosives</i>									
2,4,6-Trinitrotoluene	118-96-7	2.20E+01	1.50E-02	Risk	Yes	Exceeds SSL	3/ 13	CBLss-004M-SO	11/04/04
2-Amino-4,6-dinitrotoluene	35572-78-2	5.40E-01	3.00E-02	Risk	Yes	Exceeds SSL	3/ 13	CBLss-004M-SO	11/04/04
4-Amino-2,6-dinitrotoluene	19406-51-0	6.40E-01	3.00E-02	Risk	Yes	Exceeds SSL	3/ 13	CBLss-004M-SO	11/04/04
Nitrocellulose	9004-70-0	1.30E+00	1.30E+04	Risk	No	Below SSL	0/ 3	CBLss-005M-SO	11/04/04
<i>Semi-volatile Organic Compounds</i>									
Anthracene	120-12-7	2.10E-02	5.80E+01	Risk	No	Below SSL	0/ 3	CBLsb-011-5262-SO	03/23/10
Benz(a)anthracene	56-55-3	4.80E-02	4.25E-03	Risk	Yes	Exceeds SSL	2/ 3	CBLsb-011-5262-SO	03/23/10
Benzo(a)pyrene	50-32-8	4.90E-02	2.40E-01	MCL	No	Below SSL	0/ 3	CBLsb-011-5262-SO	03/23/10
Benzo(b)fluoranthene	205-99-2	6.20E-02	4.10E-02	Risk	Yes	Exceeds SSL	1/ 3	CBLsb-011-5262-SO	03/23/10
Benzo(ghi)perylene ^a	191-24-2	3.70E-02	1.30E+01	Risk	No	Below SSL	0/ 3	CBLsb-011-5262-SO	03/23/10
Benzo(k)fluoranthene	207-08-9	2.80E-02	4.00E-01	Risk	No	Below SSL	0/ 3	CBLsb-011-5262-SO	03/23/10
Bis(2-ethylhexyl)phthalate	117-81-7	5.40E-02	1.40E+00	MCL	No	Below SSL	0/ 3	CBLss-005M-SO	11/04/04
Chrysene	218-01-9	5.00E-02	1.20E+00	Risk	No	Below SSL	0/ 3	CBLsb-011-5262-SO	03/23/10
Fluoranthene	206-44-0	1.30E-01	8.90E+01	Risk	No	Below SSL	0/ 3	CBLsb-011-5262-SO	03/23/10
Fluorene	86-73-7	9.40E-03	5.40E+00	Risk	No	Below SSL	0/ 3	CBLsb-011-5262-SO	03/23/10
Indeno(1,2,3-cd)pyrene	193-39-5	3.00E-02	1.30E-01	Risk	No	Below SSL	0/ 3	CBLsb-011-5262-SO	03/23/10

Table E.1-3. HELP Model Parameters for Developing Water Balance Estimates

Layer	Layer Type	Thickness (inch)	Effective K (cm/sec)
1	1--Vertical Percolation Layer	60	2.50E-05
2	3--Barrier Soil Liner	84	8.20E-06

Evapotranspiration and Weather Data	
Station Latitude =	41.24
Maximum Leaf Area Index =	3.5
Start of Growing Season (Julian Date) =	120
End of Growing Season (Julian Date) =	290
Evaporative Zone Depth (inch) =	20 (Fair)

General Design and Evaporative Zone Data	
Fraction of Area Allowing Runoff (%) =	100
Default Soil Database Texture =	Silty Clay
Vegetative Cover =	Poor Stand of Grass
Surface Slope (%) =	4
Slope Length (ft) =	500
SCS Runoff Curve Number =	93

Precipitation Data
Synthetically Generated Using Cleveland, Ohio, Coefficients

Temperature Data
Synthetically Generated Using Cleveland, Ohio, Coefficients

Solar Radiation Data
Synthetically Generated Using Cleveland, Ohio, Coefficients

cm/sec = Centimeters per second.

ft = Feet.

HELP = Hydrologic evaluation of landfill performance.

K = Hydraulic conductivity.

SCS = Soil Conservation Service.

Table E.1-2. Physical and Chemical Properties of Organic SRCs in Surface and Subsurface Soil at C Block Quarry

Analyte	K _{oc} (L/kg)	Reference	HLC (atm-m ³ /mol)	Reference	C _w (mg/L)	SSL Type	Generic SSL (mg/kg)	Reference	SSL Type
Explosives									
2,4,6-Trinitrotoluene	2.81E+03	a	2.08E-08	a	2.50E-03	RSL	1.50E-02	a	Risk
2-Amino-4,6-dinitrotoluene	2.83E+02	a	1.62E-10	a	3.90E-02	RSL	3.00E-02	a	Risk
4-Amino-2,6-dinitrotoluene	2.83E+02	a	1.62E-10	a	3.90E-02	RSL	3.00E-02	a	Risk
Nitrocellulose	1.00E+01	a	3.29E-23	a	6.00E+04	RSL	1.30E+04	a	Risk
Semi-volatile Organic Compounds									
Anthracene	1.64E+04	a	5.56E-05	a	1.80E+00	RSL	5.80E+01	a	Risk
Benz(a)anthracene	1.77E+05	a	1.20E-05	a	1.20E-05	RSL	4.25E-03	a	Risk
Benzo(a)pyrene	5.87E+05	a	4.57E-07	a	2.00E-04	MCL	2.40E-01	a	MCL
Benzo(b)fluoranthene	5.99E+05	a	6.57E-07	a	3.40E-05	RSL	4.10E-02	a	Risk
Benzo(ghi)perylene ^c	1.07E+07	b	1.40E-07	b	1.20E-01	RSL	1.30E+01	a	Risk
Benzo(k)fluoranthene	5.87E+05	a	5.84E-07	a	3.40E-04	RSL	4.00E-01	a	Risk
Bis(2-ethylhexyl)phthalate	1.20E+05	a	2.70E-07	a	6.00E-03	MCL	1.40E+00	a	MCL
Chrysene	1.81E+05	a	5.23E-06	a	3.40E-03	RSL	1.20E+00	a	Risk
Fluoranthene	5.55E+04	a	8.86E-06	a	8.00E-01	RSL	8.90E+01	a	Risk
Fluorene	9.16E+03	a	9.62E-05	a	2.90E-01	RSL	5.40E+00	a	Risk
Indeno(1,2,3-cd)pyrene	1.95E+06	a	3.48E-07	a	3.40E-05	RSL	1.30E-01	a	Risk
Phenanthrene ^c	1.82E+04	b	3.93E-05	b	1.20E-01	RSL	1.30E+01	a	Risk
Pyrene	5.43E+04	a	1.19E-05	a	1.20E-01	RSL	1.30E+01	a	Risk

^a U.S. Environmental Protection Agency (USEPA) RSL generic tables June 2015; found at: <http://www2.epa.gov/risk/risk-based-screening-table-generic-tables>.

^bUSEPA 1994. Risk Reduction Engineering Laboratory Treatability Database, Version 5.0, Office of Research and Development, Cincinnati, Ohio.

^cPyrene C_w and Generic SSL used as a surrogate for benzo(ghi)perylene and phenanthrene.

atm-m³/mol = Atmospheres-Cubic Meters per Mole.

C_w = Target groundwater concentration (either MCL or RSL).

HLC = Henry's Law Constant.

K_{oc} = Organic carbon partition coefficient.

L/kg = Liters per kilogram.

MCL = Clean Water Act drinking water maximum contaminant level.

mg/L = Milligrams per liter.

mg/kg = Milligrams per kilogram

RSL = USEPA regional screening level (USEPA 2015).

SRC = Site-related contaminant.

SSL = Soil screening level.

Table E.1-1. Physical and Chemical Properties of Inorganic SRCs in Surface and Subsurface Soil at C Block Quarry

Analyte	K _d (L/kg)	Reference	HLC (atm-m ³ /mol)	Reference	C _w (mg/L)	SSL Type	Generic SSL (mg/kg)	Reference	SSL Type
<i>Metals</i>									
Arsenic	2.90E+01	a	NA	-	1.00E-02	MCL	2.90E-01	a	MCL
Cadmium	7.50E+01	a	NA	-	5.00E-03	MCL	3.80E-01	a	MCL
Chromium	1.80E+06	a	NA	-	1.00E-01	MCL	1.80E+05	a	MCL
Chromium, hexavalent	1.90E+01	a	NA	-	3.50E-05	RSL	6.70E-04	a	Risk
Copper	3.50E+01	a	NA	-	1.30E+00	MCL	4.60E+01	a	MCL
Lead	9.00E+02	a	NA	-	1.50E-02	MCL	1.40E+01	a	MCL
Mercury	5.20E+01	a	1.14E-02	a	2.00E-03	MCL	1.00E-01	a	MCL
Thallium	7.10E+01	a	NA	-	2.00E-03	MCL	1.40E-01	a	MCL

^aU.S. Environmental Protection Agency (USEPA) RSL generic tables June 2015; found at: <http://www2.epa.gov/risk/risk-based-screening-table-generic-tables>.

atm-m³/mol = atmospheres-Cubic meters per Mole.

C_w = Target groundwater concentration (either MCL or RSL).

HLC = Henry's Law Constant.

K_d = Distribution coefficient.

L/kg = Liters per kilogram.

MCL = Clean Water Act drinking water maximum contaminant level.

mg/L = Milligrams per liter.

mg/kg = Milligrams per kilogram

NA = Not applicable.

RSL = USEPA regional screening level (USEPA 2015).

SRC = Site-related contaminant.

SSL = Soil screening level.

THIS PAGE INTENTIONALLY LEFT BLANK.

Tables

THIS PAGE INTENTIONALLY LEFT BLANK.

TABLES

Table E.1-1. Physical and Chemical Properties of Inorganic SRCs in Surface and Subsurface Soil at C Block Quarry	1
Table E.1-2. Physical and Chemical Properties of Organic SRCs in Surface and Subsurface Soil at C Block Quarry	2
Table E.1-3. HELP Model Parameters for Developing Water Balance Estimates	3
Table E.1-4. Initial CMCOPCs Based on Maximum Concentration of SRCs Compared to GSSL for C Block Quarry	4
Table E.1-5. DAF Calculation for C Block Quarry	6
Table E.1-6. Initial CMCOPCs Based on Comparison of the SRC's Maximum Concentration at C Block Quarry with a DAF of 1.85	7
Table E.1-7. Initial CMCOPCs Based on Arrival Time to Groundwater Table in Less Than or Equal to 1,000 Years at C Block Quarry	9
Table E.1-8. Climatic Data from SESOIL for C Block Quarry	10
Table E.1-9. Physical and Chemical Properties of Initial CMCOPCs Selected for SESOIL Modeling for C Block Quarry	10
Table E.1-10. Load Application Data for SESOIL Model at C Block Quarry	11

FIGURES

Figure E.1-1. TNT Biotransformation Pathway	11
Figure E.1-2. SESOIL Predicted Leachate Concentration at C Block Quarry – TNT	11
Figure E.1-3. SESOIL Predicted Leachate Concentration at C Block Quarry – 2-Amino-4,6-Dinitrotoluene	12
Figure E.1-4. SESOIL Predicted Leachate Concentration at C Block Quarry – 4-Amino-2,6-Dinitrotoluene	12
Figure E.1-5. Predicted Concentration of TNT in Groundwater Based on SESOIL and Dilution Modeling at C Block Quarry	13
Figure E.1-6. Predicted Concentration of 2-Amino-4,6-Dinitrotoluene in Groundwater Based on SESOIL and Dilution Modeling at C Block Quarry	13
Figure E.1-7. Predicted Concentration of 4-Amino-2,6-Dinitrotoluene in Groundwater Based on SESOIL and Dilution Modeling at C Block Quarry	14

THIS PAGE INTENTIONALLY LEFT BLANK.

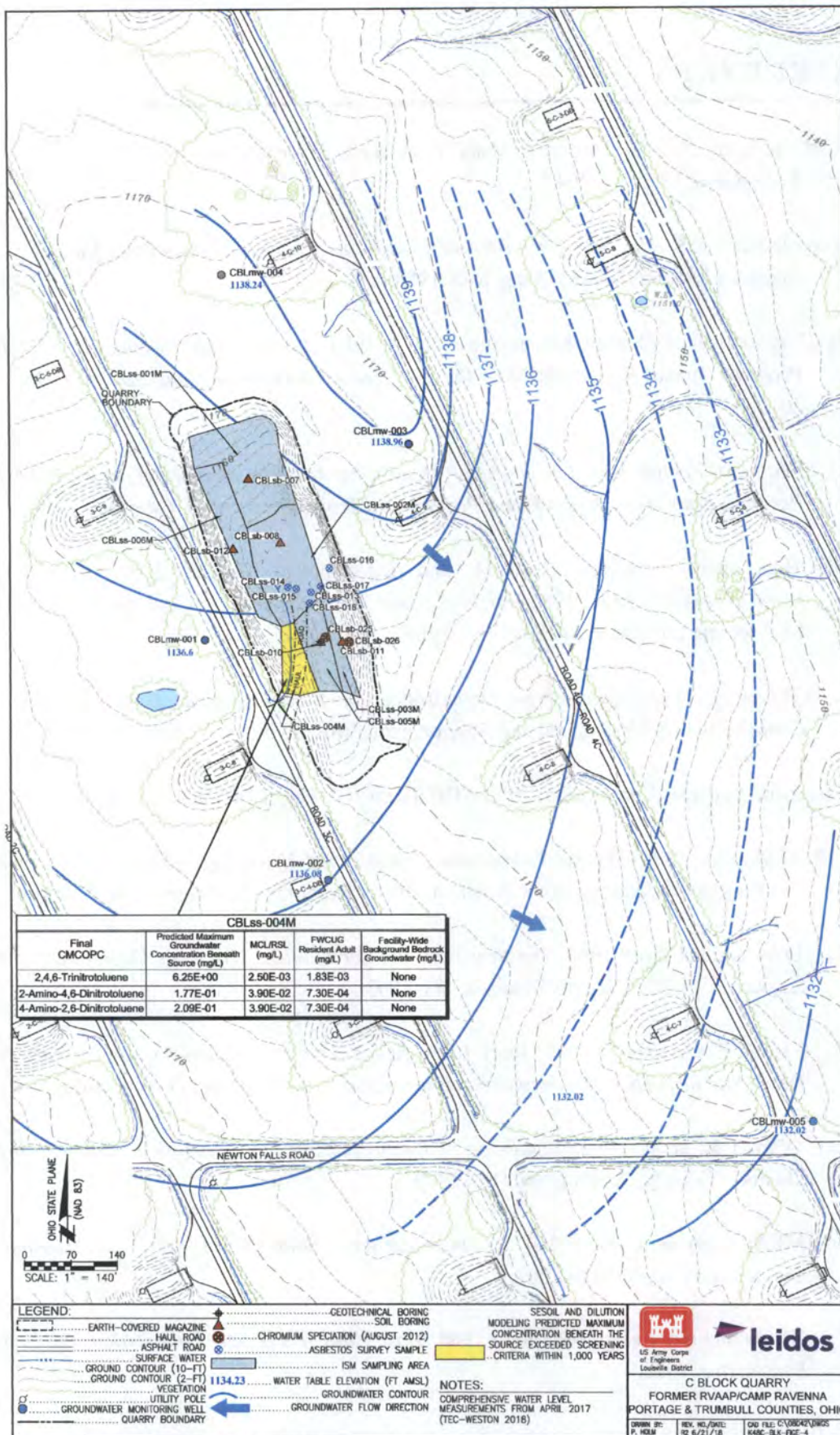
ATTACHMENT E.1

Supporting Information for Fate and Transport Modeling Results

- 1 TEC-WESTON Joint Venture 2018. *Draft Facility-wide Groundwater Monitoring Program RVAAP-*
2 *66 Annual Report for 2017, Former Ravenna Army Ammunition Plant, Portage and Trumbull*
3 *Counties, Ohio.* February 2018.
- 4
- 5 USACE (U.S. Army Corps of Engineers) 2003. *Phase II Remedial Investigation Report for the Load*
6 *Line 1 at the Ravenna Army Ammunition Plant, Ravenna, Ohio.* June 2003.
- 7
- 8 USACE 2006. *Environmental Transport and Fate Process Descriptors for Propellant Compounds.*
9 June 2006.
- 10
- 11 USACHPPM (U.S. Army Center for Health Promotion and Preventative Medicine) 2000. *Wildlife*
12 *Toxicity Assessment for 2,4,6-Trinitrotoluene.* November 2000.
- 13
- 14 USEPA (U.S. Environmental Protection Agency) 1985. *Water Quality Assessment: A Screening*
15 *Procedure for Toxic and Conventional Pollutants in Surface and Ground Water, Revised*
16 *1985 Parts 1 and 2, EPA/600/6-85/002.* Office of Research and Development, Environmental
17 Research Laboratory, Athens, Georgia. September 1985.
- 18
- 19 USEPA 1994. *The Hydrologic Evaluation of Landfill Performance (HELP) Model: Engineering*
20 *Documentation for Version 3.* EPA/600/R-94/168b, U.S. Environmental Protection Agency
21 Office of Research and Development, Washington, DC. September 1994.
- 22
- 23 USEPA 1996. *Soil Screening Guidance: Technical Background Document.* Office of Solid Waste and
24 Emergency Response, Washington, D.C. May 1996.
- 25
- 26 USEPA 2015. Risk-Based Screening Table-Generic Tables. Website: [http://www.epa.gov/risk/risk-](http://www.epa.gov/risk/risk-based-screening-table-generic-tables)
27 [based-screening-table-generic-tables](http://www.epa.gov/risk/risk-based-screening-table-generic-tables). June 2015.

1 REFERENCES

- 2
- 3 Cockerham, Lorris, G. and Barbara S. Shane 1994. *Basic Environmental Toxicology*. CRC Press, 29
4 Boca Raton, Florida. 1994.
- 5
- 6 Dragun, James 1988. *The Soil Chemistry of Hazardous Materials*. Hazardous Materials Control
7 Research Institute, Silver Spring, MD. 1988.
- 8
- 9 EQM (Environmental Quality Management, Inc.) 2010. *Facility-wide Groundwater Monitoring*
10 *Program Annual Report for 2009, Ravenna Army Ammunition Plant, Ravenna, Ohio*. March
11 2010.
- 12
- 13 EQM 2015. *Final Facility-wide Groundwater Monitoring Program Annual Report for 2014, Former*
14 *Ravenna Army Ammunition Plant, Portage and Trumbull Counties, Ohio*. March 2015.
- 15
- 16 ERDC (U.S. Army Engineer Research and Development Center) 2007. *Development of*
17 *Environmental Data for Navy, Air Force, and Marine Munitions*. Cold Regions Research and
18 Engineering Laboratory, Arlington, Virginia. June 2007.
- 19
- 20 Funk, S.B., et al. 1993. *Initial-Phase Optimization for Bioremediation of Munition Compound-*
21 *Contaminated Soils*. Applied and Environmental Microbiology, Volume 59, No. 7. July 1993.
- 22
- 23 GSC (General Sciences Corporation) 1998. *SESOIL for Windows*, Version 3.0, Laurel, MD. 1998.
- 24
- 25 Hetrick, D.M., et al. 1986. *Model Predictions of Watershed Hydrologic Components: Comparison*
26 *and Verification*. Journal of the American Water Resources Association. October 1986.
- 27
- 28 Hetrick, D.M. and S.J. Scott 1993. *The New SESOIL User's Guide*, Wisconsin Department of Natural
29 Resources, PUBL-SW-200, Madison, WI. 1993.
- 30
- 31 Jacobs (Jacobs Engineering Group, Inc.) 1989. *RCRA Facility Assessment, Preliminary Review/*
32 *Visual Site Inspection Ravenna Army Ammunition Plant, Ravenna, Ohio*. October 1989.
- 33
- 34 Lyman, Warren J., et al. 1990. *Handbook of Chemical Property Estimation Methods*. American
35 Chemical Society, Washington, D.C. 1990.
- 36
- 37 MKM (MKM Engineers, Inc.) 2007. *Final Characterization of 14 AOCs at Ravenna Army*
38 *Ammunition Plant*. March 2007.
- 39
- 40 OGE (O'Brien and Gere Engineers, Inc.) 1988. *Hazardous Waste Site Remediation, the Engineer's*
41 *Perspective*. 1988.
- 42



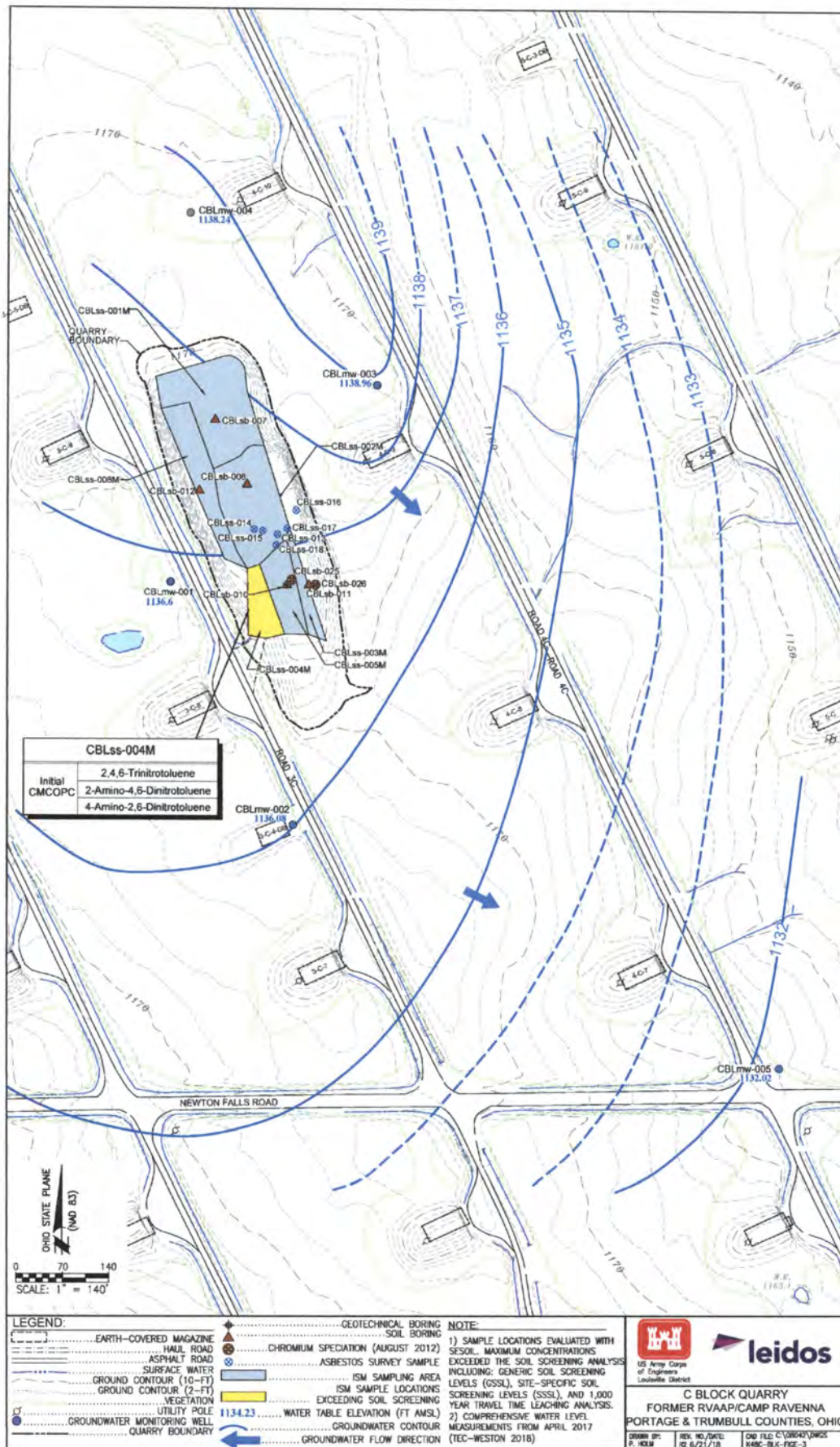


Figure E-3. Initial CMCOPCs Identified in Soil Screening Analysis for SESOIL Evaluation

THIS PAGE INTENTIONALLY LEFT BLANK.

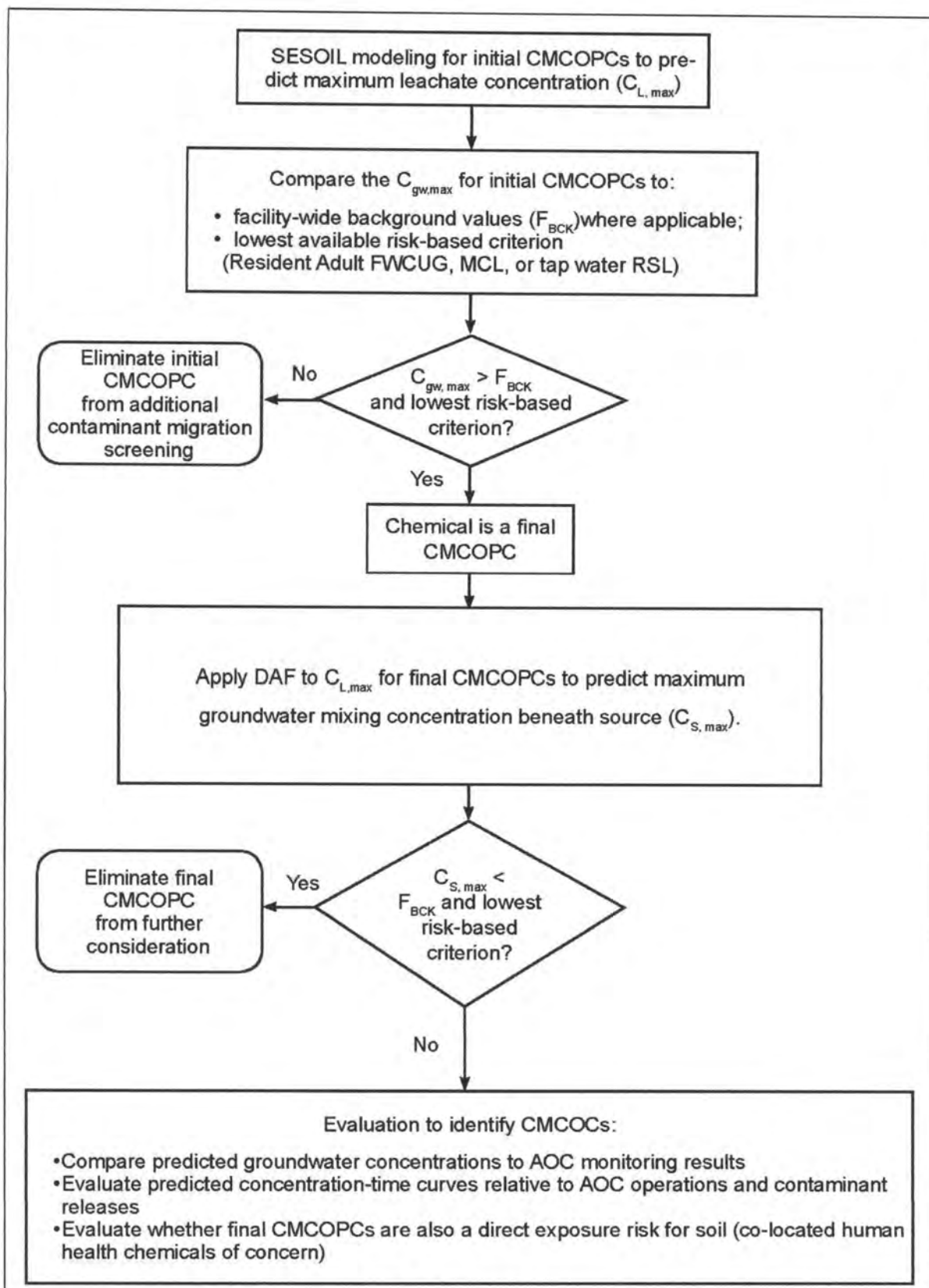


Figure E-2. Initial CMCOPCs Identified in Soil Screening Analysis for SESOIL Evaluation (continued)

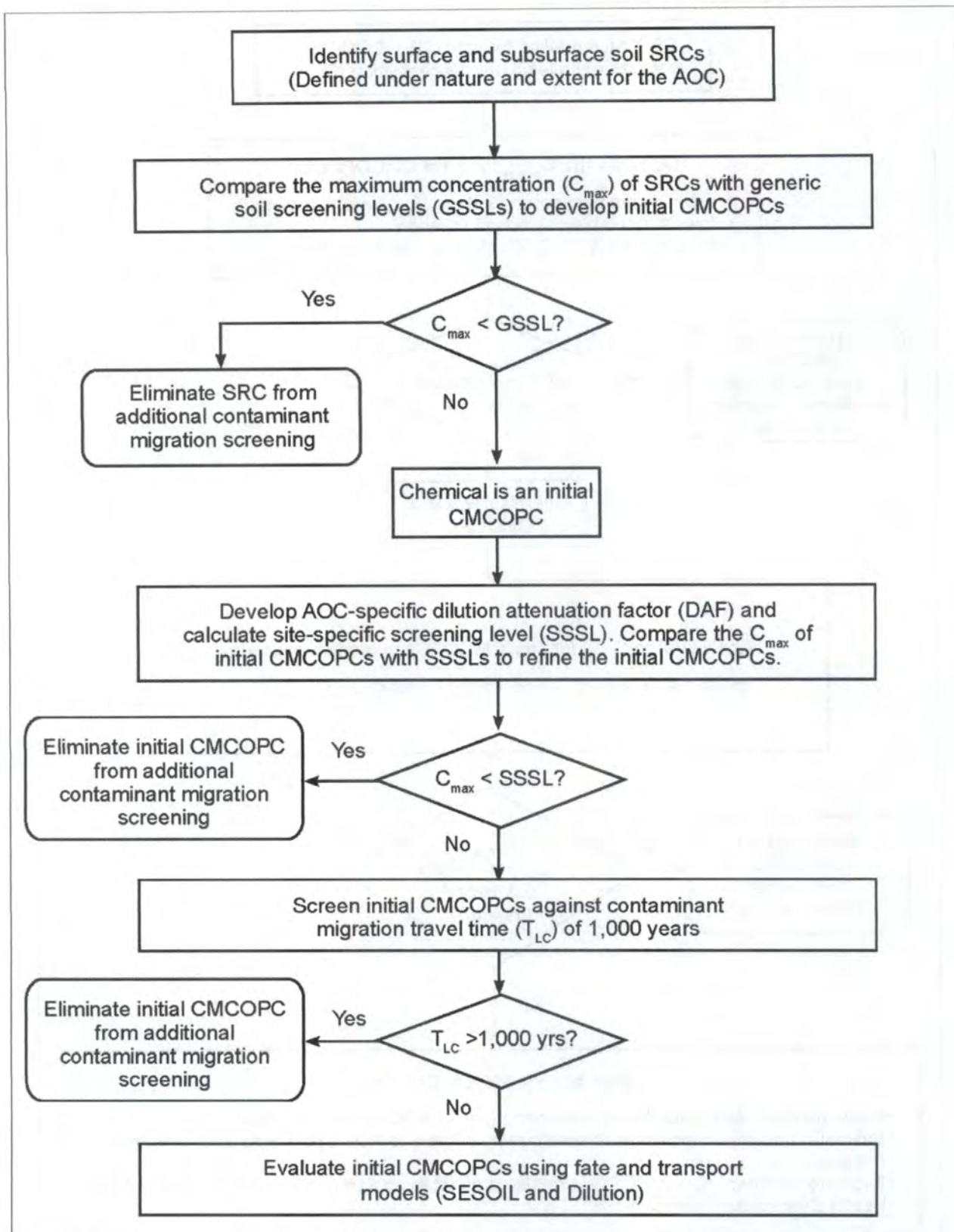


Figure E-2. Initial CMCOPCs Identified in Soil Screening Analysis for SESOIL Evaluation



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

May 18, 2018

LTC James Crowley, ARNG-IED
National Guard Bureau
111 South George Mason Drive
Arlington, VA 22204

**Re: US Army Ammunition PLT RVAAP
Remediation Response
Project Records
Remedial Response
Portage County
267000859095**

**Subject: Ravenna Army Ammunition Plant, Portage/Trumbull Counties.
"Responses to Comments on the Revised Draft Remedial
Investigation/Feasibility Study Report for Soil, Sediment, and Surface
Water at RVAAP-06 C Block Quarry"**

Dear Lieutenant Colonel Crowley:

The Ohio Environmental Protection Agency (Ohio EPA) has received and reviewed the "Response to Comments on the Revised Draft Remedial Investigation/Feasibility Study Report for Soil, Sediment, and Surface Water at RVAAP-06 C Block Quarry" for the Ravenna Army Ammunition Plant (RVAAP), Portage/Trumbull Counties. This document is dated and was received at Ohio EPA, Northeast District Office (NEDO) on March 8, 2018. Please find below Ohio EPA's comments on the Army's responses.

General Comments

Ohio EPA General Comment 1: Adequately addressed.

Ohio EPA General Comment 2: Adequately addressed.

Ohio EPA General Comment 3: Adequately addressed.

Ohio EPA General Comment 4: Adequately addressed.

Ohio EPA General Comment 5: Revise the text to incorporate the information provided in this comment response.

Ohio EPA General Comment 6: Adequately addressed.

Ohio EPA General Comment 7: Adequately addressed.

**Received
18 MAY 2018**

Ohio EPA General Comment 8: Ohio EPA concurs with the Army's response for the RI/FS. However, an updated asbestos inspection will need to be conducted during the Remedial Design (RD) phase prior to implementation of the Remedial Action (RA). The condition and location of the observed ACM, as noted in the 2011 asbestos survey, needs to be reassessed, as eight years of weathering has most likely changed the condition, the location and ability to locate the material.

Ohio EPA General Comment 9: Ohio EPA concurs with the Army's response for the RI/FS. However, an updated asbestos inspection will need to be conducted during the Remedial Design (RD) phase prior to implementation of the Remedial Action (RA). Ohio EPA recommends that additional Seibert stakes be incorporated into the RD/RA phase to ensure high visibility of the barrier for site receptors.

Ohio EPA General Comment 10: Adequately addressed.

Ohio EPA General Comment 11: Adequately addressed.

Ohio EPA General Comment 10: Adequately addressed.

Fate and Transport Model/Groundwater Comments

Ohio EPA reviewed the responses to the seven fate and transport model/ground water comments (FTGW Comments) and determined that the responses to three of the FTGW Comments (FTGW Comments 4, 5, and 7) are adequate. However, the comment responses to the remaining four FTGW Comments (FTGW Comments 1, 2, 3, and 6) are inadequate and remain a concern. Ohio EPA concurs that the SESOIL™/AT123D™ models utilized in the Draft RI/FS do not accurately predict contaminant migration, even for screening purposes beneath C Block Quarry given the hydrogeology. The use of the models for C-Block Quarry need to be resolved. The following are Ohio EPA comments on the FTGW are as follows:

1. The Army has not adequately responded to Ohio EPA's FTGW Comments 1, 2, and 3 dated November 28, 2017, regarding the appropriateness of the SESOIL™/AT123D™ fate and transport model used in the *RVAAP-06 C Block Quarry RI/FS Report* given the hydrogeology beneath C Block Quarry. Considering that the response to Ohio EPA's FTGW Comment 4 dated November 28, 2017, acknowledges that the SESOIL™/AT123D™ does not accurately predict contaminant migration through a highly heterogenous hydrogeologic system such as exists beneath C Block Quarry, the responses to Ohio EPA's, FTGW Comments 1, 2, and 3 dated November 28, 2017, are not adequate. Revise this section accordingly. Also, refer to Comment 2 below.
2. Ohio EPA concurs with the Army's response to FTGW Comment 4 and agrees that the SESOIL™/ AT123D™ model does not accurately predict contaminant migration through a highly heterogenous hydrogeologic system, such as exists beneath C Block Quarry. The geology beneath C Block Quarry consists of a thin layer of

soil/unconsolidated material over fractured and weathered Homewood Sandstone. While part of the vadose zone consists of unconsolidated material/soil, most of the vadose zone is in the fractured and weathered Homewood Sandstone. According to Pfingston (2002), this area was also likely subject to blasting during quarrying. SESOIL™/AT123D™ are not appropriate screening tools to model fate and transport in bedrock (New Jersey DEP, 2014) or in non-homogenous or fractured geologic media (Kauffman and McLane, 2015).

The Army can demonstrate potential for impact to ground water in evaluating ground water to surface water pathway by sampling the four RI wells (CBLmw-001, CBLmw-002, CBLmw-003, and CBL-004). The four aforementioned wells have not been sampled since 2013, and according to the 2016 *RI Work Plan for Ground Water* will need to be sampled to support the Facility-Wide Ground Water (FWGW) RI. Ohio EPA recommends that these four wells be sampled for the parameters specified in the 2016 *RI Work Plan for Ground Water* for C Block Quarry wells including: SVOCs, metals including hexavalent chromium, and PCBs. Considering the history, disposal practices and pH issues in the C Block, Ohio EPA recommends that these four wells also be sampled for: explosives, nitrate/nitrite, sulfate/sulfide, and pH. Further, Ohio EPA recommends that the four C Block Quarry RI wells be sampled for a minimum of two consecutive sampling events and be added to the list of wells to be sampled in 2018 in the *Facility-Wide Ground Water Monitoring Addendum*.

3. Ohio EPA concurs with the response to FTGW Comment 5. In the response, the Army acknowledges the fact that the SESOIL™/AT123D™ model does not take into account the direct disposal of wastes onto the weathered and fractured bedrock, as was reported to have been historically practiced in the 1950's and 1960's in C Block Quarry. Therefore, Ohio EPA recommends that the four C Block RI wells be added to the list of wells to be sampled in 2018 in the Facility Wide Ground Water Monitoring Addendum, as recommended in Comment 2 above.
4. The Army's response to Ohio EPA's FTGW Comment 6 dated November 28, 2017, is inadequate. The ground water flow interpretations in Figures 3, 3-1, 4, and 4-1 are incorrect. Ground water flow on the knob of the Homewood Sandstone was re-interpreted a number of years ago to be radial, and not as shown on the figures. Attached is the most recent April 2017 Potentiometric Map, which shows radial flow in that hydrostratigraphic unit in the vicinity of C Block Quarry. While the aforementioned flow map only shows one flow arrow, the potentiometric map shows an arced potentiometric line, which follows the contour of the Homewood Knob in the vicinity C Block Quarry, where ground water flow in the Homewood is radial. Ground water flow interpretations in the RI report need to be modified to accurately show ground water flow in the vicinity of C Block Quarry.
5. The Army has adequately responded to Ohio EPA's Comment 7, dated November 28, 2017. The response indicates that the Geologic Bedrock Map (Figure 3-3) will be corrected to show the correct geologic units.

REFERENCES

New Jersey DEP, 2014, *Guidance Document, Using the Combined SESOIL/AT123D Models to Develop Site-Specific Impact to Ground Water Soil Remediation Standards for Mobile Contaminants*, New Jersey DEP, Trenton, New Jersey, 35 p.

Kaufmann, Mark and McLane, Charles, 2015, *Using SESOIL to Evaluate Contaminant Release Timeframes in an Environmental Litigation Context*, 67th Annual American Academy of Forensic Sciences Meeting in Orlando Florida, McLane Environmental, Princeton, New Jersey 23 p.


Pfingsten, Ralph A., 2002, *A History of the Ravenna Arsenal*, The Northern Ohio Railway Museum, Chippewa, Ohio., 341 p

ATTACHMENTS

Potentiometric Surface Map, Homewood Sandstone Aquifer, April 2017
Surface Geology Map

Ohio EPA will be coordinating a meeting with the Army to discuss Ohio EPA's comments and the comment responses. Please contact me at (330) 963-1219 or vanessa.steigerwald-dick@epa.ohio.gov, if there are any issues or concerns.

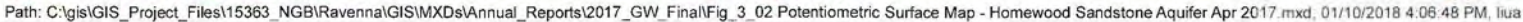
Sincerely,



Vanessa Steigerwald Dick, Ph.D. - Environmental Scientist
Division of Environmental Response and Revitalization

VS-D/nvp

ec: Katie Tait/Kevin Sedlak OHARNG RTLS
Craig Coombs, USACE
Rebecca Shreffler/Gail Harris, VISTA Sciences Corp.
Josh Koch, ODH
Brian Ng, ARAQMD
James Crowley, ARNG-IED
Nat Peters, USACE
Bob Princic, Ohio EPA, NEDO, DERR
Mark Johnson, Ohio EPA, NEDO, DERR
Tom Schneider, Ohio EPA, SWDO, DERR
Vicki Deppisch, Ohio EPA, NEDO, DERR
Tim Christman, Ohio EPA, CO, DERR
Al Muller, Ohio EPA, NEDO, DDAGW
Kevin Palumbo, NEDO, DERR
Frederick Jones, Ohio EPA, CO, DAPC
Chris Williams, Ohio EPA, NEDO, DAPC





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

June 6, 2018

LTC James Crowley
ARNG-IED
ARNG Directorate
111 South George Mason Drive
Arlington, VA 22204

Re: US Army Ravenna Ammunition Plant RVAAP
Remediation Response
Project records
Remedial Response
Portage County
267000859122

Subject: Updated Final Proposed Plan for Wet Sediment and Surface Water at Load Line 12 for the Former Ravenna Army Ammunition Plant (RVAAP) Document, (Work Activity No. 267-000859-122) Received on June 4, 2018

Dear LTC Crowley:

The Ohio Environmental Protection Agency (Ohio EPA) received the Updated Final Proposed Plan for Wet Sediment and Surface Water at RVAAP-12 Load Line 12 on June 4, 2018. The reason for the updated document was to include the dates of the public comment period and the date and time for the public meeting.

The Army will offer a public comment period from June 6, 2018 to July 6, 2018, and hold an open house/public meeting to present the conclusions and investigative findings for Wet Sediment and Surface Water at RVAAP-12 Load Line 12 on June 21, 2018, at 6PM.

Sincerely,

A handwritten signature in black ink, appearing to read "Sue Netzly-Watkins", is written over a horizontal line.

Sue Netzly-Watkins
Division of Environmental Response and Revitalization

SN-W/nvp

cc: Craig Coombs, 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
Jed Thomas, Leidos
Pat Ryan, Leidos-REIMS
Rod Beals, Ohio EPA, NEDO, DERR
Mark Johnson, Ohio EPA, NEDO, DERR
Bill Damschroder, Legal
Bob Princic, Ohio EPA, NEDO, DERR
Brian Tucker, Ohio EPA, DERR, CO
Tom Schneider, Ohio EPA, DERR, SWDO



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

January 16, 2018

RECEIVED
1/22/2018

Mr. Mark Leeper
Team Lead
Cleanup and Restoration Branch
ARNG Directorate
111 South George Mason
Arlington, VA 22204

Re: **US Army Ravenna Ammunition Plt RVAAP
Remediation Response
Project records
Remedial Response
Portage County
267000859122**

**Subject: Approval of Final Proposed Plan for Wet Sediment and Surface Water
at Load Line 12 for the Former Ravenna Army Ammunition Plant
(RVAAP) Document, (Work Activity No. 267-000859-122)**

Dear Mr. Leeper:

The Ohio Environmental Protection Agency (Ohio EPA) received the Final Proposed Plan for Wet Sediment and Surface Water at RVAAP-12 Load Line 12 on November 14, 2017. The conclusions of the Proposed Plan found that the area is protective for the resident receptor, and that no additional remedial activities are required.

We have no comments on the Final Proposed Plan for Load Line 12 Wet Sediment and Surface Water. Ohio EPA approves the Final Proposed Plan for Wet Sediment and Surface Water at RVAAP-12 Load Line 12.

The Army will offer a public comment period and hold an open house/public meeting to present the conclusions and investigative findings for Wet Sediment and Surface Water at RVAAP-12 Load Line 12.

If you have any questions concerning the above, please feel free to contact Sue Netzly-Watkins at (330) 963-1201

Sincerely,

A handwritten signature in black ink, appearing to read "Michael Proffitt", followed by a horizontal line.

Michael Proffitt, Chief
Division of Environmental Response and Revitalization

SN-W/nvp

A large, handwritten blue checkmark.

cc: Craig Coombs, USACE, Louisville District
Nat Peters, II, USACE Louisville District
Katie Tait, Camp Ravenna, Newton Falls
Gail Shreffler, Camp Ravenna, Vista Sciences Corp.
Kevin Sedlak, Camp Ravenna, Newton Falls
Rebecca Harris, Camp Ravenna, Vista Sciences Corp.
Jed Thomas, Leidos
Pat Ryan, Leidos-REIMS

ec: Rod Beals, Ohio EPA, NEDO, DERR
Bill Damschroder, Legal
Bob Princic, Ohio EPA, NEDO, DERR
Brian Tucker, Ohio EPA, DERR, CO
Tom Schneider, Ohio EPA, DERR, SWDO



NATIONAL GUARD BUREAU

111 SOUTH GEORGE MASON DRIVE
ARLINGTON VA 22204-1373

December 27, 2018

Ohio Environmental Protection Agency
DERR-NEDO
Attn: Mr. Mark Johnson
2110 East Aurora Road
Twinsburg, OH 44087-1924

Subject: Director's Final Finding and Orders Milestone Extension Request for RVAAP-19 Landfill North of Winklepeck Burning Grounds Draft Proposed Plan Milestone, Ravenna Army Ammunition Plant (RVAAP) Restoration Program, Portage/Trumbull Counties, Ohio

Dear Mr. Johnson:

Due to delays experienced in getting Legal Review Comments from Army National Guard (ARNG) Legal on the Draft Proposed Plan for RVAAP-19 Landfill North of Winklepeck Burning Grounds (LNWBG) at the former Ravenna Army Ammunition Plant, the ARNG is requesting an extension of the following approved FY19 milestone date:

- Draft Proposed Plan for RVAAP-19 Landfill North of WBG from 31 December 2018 to 14 February 2019.

Upon receiving your approval of the milestone change and receipt of ARNG Legal comments (with applicable document revisions), the ARNG will distribute the Draft version of this report. Please contact the undersigned at (703) 607-7589 or david.m.connolly8.civ@mail.mil if there are issues or concerns with this request.

Sincerely,

TAIT.KATHRYN.SEREN
A.1289508275

Digitally signed by
TAIT,KATHRYN.SERENA.1289508275
Date: 2018.12.27 14:19:00 -05'00'

FOR Mr. David M. Connolly
RVAAP Restoration Program Manager
Army National Guard Directorate

cc: Bob Princic, Ohio EPA, NEDO
Tom Schneider, Ohio EPA, SWDO
Kevin Sedlak, ARNG
Katie Tait, OHARNG
Craig Coombs, USACE Louisville
Nathaniel Peters, II, USACE Louisville
Rebecca Shreffler, Chenega

Table 1

Ohio EPA Comment	Army Response
<p>Issue A: Human Health Risk Assessment (HHRA) and Ecological Risk Assessment (ERA)</p> <p>The text in Section G.2 states, "Because the Army did not encounter DoD military munitions, concentrated areas of MD, or evidence of munitions use during either the 2007 SI or the 2015 RI conducted at the Landfill North of Winklepeck MRS, media sampling for MC-related contamination was not warranted. Therefore, the Army did not perform an HHRA or an ERA for the MRS and determined that there was no risk from MC-related contamination present at the MRS (CB&I 2015)."</p> <p>This is acceptable under the military munitions response program (MMRP); however, this does not address the chemicals potentially present related to the overlapping landfill operations under investigation through the installation restoration program (IRP).</p> <p>Please provide clarity as to how the area investigated will be addressed or has been addressed under the IRP to verify there is no risk to human health or the environment. This information will help provide transparency to the reader and support the ROD under the MMRP.</p>	<p>Concur. No edits are suggested to the text in Section G.2.</p> <p>The following text will be added to paragraph 2 of Section B. (inserted text is underlined):</p> <p>"The Landfill North of Winklepeck slightly overlaps with the RVAAP-19 Area of Concern (AOC) being investigated under the Installation Restoration Program (IRP), pursuant to CERCLA. <u>Investigation of the IRP AOC RVAAP-19 will address any potential contamination related to past industrial activities and sources (non-munitions related contamination or sources). Solid waste identified at the site will be managed under the Solid Waste Management Plan for Camp Ravenna (currently preliminary draft).</u>"</p>



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

August 15, 2018

Mr. David Connolly
Army National Guard Directorate
Environmental Programs Division
ARNG-ILE-CR
111 South George Mason Drive
Arlington, VA 22204

Re: **US Army Ammunition PLT RVAAP
Remediation Response
Project Records
Remedial Response
Portage County
267000859097**

Subject: Ravenna Army Ammunition Plant, Portage/Trumbull Counties. "Response to Ohio EPA Approval Letter on the Final, Remedial Investigation Report for Soil, Sediment, and Surface Water at RVAAP-19 Landfill North of Winklepeck Burning Grounds" Dated July 17, 2018

Dear Mr. Connolly:

The Ohio Environmental Protection Agency (Ohio EPA) has received and reviewed the "Response to Ohio EPA Approval Letter for the Final, Remedial Investigation Report for Soil, Sediment, and Surface Water at RVAAP-19 Landfill North of Winklepeck Burning Grounds" (LNWBG). The document is dated July 17, 2018 and was received at Ohio EPA, Northeast District Office (NEDO) on July 18, 2018.

Ohio EPA noted that the "Army acknowledges the presence of debris at LNWBG and will manage this solid waste as part of the Solid Waste Management Plan (SWMP)." The Army's response adequately addresses Ohio EPA's concerns and therefore the Final, Remedial Investigation Report for the LNWBG is approved.

If you have any questions, please call me at (330) 963-1207.

Sincerely,

A handwritten signature in black ink, appearing to read "Vicki Deppisch", is written over the word "Sincerely,".

Vicki Deppisch, Hydrogeologist/Project Coordinator
Division of Environmental Response and Revitalization

cc: Katie Tait/Kevin Sedlak OHARNG RTLS
Craig Coombs, USACE
Rebecca Shreffler, Chenega
David Connolly, ARNG
Nat Peters, USACE
Rod Beals, Ohio EPA, NEDO, DERR
Mark Johnson, Ohio EPA, NEDO, DERR
Bob Princic, Ohio EPA, NEDO, DERR
Tom Schneider, Ohio EPA, SWDO, DERR
Vanessa Steigerwald-Dick, Ohio EPA, NEDO, DERR
Kevin Palombo, NEDO, DERR

RECEIVED
15 AUG 2018



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

RECEIVED

July 17, 2018

JUL 18 2018

OHIO EPA NEDO

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

Subject: Ravenna Army Ammunition Plant (RVAAP) Restoration Program, Portage/Trumbull Counties, RVAAP-19 Landfill North of Winklepeck Burning Grounds (LNWBG), Response to Ohio Environmental Protection Agency (Ohio EPA) Approval Letter on the Remedial Investigation Report (Work Activity No. 267-000-859-097)

Dear Ms. Deppisch:

The Army originally submitted the *Revised Draft Remedial Investigation Report for Soil, Sediment, and Surface Water at RVAAP-19 Landfill North of Winklepeck Burning Grounds* on January 26, 2018. This Remedial Investigation (RI) Report provided the following:

- 1) A characterization of surface soil, subsurface soil, sediment, and surface water at the Landfill North of Winklepeck Burning Grounds area of concern.
- 2) An assessment of the site history, historical aerial photographs, and topography indicating that LNWBG was predominantly used for burning wastes, as opposed to trench and fill-type operations of a landfill.
- 3) A summary of field investigations (including the 1996 Phase I RI, 2004 Characterization of 14 AOCs, and 2010 PBA08 RI) that only encountered refuse within the upper 1 ft of soil.
- 4) A targeted surface and subsurface soil risk characterization of the area (defined as "Area A" in the report) identified as being used for historical activities. (Subsurface soil samples in this area were as deep as 8 ft bgs.)

With this information, the RI Report concluded that (1) the nature and extent of impacted media has been sufficiently characterized; (2) the fate and transport modeling did not identify soil contaminant migration chemical of potential concerns (CMCOCs) requiring further evaluation or remediation to protect groundwater; (3) there are no human health chemicals of concern (COCs) identified in soil, sediment, or surface water requiring further evaluation in a feasibility study or remediation; and (4) remedial actions to protect ecological resources are not warranted. Based on the investigation results, the recommended path forward for LNWBG is no further action for soil, sediment, and surface water to attain Unrestricted (Residential) Land Use.

After submission of the Revised Draft RI Report, Ohio EPA provided a letter (dated April 2, 2018) stating "Ohio EPA has no comments and requests the submittal of the final document for concurrence." Accordingly, the Army submitted the Final RI Report on April 25, 2018.

Subject: Ravenna Army Ammunition Plant (RVAAP) Restoration Program, Portage/Trumbull Counties, RVAAP-19 Landfill North of Winklepeck Burning Grounds (Work Activity No. 267-000-859-097)

A recent Ohio EPA letter (dated June 15, 2018) stated the following:

Although the risk calculations did meet the unrestricted use designation under CERCLA, Ohio EPA cannot concur with an unrestricted use designation for the entire Area of Concern (AOC). While the contaminants of concern (COCs) in surface soil meets the unrestricted use standards, the waste material underneath does not. The unrestricted use point of compliance is 13 feet below surface, which in this case is located in waste. Because waste remains buried in place, a two-foot earthen cover must be maintained on the landfill and cannot be disturbed. Ohio EPA recommends that a Land Use Control (LUC), which includes maintenance and inspection of the landfill cover material and a prohibition on digging into the cover, should be instituted for the area of the AOC which contains buried waste.

However, as summarized in Section 8.1 of the RI Report, it is evident that LNWBG was predominantly used for burning wastes, as opposed to trench and fill-type operations of a landfill. In addition, the Army did not identify waste deeper than 1 ft bgs, and no unacceptable risk was identified in surface soil, subsurface soil, sediment, or surface water.

Consistent with other areas of concern within the former RVAAP, such as RVAAP-46 Buildings F-15 and F-16, the Army acknowledges the presence of debris at LNWBG and will manage this solid waste as part of the Solid Waste Management Plan (SWMP).

Consequently, the Army does not agree that an earthen cap (or any other engineering control) is needed as a CERCLA remedy at this site and requests Ohio EPA concurrence with the conclusions of the RI Report. Please contact the undersigned at (703) 607-7589 or david.m.connolly8.civ@mail.mil if there are issues or concerns with this request.

Sincerely,



Date: 2018.07.17
17:17:51 -04'00'

Mr. David Connolly
RVAAP Restoration Program Manager
Army National Guard Directorate

cc: Mark Johnson, Ohio EPA, NEDO
Bob Princic, Ohio EPA, NEDO
Tom Schneider, Ohio EPA, SWDO
Kevin Sedlak, ARNG, Camp Ravenna
Katie Tait, OHARNG, Camp Ravenna
Craig Coombs, USACE Louisville
Nathaniel Peters, II, USACE Louisville
Jed Thomas, Leidos
Gail Harris, Vista Sciences Corporation



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

June 15, 2018

Mr. David Connolly
Army National Guard Directorate
Environmental Programs Division
ARNG-ILE-CR
111 South George Mason Drive
ARLINGTON, VA 22204

**Re: US Army Ammunition PLT RVAAP
Remediation Response
Project Records
Remedial Response
Portage County
267000859097**

**Subject: Ravenna Army Ammunition Plant, Portage/Trumbull Counties.
"Final, Remedial Investigation Report for Soil, Sediment, and
Surface Water at RVAAP-19 Landfill North of Winklepeck Burning
Grounds" Dated April 25, 2018**

Dear Mr. Connolly:

The Ohio Environmental Protection Agency (Ohio EPA) has received and reviewed the "Final, Remedial Investigation Report for Soil, Sediment, and Surface Water at RVAAP-19 Landfill North of Winklepeck Burning Grounds." The report is dated and was received at Ohio EPA, Northeast District Office (NEDO) on April 25, 2018.

Although the risk calculations did meet the unrestricted use designation under CERCLA, Ohio EPA cannot concur with an unrestricted use designation for the entire Area of Concern (AOC). While the contaminants of concern (COCs) in surface soil meets the unrestricted use standards, the waste material underneath does not. The unrestricted use point of compliance is 13 feet below surface, which in this case is located in waste. Because waste remains buried in place, a two-foot earthen cover must be maintained on the landfill and cannot be disturbed. Ohio EPA recommends that a Land Use Control (LUC), which includes maintenance and inspection of the landfill cover material and a prohibition on digging into the cover, should be instituted for the area of the AOC which contains buried waste.

RECEIVED
18 JUN 2018

MR. DAVID CONNOLLY
ARNG-ILE-CR
JUNE 15, 2018
PAGE 2

Ohio EPA is open to a meeting or conference call to discuss the above. If you have any questions, please call me at (330) 963-1207.

Sincerely,

A handwritten signature in cursive script, appearing to read "Vicki Deppisch".

Vicki Deppisch
Hydrogeologist/Project Coordinator
Division of Environmental Response and Revitalization

VD/nvp

cc: Jed Thomas, Leidos

ec: Rod Beals, Ohio EPA, NEDO, DERR
Mark Johnson, Ohio EPA, NEDO, DERR
Nat Peters, USACE
Bob Princic, Ohio EPA, NEDO, DERR
Tom Schneider, Ohio EPA, SWDO, DERR
Katie Tait/Kevin Sedlak OHARNG RTLS
Craig Coombs, USACE
Rebecca Shreffler/Gail Harris, VISTA Sciences Corp.
Kevin Palombo, NEDO, DERR
Vanessa Steigerwald-Dick, NEDO, DERR



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

RECEIVED
4/10/2018

April 2, 2018

Mr. Mark Leeper, P.G., MBA
Team Lead
Cleanup and Restoration Branch
ARNG Directorate
111 South George Mason Drive
Arlington, VA 22204

Re: US Army Ravenna Ammunition Plt RVAAP
Remediation Response
Project records
Remedial Response
Portage County
267000859097

Subject: Receipt and Review of the Revised Draft "Remedial Investigation Report for Soil, Sediment, and Surface Water at RVAAP-19 Landfill North of Winklepeck Burning Grounds" at the Former Ravenna Army Ammunition Plant in Portage and Trumbull Counties, Ohio, Dated January 24, 2018 (Work Activity No. 267000859097)

Dear Mr. Leeper:

The Ohio Environmental Protection Agency (Ohio EPA), Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR) has received and reviewed the revised draft "*Remedial Investigation Report for Soil, Sediment, and Surface Water at RVAAP-19 Landfill North of Winklepeck Burning Grounds*," dated January 24, 2018. This document was received by Ohio EPA's NEDO on January 26, 2018. It was prepared for the U.S. Army Corps of Engineers (USACE) Louisville District by Leidos. Ohio EPA has no comments and requests the submittal of the final document for concurrence.

If you have any questions or concerns, please do not hesitate to contact me at (330) 963-1235.

Sincerely,

Nicholas Roope
Site Coordinator
Division of Environmental Response and Revitalization

NCR/nvp

cc: Craig Coombs, USACE, Louisville District
Katie Tait/Kevin Sedlak, Camp Ravenna Environmental Office
Shreffler/Harris, Camp Ravenna Environmental Office, Vista Sciences

ec: Rod Beals, Ohio EPA, NEDO DERR
Bob Princic, Ohio EPA, NEDO DERR
Tom Schneider, Ohio EPA, SWDO DERR
Brian Tucker, Ohio EPA, CO DERR



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

RECEIVED
3/14/2018

March 9, 2018

Mr. Mark Leeper, P.G., MBA
Team Lead
Cleanup and Restoration Branch
ARNG Directorate
111 South George Mason Drive
Arlington, VA 22204

Re: US Army Ravenna Ammunition Plt RVAAP
Remediation Response
Project records
Remedial Response
Portage County
267000859097

Subject: Request for an Extension for the Review of the "Draft Remedial Investigation Report for Soil, Sediment, and Surface Water at RVAAP-19 Landfill North of Winklepeck Burning Grounds" at the Former Ravenna Army Ammunition Plant, Ravenna, Ohio Dated January 24, 2018 (Work Activity No. 267000859097)

Dear Mr. Leeper:

On January 26, 2018, the Ohio Environmental Protection Agency (Ohio EPA), Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR) received the "Draft Remedial Investigation Report for Soil, Sediment, and Surface Water at RVAAP-19 Landfill North of Winklepeck Burning Grounds". Pursuant to the Director's Final Findings and Orders (Orders), the deadline for review on this document is March 12, 2018.

However, this document is undergoing further review and discussion by Ohio EPA staff. The letter requests an extension of 40 days from today to ensure a proper review of the document with regards to outstanding issues. This extension would move the due date of this review to April 18, 2018.

Ohio EPA respectfully requests your review and approval of this extension request pursuant to the Orders.

If you have any questions or concerns, please do not hesitate to contact me at (330) 963-1292.

Sincerely,

A handwritten signature in black ink, appearing to read "Nicholas Roope", is written over a horizontal line.

Nicholas Roope, Site Coordinator
Division of Environmental Response and Revitalization

NCR/nvp

cc: Craig Coombs, USACE, Louisville District
Katie Tait/Kevin Sedlak, Camp Ravenna Environmental Office
Shreffler/Harris, Camp Ravenna Environmental Office, Vista Sciences
ec: Rod Beals, Ohio EPA, NEDO DERR
Bob Princic, Ohio EPA, NEDO DERR
Tom Schneider, Ohio EPA, SWDO DERR



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

Received March 5, 2018

March 2, 2018

Mr. Mark Leeper, P.G., MBA
Team Lead
Cleanup and Restoration Branch
ARNG Directorate
111 South George Mason Drive
Arlington, VA 22204

**Re: US Army Ravenna Ammunition Plt RVAAP
Remediation Response
Plans
Remedial Response
Portage County
267000859028**

Subject: Review of the "Final Proposed Plan for Soil, Sediment, and Surface Water at RVAAP-29 Upper and Lower Cobbs Ponds" for the Former Ravenna Army Ammunition Plant, Portage and Trumbull Counties, Ohio: Dated January 12, 2018 (Work Activity No. 267000859028)

Dear Mr. Leeper:

The Ohio Environmental Protection Agency (Ohio EPA), Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR) has received and reviewed the *"Final Proposed Plan for Soil, Sediment, and Surface Water at RVAAP-29 Upper and Lower Cobbs Ponds"* dated January 12, 2018. This document received by Ohio EPA's NEDO on January 12, 2018, was prepared by Leidos in response to the investigation completed under the installation restoration program.

Based on the information contained in the final proposed plan (PP), other investigation documents/reports and Ohio EPA's oversight participation during the investigation, Ohio EPA concurs with the final PP for addressing soil, sediment and surface water at the Upper and Lower Cobbs Ponds. The Army will offer a public comment period, and hold an open house/public meeting to be determined at a later date.

If you have any questions or concerns, please do not hesitate to contact Nicholas Roope at (330) 963-1235.

Sincerely,

Michael Proffitt, Chief
Division of Environmental Response and Revitalization

NCR/nvp

ec: Craig Coombs, USACE, Louisville District
Katie Tait/Kevin Sedlak, Camp Ravenna Environmental Office
Rebecca Shreffler/Gail Harris, Camp Ravenna Environmental Office, Vista Sciences
Rod Beals, NEDO DERR
Bob Princic, NEDO DERR
Tom Schneider, SWDO, DERR
Bill Damschroder, Esq., Legal



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

1/9/2018

January 5, 2018

Mr. Mark Leeper, P.G., MBA
Team Lead
Cleanup and Restoration Branch
ARNG Directorate
111 South George Mason Drive
Arlington, VA 22204

Re: US Army Ravenna Ammunition Plt RVAAP
Remediation Response
Plans
Remedial Response
Portage County
267000859028

Subject: Review of the "Draft Proposed Plan for Soil, Sediment, and Surface Water at RVAAP-29 Upper and Lower Cobbs Pond" for the Former Ravenna Army Ammunition Plant, Portage and Trumbull Counties, Ohio: Dated November 21, 2017 (Work Activity No. 267000859028)

Dear Mr. Leeper:

The Ohio Environmental Protection Agency (Ohio EPA), Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR) has received and reviewed the document entitled, "Draft Proposed Plan for Soil, Sediment, and Surface Water at RVAAP-29 Upper and Lower Cobbs Pond," dated November 21, 2017. This document, received by Ohio EPA, NEDO on November 22, 2017, was prepared by Leidos.

This document was reviewed by personnel from Ohio EPA DERR, pursuant to the Director's Findings and Orders paragraph 39 (b), and we request the preferred plan in its final format. If you have any questions or concerns, please do not hesitate to contact me at (330) 963-1235.

Sincerely,

Nicholas Roope
Site Coordinator
Division of Environmental Response and Revitalization

NCR/nvp

cc: Craig Coombs, USACE, Louisville District
Katie Tait/Kevin Sedlak, Camp Ravenna Environmental Office
Shreffler/Harris, Camp Ravenna Environmental Office, Vista Sciences

ec: Rod Beals, Ohio EPA, NEDO DERR
Bob Princic, Ohio EPA, NEDO DERR
Tom Schneider, Ohio EPA, SWDO DERR



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

RECEIVED
3/29/2018

March 29, 2018

**Re: US Army Ravenna Ammunition PLT RVAAP
Remediation Response
Project Records
Remedial Response
Trumbull County
267000859117**

Mr. Mark Leeper
Team Lead
Cleanup and Restoration Branch
ARNG Directorate
111 South George Mason Drive
Arlington, VA 22204

**SUBJECT: RAVENNA ARMY AMMUNITION PLANT PORTAGE/TRUMBULL COUNTIES,
"FINAL RECORD OF DECISION FOR SOIL, SEDIMENT, AND SURFACE WATER
AT RVAAP-33 LOAD LINE 6," DATED JANUARY 25, 2018**

Dear Mr. Leeper:

The Ohio Environmental Protection Agency (Ohio EPA) has received and reviewed the "Final Record of Decision for Soil, Sediment, and Surface Water at RVAAP-33 Load Line 6," document for the Ravenna Army Ammunition Plant (RVAAP), Portage/Trumbull Counties. The document is dated and was received at Ohio EPA, Northeast District Office (NEDO) on January 25, 2018. This letter serves to document Ohio EPA's concurrence regarding the proposal of no further action (NFA) for the RVAAP-33 Load Line 6 site contained in the Final Record of Decision (ROD).

The Army submitted a Final Proposed Plan (PP) dated March 17, 2017, recommending NFA for unrestricted (residential) land use based on the Final Remedial Investigation (RI) report findings, including the human health risk assessment and ecological risk assessment, and other investigation documents and reports. Ohio EPA concurred with the recommendation in a letter dated May 11, 2017.

The Army released the Load Line 6 PP to the public on June 12, 2017. A notice of availability was sent to radio stations, television stations, and newspapers as specified in the Community Relations Plan that initiated the 30-day public comment period beginning June 12, 2107 and ending July 12, 2017. The Army held a public meeting on June 27, 2017, to present the Final PP document. Five oral comments were received at the public meeting, and Part III of the ROD contains the Responsiveness Summary that addresses these public comments. The Final ROD contains minor changes to address the comments received on the Final PP.

MR. MARK LEEPER
ARMY NATIONAL GUARD DIRECTORATE
PAGE 2

Based on the information contained in the Final PP document, other investigation documents and reports, and Ohio EPA's oversight participation during the investigation, Ohio EPA concurs with the Final ROD document for the RVAAP-33 Load Line 6 for NFA. If you have any questions concerning the above, please feel free to contact Vanessa Steigerwald Dick, NEDO, at (330) 963-1219.

Sincerely,



Michael Proffitt
Chief
Division of Environmental Response and Revitalization

MP:VSD:nvp

cc: Gail Harris/Rebecca Shreffler, Vista Sciences

ec: Mark Leeper, ARNGD, Arlington
Katie Tait/Kevin Sedlak, ARNG, Camp Ravenna
Craig Coombs, USACE Louisville
Tom Schneider, Ohio EPA, SWDO, DERR
Rod Beals, Ohio EPA, NEDO, DERR
Bob Princic, Ohio EPA, NEDO, DERR
Vanessa Steigerwald Dick, Ohio EPA, NEDO, DERR
Vicki Deppisch, Ohio EPA, NEDO, DERR
Bill Damschroder, Ohio EPA, Legal



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

RECEIVED
1/22/2018

January 17, 2018

Mr. Mark Leeper
Team Lead
Cleanup/Restoration Branch
Army National Guard Directorate
111 South George Mason Drive
Arlington, VA 22204

Re: US Army Ammunition PLT RVAAP
Remediation Response
Project Records
Remedial Response
Portage County
267000859117

Subject: Ravenna Army Ammunition Plant, Portage/Trumbull Counties. "Response to Comments, Draft, Record of Decision for Soil, Sediment, and Surface Water at RVAAP-33, Load Line 6" Dated December 26, 2017


Dear Mr. Leeper:

The Ohio Environmental Protection Agency (Ohio EPA) has received and reviewed the "Response to Comments, Draft, Record of Decision for Soil, Sediment, and Surface Water at RVAAP-33 Load Line 6" for the Ravenna Army Ammunition Plant (RVAAP), Portage/Trumbull Counties. This document is dated and was received at Ohio EPA, Northeast District Office (NEDO) on December 26, 2017.

The comments have been adequately addressed. As stated in the response letter, once the comments have been resolved, the final version of the Record of Decision (ROD) will be forwarded to Ohio EPA. If Ohio EPA has comments on the final version that requires revision to the ROD, the Army will address the comments and submit a revised final version.

Please forward the final version of the ROD to Ohio EPA for review. I will be out of the office for an extended period of time. If you have any questions in my absence, please contact Vanessa Steigerwald Dick at Vanessa.Steigerwald-Dick@epa.ohio.gov or at (330) 963-1219.

Sincerely,



Vicki Deppisch
Hydrogeologist/Project Coordinator
Division of Environmental Response and Revitalization

VD/nvr

cc: Katie Tait, OHARNG RTLS
Craig Coombs, USACE
Gail Harris, VISTA Sciences Corp.
ec: Mark Leeper, ARNG
Rodney Beals, NEDO, DERR
Nat Peters, USACE

Kevin Sedlak, OHARNG RTLS
Rebecca Shreffler, VISTA Sciences Corp.
Bob Princic, NEDO, DERR
Tom Schneider, SWDO, DERR
Vanessa Steigerwald Dick, NEDO, DERR



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

December 11, 2018

Mr. David Connolly
Army National Guard Directorate
ARNGD-IED
111 South George Mason Drive
Arlington, VA 22204

**Re: US Army Ammunition Plt RVAAP
Remediation Response
Project Records
Remedial Response
Portage County
267000859137**

Subject: Ravenna Army Ammunition Plant, Portage/Trumbull Counties. Approval of the Response to Ohio EPA Comments on the "Draft Engineering Evaluation/Cost Analysis for RVAAP-34 Sand Creek Disposal Road Landfill, Former Ravenna Army Ammunition Plant, Ravenna, Ohio, Dated November 19, 2018, Ohio EPA ID # 267-000859-137

Dear Mr. Connolly:

The Ohio Environmental Protection Agency (Ohio EPA) has received the response to Ohio EPA's comments on the "Draft Engineering Evaluation/Cost Analysis for RVAAP-34 Sand Creek Disposal Road Landfill, Former Ravenna Army Ammunition Plant, Ravenna, Ohio. These responses to comments were received at Ohio EPA's Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR) on November 20, 2018. The report was prepared for the Army National Guard Directorate by the U.S. Army Corps of Engineers.

The response to comments were reviewed by personnel from Ohio EPA's DERR, pursuant to the Director's Findings and Orders paragraph 39 (b), the responses are satisfactory. Please submit the final document for Agency approval with the changes made as agreed in the letter.

If you have any questions, please call me at (330) 963-1292.

Sincerely,

Kevin M. Palombo, Environmental Specialist
Division of Environmental Response and Revitalization

KP/nvp

ec: Rebecca Shreffler, Chenega Tri Services, LLC
Bob Princic, Ohio EPA, NEDO DERR
Mark Johnson, Ohio EPA, NEDO DERR
Thomas Schneider, Ohio EPA, SWDO DERR
Tim Christman, Ohio EPA, CO DERR
Carrie Rasik, Ohio EPA, CO DERR
Kevin Sedlak, ARNG
Katie Tait, OHARNG RTLS
Craig Coombs, USACE, Louisville District

RECEIVED
12 DEC 2018



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

November 19, 2018

Ohio Environmental Protection Agency
DERR-NEDO
Attn: Mr. Kevin Palombo
2110 East Aurora Road
Twinsburg, OH 44087-1924

Subject: Responses to Comments on the *Draft Engineering Evaluation/Cost Analysis for RVAAP-34 Sand Creek Disposal Road Landfill, Former Ravenna Army Ammunition Plant (RVAAP)/ Camp Ravenna, Portage and Trumbull Counties, Ohio*, Dated (Ohio EPA Work ID # 267-000-859-038)

Dear Mr. Palombo,

The Army appreciates your time and comments (dated September 28, 2018) on the *Draft Engineering Evaluation/Cost Analysis for RVAAP-34 Sand Creek Disposal Road Landfill, Former Ravenna Army Ammunition Plant / Camp Ravenna, Portage and Trumbull Counties, Ohio*, dated August 10, 2018. Enclosed for your review are responses to your comments. Upon final resolution of these responses to comments, the Army will distribute the final version of the report.

Please contact the undersigned at (703) 607-7589 or david.m.connolly8.civ@mail.mil if there are issues or concerns with these responses or the submittal.

Sincerely,

Date: 2018.11.19
11:13:29 -05'00'

David M. Connolly
RVAAP Restoration Program Manager
Army National Guard Directorate

cc: Mark Johnson, Ohio EPA, DERR-NEDO (email only)
Bob Princic, Ohio EPA, DERR-NEDO (email only)
Tom Schneider, Ohio EPA, SWDO (email only)
Kevin Sedlak, ARNG, Camp Ravenna (email only)
Katie Tait, OHARNG, Camp Ravenna (email only)
Craig Coombs, USACE Louisville (email only)
Angela Schmidt, USACE Louisville (email only)
Gail Harris, Vista Sciences Corporation
REIMS - attn. Pat Ryan, Leidos

COMMENTS AND RESPONSES

General Comments

1. Figure 2-4, pg. 23 is entitled Phase I Remedial Investigation Boring Locations. In the List of Figures, pg. v, Figure 2-4 is entitled Remedial Investigation Sample Locations. Please make the correction.

Army's Response:

The Title of Figure 2-4 in the List of Figures will be changed to "Phase I Remedial Investigation Boring Locations".

2. Figure 2-5, pg. 24 is entitled Remedial Investigation Sample Locations. In the List of Figures, pg. v, Figure 2-5 is entitled Remedial Investigation (2017 Phase II RI) Sample Locations from 2017. Please keep the titles consistent.

Army's Response:

The title of Figure 2-5 will be changed in the List of Figures and on the actual Figure to the following:

Figure 2-5. Sample locations from the 2017 Remedial Investigation (2017 Phase II RI).

3. Figure 6-1, pg. 49 is entitled Remedial Investigation Sample Locations. The Table of Contents on pg. v, Figure 6-1 is entitled, Four Locations Identified as Requiring a Removal Action. Please correct the Figure.

Army's Response:

The title of Figure 6-1 will be changed to "Four Locations Identified as Requiring a Removal Action."

4. There are two Section 7.1.1.4's in both the Table of Contents, pg. ii, and on pg. 51. Please correct the document.

Army's Response:

The second Section 7.1.1.4 will be renumbered as 7.1.1.5 and subsequent subsections in 7.1.1 will be renumbered accordingly.

5. In the Table of Contents, pg. iii, the page numbers for the Appendices are not accurate, and not necessary. Please remove page numbers.

Army's Response:

The page numbers will be removed from the Appendices in the Table of Contents.

Subject: Response to Ohio EPA's Comments (dated September 28, 2018) on the *Draft Engineering Evaluation/Cost Analysis for RVAAP-34 Sand Creek Disposal Road Landfill, Former Ravenna Army Ammunition Plant (RVAAP)/Camp Ravenna, Portage and Trumbull Counties, Ohio*, Dated (Ohio EPA Work ID # 267-000-859-038)

6. Table 8, pg. 38. The yellow highlights in the table show the PAH soil samples rather than the arsenic soil samples, which is opposite of what is labeled. Please make this correction.

Army's Response:

The foot note at the bottom of Table 8 will be corrected to identify that the highlighted cells have PAH contamination.

7. (A) Section 2.4.2.6, Pg.12, first bullet, and last paragraph. The first bullet states that confirmatory samples collected from surface soil after the 2003 remedial action identified numerous semi-volatile organic compounds (SVOCs) consisting of PAHs, three explosives, one propellant, and one volatile organic compound (VOC) were detected at two surface sample locations. Were these areas resampled to evaluate whether these areas should be included in the soil removal as part of this EE/CA?

(B) The last sentence in the last paragraph stated that during confirmation sampling after the 2003 removal action, two 75 mm projectile shells (munitions debris) were discovered at the northern portion of the site. Please verify that this historical landfill was evaluated by the unexploded ordnance (UXO) personnel. Will UXO personnel be present during the proposed removal actions?

Army's Response was broken into A and B to address the two-part comment:

(A) Yes these areas were resampled and assessed in the Data Gap Analysis and the Phase II RI (2017 RI). There have been several investigations as well as a Removal Action conducted at the Sand Creek AOC. The Removal Action occurred in 2003. The two locations in the shallow soil that were confirmatory sample locations with SVOCs (PAHs) in surface soil were addressed in two subsequent studies. After the Removal Action and before the 2017 was completed, a Data Gap Analysis was completed for the AOC. The Data Gap Analysis was used to determine where sample locations should be in the 2017 RI. Figure 4-5 of the 2017 illustrates the locations where the PAHs occurred and also shows that two of the ISM grids surrounded the locations. Figure 4-5 from the Phase II RI is provided in this submittal to facilitate your review.

(B) A Digital Geophysical Mapping (DGM) survey was completed over the AOC and results are summarized in the 2017 Phase II RI. The DGM Survey report was completed by Shaw and the final report reference is as follows:

Shaw, 2011. *Final Digital Geophysical Mapping Report for the RVAAP-34 Sand Creek Disposal Road Landfill, RVAAP-03 Open Demolition Area #1, and RVAAP-28 Mustard Agent Burial Site, Version 1.0, Ravenna Army Ammunition Plant, Ravenna, Ohio, January.*

Because this AOC was determined to be NFA under the MMRP in the ROD (CB&I, September 2015) and no explosive hazards were identified, specialized UXO personnel are not required to be present during removal actions. s with all DOD Contractors and personnel, they are aware of the 3Rs (Recognize, Retreat, and Report) in dealing with potential military explosives or UXOs and would follow these at all times.

8. Section 2.4.2.7. DGM Survey. Please define the acronym in this section, and specify what type of geophysical activity was conducted (i.e., magnetometer, conductivity). This Digital Geophysical Mapping survey was conducted in 2010 and the results are presented on Figure 2.3. The results the survey shows extremely high anomaly density on the northern and northeast portion of the property. The Sand Creek Area of Concern (AOC) boundary does not include this area of high anomaly density. Also, based on information presented, it does not appear surface or subsurface samples were collected where the highest anomalies are shown. Can the Army provide additional information that would clarify this concern?

Army's Response:

The acronym DGM for Digital Geophysical Mapping will be defined in this section of the EE/CA. This area of high anomaly density at the northern portion of the AOC was included and investigated as part of the RI for RVAAP-034-R-01 Sand Creek Dump MRS. The RVAAP 034-R-01 Sand Creek Dump Munitions Response Site Final No Further Action Proposed Plan was completed in May 2015 and was prepared by CB&I Federal Services LLC. While this area was not fully covered in the Phase II RI, the area was fully assessed as required for the MMRP and a No Further Action decision was made.

9. Ohio EPA notes that Section 6.3.2, pg. 47, paragraph 5 states that residual solid waste will be managed under the solid waste management plan which is currently under development. Because so many geophysical anomalies were identified in the northeast portion of this AOC, can the Army estimate the current thickness of soil cover over these anomalies?

Army's Response:

There is a mixture of miscellaneous debris and construction debris on the AOC that is located on the surface. Prior activities involving the Removal Action completed in 2003 (Sand Creek Remedial Design/Removal Action, MKM, March 2004) involved removing as much of this debris as possible. The Removal Action only involved regarding and reseeding areas per RVAAP standards. There was not soil cover placed over top of the debris as part of the Removal Action. The Solid Waste Management Plan will include all necessary characteristics and features so that the AOC can be managed successfully under the plan following applicable Solid Waste Regulations. This was a former dump area where mainly construction debris was dumped. There is surficial construction debris that remains and contains rebar and other metallic objects. The geophysical anomalies were investigated in the RI for RVAAP-034-R-01 Sand Creek Dump MRS and were shown to be of no concern since the MRS was deemed to meet NFA criteria.



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

November 19, 2018

Ohio Environmental Protection Agency
DERR-NEDO
Attn: Mr. Kevin Palombo
2110 East Aurora Road
Twinsburg, OH 44087-1924

Subject: Responses to Comments on the *Draft Engineering Evaluation/Cost Analysis for RVAAP-34 Sand Creek Disposal Road Landfill, Former Ravenna Army Ammunition Plant (RVAAP)/ Camp Ravenna, Portage and Trumbull Counties, Ohio*, Dated (Ohio EPA Work ID # 267-000-859-038)

Dear Mr. Palombo,

The Army appreciates your time and comments (dated September 28, 2018) on the *Draft Engineering Evaluation/Cost Analysis for RVAAP-34 Sand Creek Disposal Road Landfill, Former Ravenna Army Ammunition Plant / Camp Ravenna, Portage and Trumbull Counties, Ohio*, dated August 10, 2018. Enclosed for your review are responses to your comments. Upon final resolution of these responses to comments, the Army will distribute the final version of the report.

Please contact the undersigned at (703) 607-7589 or david.m.connolly8.civ@mail.mil if there are issues or concerns with these responses or the submittal.

Sincerely,

Date: 2018.11.19
11:13:29 -05'00'

David M. Connolly
RVAAP Restoration Program Manager
Army National Guard Directorate

cc: Mark Johnson, Ohio EPA, DERR-NEDO (email only)
Bob Princic, Ohio EPA, DERR-NEDO (email only)
Tom Schneider, Ohio EPA, SWDO (email only)
Kevin Sedlak, ARNG, Camp Ravenna (email only)
Katie Tait, OHARNG, Camp Ravenna (email only)
Craig Coombs, USACE Louisville (email only)
Angela Schmidt, USACE Louisville (email only)
Gail Harris, Vista Sciences Corporation
REIMS - attn. Pat Ryan, Leidos

Comments on the Cost Analysis

The cost analysis does not provide detail. Total prices were provided without substantial detail on how the price was determined.

Army Response:

The Draft EE/CA did not provide a detailed breakdown of the remediation cost, because the estimate was an overall "planning level" estimate based on previous estimates made for similar AOCs at Camp Ravenna, using the "VEG" technology and excavation with off-site disposal. A detailed estimate for the remediation cost component is provided at the end of this response table and will be added to the end of Appendix C of the EE/CA (see Detailed Cost Estimate for Remediation, attached). Note that this detailed breakdown of remediation cost is based on an estimate done by a Contractor for work at Camp Ravenna. This estimate is suitable for comparison purposes in an EE/CA, but it is not suitable for determining actual construction cost or for awarding a remediation contract. As a result of adding this detailed remediation cost breakdown, the cost of Alternative 2 shown in the EE/CA will be changed from \$142,000 to \$142,400. The detailed cost estimate for the "VEG" treatment does not include costs for equipment mobilization. Due to the relatively small volume of soil to be treated, "VEG" treatment will be cost-effective only if the treatment unit is available at Camp Ravenna to treat several AOCs in one mobilization.

10. Provide costs associated with soil volume changes. The volume of exhumed soil to be replaced into excavated areas will vary (recognizing that some compaction will be needed to replace the arsenic-contaminated soil). Also, the thermally treated soil will probably have a smaller volume than what was removed originally and will need to be supplemented.

Army's Response:

Costs associated with soil volume changes are inherent in much of the estimate. Footnote "a" in Table 8 of the EE/CA states that soil volumes include a 20% "swell factor" beyond the in-situ volumes to account for swell during excavation. So the estimated costs of excavation, loading, transportation, thermal treatment (where applicable), and disposal at the landfill (where applicable) are all based on volumes that are 20% larger than the in-situ volumes to be removed or treated. Compaction is accounted for by using the 20% larger volume for estimating the cost of backfill. Regarding the thermally treated soil, the pilot study indicated that the "VEG" treatment did not significantly reduce the soil volume; consequently, the need for supplemental backfill is not anticipated. However, the detailed cost estimate does show a cost for purchasing topsoil to encourage re-vegetation. The volume of topsoil is based upon a 4-inch layer over the backfilled areas. See Detailed Cost Estimate for Remediation, Alternative 2a, Key Parameters and Assumptions, Subpart titled Restoration. No changes to the EE/CA document are proposed specifically for this response other than adding the Detailed Cost Estimate for Remediation to the EE/CA at the end of Appendix C.

11. Provide the estimated treatment and/or disposal costs per ton for the two batches of soil.

Army's Response:

The overall cost of excavation and disposal of the arsenic-containing soils is estimated to be \$173 per ton. This is based upon remediation of 162 tons of soil (i.e. 101 cubic yards x 1.6) at an overall cost of \$27,986. The overall cost of excavation and treatment of the PAH-containing soils is estimated to be \$115 per ton. This is based upon remediation of 90 tons of soil (i.e. 56 cubic yards x 1.6) at an overall cost of \$10,405. See the Detailed Cost Estimate for Remediation for the development of these costs. Note that the overall cost for the PAH-containing soils does not include mobilization of the VEG equipment. If the comment is referring to only the estimated unit rates of soil disposal versus "VEG" treatment, please note that these rates are not directly comparable since disposal at the landfill also requires transportation to the landfill and purchase of backfill material. The Detailed Cost Estimate for Remediation shows that the unit rate for transportation and off-site disposal at a landfill is estimated to be \$54.08 per ton. This unit rate was obtained from an estimate prepared by a contractor with experience at Camp Ravenna. The tipping fee at the landfill was not broken out separately. The Detailed Cost Estimate shows that the estimated unit rate for "VEG" treatment only is \$42.64 per cubic yard or \$68.22 per ton, using a factor of 1.6 tons per cubic yard. No changes to the EE/CA document are proposed for this response other than adding the Detailed Cost Estimate for Remediation provided herein to Appendix C of the EE/CA.

12. Provide the transportation costs to the disposal site for arsenic containing soils.

Army's Response:

The transportation and disposal cost for the arsenic containing soils is estimated in the Detailed Cost Estimate for Remediation as \$8,761 (162 tons of soil x \$54.08 per ton). The unit rate of \$54.08 per ton for transportation and disposal of soil was obtained from an estimate prepared by a contractor with extensive experience doing soil remediation at Camp Ravenna. The transportation costs were not estimated separately. No changes to the EE/CA document are proposed for this response other than adding the Detailed Cost Estimate for Remediation (included in this letter) to Appendix C of the EE/CA.

13. Provide the costs of analyses that may be required by the receiving landfill.

Army's Response:

The cost of waste characterization required by the landfill is estimated to be \$320. This is based on two samples at a cost of \$160 each for TCLP Metals and RCRA characteristics. See Detailed Cost Estimate for Remediation, Alternative 2a, Key Parameters and Assumptions, Subpart titled Waste Characterization Sampling. No changes to the EE/CA document are proposed for this response other than adding the Detailed Cost Estimate for Remediation to Appendix C.

Subject: Response to Ohio EPA's Comments (dated September 28, 2018) on the *Draft Engineering Evaluation/Cost Analysis for RVAAP-34 Sand Creek Disposal Road Landfill, Former Ravenna Army Ammunition Plant (RVAAP)/Camp Ravenna, Portage and Trumbull Counties, Ohio*, Dated (Ohio EPA Work ID # 267-000-859-038)

14. Provide the costs of reseeded the excavated areas.

Army's Response:

It was assumed that the total area to be reseeded would be approximately one acre to account for both the excavated areas (arsenic and PAH soils) and additional area for equipment staging and movement. The estimated cost is \$4,711 for reseeded, based on 44,000 square feet at \$107.07 per thousand square feet. The cost of reseeded only the excavated areas was not broken out separately. No changes to the EE/CA document are proposed for this response other than adding the Detailed Cost Estimate for Remediation to Appendix C of the EE/CA.

15. Provide the costs for the confirmatory sampling that may be needed.

Army's Response:

The cost of confirmatory sampling for the Arsenic-containing soils is estimated to be \$605. This includes sampling labor, truck rental and gasoline, sample materials, and sample analysis. See Detailed Cost Estimate for Remediation, Alternative 2a, Cost Estimate, Subpart titled Confirmation Sampling for a breakdown of this cost. The cost of confirmatory sampling for the PAH-containing soils is estimated to be \$460. This includes sampling labor, truck rental and gasoline, sample materials, and sample analysis. See Detailed Cost Estimate for Remediation, Alternative 2b, Cost Estimate, Subpart titled Confirmation Sampling for a breakdown of this cost. No changes to the EE/CA document are proposed for this response other than adding the Detailed Cost Estimate for Remediation to Appendix C of the EE/CA.

Figure 4-5 per response to Comment #7.

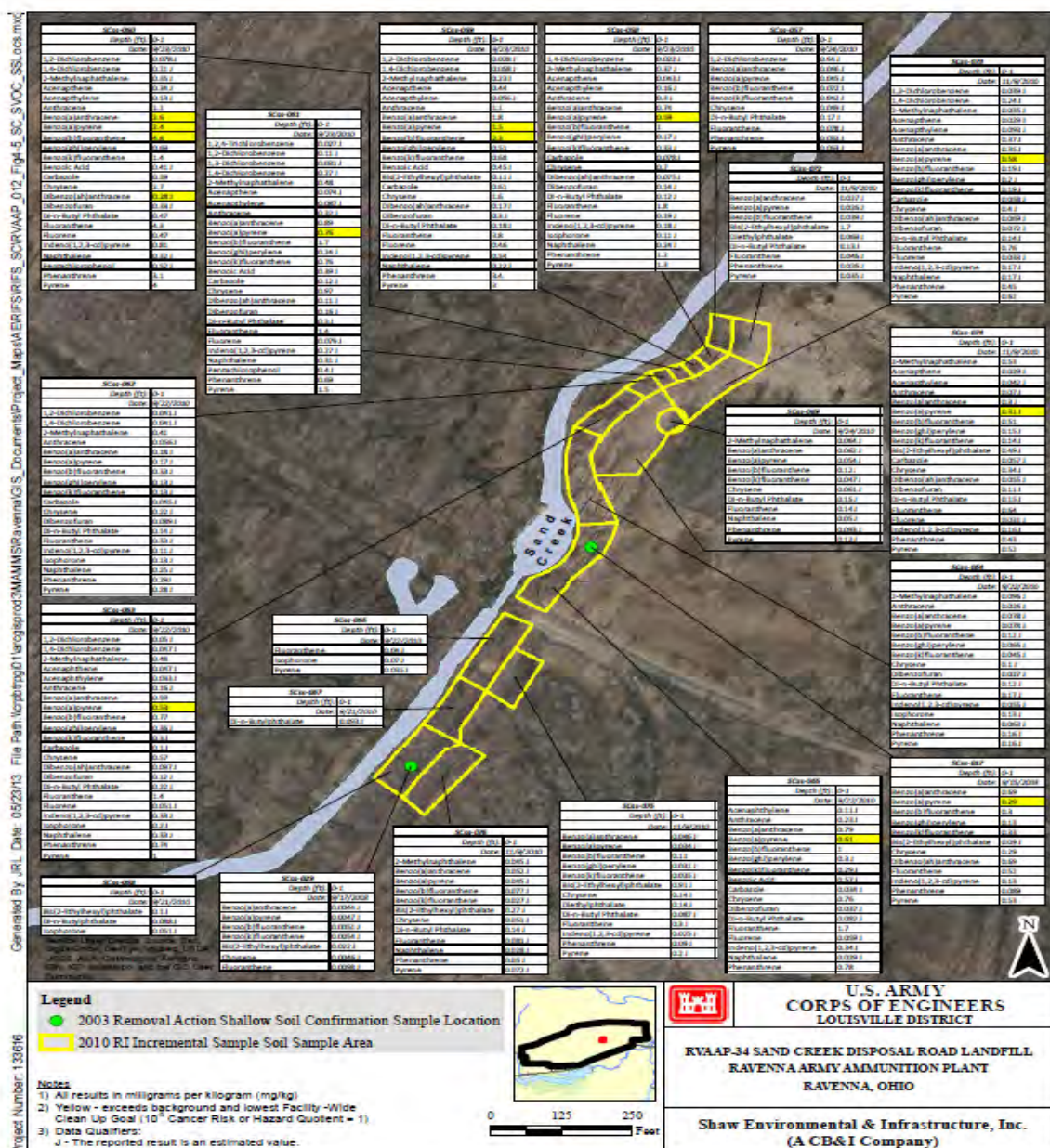


Figure 4-5 All SVOC SRCs in Surface Soil

**Engineering Evaluation/Cost Analysis (EE/CA) for RVAAP Sand Creek
Disposal Road Landfill – Cost Components**

Key Parameters and Assumptions:

Item	Units	Value	Notes
Component Costs			
Contract Award			
Government Cost	each	\$10,000	
Action Memorandum			
Government Cost	each	\$17,000	
RD			
Contractor Cost	each	\$39,000	
Oversight and Project Management	each	\$4,000	
Soil Remediation			
Contractor Cost <i>Details of specific costs (breakdown) are presented separately following this Table.</i>	157 cu.yds. 101 cu.yds for off-site disposal 56 cu.yds for thermal treatment	\$38,400	Includes pre-removal delineation sampling, removal, confirmation sampling, waste characterization, trucking, thermal treatment, disposal, backfill, site restoration, and project management
Completion Report			
Contractor Cost	each	\$31,000	
Oversight and Project Management	each	\$3,000	
	TOTAL	\$142,400	

Detailed Cost Estimate for Remediation

**EE/CA for RVAAP-34 Sand Creek Disposal Road Landfill Former Ravenna Army Ammunition Plant (RVAAP)
Summary of Alternatives**

RVAAP-34 Sand Creek Alternatives		Duration	Non Discounted Cost		
			Soil		
			Capital Cost	O&M Cost	Total
1	No Action	0	\$0	\$0	\$0
2a	Excavation and Off-site Disposal of Soil with Arsenic levels requiring remediation	<1 yr	\$27,986	\$0	\$27,986
2b	Ex-Situ Thermal Treatment of Soil with PAH levels requiring remediation	<1 yr	\$10,405	\$0	\$10,405
2	Total for 2a and 2b	<1 yr	\$38,391	\$0	\$38,391

Notes:

1. The base year of comparison and cost data will be CY2018.
2. Costs were estimated for comparison purposes only and are believed to be accurate within a range of -30% to +50%. Use of these costs for other purposes, including but not limited to, budgetary or construction cost estimating is not appropriate.

**EE/CA for RVAAP-34 Sand Creek Disposal Road Landfill,
Former Ravenna Army Ammunition Plant (RVAAP)
Summary of Removal Areas and Volumes**

Locations Requiring Remediation	Media	Treatment Interval	Surface Area	In Situ		In situ with Constructability ¹		Ex situ ^{1,2}	
		(ft bgs)	(ft ²)	Volume (ft ³)	Volume (yd ³)	Volume (ft ³)	Volume (yd ³)	Volume (ft ³)	Volume (yd ³)
SCss-062M (As)	Surface Soil	0-1	1912.5	1912.5	71	1912.5	71	2295	85
SCsb-037M (As)	Soil	0-10	36	360	13.3	360	13.3	432	16
TOTAL for Soil Containing Arsenic									101
SCss-060 (PAHs)	Surface Soil	0-1	1031.25	1031.25	38.2	1031.25	38.2	1238	46
SCss-049 (PAHs)	Soil	0-6	36	216	8	216	8	259	10
TOTAL for Soil Containing PAH									56
TOTAL									157

¹ Typically a constructability factor is used to account for over excavation, sloping of sidewalls, and addresses limitations of removal equipment. In this case, two borings are being over-excavated. An area 6 feet by 6 feet will be disposed of to ensure appropriate soil is removed and that volume is already accounted for in the in-situ volume. The additional over-excavation needed to slope side walls back will not be disposed of. In the case of the removals to one foot of depth, side walls are not a factor. Therefore, a constructability factor is not applied in this case.

² Includes 20% swell factor

EE/CA for RVAAP-34 Sand Creek Disposal Road Landfill
Alternative 2a - Excavation and Off-site Disposal of Soil with Arsenic Levels of Concern
Key Parameters and Assumptions

Key Parameters and Assumptions:

Item	Unit	Value	Notes
Capital Cost			
Pre-excavation Delineation and			
Waste Characterization Sampling			
Samples	ea	4	Two delineation samples analyzed for total Arsenic. Waste characterization includes 2 composite samples TCLP Metals, RCRA Characteristics, and Paint Filter.
Sampling Labor	hrs	8	Assumes 1 sampling technician at 8 hours to collect and ship samples.
Sampling Labor	\$/hr	75	
Truck Rental / Gas	\$/event	100	1 truck x \$80/day. Add \$20 for gas.
Sample Materials	ea	4	Reference ECHOS 33 02 0401/0402 for ISM, processing, disposable sampling and decontamination materials.
Sample Materials	\$/ea	35	
Analytical Cost	\$/event	460	Analyze samples for Arsenic (2 @ \$70) and TCLP Metals, RCRA Characteristics, and Paint Filter (2 @ \$160).
Soil Excavation			
Soil Excavation Volume (In situ)	cy	84	Includes soil volume to be transported and disposed. Ex situ volumes include 20% swell factor.
Soil Excavation Volume (Ex situ)	cy	101	
Volume to Weight Conversion	tons/cy	1.60	In situ soil conversion.
Soil Excavation Mass	tons	162	Includes soil mass to be transported and disposed.
Soil Excavation Surface Area	sf	2,400	

EE/CA for RVAAP-34 Sand Creek Disposal Road Landfill
Alternative 2a - Excavation and Off-site Disposal of Soil with Arsenic Levels of Concern
Key Parameters and Assumptions

Key Parameters and Assumptions:

<u>Mobilization/Demobilization</u>	ls	1,500	Includes mob/demob of excavation equipment.
<u>Excavate Soils</u>	day	1	Includes 2 cy excavator, 1-22 cy off highway truck, 1 O.E., 3 T.D., 1 L.S. spotter, 2 L.S. to prep trucks/and misc. Reduced productivity by 33% for loading trucks, precise excavations, and security/S&H requirements. Assume trucks are direct loaded. Average 200 cy/day and 1 day. RSMeans Crew B12-E.
	\$/day	4,994.39	
<u>Standby Time</u>	day	3	Assume 3 days equipment standby while analysis is being performed. Assume no additional hot spot excavation.
	\$/day	857	
Nonhazardous Waste	tons	162	Based on shipping waste to American Landfill, Waynesburg, Ohio (approximately 80 mi RT). Assumes a minimum of 22 tons /load. Rate includes \$16.60/ton tax from Portage County.
Transport and Offsite Disposal	\$/ton	54.08	
<u>Confirmation Sampling</u>			
Samples	ea hrs	2	Includes 2 ISM samples for confirmation (Arsenic)
Sampling Labor	\$/hr	4	Assumes 1 sampling technician at 4 hours to collect and ship samples.
Sampling Labor	\$/event	75	
Truck Rental / Gas	ea	100	1 truck x \$80/day. Add \$20 for gas.
Sample Materials	\$/ea	2	
Sample Materials	\$/event	35	Analyze samples for Arsenic (2@70).
Analytical Cost		135	
<u>Restoration</u>	cy		Includes native soil backfill. Assume productivity has been reduced by 25% to account for security and safety requirements.
Native Soil Backfill	\$/cy	101	Includes 12-in lift of native fill assuming 20% swell. ECHOS 17030423 and RSMeans 312323160040, Unclassified Fill, 6" Lifts, offsite Source @ 20 miles, Includes delivery, spreading, and compaction.
Native Soil Backfill		35.09	
	MSF		Seeding with mulch and fertilizer. Assume 1 acre is revegetated for restored areas and equipment damage. RSMeans 329219142200.
Seeding, Vegetative Cover	\$/MSF	44	
Seeding, Vegetative Cover		107.07	
<u>Plans and Reports</u>	hrs		
Corrective Action Completion Report		240	Includes Construction QC data and preparing report.
Technical Labor	\$/hr	95	

EE/CA for RVAAP-34 Sand Creek Disposal Road Landfill
Alternative 2a - Excavation and Off-site Disposal of Soil with Arsenic Levels of Concern
Cost Estimate

CAPITAL COST

Activity (unit)	Quantity	Unit Cost	Total
<u>Pre-excavation Delineation and Waste Characterization Sampling</u>			
Sampling Labor (hrs) Truck	8	\$75.00	\$600
Rental / Gas (event)	1	\$100.00	\$100
Sample Materials (ea)	4	\$35.00	\$140
Sample Analysis (event)	1	\$460.00	\$460
<u>Soil Excavation</u>			
Mobilization/Demobilization (ls)	1	\$1,500.00	\$1,500
Excavate Soil (days)	1	\$4,994.39	\$4,994
Standby Time (day)	3	\$856.89	\$2,571
Nonhazardous Transport and Offsite Disposal (ton)	162	\$54.08	\$8,761
<u>Confirmation Sampling</u>			
Sampling Labor (hrs) Truck	4	\$75.00	\$300
Rental / Gas (event)	1	\$100.00	\$100
Sample Materials (ea)	2	\$35.00	\$70
Sample Analysis (event)	1	\$135.00	\$135
<u>Restoration</u>			
Native Soil Backfill (cy)	101	\$35.09	\$3,544
Seeding, Vegetative Cover (MSF)	44	\$107.07	\$4,711
Subtotal for 2a (Arsenic Soils – Off Site Disposal)			\$27,986
Total for Alternate 2			\$38,391

**EE/CA for RVAAP-34 Sand Creek Disposal Road Landfill
Alternative 2b - Ex-Situ Thermal Treatment of Soil with PAHs of Concern
Key Parameters and Assumptions**

Key Parameters and Assumptions:

Item	Unit	Value	Notes
Capital Cost			
Pre-excavation Delineation and Waste Characterization Sampling			
Samples	ea	4	Delineation sampling includes 2 ISM sampling locations analyzed for PAHs. Waste characterization includes 2 composite samples TCLP VOCs, SVOCs, RCRA Characteristics, and Paint Filter. Assumes 1 sampling technician at 8 hours to collect and ship samples.
Sampling Labor	hrs	8	
Sampling Labor	\$/hr	75	1 truck x \$80/day. Add \$20 for gas.
Truck Rental / Gas	\$/event	100	
Sample Materials	ea	4	
Sample Materials	\$/ea	35	
Analytical Cost	\$/event	740	Analyze samples for PAHs (2 @ \$70) and TCLP VOCs, SVOCs, Metals, RCRA Characteristics, and Paint Filter (2 @ \$300).
Soil Excavation			
Soil Excavation Volume (In situ)	cy cy	46	
Soil Excavation Volume (Ex situ)	tons/cy	56	Includes soil volume to undergo thermal treatment. Ex situ volumes include a 20% swell factor.
Volume to Weight Conversion	tons sf	1.60	
Soil Excavation Mass		90	In situ soil conversion.
Soil Excavation Surface Area		2,230	Includes soil mass to be treated

**EE/CA for RVAAP-34 Sand Creek Disposal Road Landfill
Alternative 2b - Ex-Situ Thermal Treatment of Soil with PAHs of Concern
Key Parameters and Assumptions**

Key Parameters and Assumptions:

Item	Unit	Value	Notes
<u>Mobilization/Demobilization</u>	ls day	0	Mobilization not included. VEG unit is assumed to be onsite for other larger projects. Mobilization of other equipment included in 2a above.
Excavate Soils	1 \$/day	4,994.39	Includes 2 cy excavator, 1-22 cy off highway trucks, 1 O.E., 2 T.D., 1 L.S. spotter, 2 L.S. to prep trucks and misc. Reduced productivity by 33% for loading trucks, precise excavations, and security/S&H requirements. Assume trucks are direct loaded. Average 200 cy/day and 1 day. RSMeans Crew B12-E.
<u>Standby Time</u>	day \$/day	0 857	Covered in cost of 2a above. Assume no additional hot spot excavation.
<u>Thermal Treatment of Contaminated Soil</u>	cy \$/cy	56 42.64	Source: Endpoint Technology cost estimate using Vapor Energy Generator (VEG) Soil Remediation.
Hazardous Waste Transport and Offsite Disposal	drums \$/drum	0 686.40	Based on shipping one drum of hazardous waste soils to US Ecology Disposal Facility.
<u>Confirmation Sampling</u>			
Samples	ea hrs	2	Includes 2 samples for confirmation (PAHs at \$70 each)
Sampling Labor	\$/hr	2	Assumes 1 sampling technician at 4 hours to collect and ship samples.
Sampling Labor	\$/event	75	
Truck Rental / Gas	ea	1	1 truck x \$80/day. Add \$20 for gas.
Sample Materials	\$/ea	2	
Sample Materials	\$/event	35	
Analytical Cost		140	Analyze samples for PAHs (2 @ \$70).
<u>Restoration</u>			
Native Soil Backfill	cy \$/cy	28	Includes native soil backfill. Assume productivity has been reduced by 25% to account for security and safety requirements.
Native Soil Backfill		35.09	Quantity is based on 4-in of native soil over the removal area to facilitate vegetation growth. Pricing basis from ECHOS 17030423 and RSMeans 312323160040, Unclassified Fill, 6" Lifts, offsite Source @ 20 miles, Includes delivery, spreading, and compaction.
Seeding, Vegetative Cover	MSF \$/MSF	0	Seeding with mulch and fertilizer. Price for a whole acre was included in 2a above. No additional cost for 2b is needed.
Seeding, Vegetative Cover		107.07	
<u>Plans and Reports</u>			
Corrective Action Completion Report	hrs	280	Includes Construction QC data and preparing report.
Technical Labor	\$/hr	95	

**EE/CA for RVAAP-34 Sand Creek Disposal Road Landfill
Alternative 2b - Ex-Situ Thermal Treatment of Soil with PAHs of Concern
Cost Estimate**

CAPITAL COST

Activity (unit)	Quantity	Unit Cost	Total
<u>Pre-excavation Delineation and Waste Characterization Sampling</u>			
Sampling Labor (hrs) Truck	8	\$75.00	\$600
Rental / Gas (event)	1	\$100.00	\$100
Sample Materials (ea)	4	\$35.00	\$140
Sample Analysis (event)	1	\$740.00	\$740
<u>Soil Excavation</u>			
Mobilization/Demobilization (ls)	0	\$0	\$0
Excavate Soil (day)	1	\$4,994.39	\$4,994
Standby Time (day)	0	\$856.89	\$0
Thermal Treatment of Contaminated Soil (cy)	56	\$42.64	\$2,388
Hazardous Transport and Offsite Disposal (drums)	0	\$686.40	\$0
<u>Confirmation Sampling</u>			
Sampling Labor (hrs.)	2	\$75.00	\$150
Truck Rental with Gas	1	\$100.00	\$100
Sample Materials (ea)	2	\$35.00	\$70
Sample Analysis (event)	1	\$140.00	\$140
<u>Restoration</u>			
Native Soil Backfill (cy)	28	\$35.09	\$983
Seeding, Vegetative Cover (MSF)	0	\$107.07	\$0
<u>Plans and Reports</u>			
Corrective Action Completion Report (ea)	0	\$95.00	\$0
Subtotal for 2b (PAH Soils – Ex-situ Thermal)			\$10,405
Total for Alternate 2			\$ 38,391



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

September 26, 2018

Mr. David Connolly
Army National Guard Directorate
ARNGD-ILE-CR
111 South George Mason Drive
Arlington, VA 22204

**Re: US Army Ammunition Plt RVAAP
Remediation Response
Project Records
Remedial Response
Portage County
267000859137**

**Subject: Ravenna Army Ammunition Plant, Portage/Trumbull Counties.
Ohio EPA Comments on the "Draft Engineering Evaluation/Cost
Analysis: RVAAP-34 Sand Creek Disposal Road Landfill" at the
Former Ravenna Army Ammunition Plant, Portage and Trumbull
Counties, Ohio, Dated August 10, 2018, Ohio EPA ID # 267-000859-137**

Dear Mr. Connolly:

The Ohio Environmental Protection Agency (Ohio EPA) has received and reviewed the "Draft Engineering Evaluation/Cost Analysis: RVAAP-34 Sand Creek Disposal Road Landfill" at the Former Ravenna Army Ammunition Plant, Portage and Trumbull Counties, Ohio. This document was received at Ohio EPA's Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR), on August 13, 2018. The report was prepared for the National Guard Bureau by the U.S. Army Corps of Engineers, Louisville District. This document is not approvable as written. Additional information is necessary to approve the document.

Comments on the Engineering Evaluation/Cost Analysis (EE/CA) based on Ohio EPA review are provided below. Please provide responses to the enclosed comments in accordance with the Director's Findings and Orders.

The Draft Engineering Evaluation/Cost Analysis (EE/CA)

The Remedial Investigation (RI), completed in April of 2017, recommended the path forward for the project is to proceed to the Feasibility Study (FS) phase of the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) process. The FS was determined to be necessary to evaluate the remedial alternatives to address chemicals of concern (COCs) identified in surface and subsurface soils. However, instead of completing the FS and going through the Alternatives analysis, the Army determined that the removal action could be completed more efficiently, and cost



effectively through the EE/CA process. This EE/CA also includes a Risk Management Evaluation to assess each COC, and identify areas where COCs need to be removed. No Chemicals of Potential Ecological Concern (COPECs) were identified. Also, no COCs or COPECs were identified in sediment or surface water.

The EE/CA identifies four areas that require remedial activities to achieve unrestricted residential land use. These include the areas around the following sample locations:

- Surface soil ISM sample SCss-062M-0001 (0-1 foot) for arsenic (36.6 mg/kg)
- Surface soil ISM sample SCss-060M-0001 (0-1 foot) for Benzo(a)pyrene (2.4 mg/kg)
- Subsurface soil discrete sample SCsb-037M-0001-SO (1-9 feet) for arsenic at maximum of 182 mg/kg
- Subsurface soil discrete sample SCsb-049M-0001-SO (1-5 feet) for benzo(a)pyrene (8.3 mg/kg)

The EE/CA proposes excavation of metal-contaminated soil and ex-situ treatment of polynuclear aromatic hydrocarbon (PAH) - contaminated soil to achieve unrestricted /residential land use. Confirmation soil samples will be collected during and after remedial activities. The remedial activities will result in an estimated removal of 3520 ft³ of soil.

Further evaluation of ground water will be conducted at the Sand Creek Disposal Road Landfill under the Facility-Wide Groundwater RI that is currently in progress.

COMMENTS

General Comments

1. Figure 2-4, pg. 23 is entitled Phase I Remedial Investigation Boring Locations. In the List of Figures, pg. v, Figure 2-4 is entitled Remedial Investigation Sample Locations. Please make the correction.
2. Figure 2-5, pg. 24 is entitled Remedial Investigation Sample Locations. In the List of Figures, pg. v, Figure 2-5 is entitled Remedial Investigation (2017 Phase II RI) Sample Locations from 2017. Please keep the titles consistent.
3. Figure 6-1, pg. 49 is entitled Remedial Investigation Sample Locations. The Table of Contents on pg. v, Figure 6-1 is entitled, Four Locations Identified as Requiring a Removal Action. Please correct the Figure.
4. There are two Section 7.1.1.4's in both the Table of Contents, pg. ii, and on pg. 51. Please correct the document.

5. In the Table of Contents, pg. iii, the page numbers for the Appendices are not accurate, and not necessary. Please remove page numbers.
6. Table 8, pg. 38. The yellow highlights in the table show the PAH soil samples rather than the arsenic soil samples, which is opposite of what is labeled. Please make this correction.
7. Section 2.4.2.6, Pg.12, first bullet, and last paragraph. The first bullet states that confirmatory samples collected from surface soil after the 2003 remedial action identified numerous semi-volatile organic compounds (SVOCs) consisting of PAHs, three explosives, one propellant, and one volatile organic compound (VOC) were detected at two surface sample locations. Were these areas resampled to evaluate whether these areas should be included in the soil removal as part of this EE/CA?

The last sentence in the last paragraph stated that during confirmation sampling after the 2003 removal action, two 75 mm projectile shells (munitions debris) were discovered at the northern portion of the site. Please verify that this historical landfill was evaluated by the unexploded ordnance (UXO) personnel. Will UXO personnel be present during the proposed removal actions?

8. Section 2.4.2.7. DGM Survey. Please define the acronym in this section, and specify what type of geophysical activity was conducted (i.e., magnetometer, conductivity). This Digital Geophysical Mapping survey was conducted in 2010 and the results are presented on Figure 2.3. The results the survey shows extremely high anomaly density on the northern and northeast portion of the property. The Sand Creek Area of Concern (AOC) boundary does not include this area of high anomaly density. Also, based on information presented, it does not appear surface or subsurface samples were collected where the highest anomalies are shown. Can the Army provide additional information that would clarify this concern?
9. Ohio EPA notes that Section 6.3.2, pg. 47, paragraph 5 states that residual solid waste will be managed under the solid waste management plan which is currently under development. Because so many geophysical anomalies were identified in the northeast portion of this AOC, can the Army estimate the current thickness of soil cover over these anomalies?

Comments on the Cost Analysis

The cost analysis does not provide detail. Total prices were provided without substantial detail on how the price was determined.

10. Provide costs associated with soil volume changes. The volume of exhumed soil to be replaced into excavated areas will vary (recognizing that some compaction will be needed to replace the arsenic-contaminated soil). Also, the thermally

treated soil will probably have a smaller volume than what was removed originally and will need to be supplemented.

11. Provide the estimated treatment and/or disposal costs per ton for the two batches of soil.
12. Provide the transportation costs to the disposal site for arsenic containing soils.
13. Provide the costs of analyses that may be required by the receiving landfill.
14. Provide the costs of reseeding the excavated areas.
15. Provide the costs for the confirmatory sampling that may be needed.

If you have questions or would like to set up a meeting to discuss these comments, please call me at (330) 963-1292.

Sincerely,



Kevin M. Palombo
Environmental Specialist
Division of Environmental Response and Revitalization

KP/nvp

ec: Rebecca Shreffler, Chenega
Katie Tait, OHARNG RTLS
Kevin Sedlak, ARNG
Bob Princic, Ohio EPA, NEDO DERR
Mark Johnson, Ohio EPA, NEDO DERR
Rodney Beals, Ohio EPA, NEDO DERR
Thomas Schneider, Ohio EPA, SWDO DERR
Tim Christman, Ohio EPA, CO DERR
Carrie Rasik, Ohio EPA, CO DERR



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

November 9, 2018

Mr. David Connolly
Army National Guard Directorate
Environmental Programs Division
ARNG-ILE-CR
111 South George Mason Drive
Arlington, VA 22204

**Re: US Army Ammunition PLT RVAAP
Remediation Response
Project Records
Remedial Response
Portage County
267000859098**

Subject: Ravenna Army Ammunition Plant, Portage/Trumbull Counties, "Responses to Comments on the Geophysical Investigation Letter Report for the Final, Phase II Remedial Investigation Report and Feasibility Study for Soil, Sediment, and Surface Water at RVAAP-38 NACA Test Area" Dated November 2, 2018

Dear Mr. Connolly:

The Ohio Environmental Protection Agency (Ohio EPA) has received and reviewed the "Responses to Comments on the Geophysical Investigation Letter Report for the Final, Phase II Remedial Investigation Report and Feasibility Study (RI/FS) for Soil, Sediment, and Surface Water at RVAAP-38 NACA Test Area" for the Ravenna Army Ammunition Plant, Portage/Trumbull Counties. This document was received via email on November 3, 2018 and is dated November 2, 2018.

The Final RI/FS report is approved. Ohio EPA will add this response letter to the Final RI/FS report.

If you have questions, please call me at (330) 963-1207.

Sincerely,

Vicki Deppisch, Hydrogeologist/Project Coordinator
Division of Environmental Response and Revitalization

**Received
9 NOV 2018**

VD/nvp

ec: Katie Tait, OHARNG RTLS
Kevin Sedlak, OHARNG RTLS
Nat Peters, USACE
Craig Coombs, USACE
David Connolly, ARNG
Rebecca Shreffler, Chenga

Bob Princic, Ohio EPA, NEDO, DERR
Mark Johnson, Ohio EPA, NEDO, DERR
Kevin Palombo, Ohio EPA, NEDO, DERR
Tom Schneider, Ohio EPA, SWDO, DERR
Vanessa Steigerwald Dick, Ohio EPA, NEDO, DERR



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

November 2, 2018

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

Subject: Responses to Comments on the Geophysical Investigation Letter Report, RVAAP-38 NACA Test Area, Former Ravenna Army Ammunition Plant (RVAAP), Portage and Trumbull Counties (Work Activity No. 267-000-859-098)

Dear Ms. Deppisch:

In November 2017, a geophysical investigation and subsurface soil sampling effort was performed at the eastern portion of NACA Test Area within the former RVAAP. The following conclusions, as stated in Section 8.9.1 of the Phase II Remedial Investigation Report and Feasibility Study for Soil, Sediment, and Surface Water at RVAAP-38 NACA Test Area (dated July 16, 2018), were made as a result of this 2017 Supplemental Investigation:

Previous speculation of airplanes being buried subsequent to crash tests conducted from 1947–1953 was evaluated during the 2017 Supplemental Investigation. A geophysical survey was conducted and soil samples were collected in the Former Plane Burial Area EU. Given the results of the geophysical survey and subsequent targeted soil boring installation, it does not appear that there was a large effort to bury airplanes used in the crash tests conducted from 1947–1953. Rather, it is believed that this area was used to stage airplanes after the crash tests were performed for evaluation and salvaging. Given the presence of small debris items on the ground surface, metallic anomalies identified during the geophysical survey, and identified wiring within one of the six soil borings, it is evident that some debris remains at the site. This debris, however, is believed to be small pieces (e.g., wiring) from the airplanes deemed not salvageable. Also, it is speculated that this area had some grading performed after the crash tests were completed, thus the debris was slightly spread beyond this staging area. Surficial debris was identified at the site and was removed during the 2017 Supplemental Investigation.

Attached to this letter are responses to your comments received in a letter dated October 17, 2018. In addition to these responses, as agreed during the October 26, 2018 meeting, the Geophysical Investigation Letter Report (October 2018) will not be included in the Solid Waste Management Plan. Upon submittal of this response letter, the Army is requesting concurrence of the Final Phase II Remedial Investigation Report and Feasibility Study at RVAAP-38 NACA Test Area, dated July 16, 2018.

Subject: Ravenna Army Ammunition Plant (RVAAP) Restoration Program, Portage/Trumbull Counties,
RVAAP-38 NACA Test Area (Work Activity No. 267-000-859-098)

Please contact the undersigned at (703) 607-7589 or david.m.connolly8.civ@mail.mil if there are
issues or concerns with this submission.

Sincerely,



Date: 2018.11.02
11:35:21 -04'00'

David Connolly
RVAAP Restoration Program Manager
Army National Guard Directorate

cc: Mark Johnson, Ohio EPA, NEDO, DERR
Bob Princic, Ohio EPA, NEDO, DERR
Tom Schneider, Ohio EPA, SWDO, DERR
Kevin Sedlak, ARNG, Camp Ravenna
Katie Tait, OHARNG, Camp Ravenna
Craig Coombs, USACE Louisville
Nathaniel Peters, II, USACE Louisville
Jed Thomas, Leidos
Rebecca Shreffler, Camp Ravenna

Subject: Ravenna Army Ammunition Plant (RVAAP) Restoration Program, Portage/Trumbull Counties, RVAAP-38 NACA Test Area (Work Activity No. 267-000-859-098)

Ohio EPA Comments

Ohio EPA Comment 1: All boundary lines identified in the RI/FS report should be included and identified in all figures from the geophysical investigation.

Army response: Insets within Figures 8-1, 8-2, and 8-5 of the Phase II RI/FS Report (July 2018) present locations of the geophysical investigation relative to the entirety of NACA Test Area.

Ohio EPA Comment 2: Identify the black-lined, rather circular-shaped areas in the figures in the geophysical report.

Army response: The black-lined shapes at or near monitoring well NTAmw-116 represent the topography change (as estimated by the geophysicist). The topographic lines are presented on figures throughout the Phase II RI/FS Report (July 2018), such as Figure 2-1 NACA Test Area Site Features.

The black-lined shapes near marked locations of Debris 05 and Debris 07 represent an area that had protruding debris. A depiction of identified debris at the site is presented on Figure 8-2 and is in Appendix C.5 Debris Photolog.

Ohio EPA Comment 3: Provide an estimation of the volume of the area of the interpreted anomalies.

Army response: As indicated in the Phase II RI/FS Report (July 2018), the debris within the area is believed to be small pieces (e.g., wiring) from the airplanes deemed not salvageable. As the identified anomalies were small pieces of debris, a large percentage of the volume would be soil and it would be misleading to suggest that any calculated total volume or area would be that of the anomalies.

Ohio EPA Comment 4: Include a scale and North directional arrow on all figures in the geophysics report.

Army response: Comment noted. The figures are oriented such that north is at the top of the page. The scale provided in the figures depicting the geophysics results uses coordinates in U.S. State Plane 1983 Ohio North. These coordinates were used with the global positioning system (GPS) unit that accompanied the EM31-MK2 and EM61-MK2 to map anomalies.



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

October 17, 2018

Mr. David Connolly
Army National Guard Directorate
Environmental Programs Division
ARNG-ILE-CR
111 South George Mason Drive
Arlington, VA 22204

**Re: US Army Ammunition PLT RVAAP
Remediation Response
Project Records
Remedial Response
Portage County
267000859098**

**Subject: Ravenna Army Ammunition Plant, Portage/Trumbull Counties,
"Geophysical Report for the Final, Phase II Remedial Investigation
Report and Feasibility Study for Soil, Sediment, and Surface Water at
RVAAP-38 NACA Test Area" Dated October 3, 2018**

Dear Mr. Connolly:

The Ohio Environmental Protection Agency (Ohio EPA) has received and reviewed the "Geophysical Report for the Final, Phase II Remedial Investigation Report and Feasibility Study (RI/FS) for Soil, Sediment, and Surface Water at RVAAP-38 NACA Test Area" for the Ravenna Army Ammunition Plant, Portage/Trumbull Counties dated and received at the Northeast District Office (NEDO) on October 3, 2018. This document was reviewed by staff with the Division of Environmental Response and Revitalization (DERR).

Historically, the NACA Test Area was used to study airplane crash tests. The geophysical report summarizes the October 2017 geophysical investigation conducted at the former plane burial area. The purpose of the investigation was to identify subsurface debris and/or suspected trenches potentially used to dispose of airplane debris associated with historical site activities.

Our review of the geophysical investigation report determined that it was missing some information that would clarify, support and relate back to the Final RI/FS report. This information is needed prior to approval of the final RI/FS report.

It is unclear how the identified boundaries of the former crash area and the former plane burial area as shown in various figures in the final RI/FS report compare to the area of the geophysical investigation. The boundaries used in the final RI/FS report were not identified in the figures from the geophysical investigation. Please add the following to the report:

RECEIVED
18 OCT 2018

MR. DAVID CONNOLLY
ARMY NATIONAL GUARD DIRECTORATE
OCTOBER 17, 2018
PAGE 2

- All boundary lines identified in the RI/FS report should be included and identified in all figures from the geophysical investigation.
- Identify the black-lined, rather circular-shaped areas in the figures in the geophysical report.
- Provide an estimation of the volume of the area of the interpreted anomalies.
- Include a scale and North directional arrow on all figures in the geophysics report.

Please clarify/revise the geophysical investigation to address the above comments and support the Final RI/FS report for approval. The geophysical investigation will then be added to the Final RI/FS report as a supporting document.

It is the understanding of Ohio EPA that the waste burial areas will be addressed in the Solid Waste Management Plan (SWMP). Ohio EPA recommends the revised geophysical investigation report be included in the SWMP.

If you have questions, please call me at (330) 963-1207.

Sincerely,



Vicki Deppisch
Hydrogeologist/Project Coordinator
Division of Environmental Response and Revitalization

VD/nvp

ec: Katie Tait/Kevin Sedlak OHARNG RTLS
Craig Coombs, USACE
Rebecca Shreffler, Chenga
David Connolly, ARNG
Nat Peters, USACE
Mark Johnson, Ohio EPA, NEDO, DERR
Tom Schneider, Ohio EPA, SWDO, DERR
Bob Princic, Ohio EPA, NEDO, DERR



NATIONAL GUARD BUREAU

111 SOUTH GEORGE MASON DRIVE
ARLINGTON VA 22204-1373

October 3, 2018

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

Subject: Geophysical Report, RVAAP-38 NACA Test Area, Former Ravenna Army Ammunition Plant (RVAAP), Portage and Trumbull Counties (Work Activity No. 267-000-859-098)

Dear Ms. Deppisch:

Per your request on a letter dated August 29, 2018, enclosed is a report summarizing the geophysical investigation conducted at NACA Test Area in October 2017. Upon Ohio EPA's receipt and review of this geophysical investigation report, the Army is requesting comments or concurrence of the Final Phase II Remedial Investigation Report and Feasibility Study at RVAAP-38 NACA Test Area, dated July 16, 2018.

Please contact the undersigned at (703) 607-7589 or david.m.connolly8.civ@mail.mil if there are issues or concerns with this submission.

Sincerely,

Date: 2018.10.03
13:51:52 -04'00'

David Connolly
RVAAP Restoration Program Manager
Army National Guard Directorate

cc: Mark Johnson, Ohio EPA, NEDO, DERR
Bob Princic, Ohio EPA, NEDO, DERR
Tom Schneider, Ohio EPA, SWDO, DERR
Kevin Sedlak, ARNG, Camp Ravenna
Katie Tait, OHARNG, Camp Ravenna
Craig Coombs, USACE Louisville
Nathaniel Peters, II, USACE Louisville
Jed Thomas, Leidos
Rebecca Shreffler, Camp Ravenna



Mr. Jed Thomas
Project Manager
Leidos
8866 Commons Boulevard
Twinsburg, Ohio 44087

Subject: **Report – Geophysical Investigation; RVAAP-38 NACA Test Area
Former Ravenna Army Ammunition Plant
Portage and Trumbull Counties, Ohio
Leidos Project 315391.00.00.00.05.000**

Dear Mr. Thomas:

Leidos is pleased to submit this letter report summarizing the results of the geophysical investigation conducted to identify subsurface debris and/or suspected trenches potentially used to dispose of airplane debris associated with historic site activities.

PROJECT BACKGROUND

NACA Test Area was designed and used by NACA from 1947–1953 to simulate a take-off accident in which an airplane fails to become airborne and strikes an embankment, which results in rupturing of the fuel tanks (NACA 1952). Crash tests were performed on 17 excess military airplanes provided by the U.S. Air Force to develop explosion-proof fuel tanks and fuel for airplanes.

Airplanes used during these simulations were C-46 airplanes (76 ft. long, 22 ft. high, 108 ft. wingspan) and C-82 airplanes (77 ft. long, 26 ft. high, 106 ft. wingspan). Airplanes that were significantly damaged during testing were stripped of instrumentation and salvageable parts. It appears that some airplanes were moved to the northeast portion of the NACA Test Area after crash tests. There has been speculation that airplanes were bulldozed and buried at the eastern end of the AOC within the aggregate sample area identified as the Former Plane Burial Area. Figure 1 presents an aerial photograph from 1950, which was during NACA Test Area operations, and the targeted area to perform a two-phase geophysical investigation.

All field work was performed in accordance to the *Sampling and Analysis Plan Addendum for Supplemental Sampling at RVAAP-38 NACA Test Area* (USACE 2017) (herein referred to as the SAP Addendum). The SAP Addendum was developed to outline the scope, objectives, procedures, and methods associated with the geophysical investigation and proposed sampling that would be conducted to address data gaps associated with NACA Test Area.

The geophysical investigation was conducted to determine if and where materials may have been buried. Results of the geophysical investigation were also used to finalize the locations of soil samples collected to conservatively assess chemical contamination and potential risk within this area.

GEOPHYSICAL INVESTIGATION

On October 25 – 31, 2017, Leidos conducted a surface geophysical investigation to identify and delineate, if present, metallic debris areas associated with historical activities conducted at the NACA Test Area. Leidos utilized a high sensitivity metal detector and an electromagnetic terrain conductivity meter to determine the lateral extent of emplaced material.

SITE PREPARATION

In advance of the geophysical surveys, a site walk was performed to identify large pieces of surface debris identified at the site. The locations of these large pieces of debris were mapped with a Trimble® Geo7X differential global positioning system (DGPS). After identification and mapping, the surface debris was removed from the area and ultimately recycled as scrap metal. Figure 1 presents identified surface debris and their approximate locations.

In order to establish a survey grid, Leidos utilized a Trimble® Geo7X DGPS and a 300 foot measuring tape to establish survey traverses. The traverses were marked with polyvinyl chloride (PVC) pin flags with additional lines of flagging, as necessary, to establish survey control across the field.

All data for this project is referenced in the U. S. State Plane, Ohio North 3401, Coordinate System, using a 1983 North American Datum (NAD 83), with units in feet.

ELECTROMAGNETIC TERRAN CONDUCTIVITY METHOD

Electromagnetic terrain conductivity surveying is a reconnaissance method of determining the electric and magnetic properties of subsurface materials. The irregular nature of buried material and the frequent presence of metal provides for an electromagnetic response that typically contrasts with the more homogeneous natural material in a survey area. While measured responses are important to identify anomalous areas, trends in the data provide a more qualitative assessment of emplaced non-native material, such as airplane components.

During the first phase of the geophysical survey, a terrain conductivity survey was performed using an EM31-MK2 manufactured by Geonics Limited, Mississauga, Ontario, Canada that has an effective depth of investigation of 18 ft. bgs. The EM31-MK2 consists of a 12-ft-long boom configured with a transmitter and receiver coil, shown on Photograph 1.

EM31-MK2 Data Collection

The conductivity data was acquired by carrying the EM31-MK2 along the pre-marked survey lines at a normal walking speed. Survey data was recorded along traverses spaced 10 feet apart at a rate of 2 Hertz (2 times per second) and integrated with DGPS data collected at a rate of 1 Hz. A total 15,413 EM31-MK2 measurements were recorded across the 4.5 acre site.

Survey data were periodically downloaded to a field computer for verification of the data quality and to ensure an accurate representation of the site. Field survey personnel generated color-enhanced contour maps of inphase (magnetic susceptibility) and quadrature (terrain conductivity) results. A site features map was superimposed on the contour maps to aid in the interpretation of results.

Preliminary EM31-MK2 inphase magnetic susceptibility data were reviewed in the field to identify the target area for more refined metal detector survey. Due to the large footprint of measurement, isolated, small pieces of metal in the subsurface may not be detected. However, anomalous trends in the data are interpreted to represent larger pieces of metal or concentration of metal masses at depth, such as large areas used for potential airplane burial.

HIGH SENSITIVITY METAL DETECTOR METHOD

Using the results of the EM31-MK2 terrain conductivity survey, Leidos identified an area that exhibited anomalous inphase responses (indicative of subsurface metals). Within that area, Leidos used an EM61-MK2 to perform a high sensitivity metal detector survey.

Leidos used EM61-MK2 manufactured by Geonics Limited, Mississauga, Ontario, Canada to collect high sensitivity metal detector data. This time domain EM survey transmits a high frequency electromagnetic pulse. This pulse creates electric currents in the subsurface of greater magnitude and last longer in the subsurface in metallic objects than in non-metallic objects. After waiting a short time, a measurement of the remnant electromagnetic field is performed with two receiver coils, which are oriented one above the other. The magnitude of the remnant electromagnetic field provides a measurement of the metallic presence in the subsurface.

The EM61-MK2 has a focused footprint of measurement that provides high-resolution data to an effective depth of 10 ft. bgs depending on the size of the metal mass. The EM61-MK2 instrument consists of a 3-by 1.5-ft electromagnetic transmitter and receiver coil on a wheel-mounted assembly, shown on Photograph 2.

EM61-MK2 Data Collection

The metal detector data was acquired by towing the EM61-MK2 along the pre-marked survey lines at a normal walking speed. Survey data was recorded along traverses spaced 5 feet apart at a rate of 5 Hertz (5 times per second) and integrated with DGPS data collected at a rate of 1 Hz. A total 47,582 EM61-MK2 measurements were recorded across the 2.4 acre site.

Survey data were periodically downloaded to a field computer for verification of the data quality and to ensure an accurate representation of the site. Field survey personnel generated color-enhanced contour maps of the EM response. A site features map was superimposed on the contour maps to aid in the interpretation of results.

EM61-MK2 data was collected along traverses nominally spaced 3 ft. (1m) apart to represent complete coverage of the survey area. These data were integrated with Trimble® Geo7X differential global positions system (DGPS) for submeter position correlated data.



Photograph 1. EM31-MK2 Conductivity Meter



Photograph 2. EM61-MK2 Metal Detector

GEOPHYSICAL SURVEY RESULTS

Figure 2 presents the results of the EM31-MK2 (magnetic susceptibility). By the nature of the measurement, small isolated metallic debris at depth is not always detectable due the broad measurement footprint. Broad, anomalous areas interpreted to represent subsurface metallic masses within the subsurface are concentrated near the center of the survey area. Magnetic susceptibility response in this area reveals a southwest to northeast trend near the center of the investigated area. This trend suggests this is an area with a higher concentration of metallic mass. The results of the EM31-MK2 survey served as a basis for the more refined EM61-MK2 survey.

Figure 3 presents the results of the EM61-MK2. By design, the EM61-MK2 is more sensitive to smaller metallic mass. EM61-MK2 response greater than 20 mV is interpreted to represent metal mass. Response greater than 100 mS/m are interpreted to represent larger concentration of metal mass. Metallic responses were observed across a large portion of the survey area; however, the strongest EM61-MK2 response is most prominent in the center of survey area. No large or symmetrical anomaly consistent with the shape and size of a C-46 airplane (76 ft. long, 22 ft. high, 108 ft. wingspan) or the C-82 (77 ft. long, 26 ft. high, 106 ft. wingspan) could be substantiated. The anomalous trends are consistent with metallic debris co-mingled with re-worked or graded soil.

Airplanes that were significantly damaged during testing were stripped of instrumentation and salvageable parts. Upon review of the aerial photograph from 1950 (shown on Figure 1), it appears airplanes were moved to this area after the crash tests were performed.

The anomalous trends in the top and bottom coil responses from the EM61-MK2 were very similar. By subtracting the top coil from the bottom coil (Differential Channel), a qualitative assessment can be made to screen out metallic objects on or very close to the surface. Most anomalous features were a result of objects at depth, but it is estimated that these anomalies were within the first 6 ft. bgs. A distinct outline of an intact buried airplane was not substantiated.

RECOMMENDATIONS

The geophysical survey did not indicate that there was a large effort to bury airplanes used in the crash tests conducted from 1947-1953. It is believed that this area was used to stage airplanes after the crash tests were performed for evaluation and salvaging. However, if intact airplanes or airplane parts were emplaced in the subsurface, larger, more continuous anomalous trends would have been expected, particularly by the EM61-MK2. The geophysical survey results indicate more variable EM trends suggesting co-mingled metallic debris in the subsurface. This interpretation is consistent with metallic debris partially exposed at the surface in certain areas of the site.

This debris within the area is believed to be small pieces (e.g., wiring) from the airplanes deemed not salvageable. Also, it is speculated that this area had some grading performed after the crash tests were completed, thus the debris was in the subsurface and slightly spread around the area.

The SAP Addendum identified potential soil boring locations to characterize the debris present and evaluated environmental risk. The locations of the soil boring locations were modified to targeted areas focused on metallic anomalies identified during the geophysical survey. The refined soil boring locations based on the EM survey results are presented in Table 1 and the attached figures.

Table 1: Proposed Soil Boring Location Based on EM		
Location	Easting (US Ft.)	Northing (US Ft.)
NTA-150 (EM)	2348065.2	551784.2
NTA-151 (EM)	2348112.5	551793.9
NTA-152 (EM)	2348100.7	551849.8
NTA-153 (EM)	2348207.0	551851.9
NTA-154 (EM)	2348337.1	551756.3
NTA-155 (EM)	2348241.4	551718.7

LIMITATIONS AND EXCEPTIONS

The investigation work scope includes standard and/or routinely accepted practices of the geophysical industry. Leidos typically utilized multiple geophysical investigation methods as a means to provide a series of checks and balances to produce subsurface models that reflect, as uniquely as possible, the subsurface conditions at the site. For this investigation, Leidos utilized two geophysical methods and two specific instruments. By nature, no subsurface survey is 100 percent accurate and Leidos cannot accept responsibility for inherent technique limitations, survey limitations, or unforeseen site-specific conditions.

SUMMARY

Leidos appreciates the opportunity to work at NACA in support of the Ravenna Army Ammunition Plant Restoration Program. If you should have any questions or require any additional information, please do not hesitate to contact us.

Respectfully submitted,

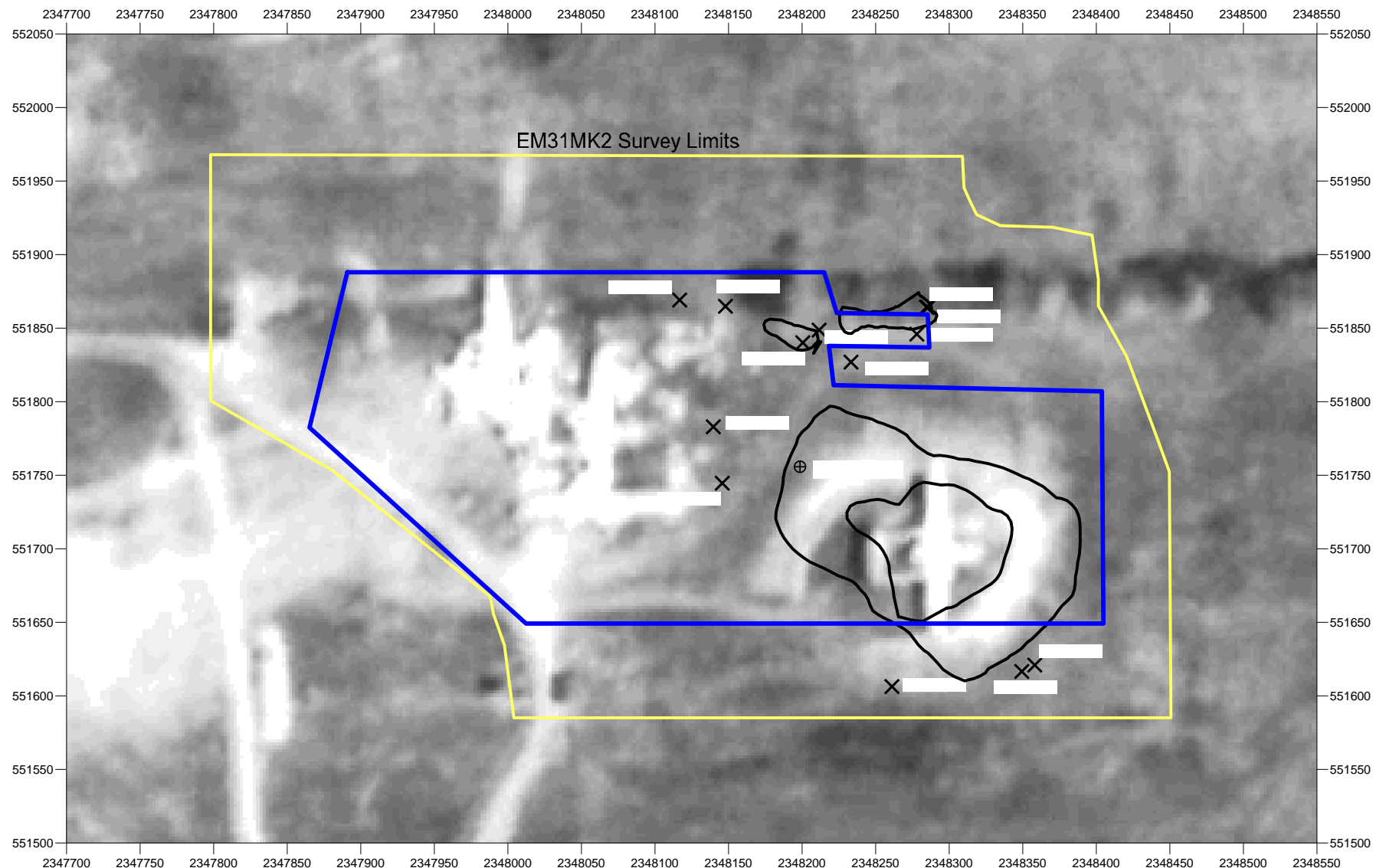
Leidos,





Jeffrey J. Warren, P.G.
Senior Geophysicist

Attachments

FIGURES



Note: Coordinates in US State Plane 1983
Ohio North 3401, Feet

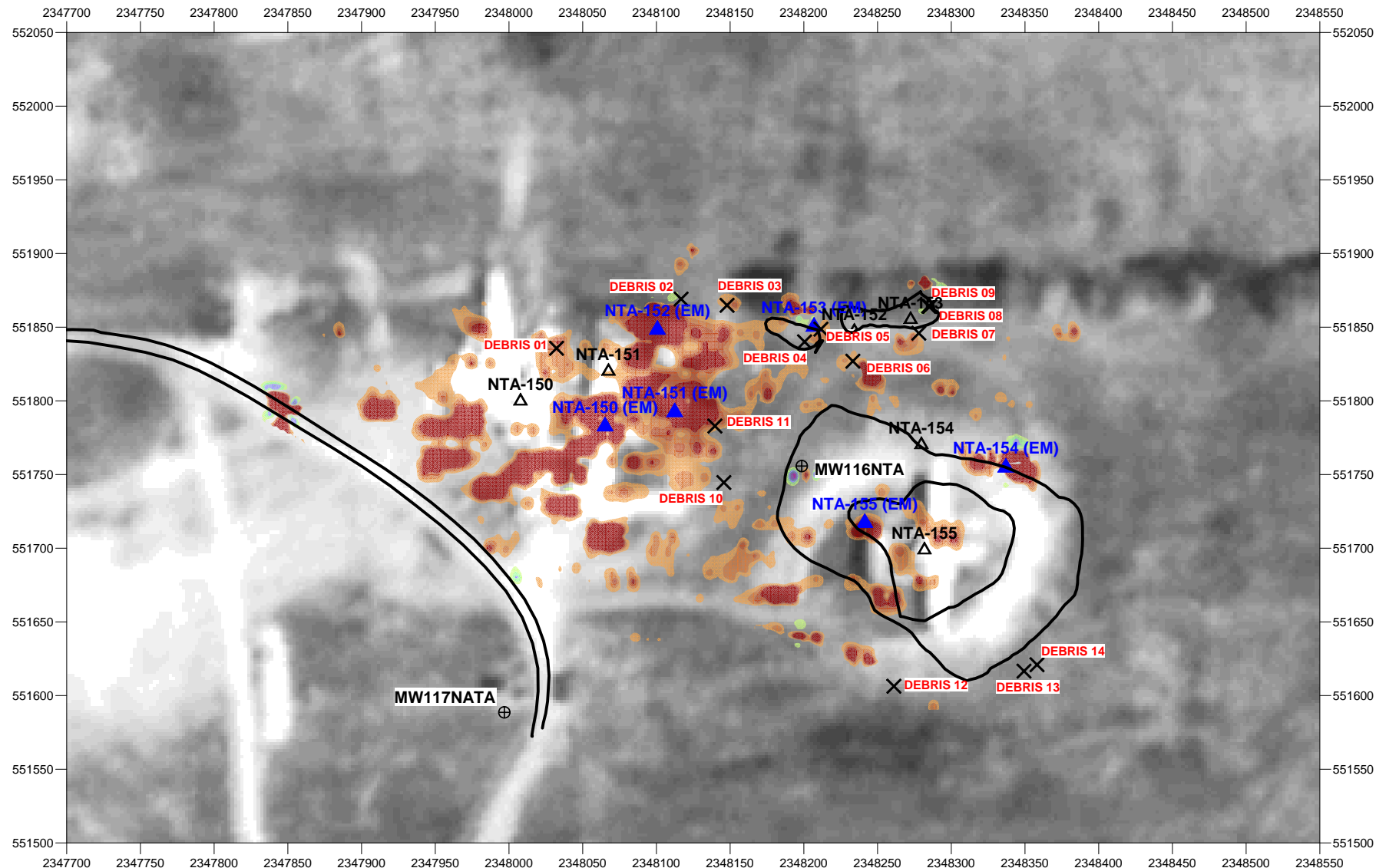
 EM61MK2 Survey Limits
 Surface Metallic Debris

NACA Test Area
Former Ravenna Army Ammunition Plant
Portage & Trumbull Counties, Ohio

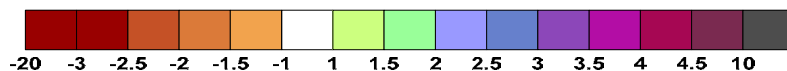
Geophysical Survey Limits
1950 Aerial Photograph



job no.	315391.00.00.05.100	figure no. 1
file no.	Fig 1_NACA_1950 Aerial.SRF	
drawn	J. Warren	
checked		
approved		
date	10/31/2017	
date		
date		



EM31MK2 Magnetic Susceptibility (Inphase) Response Scale (ppt)



-  Proposed Sample Locations per SAP
-  Proposed Sample Locations based on EM
-  Surface Metallic Debris

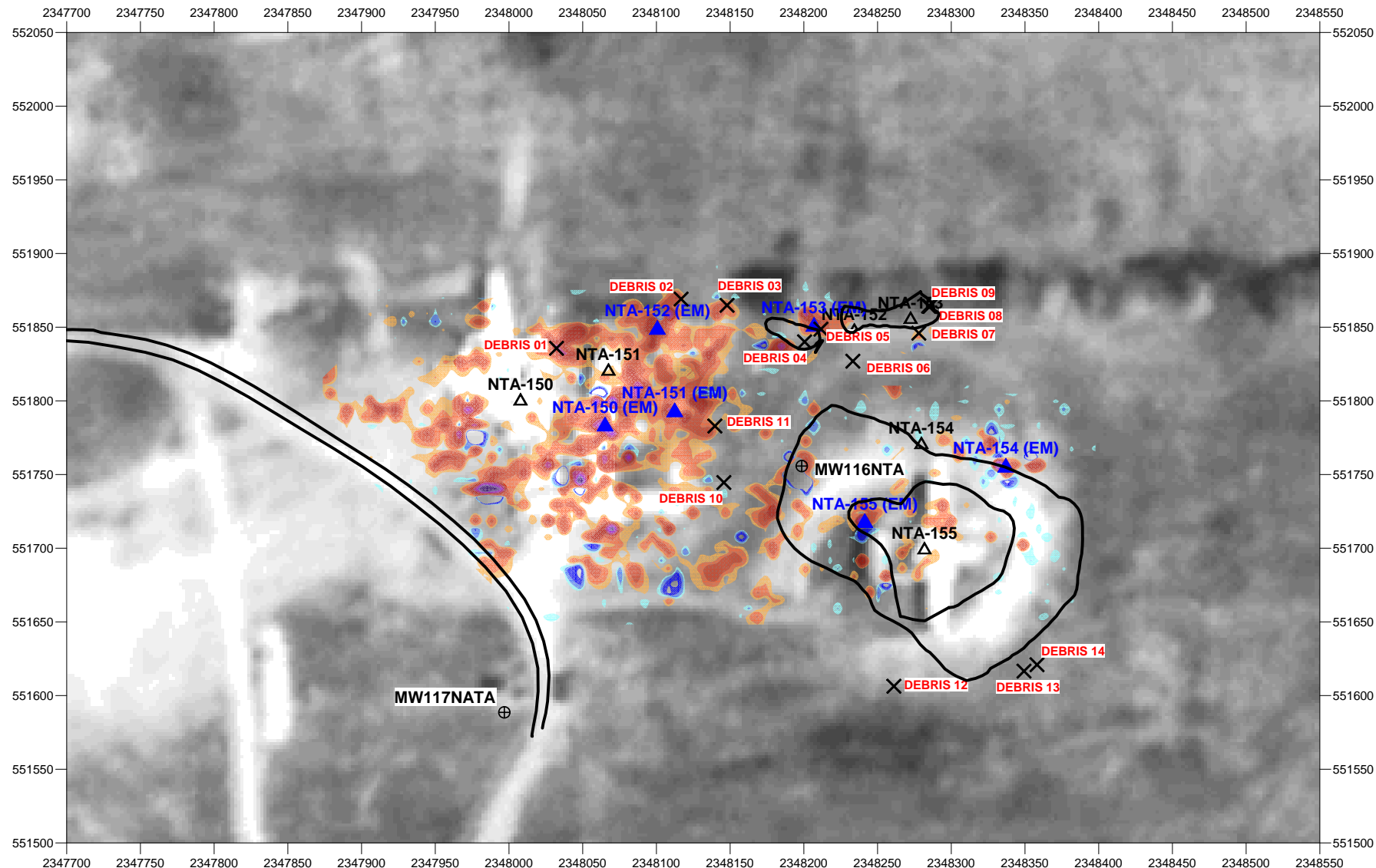
Note: Coordinates in US State Plane 1983
Ohio North 3401, Feet

NACA Test Area
Former Ravenna Army Ammunition Plant
Portage & Trumbull Counties, Ohio

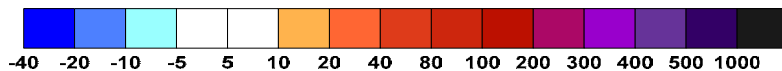
Geophysical Survey Results
EM31-MK2 Inphase (Metallic) Reponse



job no. 315391.00.00.05.100		
file no. Fig 2_NACA_EM31MK2_Inphase SRF		
drawn J. Warren	date 10/31/2017	figure no. 2
checked	date	
approved	date	



EM61MK2 Response Scale (mV)



- △ Proposed Sample Locations per SAP
- ▲ Proposed Sample Locations based on EM
- ✕ Surface Metallic Debris

Note: Coordinates in US State Plane 1983
Ohio North 3401, Feet

NACA Test Area
Former Ravenna Army Ammunition Plant
Portage & Trumbull Counties, Ohio

Geophysical Survey Results
EM61MK2 Differential Metal Detector Response

leidos

job no.	315391.00.00.05.100		
file no.	Fig 3_NACA_EM61MK2_Differential SRF		
drawn	date	figure no.	
J. Warren	10/31/2017		
checked	date		
approved	date	3	



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

August 29, 2018

Mr. David Connolly
Army National Guard Directorate
Environmental Programs Division
ARNG-ILE-CR
111 South George Mason Drive
Arlington, VA 22204

Re: US Army Ammunition PLT RVAAP
Remediation Response
Project Records
Remedial Response
Portage County
267000859098

Subject: Ravenna Army Ammunition Plant, Portage/Trumbull Counties, "Final, Phase II Remedial Investigation Report and Feasibility Study for Soil, Sediment, and Surface Water at RVAAP-38 NACA Test Area" Dated July 16, 2018

Dear Mr. Connolly:

The Ohio Environmental Protection Agency (Ohio EPA) has received and reviewed the Final, Phase II Remedial Investigation Report and Feasibility Study (RI/FS) for Soil, Sediment, and Surface Water at RVAAP-38 NACA Test Area" for the Ravenna Army Ammunition Plant, Portage/Trumbull Counties dated July 16, 2018 and received at the Northeast District Office (NEDO) on July 24, 2018.

The report included a discussion regarding the findings of the EM31-MK2 geophysical survey. Ohio EPA was not provided the actual geophysical report with the Final Phase II RI/FS report. Please provide a complete copy of the EM31-MK2 geophysical survey including all narratives, maps, etc. for Ohio EPA's review and final approval of this report.

If you have questions, please call me at (330) 963-1207.

Sincerely,

A handwritten signature in black ink, appearing to read "Vicki Deppisch", is written over a horizontal line.

Vicki Deppisch
Hydrogeologist/Project Coordinator
Division of Environmental Response and Revitalization



VD/nvp

cc: Katie Tait, OHARNG RTLS
Craig Coombs, USACE
David Connolly, ARNG
Mark Johnson, Ohio EPA NEDO DERR
Bob Princic, Ohio EPA, NEDO DERR

Kevin Sedlak, OHARNG RTLS
Rebecca Shreffler, Chenga
Nat Peters, USACE
Tom Schneider, Ohio EPA, SWDO, DERR



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

RECEIVED
2/20/2018

February 20, 2018

Mr. Mark Leeper
Team Lead
Cleanup and Restoration Branch
ARNG Directorate
111 South George Mason
Arlington, VA 22204

Re: **US Army Ravenna Ammunition Plt RVAAP
Remediation Response
Project records
Remedial Response
Portage County
267000859099**

**Subject: Concurrence of Final Record of Decision for Soil, Sediment, and Surface Water
at Load Line 5 for the Former Ravenna Army Ammunition Plant (RVAAP)
Document (Work Activity No. 267-000859-099)**

Dear Mr. Leeper:

The Ohio Environmental Protection Agency (Ohio EPA) has received and reviewed the Final Record of Decision (ROD) for Soil, Sediment, and Surface Water at RVAAP-39 Load Line 5. The document is dated December 22, 2017, and was received at Ohio EPA Northeast District Office (NEDO) on December 22, 2017. This letter serves to document Ohio EPA's concurrence regarding the proposal of No Further Action (NFA) for the RVAAP Load Line 5 site as contained in the final ROD.

We have no comments on the Final Record of Decision for Load Line 5 Soil, Sediment, and Surface Water. Based on the information contained in the Final ROD document, other investigation documents/reports, and Ohio EPA's oversight participation during the investigation, Ohio EPA concurs with the Final ROD document for the RVAAP Load Line 5 for NFA.

If you have any questions concerning the above, please feel free to contact Megan Oravec at (330) 963-1168.

Sincerely,

Michael Proffitt, Chief
Division of Environmental Response and Revitalization

MP:MNO:nvp

cc: Craig Coombs, USACE, Louisville District
Katie Tait, OHANG, Camp Ravenna
Kevin Sedlak, ANG, Camp Ravenna
Jed Thomas, Leidos

Nat Peters, II, USACE Louisville District
Rebecca Shreffler, Vista Sciences Corp.
Gail Harris, Vista Sciences
Pat Ryan, Leidos-REIMS

ec: Rod Beals, Ohio EPA, NEDO, DERR
Bob Princic, Ohio EPA, NEDO, DERR
Tom Schneider, Ohio EPA, DERR, SWDO

Bill Damschroder, Legal



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

RECEIVED
4/16/2018

April 16, 2018

Mr. Mark Leeper
Team Lead
Cleanup and Restoration Branch
ARNG Directorate
111 South George Mason
Arlington, VA 22204

Re: **US Army Ravenna Ammunition Plt RVAAP
Remediation Response
Project records
Remedial Response
Portage County
267000859118**

Subject: Concurrence of Revised Final Proposed Plan for Soil, Sediment, and Surface Water at Load Line 7 for the Former Ravenna Army Ammunition Plant (RVAAP) Document (Work Activity No. 267000859118)

Dear Mr. Leeper:

The Ohio Environmental Protection Agency (Ohio EPA) has received and reviewed the Revised Final Proposed Plan (PP) for Soil, Sediment and Surface Water at RVAAP-40 Load Line 7. The document is dated March 16, 2018 and was received at Ohio EPA, Northeast District Office (NEDO) on March 16, 2018. This Revised Final PP supersedes the Final PP dated March 22, 2017. This letter serves to document Ohio EPA's concurrence regarding the proposal of no further action (NFA) to attain Unrestricted (Residential) Land Use for the RVAAP Load Line 7 site as contained in the Revised Final PP.

Based on the information contained in the Revised Final PP document, other investigation documents/reports, and Ohio EPA's oversight participation during the investigation, Ohio EPA concurs with the Revised Final PP document for the RVAAP Load Line 7 for NFA. As stated in the Revised Final PP, the Army will offer a public comment period and hold an open house/public meeting in the near future, to present the conclusions and investigative findings for Load Line 7.

If you have any questions concerning the above, please feel free to contact Megan Oravec at (330) 963-1168.

Sincerely,

Michael Proffitt, Chief
Division of Environmental Response and Revitalization

cc: Craig Coombs, USACE, Louisville District
Katie Tait, OHANG, Camp Ravenna
Kevin Sedlak, ANG, Camp Ravenna
Jed Thomas, Leidos

Nat Peters, II, USACE Louisville District
Rebecca Shreffler, Vista Sciences Corp.
Gail Harris, Vista Sciences
Pat Ryan, Leidos-REIMS

ec: Rod Beals, Ohio EPA, NEDO, DERR
Bob Princic, Ohio EPA, NEDO, DERR
Tom Schneider, Ohio EPA, DERR, SWDO

Bill Damschroder, Ohio EPA, CO, Legal
Mark Leeper, ARNG
Megan Oravec, Ohio EPA, NEDO, DERR



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

RECEIVED
3/1/2018

February 28, 2018

Mr. Mark Leeper
Team Lead
Cleanup/Restoration Branch
Army National Guard Directorate
111 South George Mason Drive
Arlington, VA 22204

Re: US Army Ammunition Plt RVAAP
Remediation Response
Project records
Remedial Response
Portage County
267000859118

Subject: Ravenna Army Ammunition Plant, Portage/Trumbull Counties. "Revised Final, Proposed Plan for Soil, Sediment, and Surface Water at RVAAP-40 Load Line 7," Dated January 19, 2018

Dear Mr. Leeper:

The Ohio Environmental Protection Agency (Ohio EPA) has received and reviewed the "Revised Final, Proposed Plan for Soil, Sediment, and Surface Water at RVAAP-40 Load Line 7" for the Ravenna Army Ammunition Plant (RVAAP), Portage/Trumbull Counties. This document is dated and was received at Ohio EPA, Northeast District Office (NEDO) on January 19, 2018.

Ohio EPA has one comment. There is no reference in Section 1.2 of the revised Final Proposed Plan to the previously issued Proposed Plan for Load Line 7, nor the previous public meeting for that Proposed Plan. Please revise the section to refer to both the previously issued Proposed Plan and the meeting, and the fact that the current Proposed Plan is a significant change to the proposed remedy previously presented to the public. It should be clear that this Revised Proposed Plan supersedes the previously issued Final Proposed Plan. Please incorporate this revision into the final document and submit to Ohio EPA.

If you have any questions, please call me at (330) 963-1168.

Sincerely,

A handwritten signature in cursive script that reads "Megan Oravec".

Megan Oravec
Site Coordinator
Division of Environmental Response and Revitalization

MO/nvp

cc: Katie Tait/Kevin Sedlak, OHARNG RTLS
Gail Harris/Rebecca Shreffler, VISTA Sciences Corp.
Craig Coombs, USACE

ec: Mark Leeper, ARNG
Nat Peters, USACE
Bob Princic, Ohio EPA, NEDO, DERR
Rodney Beals, Ohio EPA, NEDO, DERR
Tom Schneider, Ohio EPA, SWDO, DERR
Vanessa Steigerwald-Dick, Ohio EPA, NEDO, DERR
Bill Damschroder, Esq., Ohio EPA, Legal



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

RECEIVED
3/15/2018

March 15, 2018

**Re: US Army Ravenna Ammunition PLT RVAAP
Remediation Response
Project Records
Remedial Response
Trumbull County
267000859119**

Mr. Mark Leeper
Team Lead
Army National Guard Directorate
111 South George Mason Drive
Arlington, VA 22204

**SUBJECT: RAVENNA ARMY AMMUNITION PLANT PORTAGE/TRUMBULL
COUNTIES, "FINAL RECORD OF DECISION FOR SOIL, SEDIMENT,
AND SURFACE WATER AT RVAAP-41 LOAD LINE 8," DATED
JANUARY 25, 2018**

Dear Mr. Leeper:

The Ohio Environmental Protection Agency (Ohio EPA) has received and reviewed the "Final Record of Decision for Soil, Sediment, and Surface Water at RVAAP-41 Load Line 8," document for the Ravenna Army Ammunition Plant (RVAAP), Portage/Trumbull Counties. The document is dated and was received at Ohio EPA, Northeast District Office (NEDO) on January 25, 2018. This letter serves to document Ohio EPA's concurrence regarding the proposal of no further action (NFA) for the RVAAP-41 Load Line 8 site contained in the Final Record of Decision (ROD).

The Army submitted a Final Proposed Plan (PP), dated March 17, 2017, recommending NFA for unrestricted (residential) land use based on the Final Remedial Investigation (RI) report findings, including the human health risk assessment and ecological risk assessment, and other investigation documents and reports. Ohio EPA concurred with the recommendation in a letter dated May 11, 2017.

The Army released the Load Line 8 PP to the public on June 12, 2017. A notice of availability was sent to radio stations, television stations, and newspapers, as specified in the Community Relations Plan that initiated the 30-day public comment period beginning June 12, 2107 and ending July 12, 2017. The Army held a public meeting on June 27, 2017, to present the Final PP document. Five oral comments were received at

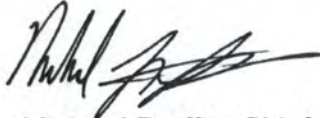
MR. MARK LEEPER
ARMY NATIONAL GUARD DIRECTORATE
PAGE 2

the public meeting, and Part II of the ROD contains the Responsiveness Summary that addresses these comments. The Final ROD contains minor changes to address the comments received on the Final PP.

Based on the information contained in the Final PP document, other investigation documents and reports, and Ohio EPA's oversight participation during the investigation, Ohio EPA concurs with the Final ROD document for the RVAAP Load Line 8 for NFA.

If you have any questions concerning the above, please feel free to contact Vanessa Steigerwald Dick, NEDO, at (330) 963-1219.

Sincerely,



Michael Proffitt, Chief
Division of Environmental Response and Revitalization

MP/VSD/nvp

ec: Mark Leeper, ARNGD, Arlington
Katie Tait/Kevin Sedlak, ARNG, Camp Ravenna
Craig Coombs, USACE Louisville
Gail Harris/Rebecca Shreffler, Vista Sciences
Tom Schneider, Ohio EPA, SWDO, DERR
Rod Beals, Ohio EPA, NEDO, DERR
Bob Princic, Ohio EPA, NEDO, DERR
Vanessa Steigerwald Dick, Ohio EPA, NEDO, DERR
Vicki Deppisch, Ohio EPA, NEDO, DERR
Bill Damschroder, Ohio EPA, Legal



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

RECEIVED
1/24/2018

January 17, 2018

Mr. Mark Leeper
Team Lead
Cleanup/Restoration Branch
Army National Guard Directorate
111 South George Mason Drive
Arlington, VA 22204

Re: US Army Ammunition PLT RVAAP
Remediation Response
Project Records
Remedial Response
Portage County
267000859119

Subject: Ravenna Army Ammunition Plant, Portage/Trumbull Counties. "Response to Comments, Draft, Record of Decision for Soil, Sediment, and Surface Water at RVAAP-41, Load Line 8," Dated December 26, 2017

Dear Mr. Leeper:

The Ohio Environmental Protection Agency (Ohio EPA) has received and reviewed the "Response to Comments, Draft, Record of Decision for Soil, Sediment, and Surface Water at RVAAP-41 Load Line 8" for the Ravenna Army Ammunition Plant (RVAAP), Portage/Trumbull Counties. This document is dated and was received at Ohio EPA, Northeast District Office (NEDO) on December 26, 2017.

The comments have been adequately addressed. As stated in the response letter, once the comments have been resolved, the Final version of the Record of Decision (ROD) will be forwarded to Ohio EPA. If Ohio EPA has comments on the Final version that requires revision to the ROD, the Army will address the comments and submit a Revised Final version.

Please forward the final version of the ROD to Ohio EPA for review. I will be out of the office for an extended period of time. If you have any questions in my absence, please contact Vanessa Steigerwald Dick at Vanessa.Steigerwald-Dick@epa.ohio.gov or at (330) 963-1219.

Sincerely,

Vicki Deppisch
Hydrogeologist/Project Coordinator
Division of Environmental Response and Revitalization

VD/nvp

cc: Katie Tait, OHARNG RTLS
Craig Coombs, USACE
Gail Harris, VISTA Sciences Corp.
ec: Mark Leeper, ARNG
Rodney Beals, NEDO, DERR
Nat Peters, USACE

Kevin Sedlak, OHARNG RTLS
Rebecca Shreffler, VISTA Sciences Corp.
Bob Princic, NEDO, DERR
Tom Schneider, SWDO, DERR
Vanessa Steigerwald Dick, NEDO, DERR



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

May 11, 2017

**Re: US Army Ravenna Ammunition PLT RVAAP
Remediation Response
Project Records
Remedial Response
Trumbull County
267000859121**

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

**SUBJECT: "RAVENNA ARMY AMMUNITION PLANT PORTAGE/TRUMBULL
COUNTIES, FINAL, RECORD OF DECISION FOR SOIL, SEDIMENT,
AND SURFACE WATER AT RVAAP-43 LOAD LINE 10," DATED
MARCH 10, 2017**

Dear Mr. Leeper:

The Ohio Environmental Protection Agency (Ohio EPA) has received and reviewed the "Final, Record of Decision (ROD) for Soil, Sediment, and Surface Water at RVAAP-43 Load Line 10," document for the Ravenna Army Ammunition Plant (RVAAP), Portage/Trumbull Counties. The document is dated March 10, 2017 and was received at the Northeast District Office (NEDO) on March 24, 2017. This letter serves to document Ohio EPA's approval regarding the proposal of No Further Action (NFA) for the RVAAP Load Line 10 site contained in the Final ROD.

Based on investigative findings, conclusions, human health risk assessment and ecological risk assessment in the Final RI report, the U.S. Army Corps of Engineers (USACE) submitted a Final Proposed Plan (PP) dated August 18, 2016, to Ohio EPA for review recommending NFA. Ohio EPA concurred with the recommendation in a letter dated October 7, 2016.

A public meeting was held on November 29, 2016, that was public noticed through radio stations, television stations, and newspapers. A 30-day public comment period was held between November 14, 2016 and December 14, 2016. No comments were received and therefore, the ROD contains no significant changes from the Final PP.

MR. MARK LEEPER
ARMY NATIONAL GUARD DIRECTORATE
PAGE 2

Based on the information contained in the Final PP document, other investigation documents/reports, and Ohio EPA's oversight participation during the investigation, Ohio EPA approves the Final ROD document for the RVAAP Load Line 10 for NFA.

If you have any questions concerning the above, please feel free to contact Vicki Deppisch, NEDO, at (330) 963-1207.

Sincerely,



Michael Proffitt
Chief
Division of Environmental Response and Revitalization

MP:VD/nvr

cc: Gail Harris/Rebecca Shreffler, Vista Sciences

ec: Tom Schneider, Ohio EPA, SWDO, DERR
Brian Tucker/Carrie Rasik, Ohio EPA, CO, DERR
Rod Beals, Ohio EPA, NEDO, DERR
Vanessa Steigerwald-Dick, Ohio EPA, NEDO, DERR
Bob Princic, Ohio EPA, NEDO, DERR
Vicki Deppisch, Ohio EPA, NEDO, DERR
Bill Damschroder, Esq., Ohio EPA, Legal
Katie Tait/Kevin Sedlak, ARNG, Camp Ravenna
Craig Coombs, USACE Louisville
Mark Leeper, ANGB, Virginia



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

May 11, 2017

**Re: US Army Ravenna Ammunition PLT RVAAP
Remediation Response
Project Records
Remedial Response
Trumbull County
267000859231**

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

**SUBJECT: "RAVENNA ARMY AMMUNITION PLANT PORTAGE/TRUMBULL
COUNTIES, FINAL, PROPOSED PLAN FOR SOIL, SEDIMENT,
AND SURFACE WATER AT RVAAP-44 LOAD LINE 11," DATED
MARCH 17, 2017**

Dear Mr. Leeper:

The Ohio Environmental Protection Agency (Ohio EPA) has received and reviewed the "Final, Proposed Plan (PP) for Soil, Sediment, and Surface Water at RVAAP-44 Load Line 11," document for the Ravenna Army Ammunition Plant (RVAAP), Portage/Trumbull Counties. The document is dated and was received at the Northeast District Office (NEDO) on March 17, 2017. This letter serves to document Ohio EPA's approval regarding the proposal of No Further Action (NFA) for the RVAAP Load Line 11 site contained in the Final Proposed Plan.

Based on the information contained in the Final PP document, other investigation documents/reports, and Ohio EPA's oversight participation during the investigation, Ohio EPA approves the Final PP document for the RVAAP Load Line 11 for NFA. As stated in the Final PP, the Army will offer a public comment period and hold an open house/public meeting in the near future to present the conclusions and investigative findings for Load Line 11.

Received
11 MAY 2017

MR. MARK LEEPER
ARMY NATIONAL GUARD DIRECTORATE
PAGE 2

If you have any questions concerning the above, please feel free to contact Vicki Deppisch, NEDO, at (330) 963-1207.

Sincerely,

A handwritten signature in blue ink, appearing to read "Michael Proffitt", with a long horizontal flourish extending to the right.

Michael Proffitt, Chief
Division of Environmental Response and Revitalization

VD/nvr

cc: Gail Harris/Rebecca Shreffler, Vista Sciences

ec: Mark Leeper, ARNGD, Arlington
Katie Tait/Kevin Sedlak, ARNG, Camp Ravenna
Tom Schneider, Ohio EPA, SWDO, DERR
Craig Coombs, USACE Louisville
Rod Beals, Ohio EPA, NEDO, DERR
Vanessa Steigerwald Dick, Ohio EPA, NEDO, DERR
Bob Princic, Ohio EPA, NEDO, DERR
Vicki Deppisch, Ohio EPA, NEDO, DERR
Bill Damschroder, Esq., Ohio EPA, Legal



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

RECEIVED
3/29/2018

March 29, 2018

Mr. Mark Leeper
Team Lead
Cleanup and Restoration Branch
ARNG Directorate
111 South George Mason
Arlington, VA 22204

**Re: US Army Ravenna Ammunition Plt RVAAP
Remediation Response
Project records
Remedial Response
Portage County
267000859115**

**Subject: Concurrence of Final Record of Decision for Soil, Sediment, and Surface Water
at Load Line 11 for the Former Ravenna Army Ammunition Plant (RVAAP)
Document (Work Activity No. 267-000859-115)**

Dear Mr. Leeper:

The Ohio Environmental Protection Agency (Ohio EPA) has received and reviewed the Final Record of Decision (ROD) for Soil, Sediment, and Surface Water at RVAAP-44 Load Line 11. The document is dated February 15, 2018, and was received at Ohio EPA, Northeast District Office (NEDO) on February 15, 2018. This letter serves to document Ohio EPA's concurrence regarding the proposal of no further action (NFA) for the RVAAP Load Line 11 site as contained in the final ROD.

We have no comments on the Final Record of Decision for Load Line 11 Soil, Sediment, and Surface Water. Based on the information contained in the Final ROD document, other investigation documents/reports, and Ohio EPA's oversight participation during the investigation, Ohio EPA concurs with the Final ROD document for the RVAAP Load Line 11 for NFA.

If you have any questions concerning the above, please feel free to contact Megan Oravec at (330) 963-1168.

Sincerely,

A handwritten signature in black ink, appearing to read "Michael Proffitt", is written over a horizontal line.

Michael Proffitt, Chief
Division of Environmental Response and Revitalization

MP/MO/nvp

cc: Craig Coombs, USACE, Louisville District
Katie Tait, OHANG, Camp Ravenna
Kevin Sedlak, ANG, Camp Ravenna
Jed Thomas, Leidos

Nat Peters, II, USACE Louisville District
Rebecca Shreffler, Vista Sciences Corp.
Gail Harris, Vista Sciences
Pat Ryan, Leidos-REIMS

ec: Rod Beals, Ohio EPA, NEDO, DERR
Bob Princic, Ohio EPA, NEDO, DERR
Tom Schneider, Ohio EPA, DERR, SWDO
Megan Oravec, Ohio EPA, NEDO

Bill Damschroder, Legal
Mark Leeper, ARNG



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

RECEIVED
2/9/2018

January 31, 2018

Mr. Mark Leeper
Team Lead
Cleanup/Restoration Branch
Army National Guard Directorate
111 South George Mason Drive
Arlington, VA 22204

Re: US Army Ammunition PLT RVAAP
Remediation Response
Project Records
Remedial Response
Portage County
267000859115

Subject: Ravenna Army Ammunition Plant, Portage/Trumbull Counties. "Response to Comments, Draft, Record of Decision for Soil, Sediment, and Surface Water at RVAAP-44, Load Line 11," Dated December 26, 2017

Dear Mr. Leeper:

The Ohio Environmental Protection Agency (Ohio EPA) has received and reviewed the "Response to Comments, Draft, Record of Decision for Soil, Sediment, and Surface Water at RVAAP-44 Load Line 11" for the Ravenna Army Ammunition Plant (RVAAP), Portage/Trumbull Counties. This document is dated and was received at Ohio EPA, Northeast District Office (NEDO) on December 26, 2017.

The comments have been adequately addressed. As stated in the response letter, once the comments have been resolved, the final version of the Record of Decision (ROD) will be forwarded to Ohio EPA. If Ohio EPA has comments on the final version that requires revision to the ROD, the Army will address the comments and submit a revised final version.

Please forward the final version of the ROD to Ohio EPA for review. I will be out of the office for an extended period of time. If you have any questions in my absence, please contact Megan Oravec at megan.oravec@epa.ohio.gov or at (330) 963-1168.

Sincerely,

Vicki Deppisch
Hydrogeologist/Project Coordinator
Division of Environmental Response and Revitalization

VD/nvp

cc:	Katie Tait, OHARNG RTLS Rebecca Shreffler, VISTA Sciences Corp. Craig Coombs, USACE	Kevin Sedlak, OHARNG RTLS Gail Harris, VISTA Sciences Corp.
ec:	Mark Leeper, ARNG Rodney Beals, Ohio EPA, DERR Nat Peters, USACE	Bob Princic, Ohio EPA, NEDO, DERR Tom Schneider, Ohio EPA, SWDO, DERR Megan Oravec, Ohio EPA, NEDO, DERR



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

RECEIVED
4/25/2018

April 25, 2018

LTC James Crowley, ARNG-IED
National Guard Bureau
111 South George Mason Drive
Arlington, VA 22204

Re: US Army Ravenna Ammunition Plt RVAAP
Remediation Response
Project records
Remedial Response
Portage County
267000859127

Subject: Concurrence of Final Proposed Plan for Soil, Sediment and Surface Water at
Wet Storage Area for the Former Ravenna Army Ammunition Plant (RVAAP)
Document (Work Activity No. 267000859127)

Dear Mr. Crowley:

The Ohio Environmental Protection Agency (Ohio EPA) has received and reviewed the Final Proposed Plan (PP) for Soil, Sediment and Surface Water at RVAAP-45 Wet Storage Area. The document is dated February 21, 2018 and was received at Ohio EPA, Northeast District Office (NEDO) on February 21, 2018. This letter serves to document Ohio EPA's concurrence regarding the proposal of soil remediation to attain Unrestricted (Residential) Land Use for the RVAAP Wet Storage Area site as contained in the Final PP.

Based on the information contained in the Final PP document, other investigation documents/reports, and Ohio EPA's oversight participation during the investigation, Ohio EPA concurs with the Final PP document for the RVAAP Wet Storage Area for remedial activities. As stated in the Final PP, the Army will offer a public comment period and hold an open house/public meeting in the near future to present the conclusions and investigative findings for Wet Storage Area.

If you have any questions concerning the above, please feel free to contact Megan Oravec at (330) 963-1168.

Sincerely,

Michael Proffitt, Chief
Division of Environmental Response and Revitalization

MP/MO/nvp

cc: Craig Coombs, USACE, Louisville District
Katie Tait, OHANG, Camp Ravenna
Kevin Sedlak, ANG, Camp Ravenna
Jed Thomas, Leidos

Nat Peters, II, USACE Louisville District
Rebecca Shreffler, Vista Sciences Corp.
Gail Harris, Vista Sciences
Pat Ryan, Leidos-REIMS

ec: Mark Johnson, Ohio EPA, NEDO, DERR
Bob Princic, Ohio EPA, NEDO, DERR
Tom Schneider, Ohio EPA, DERR, SWDO

Bill Damschroder, Legal
Mark Leeper, ARNG
Megan Oravec, Ohio EPA, NEDO, DERR



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



February 14, 2018

Mr. Mark Leeper
Team Lead
Cleanup/Restoration Branch
Army National Guard Directorate
111 South George Mason Drive
Arlington, VA 22204

**Re: US Army Ammunition Plt RVAAP
Remediation Response
Project records
Remedial Response
Portage County
267000859127**

Subject: Ravenna Army Ammunition Plant, Portage/Trumbull Counties. "Response to Comments, Draft, Proposed Plan for Soil, Sediment, and Surface Water at RVAAP-45, Wet Storage Area," Dated January 3, 2018

Dear Mr. Leeper:

The Ohio Environmental Protection Agency (Ohio EPA) has received and reviewed the "Response to Comments, Draft, Proposed Plan for Soil, Sediment, and Surface Water at RVAAP-45 Wet Storage Area" for the Ravenna Army Ammunition Plant (RVAAP), Portage/Trumbull Counties. This document is dated and was received at Ohio EPA, Northeast District Office (NEDO) on January 3, 2018.

The comments have been adequately addressed. As stated in the response letter, once the comments have been resolved, the final version of the Proposed Plan (PP) will be forwarded to Ohio EPA. If Ohio EPA has comments on the final version that requires revision to the PP, the Army will address the comments and submit a Revised Final version. Please forward the final version of the PP to Ohio EPA for review. If you have any questions, please call me at (330) 963-1168.

Sincerely,

A handwritten signature in black ink that reads "Megan Oravec".

Megan Oravec, Site Coordinator
Division of Environmental Response and Revitalization

MO/nvp

cc: Katie Tait/Kevin Sedlak, OHARNG RTLS
Gail Harris/Rebecca Shreffler, VISTA Sciences Corp.
Craig Coombs, USACE

ec: Mark Leeper, ARNG
Nat Peters, USACE
Bob Princic, NEDO, DERR
Rodney Beals, NEDO, DERR
Vicki Deppisch, NEDO, DERR
Tom Schneider, SWDO, DERR



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

August 1, 2018

Mr. David Connolly
Army National Guard Directorate
Environmental Programs Division
ARNGD-ILE-CR
111 South George Mason Drive
Arlington, VA 22204

Re: US Army Ammunition Plt RVAAP
Remediation Response
Correspondence
Remedial Response
Portage County
267000859115

Subject: Ravenna Army Ammunition Plant, Portage/Trumbull Counties. "Response to Approval Letter on the Final, Remedial Investigation Report for Soil, Sediment, and Surface Water at RVAAP-46 Buildings F-15 and F-16" Dated June 28, 2018

Dear Mr. Connolly:

The Ohio Environmental Protection Agency (Ohio EPA) has received and reviewed the "Response to Approval Letter on the Final, Remedial Investigation for Soil, Sediment, and Surface Water at RVAAP-46 Buildings F-15 and F-16" for the Ravenna Army Ammunition Plant, Portage/Trumbull Counties. The document is dated June 28, 2018 and was received at Ohio EPA, Northeast District Office (NEDO) on June 29, 2018, via email.

The recommended path forward is no further action to attain unrestricted use following the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) process. Various discussions occurred in previous comment letters regarding the presence of construction and demolition debris (CDD) on the ground surface that is subject to Ohio's Solid Waste Regulations. The Army will address the CDD piles as part of the Solid Waste Management Plan (SWMP).

The Final RI report for RVAAP-46 Buildings F-15 and F-16 is approved.

If you have any questions, please call me at (330) 963-1207.

Sincerely,

Vicki Deppisch, Hydrogeologist/Project Coordinator
Division of Environmental Response and Revitalization

RECEIVED
1 Aug 2018

VD/nvp

cc: Rebecca Shreffler, Chenega	Nat Peters, USACE
Mark Johnson, NEDO, DERR	Rodney Beals, NEDO, DERR
Tom Schneider, SWDO, DERR	Bob Princic, NEDO DERR
Vanessa Steigerwald-Dick, NEDO, DERR	Katie Tait/Kevin Sedlak OHARNG RTLS
Craig Coombs, USACE	Kevin Palombo, NEDO, DERR
David Connolly, ARNG	



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

June 28, 2018

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

Subject: Ravenna Army Ammunition Plant (RVAAP) Restoration Program, Portage/Trumbull Counties, RVAAP-46 Buildings F-15 and F-16, Response to Ohio Environmental Protection Agency (Ohio EPA) Approval Letter on the Remedial Investigation Report (Work Activity No. 267-000-859-115)

Dear Ms. Deppisch:

The Army has received the Ohio EPA approval letter (dated June 19, 2018) regarding the *Final Remedial Investigation Report for Soil, Sediment, and Surface Water at RVAAP-46 Buildings F-15 and F-16*. This report provides the characterization of the Buildings F-15 and F-16 area of concern with a no further action recommendation to attain Unrestricted (Residential) Land Use, as it pertains to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA).

In a preceding letter (dated January 19, 2018), the Army provided the following response to a comment regarding the construction and demolition debris (C&DD) at the site.

The Army acknowledges the presence of this debris and, as noted in the Final Visual Assessment Survey Report, Evaluation, Identification, and Management of Potential Solid Waste Disposal Sites (ARNG 2017), the Army will manage this solid waste as part of the Solid Waste Management Plan (SWMP) currently under development. Statements and conclusions regarding this material being considered a regulated waste will be handled in the future as part of the SWMP.

As for the CERCLA investigation and remedial investigation report in which the comments are being generated, the Buildings F-15 and F-16 AOC was fully characterized in accordance with approved CERCLA RI Work Plans. Based on the data collected per previously approved RI Work Plans, no CERCLA human health or ecological risk has been identified. Unrestricted (Residential) Land Use is based on a CERCLA risk determination. Since no unacceptable risk from contaminant exposure pathways to human health is identified, the Army will submit the final version of this RI Report with a CERCLA recommendation of Unrestricted Land Use for the area.

Ohio EPA provided a letter (dated March 19, 2018) approving this response, and the Army submitted the final Remedial Investigation Report to Ohio EPA on April 9, 2018.

Subject: Ravenna Army Ammunition Plant (RVAAP) Restoration Program, Portage/Trumbull Counties, RVAAP-46 Buildings F-15 and F-16 (Work Activity No. 267-000-859-115)

The subsequent Proposed Plan will present to the public the findings and conclusions provided in the approved Remedial Investigation Report. The Proposed Plan will include an up-to-date status of the C&DD at the site. However, the Army does not agree with Ohio EPA's stated condition that "The C&DD must be removed prior to issuance and approval of the Proposed Plan to attain unrestricted use." The timing of the actions under the SWMP should not impact the CERCLA process, including issuance and approval of the Proposed Plan.

Accordingly, the Army is requesting a revised approval letter of the Remedial Investigation Report without specified conditions of when the Proposed Plan can be issued or approved. Please contact the undersigned at (703) 607-7955 or david.m.connolly8.civ@mail.mil if there are issues or concerns with this request.

Sincerely,



Date: 2018.06.28
14:10:13 -04'00'

Mr. David Connolly
RVAAP Restoration Program Manager
Army National Guard Directorate

cc: Mark Johnson, Ohio EPA, NEDO
Bob Princic, Ohio EPA, NEDO
Tom Schneider, Ohio EPA, SWDO
Kevin Sedlak, ARNG, Camp Ravenna
Katie Tait, OHARNG, Camp Ravenna
Craig Coombs, USACE Louisville
Nathaniel Peters, II, USACE Louisville
Jed Thomas, Leidos
Gail Harris, Vista Sciences Corporation



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

June 19, 2018

**Re: US Army Ammunition PLT RVAAP
Remediation Response
Project Records
Remedial Response
Portage County
267000859115**

Mr. David Connolly
Army National Guard Directorate
Environmental Programs Division
ARNG-ILE-CR
111 South Georgia Mason Drive
Arlington, VA 22204

Subject: Ravenna Army Ammunition Plant, Portage/Trumbull Counties. "Final, Remedial Investigation Report for Soil, Sediment, and Surface Water at RVAAP-46 Buildings F-15 and F-16" Dated April 5, 2018

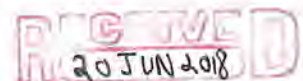
Dear Mr. Connolly:

The Ohio Environmental Protection Agency (Ohio EPA) has received and reviewed the "Final, Remedial Investigation for Soil, Sediment, and Surface Water at RVAAP-46 Buildings F-15 and F-16" for the Ravenna Army Ammunition Plant, Portage/Trumbull Counties. The document is dated April 5, 2018 and was received at Ohio EPA, Northeast District Office (NEDO) on April 9, 2018.

The recommended path forward is no further action to attain unrestricted use. Various discussions occurred in previous comment letters regarding the presence of construction and demolition debris (C&DD) on the ground surface that is subject to Ohio's Solid Waste Regulations and the attainment for unrestricted use. Until recently, this issue remained unresolved.

To attain unrestricted use, it is the understanding of Ohio EPA that the Army will remove the C&DD. The C&DD must be removed prior to issuance and approval of the Proposed Plan (PP) to attain unrestricted use. A discussion of the removal of the C&DD should also be included in the PP.

The Final RI report for buildings F-15 and F-16 is approved.



If you have any questions, please call me at (330) 963-1207.

Sincerely,

A handwritten signature in black ink, appearing to read "Vicki Deppisch". The signature is fluid and cursive, with the first name "Vicki" written in a larger, more prominent script than the last name "Deppisch".

Vicki Deppisch
Hydrogeologist/Project Coordinator
Division of Environmental Response and Revitalization

VD/nvp

ec: Rebecca Shreffler, Chenega
David Connolly, ARNG
Nat Peters, USACE
Mark Johnson, Ohio EPA, NEDO, DERR
Rodney Beals, Ohio EPA, NEDO, DERR
Tom Schneider, Ohio EPA, SWDO, DERR
Bob Princic, Ohio EPA, NEDO, DERR
Vanessa Steigerwald-Dick, Ohio EPA, NEDO, DERR
Katie Tait/Kevin Sedlak, OHARNG RTLS
Craig Coombs, USACE
Kevin Palombo, Ohio EPA, NEDO, DERR



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

Received 21 March 2018

March 19, 2018

Re: US Army Ravenna Ammunition PLT RVAAP
Remediation Response
Project Records
Remedial Response
Portage County
267000859115

Mr. Mark Leeper
Team Lead
Army National Guard Directorate
111 South George Mason Drive
Arlington, VA 22204

**SUBJECT: RAVENNA ARMY AMMUNITION PLANT PORTAGE/TRUMBULL COUNTIES,
RVAAP-46 BUILDINGS F-15 AND F-16, RESPONSE TO COMMENTS ON THE
REVISED DRAFT RI REPORT**

Dear Mr. Leeper:

The Ohio Environmental Protection Agency (Ohio EPA) has received and reviewed the Army's responses to comments on the *Revised Draft Remedial Investigation Report for Soil, Sediment, and Surface Water at RVAAP-46 Buildings F-15 and F-16* for the Ravenna Army Ammunition Plant (RVAAP), Portage/Trumbull Counties. Ohio EPA provided a comment letter, dated November 11, 2017, on this Revised Draft Remedial Investigation (RI) Report. The Army's responses to comments document is dated January 19, 2018 and was received at Ohio EPA, Northeast District Office (NEDO) on January 29, 2018. This letter serves to document that Ohio EPA's comments on the Revised Draft RI have been addressed in the Army's responses to comments.

The Army will revise the RI Report per this response to comments and previous comment responses and will distribute the final version of the RI Report to Ohio EPA. Ohio EPA will await submittal of the final version of the RI Report for Ohio EPA review and concurrence.

If you have any questions concerning the above, please contact me at Vanessa.Steigerwald-Dick@epa.ohio.gov or at (330) 963-1219.

Sincerely,

A handwritten signature in black ink, appearing to read "Vanessa Steigerwald Dick", is written over a horizontal line.

Vanessa Steigerwald Dick, Ph.D. - Environmental Scientist
Division of Environmental Response and Revitalization

cc: Gail Harris/Rebecca Shreffler, Vista Sciences
ec: Mark Leeper, ARNGD, Arlington
Katie Tait/Kevin Sedlak, ARNG, Camp Ravenna
Craig Coombs, USACE Louisville
Tom Schneider, Ohio EPA, SWDO, DERR
Rod Beals, Ohio EPA, NEDO, DERR
Bob Princic, Ohio EPA, NEDO, DERR
Vicki Deppisch, Ohio EPA, NEDO, DERR
Bill Damschroder, Ohio EPA, Legal



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

November 27, 2018

Mr. David Connolly
Army National Guard Directorate
Environmental Programs Division
ARNG-ILE-CR
111 South George Mason Drive
Arlington, VA 22204

**Re: US Army Ammunition Plt RVAAP
Remediation Response
Project Records
Remedial Response
Portage County
267000859248**

**Subject: Ravenna Army Ammunition Plant, Portage/Trumbull Counties.
Comments on the Draft Remedial Design for Soil at RVAAP-51 Dump
along Paris Windham Road at the Former Ravenna Army
Ammunition Plant, Ravenna, Ohio, Dated October 17, 2018, Ohio EPA
ID # 267-000859-248**

Dear Mr. Connolly:

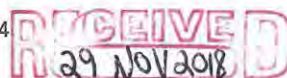
The Ohio Environmental Protection Agency (Ohio EPA) has provided comments on the Draft Remedial Design for Soil at RVAAP-51 Dump along Paris Windham Road at the Former Ravenna Army Ammunition Plant (RVAAP), Ravenna, Ohio. This document was received at Ohio EPA's Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR) on October 22, 2018. The report was prepared for the U.S. Army Corps of Engineers by Chenega Tri-Services, LLC under Contract Number W912QR-18-C-0013.

Comments on the document based on Ohio EPA review are provided below. Please provide responses to the enclosed comments in accordance with the Directors Findings and Orders.

Statement

This Remedial Design (RD) describes the requirements to implement the chosen remedy for soil (Alternative 2 – Land Use Controls (LUCs)) at RVAAP-51 Dump along Paris Windham Road. Surface Water and Sediment achieved No Further Action per the Final Record of Decision (ROD) dated September 2017. Additional information about the selected remedy is documented in the following:

- Final Proposed Plan (PP) for Soil, Sediment and Surface Water for RVAAP-51 Dump along Paris-Windham Road. United States Army Corps of Engineers (USACE). 29 September 2016.
- Final Record of Decision for Soil, Sediment and Surface Water for RVAAP-51 Dump Along Paris-Windham Road. USACE. 25 September 2017.



The chosen Alternative was Alternative 2, LUCs, as stated in the ROD. Alternative 2 contains provisions to implement specific LUCs at the Area of Concern (AOC) in order to prevent exposure to polycyclic aromatic hydrocarbons (PAHs), which are chemicals of concern (COCs) in shallow surface soils for the Residential Receptor and asbestos in soil. A description of the LUCs to be implemented at the AOC is provided in Section 2.0. This RD presents the specifics of the LUCs to be implemented and maintained at the AOC.

Comments:

1. Table of Contents, page i, line 69. Please remove extra period before 2.1.
2. Table of Contents, page i, line 73. The "o" in the word "operations" needs to be capitalized.
3. This RD should provide schedules of deliverables for estimated completion of the RD and annual work activities per the operation and maintenance plan.
4. Page 3, line 197. Please remove the extra period before 2.1.
5. Page 3. Please provide a description of "Seibert stakes." Explain how they are used to prevent military or other personnel from entering a potentially contaminated area.
6. Page 4, paragraph 1, line 232. Reference is made to Appendix B. This should read Appendix A.
7. Figure 2 shows locations of Seibert markers, and signs, Type E that are present at the Paris Windham Road dump area. It also shows the proposed locations of asbestos warning signs. This map needs to show more detail of the Dump area. It should at least include the description of the orange line, and label Paris-Windham Road. It should also show Remalia Road, the limits of waste placement, and the erosion control measures that are in place. This map should give the reader a good understanding of the current state of this AOC.

If you wish to discuss these comments, let me know and we will set up a meeting. If you have any other questions, please call me at (330) 963-1292.

Sincerely,



Kevin M. Palombo, Environmental Specialist
Division of Environmental Response and Revitalization

KP/nvp

ec: Katie Tait, OHARNG RTLS
Kevin Sedlak, ARNG
Rebecca Schreffler, Chenega
Craig Coombs, USACE

Mark Johnson, Ohio EPA NEDO DERR
Thomas Schneider, Ohio EPA, SWDO DERR
Bob Princic, Ohio EPA, NEDO DERR



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

September 20, 2018

Ohio Environmental Protection Agency
DERR-NEDO
Attn: Mr. Kevin Palombo, Project Coordinator
2110 East Aurora Road
Twinsburg, OH 44087-1924

Subject: Notification of Field Work, Ravenna Army Ammunition Plant (RVAAP) Restoration Program,
Portage/Trumbull Counties, RVAAP-66 Facility-wide Groundwater

Dear Mr. Palombo:

In accordance with the Director's Final Findings and Orders, Section XIII, #28, for the RVAAP Restoration Program, the Army National Guard (ARNG) is providing notification of field activities at the former RVAAP (Camp Ravenna) 15 days prior to the scheduled start date. These field activities include:

- 1) Monitoring well installation and groundwater sampling at Sand Creek Landfill Dump, Electric Substation No. 3, and Open Demolition Area No. 1;
- 2) Production well abandonment;
- 3) Facility-wide monitoring well gauging; and
- 4) Groundwater sampling per the 2018 Addendum.

Below is the anticipated schedule for Leidos and their subcontractors to conduct the field activities:

- 10/8/18-10/12/18: Mobilization and site set up
- 10/15/18-10/19/18: Well installation and facility-wide monitoring well gauging
- 10/22/18-11/2/18: Production well abandonment and groundwater sampling.

Please contact the undersigned at (703) 607-7589 or david.m.connolly8.civ@mail.mil if there are issues or concerns with this submission.

Sincerely,

SEDLAK.KEVIN.MIC
HAEL.1254440171

Digitally signed by
SEDLAK.KEVIN.MICHAEL.125444
0171
Date: 2018.09.20 07:29:22 -04'00'

FOR Mr. David Connolly
RVAAP Restoration Program Manager
Army National Guard Directorate

cc: Mark Johnson, Ohio EPA, DERR-NEDO
Bob Princic, Ohio EPA, DERR-NEDO
Al Muller, Ohio EPA, DERR-NEDO
Kevin Sedlak, ARNG, Camp Ravenna
Katie Tait, OHARNG, Camp Ravenna
Craig Coombs, USACE Louisville
Jay Trumble, USACE Louisville
Vasu Peterson, Leidos
Jed Thomas, Leidos
Gail Harris, Vista Sciences Corporation



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

August 16, 2018

Mr. David Connolly
Army National Guard Directorate
Environmental Programs Division
ARNG-ILE-CR
111 South George Mason Drive
Arlington, VA 22204

**Re: US Army Ammunition PLT RVAAP
Remediation Response
Project Records
Remedial Response
Portage County
267000859036**

Subject: Ravenna Army Ammunition Plant, Portage/Trumbull Counties. Approval of the "Final Facility-Wide Groundwater Monitoring Annual Report for 2017" at the Former Ravenna Army Ammunition Plant, Portage and Trumbull Counties, Ohio, Dated July 27, 2018, Ohio EPA ID # 267-000859-036

Dear Mr. Connolly:

The Ohio Environmental Protection Agency (Ohio EPA) has received the "Final Facility-Wide Groundwater Monitoring Annual Report for 2017" at the Former Ravenna Army Ammunition Plant, Portage and Trumbull Counties, Ohio, Dated July 27, 2018, Ohio EPA ID # 267-000859-036. This document was received at Ohio EPA's Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR) on August 1, 2018. The response was prepared for the Army National Guard Directorate by TEC-Weston Joint Venture.

The final document was reviewed by personnel from Ohio EPA's DERR and DDAGW. Pursuant to the Director's Findings and Orders paragraph 39 (b), Ohio EPA considers the document final and approved.

If you have any questions, please call me at (330) 963-1292.

Sincerely,

Kevin M. Palombo
Environmental Specialist
Division of Environmental Response and Revitalization

ec: Rebecca Shreffler, Chenega
Bob Princic, Ohio EPA, NEDO DERR
Rodney Beals, Ohio EPA, NEDO DERR
Mark Johnson, Ohio EPA, NEDO DERR
Thomas Schneider, Ohio EPA, SWDO DERR
Carrie Rasik, Ohio EPA, CO DERR
Albert Muller, Ohio EPA, NEDO
Kevin Sedlak, ARNG
Katie Tait, OHARNG RTLS

RECEIVED
16 AUG 2018



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

July 30, 2018

Mr. David Connolly
Army National Guard Directorate
Environmental Programs Division
ARNGD-ILE-CR
111 South George Mason Drive
Arlington, VA 22204

Re: **US Army Ammunition Plt RVAAP
Remediation Response
Correspondence
Remedial Response
Portage County
267000859036**

**Subject: Ravenna Army Ammunition Plant, Portage/Trumbull Counties.
Approval of the Request to Abandon Monitoring Well FWGmw-017,
RVAAP-66 Facility-Wide Groundwater Monitoring Program at the
Former Ravenna Army Ammunition Plant, Portage and Trumbull
Counties, Ohio, Dated June 27, 2018, Ohio EPA ID # 267-000859-036**

Dear Mr. Connolly:

The Ohio Environmental Protection Agency (Ohio EPA) has received the **Request to Abandon Monitoring Well FWGmw-017, RVAAP-66 Facility-Wide Groundwater Monitoring Program** at the Former Ravenna Army Ammunition Plant, Portage and Trumbull Counties, Ohio, Dated June 27, 2018, Ohio EPA ID # 267-000859-036. This request was received at Ohio EPA's Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR) on July 2, 2018. The request was prepared by the Army National Guard Directorate and U.S. Army Corps of Engineers.

Monitoring well SCON3, also known as FWGmw-017, was mistakenly placed on private property on the south side of SR 5 and situated in Portage County, Paris Township, lot 13. The Army National Guard requests permission to abandon the well that has been part of the Facility Wide Groundwater Remedial Investigation. The well is located off National Guard Property by approximately 10 feet, on the property of Donald and Barrie Forner. Based on information presented in the Facility-Wide Groundwater Annual Report for 2017, the well is a relatively deep bedrock well at 143.5 feet deep. It is set at the base of the Sharon Conglomerate and is screened from 133.5 to 143.5 feet.

Ohio EPA received a summary of the analytical results for this well. It has been sampled for four quarters and was also sampled as part of the 2018 semiannual sampling event, which took place in June 2018. So, as of this date, it has been sampled five times. Based on the results provided, and preliminary interpretations of the data, it

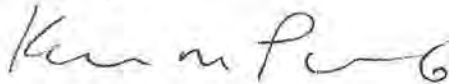
MR. DAVID CONNOLLY
ARMY NATIONAL GUARD DIRECTORATE
JULY 30, 2018
PAGE 2

does not appear this well, installed at the base of the Sharon Conglomerate, has been impacted by Army activities. For those reasons, it would not be necessary to replace this well. Of course, once the Remedial Investigation Report has been submitted, decisions on whether additional wells are necessary will be fully evaluated. As described in your letter, well FWGmw-017 will be abandoned according to the Final Well Abandonment Work Plan for RVAAP-66 Facility-Wide Groundwater.

Based on your submittal, the request to abandon well FWGmw-017 is approved. Ohio EPA asks that a final abandonment report once completed be submitted to us for our file.

If you have any questions, please call me at (330) 963-1292.

Sincerely,



Kevin M. Palombo
Environmental Specialist
Division of Environmental Response and Revitalization

KP/nvp

ec: Rebecca Shreffler, Chenega
Bob Princic, Ohio EPA, NEDO, DERR
Rodney Beals, Ohio EPA, NEDO, DERR
Mark Johnson, Ohio EPA, NEDO, DERR
Thomas Schneider, Ohio EPA, SWDO, DERR
Carrie Rasik, Ohio EPA, CO, DERR
Albert Muller, Ohio EPA, NEDO
Craig Coombs, USACE-Louisville, KY
Kevin Sedlak, ARNG
Katie Tait, OHARNG RTLS



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

July 18, 2018

Mr. David Connolly
Army National Guard Directorate
Environmental Programs Division
ARNGD-ILE-CR
111 South George Mason Drive
Arlington, VA 22204

Re: **US Army Ammunition Plt RVAAP
Remediation Response
Project Records
Remedial Response
Portage County
267000859036**

Subject: Ravenna Army Ammunition Plant, Portage/Trumbull Counties. Approval of the Response to Ohio EPA Comments on the "Draft Facility-Wide Groundwater Monitoring Program RVAAP-66 Facility-Wide Groundwater Annual Report for 2017" at the Former Ravenna Army Ammunition Plant, Portage and Trumbull Counties, Ohio, Dated March 30, 2018, Ohio EPA ID # 267-000859-036

Dear Mr. Connolly:

The Ohio Environmental Protection Agency (Ohio EPA) has received the Response to Comments on the "Draft Facility-Wide Groundwater Monitoring Program RVAAP-66 Facility-Wide Groundwater Annual Report for 2017" at the Former Ravenna Army Ammunition Plant, Portage and Trumbull Counties, Ohio, Dated March 30, 2018, Ohio EPA ID # 267-000859-036. These responses to comments were received at Ohio EPA's Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR) on July 5, 2018. The response was prepared for the Army National Guard Directorate by TEC-Weston Joint Venture.

The responses to comments were reviewed by personnel from Ohio EPA's DERR and DDAGW, pursuant to the Director's Findings and Orders paragraph 39 (b), the responses are satisfactory. Please submit the final document for agency approval with the changes made as agreed in the Comment Resolution Table.

If you have any questions, please call me at (330) 963-1292.

Sincerely,

Kevin M. Palombo, Environmental Specialist
Division of Environmental Response and Revitalization

RECEIVED
19 JUL 2018

KP/nvp

ec: Rebecca Shreffler, Chenega
Rodney Beals, Ohio EPA, NEDO DERR
Carrie Rasik, Ohio EPA, CO DERR
Albert Muller, Ohio EPA, NEDO
Katie Tait, OHARNG RTLS

Bob Princic, Ohio EPA, NEDO DERR
Mark Johnson, Ohio EPA, NEDO DERR
Thomas Schneider, Ohio EPA, SWDO DERR
Kevin Sedlak, ARNG



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

July 10, 2018

Mr. David Connolly
Army National Guard Directorate
ARNGD-ILE-CR
111 South George Mason Drive
Arlington, VA 22204

**Re: US Army Ammunition Plant RVAAP
Remediation Response
Project Records
Remedial Response
Portage County
267000859036**

Subject: Ravenna Army Ammunition Plant, Portage/Trumbull Counties. Approval of the "Final Facility-Wide Groundwater Monitoring Addendum for 2018" at the Former Ravenna Army Ammunition Plant, Portage and Trumbull Counties, Ohio, Dated June 21, 2018, Ohio EPA ID # 267-000859-036

Dear Mr. Connolly:

The Ohio Environmental Protection Agency (Ohio EPA) has received the "Final Facility-Wide Groundwater Monitoring Addendum for 2018" at the Former Ravenna Army Ammunition Plant, Portage and Trumbull Counties, Ohio, dated June 21, 2018, Ohio EPA ID # 267-000859-036. This document was received at Ohio EPA's Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR) on June 25, 2018. The response was prepared for the Army National Guard Directorate by TEC-Weston Joint Venture.

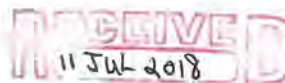
The final document was reviewed by personnel from Ohio EPA's DERR and Division of Drinking and Ground Water (DDAGW). Pursuant to the Director's Findings and Orders paragraph 39 (b), Ohio EPA considers the document final and approved.

If you have any questions, please call me at (330) 963-1292.

Sincerely,

A handwritten signature in black ink, appearing to read "Kevin M. Palombo", is written over a light blue horizontal line.

Kevin M. Palombo
Environmental Specialist
Division of Environmental Response and Revitalization



KP:cla

cc: Rebecca Shreffler, Chenega
Craig Coombs, USACE
Kevin Sedlak, ARNG
Rodney Beals, Ohio EPA, NEDO, DERR
Bob Princic, Ohio EPA, NEDO, DERR
Thomas Schneider, Ohio EPA, SWDO, DERR
Carrie Rasik, Ohio EPA, Central Office, DERR

David Connolly, ARNG
Nat Peters, USACE
Katie Tait, OHARNG RTLS
Mark Johnson, Ohio EPA, NEDO, DERR
Albert Muller, Ohio EPA, NEDO, DMWM



NATIONAL GUARD BUREAU
111 SOUTH GEORGE MASON DRIVE, AH2
ARLINGTON VA 22204-1373

June 29, 2018

Ohio Environmental Protection Agency
DERR-NEDO
Attn: Mr. Kevin Palombo
2110 East Aurora Road
Twinsburg, OH 44087-1924

Subject: Response to Comments on the Draft Facility-Wide Groundwater Monitoring Program
RVAAP-66 Facility-Wide Groundwater Annual Report for 2017, Camp Ravenna,
Portage and Trumbull Counties, Ohio, Ohio EPA ID # 267-000859-036

Dear Mr. Palombo:

The Army National Guard is pleased to submit the enclosed Comment Resolution Table in response to comments on the Draft Facility-Wide Groundwater Monitoring Program RVAAP-66 Facility-Wide Groundwater Annual Report for 2017. This deliverable is in response to Ohio EPA comments dated 8 June 2018. This deliverable consists of one hardcopy and one electronic copy containing a single pdf of the submission.

Please contact the undersigned at 703-607-7589 or david.m.connolly8.civ@mail.mil if you would like to discuss this submission.

Sincerely,

David M. Connolly
RVAAP Restoration Program Manager
Army National Guard Directorate

cc:

Mark Johnson, Ohio EPA, DERR-NEDO
Al Muller, Ohio EPA, DDAGW-NEDO
Bob Princic, Ohio EPA, DERR-NEDO
Tom Schneider, Ohio EPA, SWDO
Kevin Sedlak, ARNG, Camp Ravenna
Katie Tait, OHARNG, Camp Ravenna
Rebecca Shreffler, Chenega
Brent Ferry, JV Project Manager

Comment Resolution Table

Installation: Camp Ravenna/Former RVAAP

Document: Comments on the Draft Facility-Wide Groundwater Monitoring Program RVAAP-66 Facility-Wide Groundwater Annual Report for 2017

Reviewer(s): Kevin M. Palombo, Ohio EPA, (330) 963-1292

Date: 8 June 2018

Cmt No.	Page or Sheet	Comment	Response
Groundwater Comments			
1	Executive Summary	<p>The Executive Summary of the report indicated that extent of impacts of organic compounds in ground water is limited to six areas beneath Camp Ravenna: Fuse and Booster Quarry Landfill/Ponds AOCs, Load Line 10 AOC, Load Line 1/Load Line2/Load Line 3 AOCs, Open Demolition Area and #2/Winklepeck Burning Grounds AOCs, Ramsdell Quarry AOC and the NACA Test Area AOC. These six areas are shown on Figure 4-8 of the report. Ohio EPA wishes to emphasize that the extent of impact due to organic compounds in ground water as described in the report is only preliminary and generalized. The National Guard has not completed its remedial investigation, nor has it completed background/baseline sampling of the 15 newly-installed RI wells. As the National Guard has not completed its RI, it is not clear if any other hydrostratigraphic units that may exist beneath Camp Ravenna (such as Massillon Sandstone or Mercer Member) need to be evaluated. Note: The report (page 3-5) indicated that the degree to which the Mercer and Sharon shales act as an aquitard will be evaluated as part of the ongoing FWGW monitoring. DDAGW recommends that the National Guard reference Ohio EPA's <i>Technical Guidance Manual</i> document entitled <i>Assessment of an Aquitard during a Ground Water Contamination Investigation</i> (http://www.epa.state.oh.us/portals/28/documents/TGM-Suppl1 .pdf) when making this evaluation. Additionally, time-series graphs in this report indicated increasing concentrations of explosives/propellants and VOCs in several wells. Therefore, the estimated extent of organic contamination in ground water described in the submitted report is preliminary and generalized at best. Additionally, the extent of impact to ground water due to metals and cyanide does not appear to have been taken into consideration. Ohio EPA understands that the National Guard needs to complete metal background study to evaluate the extent of metals contamination in ground water beneath Camp Ravenna.</p>	<p>Concur with clarification. It is acknowledged that the extent of groundwater contaminants requiring additional investigation or cleanup at Camp Ravenna should be considered preliminary until the Facility-wide Groundwater (FWGW) RI has been completed. ARNG also concurs that a background study is still required to complete an evaluation of metals contamination for the RI. Note that each of the new wells installed in 2016 for the purposes of the FWGW RI had been sampled four times as of December 2017. Continued sampling of each of the non-background wells installed in 2016 will be conducted in the current year program to address continuing concerns for these wells as discussed in the FWGWMP Addendum for 2018.</p> <p>ARNG will reference the indicated USEPA guidance in future FWGM documents related to evaluating potential aquitard layers affecting contaminant fate and transport.</p>

Comment Resolution Table

Installation: Camp Ravenna/Former RVAAP

Document: Comments on the Draft Facility-Wide Groundwater Monitoring Program RVAAP-66 Facility-Wide Groundwater Annual Report for 2017

Reviewer(s): Kevin M. Palombo, Ohio EPA, (330) 963-1292

Date: 8 June 2018

2	Section 3.1.2 Page 3-4	<p>In Section 3.1.2 (Vertical Gradients) of the report (page 3-4) states:</p> <p><i>One well cluster for the potential of vertical flow between the unconsolidated and Homewood aquifers {sic}. As shown in Table 3-2, the calculated gradient for the well cluster in the Load Line 6 AOC is 0.007 ft/ft downwards. The magnitude of this vertical gradient is negligible and indicates vertical ground water flow between the unconsolidated and Homewood aquifers is limited.</i></p> <p>Ohio EPA does not believe that one vertical gradient calculation from a single well pair adequately demonstrates the direction/magnitude of vertical flow between the Unconsolidated and Homewood Aquifers. Any such demonstration would need to include additional data taking into consideration seasonal, temporal, and spatial variation. Such a demonstration would require additional well pairs in the Unconsolidated and Homewood Aquifers.</p> <p>Also, Table 3-2 contains a number of typographical errors. In Table 3-2 for well pairs WBGmw-009/WBGmw-020, WBGmw-018/WBGmw-019, and WBGmw-006 and WBGmw-021 the vertical flow direction is down and in the comments column it states that "flow is from Sharon to Unconsolidated", and it should state "flow is from the Unconsolidated Aquifer to the Upper Sharon Aquifer". For clarity and accuracy, these errors need to be corrected.</p>	<p>Concur. The document text has been revised as follows:</p> <p><i>One well cluster was evaluated for the potential of vertical flow between the unconsolidated and Homewood aquifers. As shown in Table 3-2, the calculated gradient for the well cluster in the Load Line 6 AOC is 0.007 ft/ft downwards. The magnitude of this vertical gradient is negligible and indicates <u>limited</u> vertical ground water flow between the unconsolidated and Homewood aquifers is limited <u>at the location of the two wells during the gauging event</u>.</i></p> <p>Revisions to Table 3-2 have been completed as requested.</p>
---	-----------------------------------	--	---

Comment Resolution Table

Installation: Camp Ravenna/Former RVAAP

Document: Comments on the Draft Facility-Wide Groundwater Monitoring Program RVAAP-66 Facility-Wide Groundwater Annual Report for 2017

Reviewer(s): Kevin M. Palombo, Ohio EPA, (330) 963-1292

Date: 8 June 2018

3	Section 3.5	<p>According to the FWGWMP Semi-Annual Report for 2017, the FWGWMP Annual Report for 2017, was supposed to contain a comprehensive discussion of pH test results and the geochemical parameters sulfide/sulfate, nitrate/nitrite, alkalinity and hexavalent chromium to help evaluate the potential source of pH values outside the natural range (i.e., pH >9 and < 5). Section 3.5 (pH Monitoring) of the report did not contain any significant discussion of the aforementioned geochemical parameters in relation to pH or the potential causes of pH values consistently outside the normal range in number of wells at Camp Ravenna. This issue needs to be addressed.</p>	<p>At the time of the preparation of the Semi-Annual Report for 2017, it was anticipated that evaluation of the geochemical parameter results for anomalous pH value wells in the Annual report would be supported by the data collected and developed as part of the FWGW RI and background study. Specifically, the background study would provide a determination of what the naturally occurring geochemical conditions were for each hydrostratigraphic unit under review to enable a comparison of sample results for the anomaly wells. Based on the currently incomplete status of the FWGW RI and background study, detailed review of the sample results for these wells will need to be deferred to completion of the FWGW RI.</p>
4	Table 3-5	<p>Upper Sharon well LL2mw-270 was sampled as part of the April 2017 sampling event. Table 3-5 does not contain results for well LL2mw-270. The sampling results for well LL2mw-270 need to be included in Table 3-5.</p>	<p>Results of the April 2017 sampling at LL2mw-270 have been included in a revised Table 3-5.</p>
5	Section 4.9.1 Page 4-10	<p>Section 4.9.1 (explosives and Propellants) [page 4-1 O] states:</p> <p><i>FBQmw-174 (Fuze and Booster Quarry AOC) - the trend line for 2, 4-dinitrotoluene indicates an increasing trend as a result of the plotting of a non-detect sample result with an elevated detection limit for the April 2017 (sic). FBQmw-174 was not sampled during the December sampling event due to insufficient ground water volume.</i></p> <p>DDAGW does not concur that the above-described trend represents a statistically significant increasing trend in the concentration of 2,4-dinitrotoluene in well FBQmw-174, but rather is an artifact of data quality.</p>	<p>Concur. The indicated text has been revised to more clearly state the condition as follows:</p> <p><i>FBQmw-174 (Fuze and Booster Quarry AOC) - the <u>upward</u> trend line for 2, 4-dinitrotoluene indicates an increasing trend as is a result of the plotting of a non-detect sample result with an elevated detection limit for the April 2017, <u>rather than being representative of a statistically significant increasing concentration trend</u>. FBQmw-174 was not sampled during the December 2017 sampling event due to insufficient ground water volume.</i></p>

Comment Resolution Table

Installation: Camp Ravenna/Former RVAAP

Document: Comments on the Draft Facility-Wide Groundwater Monitoring Program RVAAP-66 Facility-Wide Groundwater Annual Report for 2017

Reviewer(s): Kevin M. Palombo, Ohio EPA, (330) 963-1292

Date: 8 June 2018

6	Section 2.4.2 Page 2-6	<p>Section 2.4.2 (April 2017) (page 2-6) contains a typographical error. This section of the report states:</p> <p style="padding-left: 40px;"><i>The April 2017 FWGWMP sampling event was performed April 17 through May 4, 2017, During the event, 101 monitoring wells were sampled. This includes four of the five RCRA wells (RQLmw-007, RQLmw-008, RQLmw-009, and DETmw-003).</i></p> <p>In fact, 105 wells were sampled, including the four RCRA wells during the April 2017 sampling event. The above statement should be corrected to accurately reflect the number of wells that were sampled during the April 2017 sampling event.</p>	<p>The indicated text has been revised for clarity:</p> <p style="padding-left: 40px;"><i>The April 2017 FWGWMP sampling event was performed April 17 through May 4, 2017. During the event, 101 monitoring wells were sampled (<u>four of the planned total of 105 wells contained insufficient groundwater for sampling</u>). This includes four of the five RCRA wells (RQLmw-007, RQLmw-008, RQLmw-009, and DETmw-003).</i></p>
7	Table 3-5	<p>Page 31 of Table 3-5 is missing the column header indicating the well identifications and sampling dates. Note: The data on this page is paired with data on page 32. For clarity, the missing information on these column headers need to be complete.</p>	<p>Concur, the requested edits have been incorporated into the final report.</p>



NATIONAL GUARD BUREAU

111 SOUTH GEORGE MASON DRIVE
ARLINGTON VA 22204-1373

June 27, 2018

Ohio Environmental Protection Agency
Attn: Mr. Kevin Palombo
2110 East Aurora Road
Twinsburg, OH 44087-1924

SUBJECT: Request for approval to abandon monitoring well FWGmw-017, RVAAP-66, Facility-wide Groundwater Monitoring Program (FWGWMP), RVAAP Restoration Program, Portage and Trumbull Counties, Ohio

Dear Mr. Palombo:

The Army National Guard is requesting approval to abandon one groundwater well, FWGmw-017, located south of State Route 5, just south of the Camp Ravenna facility boundary on private property. This well was mistakenly placed on an adjacent landowner's property and based on discussions with the landowner and his requests, it is in the best interest of the government to properly abandon this well. The well was previously sampled for four quarters and the sampling data is attached for your use and reference. The well will also be sampled as part of the Semi-annual groundwater sampling event scheduled to take place in June 2018. The groundwater data from this well will be utilized as part of the FWGWMP and archived as part of the REIMS database. The well will be properly abandoned in accordance with the Final Well Abandonment Work Plan for RVAAP-66 Facility-wide Groundwater, dated 3 May 2016.

Please contact the undersigned at (703) 607-7589 or david.m.connolly8.civ@mail.mil if there are issues or concerns with this submission.

Sincerely,

Date: 2018.06.27
15:20:03 -04'00'

Mr. David Connolly
RVAAP Restoration Program Manager
Army National Guard Directorate

cc:

Mark Johnson, Ohio EPA, DERR
Bob Princic, Ohio EPA, DERR
Tom Schneider, Ohio EPA, DERR, SWDO
Kevin Sedlak, ARNG, Camp Ravenna
Katie Tait, OHARNG, Camp Ravenna
Craig Coombs, USACE – Louisville Project Manager
Gail Harris, Vista Sciences Corp.

Summary of Laboratory Analytical Results
FWGmw-017
November 2016 Through December 2017
Camp Ravenna, OH

AnalysisGroup	Parameter	FWGmw-017 11/15/2016 (ug/L)	FWGmw-017 4/28/2017 (ug/L)	FWGMW-017 8/9/2017 NOT VALIDATED (ug/L)	FWGMW-017 8/9/2017(Dup) NOT VALIDATED (ug/L)	FWGMW-017 12/2/2017 (ug/L)
Detected concentrations highlighted in yellow						
Explosives	1,3,5-Trinitrobenzene	0.42 U	0.43 U	0.2 U	0.2 U	0.44 UJ
Explosives	1,3-Dinitrobenzene	0.21 U	0.21 U	0.2 U	0.2 U	0.22 UJ
Explosives	2,4,6-Trinitrotoluene	0.21 U	0.21 U	0.2 U	0.2 U	0.22 UJ
Explosives	2,4-Dinitrotoluene	0.21 U	0.21 U	0.2 U	0.2 U	0.22 UJ
Explosives	2,6-Dinitrotoluene	0.21 U	0.21 U	0.2 U	0.2 U	0.22 UJ
Explosives	2-Amino-4,6-dinitrotoluene	0.13 UJ	0.13 U	0.2 U	0.2 U	0.13 UJ
Explosives	2-Nitrotoluene	0.21 U	0.21 U	0.5 U	0.5 U	0.22 UJ
Explosives	3-Nitrotoluene	0.21 U	0.21 U	0.2 U	0.2 U	0.22 UJ
Explosives	4-Amino-2,6-dinitrotoluene	0.13 U	0.13 U	0.2 U	0.2 U	0.13 UJ
Explosives	4-Nitrotoluene	0.42 U	0.43 U	0.2 U	0.2 U	0.44 UJ
Explosives	HMX	0.21 U	0.21 U	0.2 U	0.2 U	0.22 UJ
Explosives	Nitrobenzene	0.21 U	0.21 U	0.2 U	0.2 U	0.22 UJ
Explosives	Nitrocellulose	Not Tested	1000 U	1000 U	1000 U	1000 U
Explosives	Nitroglycerin	2.1 U	2.1 U	1 U	1 U	2.2 UJ
Explosives	Nitroguanidine	6 U	6 U	6 U	6 U	6 U
Explosives	PETN	1.3 U	1.3 U	1 U	1 U	1.3 UJ
Explosives	RDX	0.13 U	0.13 U	0.2 U	0.2 U	0.13 UJ
Explosives	Tetryl	0.21 U	0.21 U	0.2 U	0.2 U	0.22 UJ
Inorganics	Aluminum	70 U	70 U	62 J	150 U	70 U
Inorganics	Antimony	6 U	1 U	9 U	9 U	1 U
Inorganics	Arsenic	12	10	7.6 J D	8 J D	5.6
Inorganics	Barium	140	130 J	130 D	130 D	130 J
Inorganics	Beryllium	0.3 U	0.3 U	4.5 U	4.5 U	0.3 U
Inorganics	Cadmium	1 U	1 U	4.5 U	4.5 U	1 U
Inorganics	Calcium	65000	69000	65000 D	66000 D	63000
Inorganics	Chromium	1.8 U	1.8 U	8 U	8 U	1.8 U

Notes:
U - undetected; J - estimated value; D - diluted sample
Q - one or more lab QC issues

Summary of Laboratory Analytical Results
FWGmw-017
November 2016 Through December 2017
Camp Ravenna, OH

AnalysisGroup	Parameter	FWGmw-017 11/15/2016 (ug/L)	FWGmw-017 4/28/2017 (ug/L)	FWGMW-017 8/9/2017 NOT VALIDATED (ug/L)	FWGMW-017 8/9/2017(Dup) NOT VALIDATED (ug/L)	FWGMW-017 12/2/2017 (ug/L)
Detected concentrations highlighted in yellow						
Inorganics	Chromium, hexavalent	Not Tested	4 UJ	20 U	20 U	20 U
Inorganics	Cobalt	0.93 J	0.62 J	1.8 U	1.8 U	0.39 J
Inorganics	Copper	1.8 U	1.8 U	0.8 U	0.8 U	1.8 U
Inorganics	Iron	1800	740 J	480	520	470
Inorganics	Lead	0.7 U	0.7 U	2 U	2 U	0.7 U
Inorganics	Magnesium	26000	26000	27000 D	26000 D	25000
Inorganics	Manganese	480	340	320 D	320 D	310 J
Inorganics	Mercury	0.08 U	0.08 U	0.15 U	0.15 U	0.08 U
Inorganics	Nickel	0.67 J	2.9 J	4 U	2.1 J D	1.7 J
Inorganics	Potassium	2100 J	3000 U	1800 D	1800 D	3000 U
Inorganics	Selenium	2 U	2 U	4 U	4 U	2 U
Inorganics	Silver	0.1 U	0.1 U	1.8 U	1.8 U	0.1 U
Inorganics	Sodium	14000	13000 J	14000 D	14000 D	13000
Inorganics	Thallium	0.2 U	0.2 U	15 U	15 U	0.2 U
Inorganics	Total Cyanide	3.2 J	5 U	5 U	5 U	5 U
Inorganics	Vanadium	2 U	2 U	8 U	8 U	2 U
Inorganics	Zinc	20 U	8 U	18 U	18 U	8 U
Miscellaneous	Perchlorate	Not Tested	0.01 U	0.01 U	0.01 U	0.01 U
Pesticides and PCBs	4,4'-DDD	0.051 U	0.051 U	0.02 U	0.019 U	0.05 U
Pesticides and PCBs	4,4'-DDE	0.022 U	0.022 U	0.02 U	0.019 U	0.022 U
Pesticides and PCBs	4,4'-DDT	0.014 U	0.014 U	0.02 U	0.019 U	0.014 U
Pesticides and PCBs	Aldrin	0.021 U	0.021 U	0.02 U	0.019 U	0.021 U
Pesticides and PCBs	Alpha-BHC	0.019 U	0.019 U	0.02 U	0.019 U	0.019 U
Pesticides and PCBs	Alpha-chlordane	0.03 U	0.029 U	0.02 U	0.019 U	0.029 U
Pesticides and PCBs	Aroclor-1016	0.095 U	0.099 U	0.78 U	0.77 U	0.095 U
Pesticides and PCBs	Aroclor-1221	0.095 U	0.099 U	0.78 U	0.77 U	0.095 U

Notes:

U - undetected; J - estimated value; D - diluted sample

Q - one or more lab QC issues

Summary of Laboratory Analytical Results
FWGmw-017
November 2016 Through December 2017
Camp Ravenna, OH

AnalysisGroup	Parameter	FWGmw-017 11/15/2016 (ug/L)	FWGmw-017 4/28/2017 (ug/L)	FWGMW-017 8/9/2017 NOT VALIDATED (ug/L)	FWGMW-017 8/9/2017(Dup) NOT VALIDATED (ug/L)	FWGMW-017 12/2/2017 (ug/L)
Detected concentrations highlighted in yellow						
Pesticides and PCBs	Aroclor-1232	0.095 U	0.099 U	0.78 U	0.77 U	0.095 U
Pesticides and PCBs	Aroclor-1242	0.095 U	0.099 U	0.78 U	0.77 U	0.095 U
Pesticides and PCBs	Aroclor-1248	0.095 U	0.099 U	0.78 U	0.77 U	0.095 U
Pesticides and PCBs	Aroclor-1254	0.095 U	0.099 U	0.29 U	0.29 U	0.095 U
Pesticides and PCBs	Aroclor-1260	0.095 U	0.099 U	0.29 U	0.29 U	0.095 U
Pesticides and PCBs	Beta-BHC	0.041 U	0.041 U	0.02 U	0.019 U	0.04 U
Pesticides and PCBs	Delta-BHC	0.024 U	0.024 U	0.02 U	0.019 U	0.024 U
Pesticides and PCBs	Dieldrin	0.016 U	0.016 U	0.02 U	0.019 U	0.016 U
Pesticides and PCBs	Endosulfan I	0.022 U	0.022 U	0.02 U	0.019 U	0.022 U
Pesticides and PCBs	Endosulfan II	0.041 U	0.041 U	0.02 U	0.019 U	0.04 U
Pesticides and PCBs	Endosulfan Sulfate	0.018 U	0.018 U	0.02 U	0.019 U	0.018 U
Pesticides and PCBs	Endrin	0.024 U	0.024 U	0.02 U	0.019 U	0.024 U
Pesticides and PCBs	Endrin Aldehyde	0.041 U	0.041 U	0.02 U	0.019 U	0.04 U
Pesticides and PCBs	Endrin Ketone	0.036 U	0.036 U	0.02 U	0.019 U	0.035 U
Pesticides and PCBs	Gamma-BHC	0.032 U	0.032 U	0.02 U	0.019 U	0.031 U
Pesticides and PCBs	Gamma-Chlordane	0.031 U	0.031 U	0.02 U	0.019 U	0.03 U
Pesticides and PCBs	Heptachlor	0.051 U	0.051 U	0.02 U	0.019 U	0.05 U
Pesticides and PCBs	Heptachlor Epoxide	0.037 U	0.037 U	0.02 U	0.019 U	0.036 U
Pesticides and PCBs	Methoxychlor	0.037 U	0.037 U	0.02 U	0.019 U	0.036 U
Pesticides and PCBs	Toxaphene	1.9 U	1.9 U	0.39 U	0.39 U	1.9 U
Semi-Volatile Organics	1,2,4-Trichlorobenzene	0.96 U	0.97 U	2.9 U	2.9 U	4.4 U
Semi-Volatile Organics	1,2-Dichlorobenzene	0.48 U	0.49 U	2.9 U	2.9 U	4.4 U
Semi-Volatile Organics	1,3-Dichlorobenzene	0.96 U	0.97 U	2.9 U	2.9 U	4.4 U
Semi-Volatile Organics	1,4-Dichlorobenzene	0.96 U	0.97 U	2.9 U	2.9 U	4.4 U
Semi-Volatile Organics	1,4-Dioxane	Not Reported	Not Reported	2.9 U	2.9 U	Not Reported
Semi-Volatile Organics	2,4,5-Trichlorophenol	0.96 U	0.97 U	2.9 U	2.9 U	2 U

Notes:

U - undetected; J - estimated value; D - diluted sample

Q - one or more lab QC issues

Summary of Laboratory Analytical Results
FWGmw-017
November 2016 Through December 2017
Camp Ravenna, OH

AnalysisGroup	Parameter	FWGmw-017 11/15/2016 (ug/L)	FWGmw-017 4/28/2017 (ug/L)	FWGMW-017 8/9/2017 NOT VALIDATED (ug/L)	FWGMW-017 8/9/2017(Dup) NOT VALIDATED (ug/L)	FWGMW-017 12/2/2017 (ug/L)
Detected concentrations highlighted in yellow						
Semi-Volatile Organics	2,4,6-Trichlorophenol	0.96 U	0.97 U	2.9 U	2.9 U	2 U
Semi-Volatile Organics	2,4-Dichlorophenol	1.9 U	1.9 U	2.9 U	2.9 U	2 U
Semi-Volatile Organics	2,4-Dimethylphenol	1.9 U	1.9 U	2.9 U	2.9 U	4 U
Semi-Volatile Organics	2,4-Dinitrophenol	29 U	29 U	9.7 U Q	9.7 U Q	16 U
Semi-Volatile Organics	2,4-Dinitrotoluene	4.2 U	4.3 U	2.9 U Q	2.9 U Q	2 U
Semi-Volatile Organics	2,6-Dinitrotoluene	4.2 U	4.3 U	2.9 U	2.9 U	2 U
Semi-Volatile Organics	2-Chloronaphthalene	0.96 U	0.97 U	2.9 U	2.9 U	1 U
Semi-Volatile Organics	2-Chlorophenol	4.2 U	4.3 U	2.9 U	2.9 U	1 U
Semi-Volatile Organics	2-Methylnaphthalene	0.96 U	0.97 U	2.9 U	2.9 U	1 U
Semi-Volatile Organics	2-Methylphenol	1.9 U	1.9 U	2.9 U	2.9 U	2 U
Semi-Volatile Organics	2-Nitroaniline	4.2 U	4.3 U	2.9 U	2.9 U	2 U
Semi-Volatile Organics	2-Nitrophenol	0.96 U	0.97 U	2.9 U Q	2.9 U Q	2 U
Semi-Volatile Organics	3 & 4 Methylphenol	0.48 U	0.49 U	2.9 U	2.9 U	1 U
Semi-Volatile Organics	3,3'-Dichlorobenzidine	4.2 U	4.3 U	2.9 U	2.9 U	2 U
Semi-Volatile Organics	3-Nitroaniline	4.2 U	4.3 U	9.7 U	9.7 U	2 U
Semi-Volatile Organics	4,6-Dinitro-2-methylphenol	8.4 U	8.6 U	2.9 U Q	2.9 U Q	16 U
Semi-Volatile Organics	4-Bromophenyl-phenylether	0.96 U	0.97 U	2.9 U	2.9 U	1 U
Semi-Volatile Organics	4-Chloro-3-methylphenol	4.8 U	4.9 U	2.9 U	2.9 U	1 U
Semi-Volatile Organics	4-Chloroaniline	4.2 U	4.3 U	2.9 U	2.9 U	2 U
Semi-Volatile Organics	4-Chlorophenyl-phenylether	4.2 U	4.3 U	2.9 U	2.9 U	2 U
Semi-Volatile Organics	4-Nitroaniline	4.2 U	4.3 U	2.9 U	2.9 U	2 U
Semi-Volatile Organics	4-Nitrophenol	3.8 U	3.9 U	9.7 U	9.7 U	4 UJ
Semi-Volatile Organics	Acenaphthene	0.041 UJ	0.04 UJ	2.9 U	2.9 U	0.04 U
Semi-Volatile Organics	Acenaphthylene	0.041 UJ	0.04 UJ	2.9 U	2.9 U	0.04 U
Semi-Volatile Organics	Anthracene	0.041 UJ	0.04 UJ	2.9 U	2.9 U	0.04 U
Semi-Volatile Organics	Benz(a)anthracene	0.012 U	0.012 U	2.9 U	2.9 U	0.012 U

Notes:

U - undetected; J - estimated value; D - diluted sample

Q - one or more lab QC issues

Summary of Laboratory Analytical Results
FWGmw-017
November 2016 Through December 2017
Camp Ravenna, OH

AnalysisGroup	Parameter	FWGmw-017 11/15/2016 (ug/L)	FWGmw-017 4/28/2017 (ug/L)	FWGMW-017 8/9/2017 NOT VALIDATED (ug/L)	FWGMW-017 8/9/2017(Dup) NOT VALIDATED (ug/L)	FWGMW-017 12/2/2017 (ug/L)
Detected concentrations highlighted in yellow						
Semi-Volatile Organics	Benzo(a)pyrene	0.027 J	0.012 U	2.9 U	2.9 U	0.012 U
Semi-Volatile Organics	Benzo(b)fluoranthene	0.043 J	0.012 U	2.9 U	2.9 U	0.012 U
Semi-Volatile Organics	Benzo(g,h,i)perylene	0.078 J	0.012 U	2.9 U	2.9 U	0.012 U
Semi-Volatile Organics	Benzo(k)fluoranthene	0.012 U	0.012 U	2.9 U	2.9 U	0.012 U
Semi-Volatile Organics	Benzoic acid	29 U	29 U	9.7 U	9.7 U	16 UJ
Semi-Volatile Organics	Benzyl alcohol	0.48 U	0.49 U	2.9 U	2.9 U	1 U
Semi-Volatile Organics	bis(2-Chloroethoxy)methane	1.9 U	1.9 U	2.9 U	2.9 U	2 U
Semi-Volatile Organics	bis(2-Chloroethyl)ether	0.96 U	0.97 U	2.9 U	2.9 U	1 U
Semi-Volatile Organics	bis(2-Chloroisopropyl)ether	0.96 U	0.97 U	2.9U	2.9U	1 U
Semi-Volatile Organics	bis(2-Ethylhexyl)phthalate	1.9 U	1.9 U	2.9 U	2.9 U	4.4 U
Semi-Volatile Organics	Butyl benzyl phthalate	1.9 U	1.9 U	2.9 U	2.9 U	4.4 U
Semi-Volatile Organics	Carbazole	0.96 U	0.97 U	2.9 U	2.9 U	1 U
Semi-Volatile Organics	Chrysene	0.012 U	0.012 U	2.9 U	2.9 U	0.012 U
Semi-Volatile Organics	Dibenz(a,h)anthracene	0.013 J	0.012 U	2.9 U Q	2.9 U Q	0.012 U
Semi-Volatile Organics	Dibenzofuran	0.96 U	0.97 U	2.9 U	2.9 U	1 U
Semi-Volatile Organics	Diethylphthalate	0.96 U	0.97 U	2.9 U	2.9 U	2 U
Semi-Volatile Organics	Dimethyl phthalate	0.48 U	0.49 U	2.9 U	2.9 U	2 U
Semi-Volatile Organics	Di-N-Butyl phthalate	4.2 U	4.3 U	2.9 U	2.9 U	2 U
Semi-Volatile Organics	Di-N-Octyl phthalate	0.96 U	0.97 U	9.7 U	9.7 U	4.4 U
Semi-Volatile Organics	Fluoranthene	0.012 UJ	0.012 UJ	2.9 U	2.9 U	0.012 U
Semi-Volatile Organics	Fluorene	0.041 UJ	0.04 UJ	2.9 U	2.9 U	0.04 U
Semi-Volatile Organics	Hexachlorobenzene	1.9 U	1.9 U	2.9 U	2.9 U	2 U
Semi-Volatile Organics	Hexachlorobutadiene	9.6 U	9.7 U	2.9 U	2.9 U	30 U
Semi-Volatile Organics	Hexachlorocyclopentadiene	29 U	29 U	2.9 U	2.9 U	25 U
Semi-Volatile Organics	Hexachloroethane	4.2 U	4.3 U	2.9 U	2.9 U	30 U
Semi-Volatile Organics	Indeno(1,2,3-cd)pyrene	0.075 J	0.04 U	2.9 U	2.9 U	0.04 U

Notes:

U - undetected; J - estimated value; D - diluted sample
Q - one or more lab QC issues

Summary of Laboratory Analytical Results
FWGmw-017
November 2016 Through December 2017
Camp Ravenna, OH

AnalysisGroup	Parameter	FWGmw-017 11/15/2016 (ug/L)	FWGmw-017 4/28/2017 (ug/L)	FWGMW-017 8/9/2017 NOT VALIDATED (ug/L)	FWGMW-017 8/9/2017(Dup) NOT VALIDATED (ug/L)	FWGMW-017 12/2/2017 (ug/L)
Detected concentrations highlighted in yellow						
Semi-Volatile Organics	Isophorone	0.48 U	0.49 U	2.9 U	2.9 U	2 U
Semi-Volatile Organics	Naphthalene	0.012 UJ	0.024 J	2.9 U	2.9 U	0.023 J
Semi-Volatile Organics	Nitrobenzene	1.9 U	1.9 U	2.9 U	2.9 U	1 U
Semi-Volatile Organics	N-Nitroso-di-N-propylamine	0.96 U	0.97 U	2.9 U	2.9 U	2 U
Semi-Volatile Organics	N-Nitrosodiphenylamine	0.96 U	0.97 U	2.9 U	2.9 U	2 U
Semi-Volatile Organics	Pentachlorophenol	58 U	58 U	2.9 U	2.9 U	16 U
Semi-Volatile Organics	Phenanthrene	0.021 UJ	0.02 UJ	2.9 U	2.9 U	0.02 U
Semi-Volatile Organics	Phenol	4.2 U	4.3 U	2.9 U	2.9 U	2 UJ
Semi-Volatile Organics	Pyrene	0.021 UJ	0.02 UJ	2.9 U	2.9 U	0.02 U
Volatile Organics	1,1,1-Trichloroethane	0.4 U	0.4 U	0.25 U	0.25 U	0.4 U
Volatile Organics	1,1,2,2-Tetrachloroethane	0.8 U	0.8 U	0.25 U	0.25 U Q	0.8 U
Volatile Organics	1,1,2-Trichloroethane	0.8 U	0.8 U	0.25 U	0.25 U	0.8 U
Volatile Organics	1,1-Dichloroethane	0.8 U	0.8 U	0.25 U	0.25 U	0.8 U
Volatile Organics	1,1-Dichloroethene	0.8 U	0.8 U	0.25 U	0.25 U	0.8 U
Volatile Organics	1,2-Dibromoethane	0.4 U	0.4 U	0.5 U	0.5 U	0.4 U
Volatile Organics	1,2-Dichloroethane	0.4 U	0.4 U	0.25 U	0.25 U	0.4 U
Volatile Organics	1,2-Dichloroethene	0.2 U	0.2 U			0.2 U
Volatile Organics	1,2-Dichloropropane	0.4 U	0.4 U	0.25 U	0.25 U	0.4 U
Volatile Organics	2-Butanone	4 U	4 U	1 U	1 U	4 U
Volatile Organics	2-Hexanone	4 U	4 U	0.5 U	0.5 U	4 U
Volatile Organics	4-Methyl-2-pentanone	3.2 U	3.2 U	0.5 U	0.5 U	3.2 U
Volatile Organics	Acetone	6.4 U	6.4 U	2	1 U	2 J
Volatile Organics	Benzene	0.4 U	0.4 U	0.25 U	0.25 U	0.4 U
Volatile Organics	Bromodichloromethane	0.4 U	0.4 U	0.25 U	0.25 U	0.4 U
Volatile Organics	Bromoform	0.4 U	0.4 U	0.25 U	0.25 U	0.4 U
Volatile Organics	Bromomethane	0.8 U	0.8 UJ	0.5 U	0.5 U	0.8 U

Notes:

U - undetected; J - estimated value; D - diluted sample

Q - one or more lab QC issues

Summary of Laboratory Analytical Results
FWGmw-017
November 2016 Through December 2017
Camp Ravenna, OH

AnalysisGroup	Parameter	FWGmw-017 11/15/2016 (ug/L)	FWGmw-017 4/28/2017 (ug/L)	FWGMW-017 8/9/2017 NOT VALIDATED (ug/L)	FWGMW-017 8/9/2017(Dup) NOT VALIDATED (ug/L)	FWGMW-017 12/2/2017 (ug/L)
Detected concentrations highlighted in yellow						
Volatile Organics	Carbon disulfide	1.6 U	1.6 U	0.25 U	0.25 U	1.6 U
Volatile Organics	Carbon tetrachloride	0.4 U	0.4 U	0.25 U	0.25 U	0.4 U
Volatile Organics	Chlorobenzene	0.4 U	0.4 U	0.25 U	0.25 U	0.4 U
Volatile Organics	Chlorobromomethane	0.2 U	0.2 U	0.5 U	0.5 U	0.2 U
Volatile Organics	Chloroethane	1.6 U	1.6 UJ	0.25 U	0.25 U	1.6 U
Volatile Organics	Chloroform	0.37 J	0.4 U	0.25 U	0.25 U	0.4 U
Volatile Organics	Chloromethane	0.8 U	0.8 UJ	0.25 U	0.25 U	0.8 U
Volatile Organic Compound	cis-1,2-Dichloroethene	Not Reported	Not Reported	0.25 U	0.25 U	Not Reported
Volatile Organics	cis-1,3-Dichloropropene	0.4 U	0.4 U	0.25 U	0.25 U	0.4 U
Volatile Organics	Dibromochloromethane	0.4 U	0.4 U	0.25 U	0.25 U	0.4 U
Volatile Organics	Ethylbenzene	2.4 J	0.4 U	0.25 U	0.25 U	0.4 U
Volatile Organics	Methylene chloride	0.8 U	0.8 U	0.5 U	0.5 U	0.8 U
Volatile Organics	Styrene	0.4 U	0.4 U	0.25 U	0.25 U	0.4 U
Volatile Organics	Tetrachloroethene	0.4 U	0.4 U	0.5 U	0.5 U	0.4 U
Volatile Organics	Toluene	0.4 U	0.4 U	0.25 U	0.25 U	0.4 U
Volatile Organic Compound	trans-1,2-Dichloroethene	Not Reported	Not Reported	0.25 U	0.25 U	Not Reported
Volatile Organics	trans-1,3-Dichloropropene	0.4 U	0.4 U	0.25 U	0.25 U	0.4 U
Volatile Organics	Trichloroethene	0.4 U	0.4 U	0.5 U	0.5 U	0.4 U
Volatile Organics	Vinylchloride	0.2 U	0.2 U	0.25 U	0.25 U	0.2 U
Volatile Organics	Xylene (Total)	10 J	0.8 U	0.5 U	0.5 U	0.8 U

Notes:

U - undetected; J - estimated value; D - diluted sample
Q - one or more lab QC issues



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

June 14, 2018

Ohio Environmental Protection Agency
DERR-NEDO
Attn: Mr. Kevin M. Palombo
2110 East Aurora Road
Twinsburg, OH 44087-1924

Subject: Notification of Field Work, Ravenna Army Ammunition Plant (RVAAP) Restoration Program, Portage/Trumbull Counties, RVAAP-66 Facility-Wide Groundwater and Semi-annual Facility-Wide Groundwater Monitoring, Ohio EPA ID # 267-000-859-036

Dear Mr. Palombo:

In accordance with the Director's Final Findings and Orders, Section XIII, #28, for the RVAAP Restoration Program, the Army National Guard (ARNG) is providing notification of field activities at Camp Ravenna/former RVAAP 15 days prior to the scheduled start date. TEC-Weston Joint Venture and their subcontractors will be conducting field activities including performing the June 2018 quarterly and semi-annual groundwater monitoring event beginning June 25, 2018. Bottle and cooler preparatory work will begin in the contractor's building on June 19, 2018. The quarterly and semi-annual event will include continued sampling of newly installed and previously existing wells being evaluated as part of the on-going Facility-Wide Groundwater RI and metals background study.

For additional information on the field activities, please refer to the Final Remedial Investigation Work Plan approved by the Ohio EPA on March 2, 2017 and Draft Facility-Wide Groundwater Monitoring Addendum for 2018 submitted to the Ohio EPA on April 2, 2018.

Please contact the undersigned at (703) 601-7785 or james.c.crowley.mil@mail.mil if there are issues or concerns with this submission.

Sincerely,

James C. Crowley
Lieutenant Colonel, Corps of Engineers
RVAAP Restoration Program Manager
Army National Guard Installations and Environment

cc: Rod Beals, Ohio EPA, DERR-NEDO
Bob Prince, Ohio EPA, DERR-NEDO
Al Muller, Ohio EPA, CO
Kevin Sedlak, ARNG, Camp Ravenna
Katie Tait, OHARNG Camp Ravenna
Gail Harris, Vista Sciences



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

June 8, 2018

LTC James Crowley
Army National Guard Directorate
ARNGD-IED
111 South George Mason Drive
Arlington, VA 22204

**Re: US Army Ammunition Plt RVAAP
Remediation Response
Project Records
Remedial Response
Portage County
267000859036**

Subject: Ravenna Army Ammunition Plant, Portage/Trumbull Counties. Approval of the Response to Ohio EPA Comments on the "Draft Facility-Wide Groundwater Monitoring Addendum for 2018" at the Former Ravenna Army Ammunition Plant, Portage and Trumbull Counties, Ohio, Dated March 30, 2018: Ohio EPA ID # 267-000859-036

Dear Col. Crowley:

The Ohio Environmental Protection Agency (Ohio EPA) has received the Response to Comments (RTCs) on the "Draft Facility-Wide Groundwater Monitoring Addendum for 2018" at the Former Ravenna Army Ammunition Plant, Portage and Trumbull Counties, Ohio, dated March 30, 2018, Ohio EPA ID # 267-000859-036. These RTCs were received at Ohio EPA's Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR) via email on June 7, 2018. The response was prepared for the Army National Guard Directorate by TEC-Weston Joint Venture.

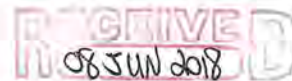
The RTCs were reviewed by personnel from Ohio EPA's DERR and DDAGW. Pursuant to the Director's Findings and Orders paragraph 39 (b), the responses are satisfactory. Please submit the final document for Agency approval with the changes made as agreed in the Comment Resolution Table.

If you have any questions, please call me at (330) 963-1292.

Sincerely,

Kevin M. Palombo, Environmental Specialist
Division of Environmental Response and Revitalization

KP/nvp



cc: Rebecca Shreffler, VISTA Sciences Corp.
Bob Princic, Ohio EPA, NEDO, DERR
Mark Johnson, Ohio EPA, NEDO, DERR
Carrie Rasik, Ohio EPA, CO, DERR
Albert Muller, Ohio EPA, NEDO

Gail Harris, VISTA Sciences Corp.
Rodney Beals, Ohio EPA, NEDO, DERR
Katie Tait, OHARNG RTLS
Kevin Sedlak, ARNG
Thomas Schneider, Ohio EPA, SWDO, DERR



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

June 8, 2018

LTC James Crowley
Army National Guard Directorate
ARNGD-IED
111 South George Mason Drive
Arlington, VA 22204

**Re: US Army Ammunition Plt RVAAP
Remediation Response
Project Records
Remedial Response
Portage County
267000859036**

Subject: Ravenna Army Ammunition Plant, Portage/Trumbull Counties. Ohio EPA Comments on the "Draft Facility-Wide Groundwater Monitoring Program RVAAP-66 Facility-Wide Groundwater Annual Report for 2017" at the Former Ravenna Army Ammunition Plant, Portage and Trumbull Counties, Ohio, Dated March 30, 2018, Ohio EPA ID # 267-000859-036

Dear Col. Crowley:

The Ohio Environmental Protection Agency (Ohio EPA) has received and reviewed the "Draft Facility-Wide Groundwater Monitoring Program RVAAP-66 Facility-Wide Groundwater Annual Report for 2017" at the former Ravenna Army Ammunition Plant, Portage and Trumbull counties, Ohio. This document was received at Ohio EPA's Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR) on April 2, 2018. The report was prepared for the National Guard Bureau by TEC-Weston Joint Venture under Contract Number W9133L-14-D-0008.

Comments on the document based on Ohio EPA review are provided below. Please provide responses to the enclosed comments in accordance with the Directors Findings and Orders.

General Summary of the Draft Facility Wide Groundwater Annual Report for 2017

Ground water samples were analyzed for: volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), organochlorinated pesticides, PCBs, explosives/propellants, cyanide, nitrate/nitrite, and metals (field filtered) including hexavalent chromium. Ground water results were compared to Ohio EPA Drinking Water MCLs and U.S. EPA Regional Screening Levels (RSLs) (November 2017) for tap water. Ground water results are summarized in Table 3-4 of the report.

- **VOCs:** These constituents were detected above screening criteria in three wells. Carbon tetrachloride, chloroform and/or ethylbenzene were detected above

screening criteria in a Homewood Sandstone Aquifer well L10mw-003 and Upper Sharon Sandstone Aquifer wells FWGmw-022 and FWGmw-023.

- **SVOCs:** These constituents were detected above screening criteria in 10 wells. At least one of the following: Benz(a) anthracene, benzo(b)fluoranthene, and/or indeno(1,2,3-cd)pyrene were detected above screening levels in Unconsolidated Aquifer wells DETmw-003 and NTAmw-119; in Homewood Aquifer wells LL10mw-003, BKGmw-022, and BKGmw-023; in Upper Sharon Aquifer wells LL12mw-183, LL1mw-089, and RQLmw-007; and in basal Sharon Conglomerate wells BKGmw-024 and BKGmw-125.
- **Explosives and propellants:** These constituents were detected above screening criteria in 17 monitoring wells. At least one of the following: RDX, 2-amino-4,6-dinitrotoluene, 4-Amino-2,6-dinitrotoluene, 2,4,6-trinitrotoluene, nitrobenzene, 1,3-dinitrobenzene, 2,4-dinitrotoluene and/or 3-nitrotoluene were detected in Unconsolidated Aquifer well DET-003, WBTmw-009; in Homewood Aquifer Wells FBQmw-174 and LL7mw-006; and in Upper Sharon Sandstone wells FWGmw-021, LL1mw-080, LL1mw-081, LL1mw-083, LL1mw-084, LL2mw-059, LL2mw-267, LL3mw-237, LL3mw-244, LL3mw-246, LL7mw-006, RQLmw-008, WBGmw-006.
- **Pesticides:** These constituents were not detected above screening criteria in any of the wells sampled during 2017.
- **Inorganics:** (dissolved metals and cyanide): One or more of these constituents, including the following: aluminum, antimony, arsenic, cadmium, cobalt, cyanide, hexavalent chromium, iron, manganese, nickel, thallium and/or vanadium, were detected above screening criteria in 56 wells sampled during the 2017 sampling events. These 56 wells included wells in all four of the monitored hydrostratigraphic units. Hexavalent chrome exceeded screening criteria in only one of the wells sampled during 2017, Basal Sharon Conglomerate Aquifer well FWGmw-024, located along the southern boundary of Camp Ravenna and State Route 5.
- **pH:** Unconsolidated Aquifer wells: BKGmw-016, FWGmw-010, LL1mw-086, and LL11mw-005 and Upper Sharon Sandstone Aquifer wells: LL1mw-083, LL1mw-089, RQLmw-011, and RQLmw-013 had pH levels outside the typical pH range for naturally occurring ground water (i.e., >9 and < 5) during at least one of the 2017 sampling events.

RI Boundary Monitoring Wells. The report summarizes analytical results from the five new monitoring wells installed in 2016 along Camp Ravenna southern property boundary, south of State Route 5. The five aforementioned monitoring wells are: FWGmw-020, FWGmw-021, and FWGmw-024 screened in the Upper Sharon Sandstone Aquifer; and FWGmw-017 and FWGmw-018 screened in the Basal Sharon

Conglomerate Aquifer. All five of these wells have levels of organic (i.e., explosives and PCBs) or inorganic (i.e., metals and cyanide) COCs that exceed screening levels and are summarized below.

- **Organics:** 2-amino-4,6-dinitrotoluene (FWGmw-021), 4-amino-2,6-dinitrotoluene (FWGmw-021), and Aroclor-1254 (FWGmw-021 and FWGmw-018).
- **Inorganics:** arsenic (all five RI boundary wells), hexavalent chromium (FWGmw-024), cobalt (all five RI boundary wells), iron (FWGmw-020, FWGmw-021, and FWGmw-024), manganese (all five RI boundary wells), and total cyanide (FWGmw-021).

Note: The Army has not yet completed its ground water metals background study for Camp Ravenna.

COMMENTS

Groundwater Comments

1. The Executive Summary of the report indicated that extent of impacts of organic compounds in ground water is limited to six areas beneath Camp Ravenna: Fuse and Booster Quarry Landfill/Ponds AOCs, Load Line 10 AOC, Load Line 1/Load Line 2/Load Line 3 AOCs, Open Demolition Area and #2/Winklepeck Burning Grounds AOCs, Ramsdell Quarry AOC and the NACA Test Area AOC. These six areas are shown on Figure 4-8 of the report. Ohio EPA wishes to emphasize that the extent of impact due to organic compounds in ground water as described in the report is only preliminary and generalized. The National Guard has not completed its remedial investigation, nor has it completed background/baseline sampling of the 15 newly-installed RI wells. As the National Guard has not completed its RI, it is not clear if any other hydrostratigraphic units that may exist beneath Camp Ravenna (such as Massillon Sandstone or Mercer Member) need to be evaluated. **Note:** The report (page 3-5) indicated that the degree to which the Mercer and Sharon shales act as an aquitard will be evaluated as part of the ongoing FWGW monitoring. DDAGW recommends that the National Guard reference Ohio EPA's *Technical Guidance Manual* document entitled *Assessment of an Aquitard during a Ground Water Contamination Investigation* (<http://www.epa.state.oh.us/portals/28/documents/TGM-Supp1.pdf>) when making this evaluation. Additionally, time-series graphs in this report indicated increasing concentrations of explosives/propellants and VOCs in several wells. Therefore, the estimated extent of organic contamination in ground water described in the submitted report is preliminary and generalized at best. Additionally, the extent of impact to ground water due to metals and cyanide does not appear to have been taken into consideration. Ohio EPA understands that the National Guard needs to complete metal background study to evaluate the extent of metals contamination in ground water beneath Camp Ravenna.

2. In Section 3.1.2 (Vertical Gradients) of the report (page 3-4) states:

One well cluster for the potential of vertical flow between the unconsolidated and Homewood aquifers [sic]. As shown in Table 3-2, the calculated gradient for the well cluster in the Load Line 6 AOC is 0.007 ft/ft downwards. The magnitude of this vertical gradient is negligible and indicates vertical ground water flow between the unconsolidated and Homewood aquifers is limited.

Ohio EPA does not believe that one vertical gradient calculation from a single well pair adequately demonstrates the direction/magnitude of vertical flow between the Unconsolidated and Homewood Aquifers. Any such demonstration would need to include additional data taking into consideration seasonal, temporal, and spatial variation. Such a demonstration would require additional well pairs in the Unconsolidated and Homewood Aquifers.

Also, Table 3-2 contains a number of typographical errors. In Table 3-2 for well pairs WBGmw-009/WBGmw-020, WBGmw-018/WBG-mw-019, and WBGmw-006 and WBGmw-021 the vertical flow direction is down and in the comments column it states that "flow is from Sharon to Unconsolidated", and it should state "flow is from the Unconsolidated Aquifer to the Upper Sharon Aquifer". For clarity and accuracy, these errors need to be corrected.

3. According to the FWGWMP Semi-Annual Report for 2017, the FWGWMP Annual Report for 2017, was supposed to contain a comprehensive discussion of pH test results and the geochemical parameters sulfide/sulfate, nitrate/nitrite, alkalinity and hexavalent chromium to help evaluate the potential source of pH values outside the natural range (i.e., pH >9 and < 5). Section 3.5 (pH Monitoring) of the report did not contain any significant discussion of the aforementioned geochemical parameters in relation to pH or the potential causes of pH values consistently outside the normal range in number of wells at Camp Ravenna. This issue needs to be addressed.
4. Upper Sharon well LL2mw-270 was sampled as part of the April 2017 sampling event. Table 3-5 does not contain results for well LL2mw-270. The sampling results for well LL2mw-270 need to be included in Table 3-5.
5. Section 4.9.1 (explosives and Propellants) [page 4-10] states:

FBQmw-174 (Fuze and Booster Quarry AOC) – the trend line for 2,4-dinitrotoluene indicates an increasing trend as a result of the plotting of a non-detect sample result with an elevated detection limit for the April 2017 (sic). FBQmw-174 was not sampled during the December sampling event due to insufficient ground water volume.

DDAGW does not concur that the above-described trend represents a statistically significant increasing trend in the concentration of 2,4-dinitrotoluene in well FBQmw-174, but rather is an artifact of data quality.

6. Section 2.4.2 (April 2017) (page 2-6) contains a typographical error. This section of the report states:

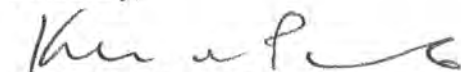
The April 2017 FWGWMP sampling event was performed April 17 through May 4, 2017. During the event, 101 monitoring wells were sampled. This includes four of the five RCRA wells (RQLmw-007, RQLmw-008, RQLmw-009, and DETmw-003).

In fact, 105 wells were sampled, including the four RCRA wells during the April 2017 sampling event. The above statement should be corrected to accurately reflect the number of wells that were sampled during the April 2017 sampling event.

7. Page 31 of Table 3-5 is missing the column header indicating the well identifications and sampling dates. **Note:** The data on this page is paired with data on page 32. For clarity, the missing information on these column headers need to be complete.

This *Draft Facility Wide Groundwater Annual Report for 2017* was reviewed by personnel from Ohio EPA. Additional information is necessary to approve the document. If you have questions or would like to set up a meeting to discuss these comments, please call me at (330) 963-1292.

Sincerely,



Kevin M. Palombo
Environmental Specialist
Division of Environmental Response and Revitalization

KP/nvp

ec: Rebecca Shreffler/Gail Harris, VISTA Sciences Corp.
Katie Tait, OHARNG RTLS
Kevin Sedlak, ARNG
Bob Princic, Ohio EPA, NEDO DERR
Mark Johnson, Ohio EPA, NEDO DERR
Rodney Beals, Ohio EPA NEDO DERR
Thomas Schneider, Ohio EPA, SWDO DERR
Albert Muller, Ohio EPA, NEDO DDAGW
Carrie Rasik, Ohio EPA, CO DERR



NATIONAL GUARD BUREAU

111 SOUTH GEORGE MASON DRIVE
ARLINGTON VA 22204-1373

June 1, 2018

Ohio Environmental Protection Agency
DERR-NEDO
Attn: Kevin Palombo
2110 East Aurora Road
Twinsburg, OH 44087-1924

Subject: Response to Comments – Draft Facility-Wide Groundwater Monitoring Addendum for 2018
Camp Ravenna, Portage and Trumbull Counties, Ohio
Ohio EPA ID # 267-000859-036
Contract Number: W9133L-14-D-0008
Task Order Number: 0003

Dear Mr. Kevin Palombo:

The Army National Guard is pleased to submit the enclosed Comment Resolution Table to Comments on the Draft Facility-Wide Groundwater Monitoring Addendum for 2018. This deliverable is in response to Ohio EPA comments dated 17 May 2018. This deliverable consists of one hardcopy and one electronic copy containing a single pdf of the submission.

Please contact the undersigned at (703) 601-7785 or james.c.crowley.mil@mail.mil if you would like to discuss this submission.

Sincerely,

CROWLEY.JAMES.

CORNELIUS.1045

120399

James C. Crowley

Lieutenant Colonel, Corps of Engineers

RVAAP Restoration Program Manager

Army National Guard Installations & Environment

Digitally signed by
CROWLEY.JAMES.CORNELIUS.
1045120399
Date: 2018.05.31 13:26:14
-04'00'

CC:

Thomas Schneider, Ohio EPA, SWDO
Mark Johnson, Ohio EPA, DERR-NEDO
Al Muller, Ohio EPA, DERR-NEDO
Bob Princic, Ohio EPA, DERR-NEDO
Kevin Sedlak, ARNG, Camp Ravenna
Katie Tait, OHARNG, Camp Ravenna
Rebecca Shreffler, OHARNG, Camp Ravenna
Brent Ferry, JV Project Manager

Comment Resolution Table

Installation: Camp Ravenna/Former RVAAP

Document: Comments on the Draft Facility-Wide Groundwater Addendum for 2018

Reviewer(s): Kevin M. Palombo, Ohio EPA, (330) 963-1292

Date: 17 May 2018

Cmt No.	Page or Sheet	Comment	Response
1	General	<p>Ohio EPA previously reviewed the August 2017 <i>Draft RI/FS Report for the Soil, Sediment, and Surface Water at RVAAP-06 C Block Quarry</i>. Ohio EPA also reviewed the National Guard's March 2018 response letter to Ohio EPA's comments dated November 28, 2017, regarding that document. Based on that review, Ohio EPA concluded that the SESOIL™/AT123D™ model used in the C Block Quarry RI/FS does not accurately predict contaminant migration through the highly heterogenous hydrogeologic system such as exists beneath C Block Quarry. The geology beneath C Block Quarry consists of a thin layer of soil/unconsolidated material over fractured and weathered Homewood Sandstone. While part of the vadose zone consists of unconsolidated material soil, most of the vadose zone is in the fractured and weathered Homewood Sandstone. SESOIL™/AT123D™ are not appropriate screening tools to model fate and transport in bedrock or in non-homogenous or fractured geologic media.</p> <p>During the 1950s and 1960s, C Block Quarry was used as a disposal area for annealing process waste. Liquid waste was dumped on the ground surface in the bottom of the quarry. The SESOIL™/AT123D™ model does not consider the direct disposal of wastes onto the weathered and fractured bedrock, as has been reported to have been historically practiced in the 1950s and 1960s in C Block Quarry.</p> <p>The four RI wells (CBLmw-001, CBLmw-002, CBLmw-003, and CBL-004) located in the C Block Quarry Area have not been sampled since 2013.</p> <p>According to the 2016 <i>RI Work Plan for Ground Water</i>, the four RI wells in the C Block Quarry need to be sampled to support the Facility-Wide Ground Water (FWGW) RI. Considering the potential for impact to the uppermost hydrostratigraphic unit (Homewood Sandstone) beneath C Block Quarry, and that RI wells in that area have not been sampled in about five years, Ohio EPA recommends that these four wells be added to the list of FWGWMP wells to be sampled in the <i>Facility-Wide Ground Water Monitoring Addendum for 2018</i>. Ohio EPA recommends that these four wells be sampled for the parameters specified in the 2016 <i>RI Work Plan for Ground Water</i> for C Block Quarry wells including: SVOCs; metals, including hexavalent chromium; and PCBs. Considering the history, disposal practices and pH issues in the C Block, Ohio EPA recommends that these four wells also be sampled for explosives, nitrate/nitrite, sulfate/sulfide, and pH. Ohio EPA recommends that the four C Block Quarry RI wells be sampled for a minimum of two consecutive sampling events and be added to the list of wells to be sampled in 2018 in the Facility-Wide Ground Water Monitoring Addendum.</p>	<p>Sampling was conducted at the C-Block Quarry in Fall 2016 as part of the FWGW RI and in accordance with Table 3-3 of the approved Final RI Work Plan. Results for CBLmw-001, CBLmw-002, CBLmw-003 and CBLmw-004 indicated non-detect SVOC, PCB and cyanide concentrations. Explosives constituents have not been historically detected above current screening levels in CBL monitoring wells and so they were not included in the proposed FWGW RI sampling at the site.</p> <p>The potential need for additional evaluation of metals, including hex chrome, as part of the FWGW RI was intended to be addressed following approval of the background study.</p> <p>Based on review of the Final FWGW RI Work Plan content, it appears that OEPA likely intended to attribute the requirement for characterization of explosives and metals (including hex chrome) to the conclusions of the August 2017 Revised Draft RI/FS for Soil, Sediment and Surface Water at RVAAP-06 C Block Quarry.</p> <p>TEC-WESTON concurs with the conclusions of the Revised Draft RI/FS for Soil, Sediment and Surface Water at RVAAP-06 C Block Quarry as they relate to the need for an updated characterization of metals at the site. As requested by OEPA, the first semi-annual sampling activities of 2018 will include samples collected from CBLmw-001, CBLmw-002, CBLmw-003, and CBLmw-004 for analysis of SVOCs; metals, including hexavalent chromium; PCBs; explosives; nitrate/nitrite; sulfate/sulfide; and pH.</p>



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

May 17, 2018

LTC. James Crowley
Army National Guard Directorate
ARNGD-IED
111 South George Mason Drive
Arlington, VA 22204

Re: US Army Ammunition Plt RVAAP
Remediation Response
Project Records
Remedial Response
Portage County
267000859036

Subject: Ravenna Army Ammunition Plant, Portage/Trumbull Counties. Ohio EPA Comments on the "Draft Facility-Wide Groundwater Monitoring Addendum for 2018" at the Former Ravenna Army Ammunition Plant, Portage and Trumbull Counties, Ohio, Dated March 30, 2018, Ohio EPA ID # 267-000859-036

Dear LTC Crowley:

The Ohio Environmental Protection Agency (Ohio EPA) has received and reviewed the "Draft Facility-Wide Groundwater Monitoring Addendum for 2018" at the Former Ravenna Army Ammunition Plant, Portage and Trumbull Counties, Ohio. This document was received at Ohio EPA's Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR), on April 2, 2018. The report was prepared for the National Guard Bureau by TEC-Weston Joint Venture under Contract Number W9133L-14-D-0008.

Comments on the document based on Ohio EPA review are provided below. Please provide responses to the enclosed comments in accordance with the Directors Findings and Orders.

General Summary of the Draft Groundwater Monitoring Addendum for 2018

The *Draft GWM Addendum for 2018* is a supplement to the 2016 *Facility-Wide Ground Water Monitoring Program Plan (FWGWMPP)*. The *Draft GWM Addendum for 2018* identifies the subset of 76 of the 299 existing monitoring wells that will be sampled as part of the FWGWMP sampling semi-annually (Spring and Fall) during 2018. Previously, the 2017 FWGWMP system included a subset of 77 FWGWMP monitoring wells, including five RCRA monitoring wells. Only one of the 2017 FWGWMP wells (FWGmw-002) has not been carried over to the 2018 FWGWMP sampling program. No reductions in sampling constituent suites from 2017 have been proposed for the 2018 program, other than testing for alkalinity in FWGmw-002.

The *Draft GWM Addendum for 2018* states (page 2-1):

The primary objectives of the 2018 facility-wide monitoring network are to assess the potential exit pathways and to monitor contaminant levels tied to historical RVAAP activities (e.g., explosives/propellants, volatile organic compounds [VOCs], semi-volatile organic compounds [SVOCs], pesticides, and polychlorinated biphenyls [PCBs]) at selected source area wells for trend analysis. Metals concentrations will also be

determined in ground water, but the evaluation of the nature and extent of metals constituents representing a release requiring a corrective action response will be deferred pending Ohio EPA approval of the background study being conducted as part of the Facility-Wide Ground Water RI.

According to the submitted document (pages 2-1 and 2-2), wells were selected for inclusion in the 2018 FWGWMP system for sampling based on the five criteria listed below:

- FWGWMP Criterion 1: Wells representing critical exit pathway monitoring points.
- FWGWMP Criterion 2: Wells representing primary AOC-specific contaminant source area conditions indicated to be potentially increasing or otherwise unstable plume conditions.
- FWGWMP Criterion 3: Wells with 2016 or 2017 sampling results representing a historical maximum concentration above regulatory screening levels for one or more site related compounds in ground water.
- FWGWMP Criterion 4: Co-located wells used to establish the vertical distribution of contaminants within a stratigraphic sequence.
- FWGWMP Criterion 5: New wells installed during 2016 as part of the FWGW RI and sampled for four quarters as of December 2017.

COMMENT

1. Ohio EPA previously reviewed the August 2017 *Draft RI/FS Report for the Soil, Sediment, and Surface Water at RVAAP-06 C Block Quarry*. Ohio EPA also reviewed the National Guard's March 2018 response letter to Ohio EPA's comments dated November 28, 2017, regarding that document. Based on that review, Ohio EPA concluded that the SESOIL™/AT123D™ model used in the C Block Quarry RI/FS does not accurately predict contaminant migration through the highly heterogenous hydrogeologic system such as exists beneath C Block Quarry. The geology beneath C Block Quarry consists of a thin layer of soil/unconsolidated material over fractured and weathered Homewood Sandstone. While part of the vadose zone consists of unconsolidated material soil, most of the vadose zone is in the fractured and weathered Homewood Sandstone. SESOIL™/AT123D™ are not appropriate screening tools to model fate and transport in bedrock or in non-homogenous or fractured geologic media.

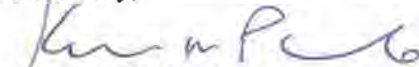
During the 1950s and 1960s, C Block Quarry was used as a disposal area for annealing process waste. Liquid waste was dumped on the ground surface in the bottom of the quarry. The SESOIL™/AT123D™ model does not consider the direct disposal of wastes onto the weathered and fractured bedrock, as has been reported to have been historically practiced in the 1950's and 1960's in C Block Quarry.

The four RI wells (CBLmw-001, CBLmw-002, CBLmw-003, and CBL-004) located in the C Block Quarry Area have not been sampled since 2013.

According to the 2016 *RI Work Plan for Ground Water*, the four RI wells in the C Block Quarry need to be sampled to support the Facility-Wide Ground Water (FWGW) RI. Considering the potential for impact to the uppermost hydrostratigraphic unit (Homewood Sandstone) beneath C Block Quarry, and that RI wells in that area have not been sampled in about five years, Ohio EPA recommends that these four wells be added to the list of FWGWMP wells to be sampled in the *Facility-Wide Ground Water Monitoring Addendum for 2018*. Ohio EPA recommends that these four wells be sampled for the parameters specified in the 2016 *RI Work Plan for Ground Water* for C Block Quarry wells including: SVOCs; metals, including hexavalent chromium; and PCBs. Considering the history, disposal practices and pH issues in the C Block, Ohio EPA recommends that these four wells also be sampled for explosives, nitrate/nitrite, sulfate/sulfide, and pH. Ohio EPA recommends that the four C Block Quarry RI wells be sampled for a minimum of two consecutive sampling events and be added to the list of wells to be sampled in 2018 in the Facility-Wide Ground Water Monitoring Addendum.

This Groundwater Monitoring Addendum for 2018 was reviewed by personnel from Ohio EPA, DERR, and DDAGW. Additional information is necessary to approve the document. If you have questions or would like to set up a meeting to discuss these comments, please call me at (330) 963-1292.

Sincerely,



Kevin M. Palombo
Environmental Specialist
Division of Environmental Response and Revitalization

KP/nvp

cc: Rebecca Shreffler/Gail Harris, VISTA Sciences Corp.

ec: Katie Tait, OHARNG RTLS
Kevin Sedlak, ARNG
Bob Princic, Ohio EPA, NEDO DERR
Mark Johnson, Ohio EPA NEDO DERR
Rodney Beals, Ohio EPA NEDO DERR
Thomas Schneider, Ohio EPA, SWDO DERR
Albert Muller, Ohio EPA, NEDO DDAGW
Carrie Rasik, Ohio EPA, CO DERR



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

May 9, 2017

Mr. Mark Leeper
Army National Guard Directorate
ARNGD-ILE Clean Up
111 South George Mason Drive
Arlington, VA 22204

Re: US Army Ammunition Plt RVAAP
Remediation Response
Project Records
Remedial Response
Portage County
267000859036

Subject: Ravenna Army Ammunition Plant, Portage/Trumbull Counties. Approval of the Response to Ohio EPA Comments on the "Draft Facility-Wide Groundwater Monitoring Program, RVAAP-66 Facility-Wide Groundwater, Annual Report for 2016" at the Former Ravenna Army Ammunition Plant, Ravenna, Ohio, Dated April 18, 2017

Dear Mr. Leeper:

The Ohio Environmental Protection Agency (Ohio EPA) has received the Response to Comments on the "Draft Facility-Wide Groundwater Monitoring Program, RVAAP-66 Facility-Wide Groundwater, Annual Report for 2016" at the Ravenna Army Ammunition Plant (RVAAP), Ravenna, Ohio. These responses to comments were received at Ohio EPA's Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR) on April 20, 2017. The report was prepared for the Army National Guard Directorate by TEC-Weston Joint Venture under Contract Number W9133L-14-D-0008.

The response to comments were reviewed by personnel from Ohio EPA's DERR and DDAGW, pursuant to the Director's Findings and Orders paragraph 39 (b), the responses are satisfactory. Please submit the final document for agency approval with the changes made as agreed in the Comment Resolution Table.

If you have any questions, please call me at (330) 963-1292.

Sincerely,

Kevin M. Palombo, Environmental Specialist
Division of Environmental Response and Revitalization

KP/nvr

cc: Rebecca Shreffler/Gail Harris, VISTA Sciences Corp.
ec: Bob Princic, Ohio EPA, NEDO DERR
Rodney Beals, Ohio EPA, NEDO DERR
Thomas Schneider, Ohio EPA, SWDO DERR
Carrie Rasik, Ohio EPA, CO DERR
Kevin Sedlak/Katie Tait, OHARNG RTLS

Received
11 MAY 2017



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

May 8, 2017

Mr. Mark Leeper
Army National Guard Directorate
ARNGD-ILE Clean Up
111 South George Mason Drive
Arlington, VA 22204

Re: US Army Ammunition Plt RVAAP
Remediation Response
Project Records
Remedial Response
Portage County
267000859036

Subject: Ravenna Army Ammunition Plant, Portage/Trumbull Counties. Approval of the "Final Facility-Wide Groundwater Monitoring Program Plan, RVAAP-66 Facility-Wide Groundwater, Groundwater Monitoring Addendum for 2017" at the Former Ravenna Army Ammunition Plant, Ravenna, Ohio, Dated April 27, 2017, Ohio EPA ID # 267-000859-036

Dear Mr. Leeper:

The Ohio Environmental Protection Agency (Ohio EPA) has received and reviewed the "Final Facility-Wide Groundwater Monitoring Program Plan, RVAAP-66 Facility-Wide Groundwater, Groundwater Monitoring Addendum for 2017" at the Ravenna Army Ammunition Plant (RVAAP), Ravenna, Ohio. The final document was received at Ohio EPA's Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR) on April 27, 2017. The report was prepared for the Army National Guard Directorate by TEC-Weston Joint Venture under Contract Number W9133L-14-D-0008.

The final document was reviewed by personnel from Ohio EPA's DERR and DDAGW. Pursuant to the Director's Findings and Orders paragraph 39 (b), Ohio EPA considers the document final and approved.

If you have any questions, please call me at (330) 963-1292.

Sincerely,

A handwritten signature in black ink, appearing to read "Kevin M. Palombo", is written over a horizontal line.

Kevin M. Palombo
Environmental Specialist
Division of Environmental Response and Revitalization

KP/nvr

cc: Rebecca Shreffler/Gail Harris, VISTA Sciences Corp.
ec: Bob Princic, Ohio EPA, NEDO DERR
Rodney Beals, Ohio EPA, NEDO DERR
Thomas Schneider, Ohio EPA, SWDO DERR
Carrie Rasik, Ohio EPA, CO DERR
Kevin Sedlak/Katie Tait, OHARNG RTLS

Received
10 MAY 2017



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

RECEIVED
5/4/2018

May 2, 2018

Re: US Army Ravenna Ammunition Plt RVAAP
Remediation Response
Project records
Remedial Response
Portage County
267000859036

LTC James Crowley
Army National Guard Directorate
ARNG-IED
111 South George Mason Drive
Arlington, VA 22204

Subject: Request for an Extension for the Review of the "Draft Facility-Wide Groundwater Monitoring Addendum for 2018," dated March 30, 2018, and the "Draft Facility-Wide Groundwater Annual Report for 2017," also dated March 30, 2018, for the Former Ravenna Army Ammunition Plant, Ravenna, Ohio; Both under Contract No. W9133L-14-D-0008 (Ohio EPA Work Activity No. 267000859036)

Dear LTC Crowley:

On April 2, 2018, the Ohio Environmental Protection Agency (Ohio EPA), Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR) received both the "Draft Facility-Wide Groundwater Monitoring Addendum for 2018" and the Draft Facility-Wide Groundwater Monitoring Program Annual Report for 2017." Pursuant to the Director's Final Findings and Orders (Orders), the deadline for review on these documents is May 17, 2018.

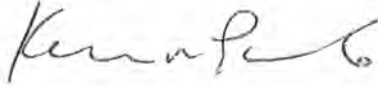
These documents are undergoing further review by Ohio EPA staff. This letter requests an extension of 30 days from May 17, 2018, to ensure a proper review of the document. This extension would move the due date of this review to June 17, 2018.

Ohio EPA respectfully requests your review and approval of this extension request pursuant to the Orders.

LTC JAMES CROWLEY
ARMY NATIONAL GUARD DIRECTORATE
MAY 2, 2018
PAGE 2

If you have any questions or concerns, please do not hesitate to contact me at (330) 963-1292.

Sincerely,



Kevin Palombo
Environmental Specialist
Division of Environmental Response and Revitalization

KMP/nvp

cc: Rebecca Schreffler/Gail Harris, VISTA Sciences Corp

ec: Mark Johnson, Ohio EPA NEDO, DERR
Rod Beals, Ohio EPA, NEDO, DERR
Bob Princic, Ohio EPA, NEDO, DERR
Thomas Schneider, Ohio EPA, SEDO, DERR
Al Muller, Ohio EPA, NEDO, DDAGW
Carrie Rasik, Ohio EPA CO, DERR
Katie Tait, OHARNG RTLS
Kevin Sedlak, ARNG
Craig Coombs, USACE



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

RECEIVED
4/24/2018

April 17, 2018

Mr. Kevin Sedlak
Restoration Project Manager
Camp Ravenna JMTC
1438 State Rte. 534 SW
Newton Falls, Ohio 44444-8503

**Re: US Army Ammunition Plt RVAAP
Remediation Response
Project Records
Remedial Response
Portage County
267000859036**

**Subject: Ravenna Army Ammunition Plant, Portage/Trumbull Counties.
Approval of the "Final Facility-Wide Groundwater Monitoring Program
RVAAP-66 Facility-Wide Groundwater Semi-Annual Report for April
and July 2017 Sampling Events" at the Former Ravenna Army
Ammunition Plant, Portage and Trumbull Counties, Ohio, Dated March
23, 2018, Ohio EPA ID # 267-000859-036**

Dear Mr. Sedlak:

The Ohio Environmental Protection Agency (Ohio EPA) has received and reviewed the "Final Facility-Wide Groundwater Monitoring Program RVAAP-66 Facility-Wide Groundwater Semi-Annual Report for April and July 2017 Sampling Events" at the Former Ravenna Army Ammunition Plant, Portage and Trumbull Counties, Ohio. This document was received at Ohio EPA's Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR), on March 26, 2018. The report was prepared for the National Guard Bureau by TEC-Weston Joint Venture under Contract Number W9133L-14-D-0008.

Comments on the draft document based on Ohio EPA review were provided in a letter dated March 1, 2018. This document was finalized prior to Ohio EPA concurring with your responses. Be advised that if the comments are not satisfactorily addressed, Ohio EPA may require the document be resubmitted according to Section XVIII, paragraph 43 of the Director's Final Findings and Orders dated June 10, 2004. As always, Ohio EPA recommends that the document be finalized after Ohio EPA's concurrence with your comment response.

Ohio EPA noted that the response to our comments were located in Appendix D of the Final Report. Upon review of these responses, and the entire final document by personnel from Ohio EPA's DERR and DDAGW, we consider the document final and approved pursuant to the Director's Findings and Orders paragraph 39 (b).

MR. KEVIN SEDLAK
ARMY NATIONAL GUARD
APRIL 17, 2018
PAGE 2

If you have questions, please call me at (330) 963-1292.

Sincerely,



Kevin M. Palombo
Environmental Specialist
Division of Environmental Response and Revitalization

KP/nvp

cc: Rebecca Shreffler/Gail Harris, VISTA Sciences Corp.

ec: Katie Tait, OHARNG RTLS
Mark Johnson, Ohio EPA, NEDO, DERR
Bob Princic, Ohio EPA, NEDO, DERR
Rodney Beals, Ohio EPA, NEDO, DERR
Thomas Schneider, Ohio EPA, SWDO, DERR
Albert Muller, Ohio EPA, NEDO, DDAGW
Carrie Rasik, Ohio EPA, CO, DERR
Brian Tucker, Ohio EPA, CO, DERR



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

Received 2 March 2018

March 1, 2018

Mark Leeper, P.G., MBA
Team Lead
Cleanup and Restoration Branch
ARNG Directorate
111 George Mason St.
Arlington, VA 22204

**Re: US Army Ammunition Plt RVAAP
Remediation Response
Project Records
Remedial Response
Portage County
267000859036**

Subject: Ravenna Army Ammunition Plant, Portage/Trumbull Counties. Ohio EPA Comments on the "Draft Facility-Wide Groundwater Monitoring Program RVAAP-66 Facility-Wide Groundwater Semi-Annual Report for April and July 2017 Sampling Events" at the Former Ravenna Army Ammunition Plant, Portage and Trumbull Counties, Ohio, Dated January 22, 2018, Ohio EPA ID # 267-000859-036

Dear Mr. Leeper:

The Ohio Environmental Protection Agency (Ohio EPA) has received and reviewed the "Draft Facility-Wide Groundwater Monitoring Program RVAAP-66 Facility-Wide Groundwater Semi-Annual Report for April and July 2017 Sampling Events" at the Former Ravenna Army Ammunition Plant, Portage and Trumbull Counties, Ohio. This document was received at Ohio EPA's Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR), on January 23, 2018. The report was prepared for the National Guard Bureau by TEC-Weston Joint Venture under Contract Number W9133L-14-D-0008.

Comments on the document based on Ohio EPA review are provided below. Please provide responses to the enclosed comments in accordance with the Directors Findings and Orders.

Summary April and July 2017 Ground Water Sampling Results.

Ground water samples were analyzed for: volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), organochlorinated pesticides, explosives/propellants, cyanide, nitrate, and metals (mostly unfiltered) including hexavalent chromium (field filtered). Ground water results were compared to Ohio EPA Drinking Water Maximum Contaminant Levels (MCLs) and U.S. EPA Regional Screening Levels (RSLs) (November 2017) for tap water.

Exceedances of ground water screening criteria in the 116 wells sampled during April 2017 and the 15 wells sampled in July 2017 are summarized below:

- VOCs: One VOC chloroform was detected at an estimated concentration (i.e., below the practical quantification limit [PQL]) that is above the screening criteria in Homewood Aquifer well L10mw-003 during the April 2017 sampling event. VOCs were not detected in samples collected during the July 2017 sampling event.
- SVOCs: One SVOC (nitrobenzene, which is also an explosive/propellant compound), was detected at a concentration above the screening criteria in Homewood Aquifer well LL10mw-003 during the April 2017 sampling event. SVOCs were not detected in the samples collected during the July 2017 sampling event.
- Pesticides: No pesticides were detected above screening criterion in any of the samples collected during the April or July 2017 sampling events.
- Explosives and propellants: Eight explosive/propellant constituents were detected above screening criteria in 17 monitoring wells during the April 2017 sampling event. The eight explosive propellant compounds include: 1,3-dinitrobenzene, 2,4,6-trinitrotoluene, 2,4-dinitrotoluene, 2-amino-4,6-dinitrotoluene, 3-nitrotoluene, 4-amino-2,6-dinitrotoluene, nitrobenzene, and RDX. The 17 wells include four Unconsolidated Aquifer wells (DETmw-003, WBGmw-006, WBGmw-009, and FWGmw-011), two Homewood Aquifer wells (FBQmw-174 and LL10mw-003) and 11 Upper Sharon Aquifer well (LL1mw-080, LL1mw-080, LL1mw-083, LL1mw-084, LL2mw-059, LL2mw-267, LL3mw-237, LL3mw-244, LL3mw-246, FWGmw-021 and RQLmw-008).

One explosives/propellant (2-amino-4,6-dinitrotoluene) was detected at an estimated concentration (i.e., below the PQL) above screening criteria in new Upper Sharon Aquifer well FWGmw-021.

- Metals: Dissolved metals, including: aluminum, antimony, arsenic, cadmium, cobalt, manganese, thallium and vanadium were detected above screening criteria in many (52) of the wells sampled during the April 2017 sampling event, and most (11) of the wells sampled during the July 2017 sampling event. Hexavalent chrome was detected at an estimated concentration (i.e., below its PQL) that is above its respective screening criteria in a new Upper Sharon Sandstone Aquifer well (FWG-024). Based on information presented in Table 3-2, it does not appear that any of the wells sampled during the July 2017 sampling event were tested for hexavalent chrome.
- Phosphorous: Phosphorous was detected at estimated concentrations (i.e., below the PQL) that are above screening criteria in Upper Sharon Sandstone well RQL-mw-007.
- Nitrate: Nitrate was detected at a concentration above its screening level in two Unconsolidated Aquifer wells (LL12mw-187 and LL12mw-185) during the April 2017 sampling event. Wells were not tested for nitrate during the July 2017 sampling event.
- Cyanide: This constituent exceeding its screening criteria in 18 wells during the April 2017 sampling event. These 18 wells include seven Unconsolidated Aquifer wells, two Homewood Aquifer wells, seven Upper Sharon Aquifer wells, two Basal Sharon Conglomerate wells. The 18 wells include the four sampled RCRA monitoring wells Ramsdell Quarry and Open Demolition Area #2), and wells located in the following areas: Erie Burning Grounds, Fuse and Booster Quarry, NACA Test Area, Load Lines 2, 4, 6, 7 and 12. Note: Cyanide was detected at estimated concentrations (i.e., below its PQL) exceeding its screening criteria in two of the new wells BKGmw-022 (Homewood Aquifer) and BKGmw-025 (Basal Sharon Aquifer) sampled during the April 2017 sampling event. Cyanide was detected at estimated concentrations (i.e., below its PQL) exceeding its screening criteria in new Basal Sharon Aquifer well FWGmw-019.
- pH: Unconsolidated Aquifer wells: LL1mw-086 (pH = 9.34), LL1mw-089 (pH = 4.51), FWGmw-010 (pH = 4.42), BKGmw-016 (pH = 4.93) and Upper Sharon Sandstone Aquifer well LL1mw-083 (pH = 4.67) had pH levels outside the typical pH range for naturally occurring ground water (i.e., > 9 and < 5) during the

April 2017 sampling event. No pH readings below 5 or above 9 were recorded during the July 2017 sampling event.

In addition to pH measurements, monitoring wells with a history of anomalously low or high pH readings, including wells: LL1mw-083, LL1mw-084, LL1mw-086, LL1mw-088, FWM-002, RQLmw-011, RQLmw-012, RQLmw-013, RQLmw-014, FBQmw-171, FBQ-174, and FBQmw-175 were sampled for alkalinity, sulfide/sulfates and nitrate/nitrite to help evaluate potential sources of low or high pH values (i.e., > 5 or < 9). According to the report, a comprehensive discussion of 2017 test results for pH levels and the geochemical parameters will be discussed in the upcoming Annual FWGW Report for 2017 that has yet to be submitted to Ohio EPA.

COMMENTS

General Comments

1. Section 1.0, paragraph 1 describes the activities being conducted at the former Ravenna Army Ammunition Plant (RVAAP) as a Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) "closure." Use of the word "closure" is confusing in this context as the CERCLA program does not cover closure. "Closure" is a Resource Conservation and Recovery Act term. Please clarify the language in this section of the document.

Specific Ground Water Comments

1. What is summarized on page ES-1, ES-2 in the executive summary and page 1-4 of the report regarding the number of wells sampled is inaccurate and confusing.

Page ES-1 states:

Sampling conducted in April 2017 supported the current FWGWMP, as amended, and includes the sampling of 65 monitoring wells, 5 of which are RCRA wells. The April 2017 event included the sampling of an additional 40 monitoring well locations as part of the Facility-Wide Ground Water (FWGW) Remedial Investigation (RI).

Page ES-2 States:

Collected ground water samples from 101 FWGWMP and FWGW RI monitoring wells including the 5 RCRA wells during the April 2017 event.

The 2017 FWGWMP Sampling list (refer to the *Final Facility-Wide Ground Water Monitoring Addendum for 2017*) contains 65 wells, five of which are RCRA wells. One of these wells (DET-4) could not be sampled during the April 2017 sampling event. Therefore, a total of 64 FWGWMP wells, four of which are RCRA wells, were sampled during the April 2017 event. Also, the Army planned to sample 40 additional monitoring wells during the April 2017 sampling event as part of the Facility-Wide Ground Water RI; however, three of the wells (B12mw-012, LL1mw-063, and LL4mw-194) could not be sampled. Therefore, only 37 wells were sampled during the April 2017 event to support the facility-wide ground water RI. In summary, 116 monitoring wells were sampled as part of the April 2017 sampling event – specifically 64 FWGWMP wells (including four RCRA wells), 15 new wells, and 37 RI wells.

The text of the report needs to clearly and accurately describe which wells were sampled.

2. The executive summary (page ES-4) indicates that samples were tested for hexavalent chromium during both the April and July 2017 sampling events. Table 3-2 indicates that none of the wells sampled during the July 2017 sampling event were tested for hexavalent chromium. This contradiction needs to be explained.
3. Laboratory analyses were performed for the samples collected during the April and July 2017 sampling events. However, data validation has only been performed on results for samples collected in the April 2017 sampling event. It is not clear if the July data is going to be validated. This needs to be explained.
4. Well LL10mw-003 was not specifically analyzed for explosives/propellants (i.e., U.S. EPA Method SW-846-8330B/8330 B modified), but was analyzed for SVOCs (U.S. EPA Method SW-846-8270) which includes some explosive/propellant compounds. One SVOC nitrobenzene (also an explosive/propellant compound) was detected at a concentration above the screening criterion in Homewood Aquifer well LL10mw-003 during the April 2017 sampling event. This detection above the screening criterion was not included in the summary of explosive/propellant detections above screening levels in the Executive Summary section of the report on page ES-3 or in Section 4.3

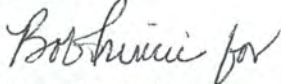
Explosives and Propellants, and this information needs to be included in those sections of the report.

5. The *Ground Water Annual Report for 2016* indicated that only two wells, FWGmw-002 and FWGmw-011, would need redevelopment prior to the first semi-annual sampling event for 2017. Although DDAGW has no objection to their redevelopment, it is not clear why wells LL4mw-194 and FBQmw-175 were also redeveloped prior to sampling. For a more complete understanding of the maintenance issues with the facility's monitoring wells this needs to be explained.

Table 1-1 indicates that samples collected during the April and July 2017 sampling events were analyzed for PCBs. The results of these analyses are not summarized in the text of the report or in Table 3-2. These results need to be summarized in the report even if the results were below the PQL.

This Facility-Wide Groundwater Semi-Annual Report for April and July 2017 Sampling Events was reviewed by personnel from Ohio EPA, DERR and DDAGW. Additional information is necessary to approve the document. If you have questions, or would like to set up a meeting to discuss these comments, please call me at (330) 963-1292.

Sincerely,



Kevin M. Palombo
Environmental Specialist
Division of Environmental Response and Revitalization

KP/nvp

cc: Rebecca Shreffler/Gail Harris, VISTA Sciences Corp.

ec: Katie Tait, OHARNG RTLS
Kevin Sedlak, ARNG
Bob Princic, Ohio EPA, NEDO DERR
Rodney Beals, Ohio EPA NEDO DERR
Thomas Schneider, Ohio EPA, SWDO DERR
Albert Muller, Ohio EPA, NEDO DDAGW
Carrie Rasik, Ohio EPA, CO DERR
Brian Tucker, Ohio EPA, CO DERR



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

November 5, 2018

Ohio Environmental Protection Agency
DERR-NEDO
Attn: Mr. Ed D'Amato
2110 East Aurora Road
Twinsburg, OH 44087-1924

Subject: Notification of Field Work, Ravenna Army Ammunition Plant (RVAAP) Restoration Program, Portage/Trumbull Counties, Additional Sampling for CC RVAAP-69 Building 1048 Fire Station and CC RVAAP-74 Building 1034-Motor Pool Hydraulic Lift, Ohio EPA ID #s 267-000859-214 and 267-000859-211

Dear Mr. D'Amato:

In accordance with the Director's Final Findings and Orders, Section XIII, #28, for the RVAAP Restoration Program, the Army National Guard (ARNG) is providing notification of field activities at Camp Garfield / former RVAAP 15 days prior to the scheduled start date. Parsons and their subcontractors will be conducting field activities including additional sampling and quarterly groundwater sampling at CC RVAAP-69 Building 1048 Fire Station and quarterly groundwater sampling at CC RVAAP-74 Building 1034-Motor Pool Hydraulic Lift beginning the week of 26 November 2018 through approximately 7 December 2018.

For additional information on the field activities, please refer to the *Final Work Plan Additional Sampling for CC RVAAP-69 Building 1048 Fire Station, CC RVAAP-70 East Classification Yard, and CC RVAAP-74 Building 1034-Motor Pool Hydraulic Lift at the former Ravenna Army Ammunition Plant (RVAAP)* submitted to Ohio EPA on 30 November 2017 and approved on 27 December 2017, and the *Final Update and Progress Report on Remedial Investigation at CC RVAAP-69 Building 1048 Fire Station, Ravenna Army Ammunition Plan Restoration Program*, dated 24 July 2018.

Please contact the undersigned at (703) 607-7589 or david.m.connolly8.civ@mail.mil if there are issues or concerns with this submission.

Sincerely,

SEDLAK.KEVIN.MIC Digitally signed by
SEDLAK.KEVIN.MICHAEL.1254440171
Date: 2018.10.30 12:51:30 -04'00'
HAEL.1254440171

FOR Mr. David M. Connolly
RVAAP Restoration Program Manager
Army National Guard Directorate

cc: Mark Johnson, Ohio EPA, DERR-NEDO
Bob Princic, Ohio EPA, DERR-NEDO
Tom Schneider, Ohio EPA, SWDO
Kevin Sedlak, ARNG, Camp Ravenna
Katie Tait, OHARNG, Camp Ravenna
Craig Coombs, USACE Louisville
Kevin Mieczkowski, USACE Louisville

Gail Harris, Vista Sciences
Edward Heyse, Parsons



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

September 25, 2018

Mr. David Connolly
Army National Guard Directorate
ARNGD-ILE-CR
111 South George Mason Drive
Arlington, VA 22204

**Re: US Army Ammunition Plt RVAAP
Remediation Response
Project Records
Remedial Response
Portage County
267000859214**

Subject: Ravenna Army Ammunition Plant, Portage/Trumbull Counties. Response to Ohio EPA Comments on the "Update and Progress Report on the Remedial Investigation at CC RVAAP-69 Building 1048 Fire Station" at the Former Ravenna Army Ammunition Plant, Portage and Trumbull Counties, Ohio, Dated August 28, 2018

Dear Mr. Connolly:

The Ohio Environmental Protection Agency (Ohio EPA) has received and reviewed the response to Ohio EPA comments on the "Update and Progress Report on the Remedial Investigation (RI) at CC RVAAP-69 Building 1048 Fire Station" at the former Ravenna Army Ammunition Plant, Portage and Trumbull Counties, Ohio. This response document was received at Ohio EPA's Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR), on September 4, 2018. The response was prepared for the U.S. Army Corps of Engineers on behalf of the National Guard Bureau by PARSONS.

The submitted response is to Ohio EPA's comment letter dated August 16, 2018, regarding the July 24, 2018 "Update and Progress Report on the Remedial Investigation (RI) at CC RVAAP-69 Building 1048 Fire Station." Ohio EPA provided 11 comments.

COMMENTS

The Army has satisfactorily responded, and Ohio EPA concurs with responses to comment numbers 1, 2, 4, 5, 6, 7, 8, 9, 10, and 11. Ohio EPA provides clarification of our requirements on Comment 3 below:

- 1. Ohio EPA Comment 3.** In the report, isoconcentration maps of the combined parameters carbon tetrachloride and chloroform are presented in Figures 6 and 7. In these figures two isoconcentration lines are shown: 5 µg/L (the MCL for carbon tetrachloride) and one for 100 µg/L. The highest concentrations of carbon tetrachloride at sample locations on these maps are multiples of 100µ/L.

RECEIVED
26 SEPT 2018

First, the Army needs to delineate the concentrations of carbon tetrachloride and its degradation products to their respective FWCUG concentration (e.g., 0.24 µg/L for carbon tetrachloride and 0.27 µg/L for chloroform).

Additionally, for clarity, the isoconcentration maps need to reflect the full range of concentrations of a given parameter. Also, Ohio EPA recommends isocentration maps be prepared for individual parameters instead of groups of parameters. An isocentration line equivalent to a parameter's MCL may be included for reference.

Army Response to Comment 3. *As indicated in the legend for Figures 6 and 7, the isoconcentration lines are for carbon tetrachloride, not combined carbon tetrachloride and chloroform.*

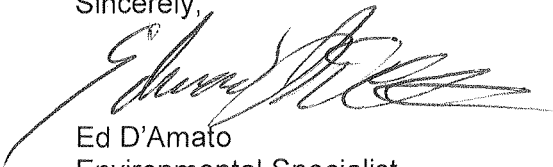
Agree that concentrations of carbon tetrachloride and its degradation products will be delineated to their respective FWCUG concentrations. Additional monitoring wells will be installed as indicated on Figure 10 to complete plume delineation. Grab sample results (Figure 6) also provide information for plume delineation.

The isoconcentration lines of 5 µg/L and 100 µg/L are an appropriate level of detail given the data collected to date. Additional contours can be added to plume maps in the RI Report after additional wells are installed and samples are analyzed.

Ohio EPA Clarification. Ohio EPA concurs with the response in the first two paragraphs; however, to clearly represent the full range of concentrations of carbon tetrachloride, which ranges from 7.3 to 1000 ug/l within the contour map presented on Figure 6, which shows the results for "Groundwater Grab Samples," a more appropriate contour interval than one that ends at 100 ug/l should be provided on future maps.

This response to Ohio EPA comments was reviewed by personnel from Ohio EPA, DERR and Ground Water reviewers. Thank you for your response. We provided minor clarification for future submittals. Ohio EPA looks forward to completion of the Remedial Investigation of the RVAAP-69 Building 1048 Fire Station. If you have questions, please call me at (330) 963-1170.

Sincerely,



Ed D'Amato
Environmental Specialist
Division of Environmental Response and Revitalization

ED/nvp

ec: Katie Tait, OHARNG RTLS
Kevin Sedlak, ARNG
Rebecca Schreffler, Chenega
Carrie Rasik, Ohio EPA, CO DERR
Thomas Schneider, Ohio EPA SWDO

Kevin Palombo, Ohio EPA, NEDO DERR
Albert Muller, Ohio EPA, NEDO DDAGW
Rodney Beals, Ohio EPA NEDO DERR
Bob Princic, Ohio EPA, NEDO DERR
Mark Johnson, Ohio EPA, NEDO DERR



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

August 28, 2018

Ohio Environmental Protection Agency
DERR-NEDO
Attn: Edward J. D'Amato, Project Coordinator
2110 East Aurora Road
Twinsburg, Ohio 44087-1924

Subject: Responses to Comments (dated August 16, 2018) on the "*Update and Progress Report on the Remedial Investigation at CC RVAAP-69 Building 1048 Fire Station*" at the Former Ravenna Army Ammunition Plant, Portage and Trumbull Counties, Ohio, Dated July 24, 2017, Ohio EPA ID# 267-000859-214

Dear Mr. D'Amato:

The Army appreciates your time and comments (dated August 16, 2018) on the *Update and Progress Report on the Remedial Investigation at CC RVAAP-69 Building 1048 Fire Station*" at the Former Ravenna Army Ammunition Plant, Portage and Trumbull Counties, Ohio, dated July 24, 2018. Enclosed are responses to your comments.

This was a Final document that was shared for informational purposes with the Ohio EPA. The Army is not planning on issuing another version of the report. However, the revisions and comments provided by the Ohio EPA will be incorporated into the investigation approach and documented in the Remedial Investigation Report once the investigation is complete.

Please contact the undersigned at (703) 607-7589 or david.m.connolly8.civ@mail.mil if there are issues or concerns with these responses.

Sincerely,

Date: 2018.08.28
16:03:18 -04'00'

David M. Connolly
RVAAP Restoration Program Manager
Army National Guard Directorate

cc. Bob Princic, Ohio EPA, DERR-NEDO
Mark Johnson, Ohio EPA, DERR-NEDO
Tom Schneider, Ohio EPA, DERR-SWDO
Kevin Sedlak, ARNG
Katie Tait, OHARNG
Craig Coombs, USACE Louisville
Kevin Meiczkowski, USACE Louisville
Gail Harris, Vista Sciences Corp.
Ed Heyse, Parsons

Responses to Ohio EPA Comments (dated August 16, 2018)
Update and Progress Report on the Remedial Investigation at CC RVAAP-69 Building 1048
Fire Station at the Former Ravenna Army Ammunition Plant, Portage and Trumbull
Counties, Ohio, Dated July 24, 2017, Ohio EPA ID# 267-000859-214

1. To be consistent with the Facility-Wide Groundwater Remedial Investigation and associated reports, the submitted document needs to identify the hydrostratigraphic units beneath Camp Ravenna by their accepted conventional names.

Based on the elevation of the top of the weathered sandstone (about 1,005 feet AMSL), that hydrostratigraphic unit is the Upper Sharon Aquifer. In the report, the Upper Sharon Aquifer is variously referred to "weathered sandstone", "weathered bedrock", or the "deep zone." There are more than one sandstone hydrostratigraphic units beneath Camp Ravenna. For more information about the elevations of the different bedrock hydrostratigraphic units beneath Camp Ravenna, refer to the cross-sections in: the *2017 Facility-Wide Ground Water Annual Report*, and/or *RI Work Plan*, and/or *Geology and Ground Water Resources of Portage County Ohio* (Winslow and White, 1966).

Response: Agree that weathered sandstone layer is the Upper Sharon Aquifer. Text and Figures in the RI report will refer to this unit as the Upper Sharon Aquifer.

2. In the report's Summary of Findings (page 2), under the heading "Soil" (second bullet point), the report incorrectly states:

Carbon tetrachloride and chloroform were detected in soil samples above 14 feet bgs (in the brown clays, sands, and silts), which is consistent with previous investigations.

Figure 2 in the report shows that carbon tetrachloride was detected in the 2015 sample from soil boring 69-1048SB-101 at a depth of 14-15 feet bgs (4.6 µg/L) and a depth of 15-16 feet Bgs (3.2 µg/L [j]).

Response: Clarification. Please note that soil concentrations displayed in Figure 2 are in units of mg/kg, not µg/L. Agree that carbon tetrachloride was detected in samples from 69-1048SB-101 at depths of 14-15 and 15-16 feet bgs in 2015. Please note that these samples are within the brown clays, sands and silts and above the gray clay layer, which is consistent with the soil layers where carbon tetrachloride was detected in samples collected from borings installed in 2018. Please see cross-section Figure 3.

3. In the report, isoconcentration maps of the combined parameters carbon tetrachloride and chloroform are presented in Figures 6 and 7. In these figures, two isoconcentration lines are shown: 5 µg/L (the MCL for carbon tetrachloride) and one for 100 µg/L. The highest concentrations of carbon tetrachloride at sample locations on these maps are multiples of 100 µ/L.

First, the Army needs to delineate the concentrations of carbon tetrachloride and its degradation products to their respective FWCUG concentration (e.g., 0.24 µg/L for carbon tetrachloride and 0.27 µg/L for chloroform).

Additionally, for clarity, the isoconcentration [sic] maps need to reflect the full range of concentrations of a given parameter. Also, Ohio EPA recommends isocenters [sic] maps be prepared for individual parameters instead of groups of parameters. An isocentration [sic] line equivalent to a parameter's MCL may be included for reference.

Response: As indicated in the legend for Figures 6 and 7, the isoconcentration lines are for carbon tetrachloride, not combined carbon tetrachloride and chloroform.

Agree that concentrations of carbon tetrachloride and its degradation products will be delineated to their respective FWCUG concentrations. Additional monitoring wells will be installed as indicated on Figure 10 to complete plume delineation. Grab sample results (Figure 6) also provide information for plume delineation.

The isoconcentration lines of 5 µg/L and 100 µg/L are an appropriate level of detail given the data collected to date. Additional contours can be added to plume maps in the RI Report after additional wells are installed and samples are analyzed.

4. Ohio EPA agrees that the March 2018 water level data suggests a downward ground water gradient between the Unconsolidated and Upper Sharon Aquifers near the location of well pair 069MW-001/069MW-003.

Response: Comment noted.

5. Page 3 of the report claims that the gray clay layer beneath CC RVAAP-69 is limiting the vertical migration of ground water.

Given the presence of the degradation products chloroform (34 µ/L) and methylene chloride (15 µ/L) in "weathered sandstone" (Upper Sharon Aquifer) well 69MW-003 it is premature for the ARMY to make this claim.

It is unclear that the gray clay layer is laterally continuous enough and thick enough to be an effective barrier between the Unconsolidated Aquifer and the Upper Sharon Aquifer to prevent downward migration of contamination.

For more information about evaluating whether a clay or low permeability layer adequately protects underlying ground water when an overlying ground water zone is contaminated, refer to Ohio EPA's 2009 *Technical Guidance Manual Supplement* document entitled: *Assessment of an Aquitard during a Ground Water Contamination Investigation.*

Response: The report states: *"The three-foot difference in hydraulic head between these wells [069MW-001 and 069MW-003] suggests that the gray clay layer (located between the two screened intervals) is limiting vertical migration of groundwater."* This observation is a reasonable interpretation of the data at this well pair.

The Army acknowledges that the extent of the gray clay layer and its role and effectiveness as a barrier between the Unconsolidated Aquifer and the Upper Sharon Aquifer remain to be determined. To that end, the report indicates that additional soil borings (SB114 and SB115) will be completed to the top of the Upper Sharon Aquifer, and the potential for vertical migration of carbon tetrachloride decay products will be investigated by continued monitoring of well 069MW-003 and, if needed, installation of additional deep monitoring wells.

6. The report indicates that chloroform and methylene chloride contamination in well 069mw-003 may have been introduced during drilling.

If the presence of chloroform and methylene chloride in "weathered sandstone" (Upper Sharon Aquifer) is an artifact of cross-contamination originating in the Unconsolidated Aquifer and introduced into the well 069MW-003 during its installation and not removed

due to inadequate development, one would expect a detectable quantity of carbon tetrachloride to be present in that well and it is not.

If the Army believes that chloroform and methylene chloride were introduced by drilling, then it is not clear why they proposed in the report (page 5) to wait until after the June 2018 sampling event to redevelop well 069MW-003. This needs to be explained.

Response: The Army decided to wait until after the June 2018 sampling event to determine if the results of the March 2018 sampling event would be confirmed.

7. Page 4 of the report states: "Carbon tetrachloride DNAPL is unlikely to be present because dissolved concentrations in ground water are much lower than (sic) the solubility limit of 800,000 ug/l."

The facility has not adequately demonstrated that DNAPL is not present in the vicinity of Building 1048 Fire Station. According to the Interstate Technology and Regulatory Council's (ITRC's) 2015 guidance document entitled *Integrated DNAPL Site Characterization and Tools Selection*:

Historically, a 1% dissolved-phase concentration of chlorinated solvent DNAPL, based on compound-specific solubility in ground water, was thought to be indicative of potential presence of DNAPL; however, this method is now viewed as unreliable (that is, either falsely positive or falsely negative.)

It is unclear if the Army gauged any of the monitoring wells for DNAPL during sampling. This needs to be clarified. According to Chapter 10 of Ohio EPA's Technical Guidance Document (TGM) [2012]:

If the presence of NAPL is suspected, the sampling program should include devices and protocols to detect them.

If the ARMY has not gauged the CC RVAAP - 69 Building 1048 Fire Station's monitoring wells for DNAPL, it needs to gauge them to demonstrate the presence or absence of DNAPL. Protocols to detect immiscible liquids should also include the visual inspection of purge water and any equipment removed from the well.

Response: All wells are gauged with an interface probe. To date no NAPL has been detected. Wells will be gauged for DNAPL during all subsequent monitoring events. There was no indication of DNAPL in well development or purging notes, and concentrations in waste characterization samples of purge water were well below solubility.

8. The report indicates (page 3 and Figures 6 and 7) that a ground water data gap exists north of well 069MW-001. However, the Army has not proposed any additional Unconsolidated Aquifer monitoring wells in this area. This needs to be explained.

Response: Additional well 069MW-006 will be installed northwest of existing well 069MW-002 and will provide additional delineation to the north of 069MW-001. Results from new well 069MW-006 and grab sample 069WP-017 (Figure 6) are expected to provide adequate delineation on the north side of the plume.

9. Ohio EPA agrees that if chlorinated methanes continue to be detected in well 069MW-003 that the Army will have to install additional wells in the Upper Sharon Aquifer in the

vicinity of CC RVAAP-69 to delineate contamination in that hydrostratigraphic zone.

Response: Comment noted.

10. On Figure 8 and 10, the practical quantification limit (PQL) for carbon tetrachloride in the March 2018 ground water sample from well 069MW-003 is listed as 0.18 µg/L, and in Table 3 of the report the PQL for that sample is listed as 0.25 µg/L. It needs to be clarified what the PQL for carbon tetrachloride in March 2018 sample from 069MW-003 is.

Response: The detection limit was 0.18 µg/L and level of detection (LOD) was 0.25 µg/L. In accordance with the QAPP and DoD Quality Systems Manual, we will report the non-detections at the LOD (in this case, 0.25 µg/L) in all figures and tables in the RI report.

11. The report contains a few typographical errors that should be corrected to improve the clarity of the report.

On page 3 under the third bullet item: "well 06MW-003" should be "well 069MW-003" and "1,016.7 feet bgs" should be "1,016.7 feet AMSL. Also, on Figure 2 soil boring "72-1048RVSB2" should be "69-1048RVSB2".

Response: Comment noted.



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

August 16, 2018

Mr. David Connolly
Army National Guard Directorate
Environmental Programs Division
ARNG-ILE-CR
111 South George Mason Drive
Arlington, VA 22204

**Re: US Army Ammunition PLT RVAAP
Remediation Response
Project Records
Remedial Response
Portage County
267000859214**

Subject: Ravenna Army Ammunition Plant, Portage/Trumbull Counties. Ohio EPA Comments on the "Update and Progress Report on the Remedial Investigation at CC RVAAP-69 Building 1048 Fire Station" at the Former Ravenna Army Ammunition Plant, Portage and Trumbull Counties, Ohio, Dated July 24, 2018, Ohio EPA ID # 267-000859-214

Dear Mr. Connolly:

The Ohio Environmental Protection Agency (Ohio EPA) has received and reviewed the **"Update and Progress Report on the Remedial Investigation at CC RVAAP-69 Building 1048 Fire Station"** at the Former Ravenna Army Ammunition Plant, Portage and Trumbull Counties, Ohio. This document was received at Ohio EPA's Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR), on July 24, 2018. The report was prepared for the US Army Corps of Engineers on behalf of the U.S. Army National Guard Bureau by PARSONS.

The Army has not completed the assessment of the CC RVAAP-69 Building 1048 Fire Station (CC RVAAP-69). This review is based only on the work done by the Army to date, and proposed work to delineate ground water impacts in the area. Because CC RVAAP-69 ground water contamination issues are captured under the Facility-wide Groundwater Remedial Investigation, Ohio EPA requests that we have the opportunity to comment on further efforts to delineate impacts to ground water in this area as the work proceeds.

Comments on the current Update Report based on Ohio EPA review are provided below. Please provide responses to the enclosed comments in accordance with the Directors Findings and Orders.

RECEIVED
16 AUG 2018

BACKGROUND

The RVAAP-69, is the former location of Building 1048 Fire Station. It is located in the northwest quadrant of the intersection of George Road and South Service Road. No documentation was found regarding the specific years of service for the fire station. A site schematic dated 1941 shows the fire station, which was razed in 2008. The fire station is currently vacant land. Depth to ground water in this area is expected to be between 10 and 20 feet below ground surface (bgs).

Chemicals of potential concern (COPCs) associated with the fire station include carbon tetrachloride and its degradation products. Carbon tetrachloride was used through the 1950's to extinguish fires.

Previous Remedial Investigation (RI) sampling of CC RVAAP-69 Building 1048 Fire Station (CC RVAAP-69) was conducted in 2012 and 2015.

Subsurface geology beneath CC RVAAP 69 typically consists of 15 to 19 feet of interbedded brown clay, silt, and sand (surface elevation [about 1025 feet AMSL] to about 1,010 feet AMSL) overlying 5 to 7 feet of gray clay (1,010 feet AMSL to 1,003 feet AMSL) overlying "weathered brown sandstone" (1,003 to 1,005 feet AMSL).

UPDATE/PROGRESS REPORT ON RI INVESTIGATION AT CC-RVAAP-69 FIRE STATION

According to the report, the objectives of the 2017 Final Work Plan for investigations of CC RVAAP-69 are:

- Define the vertical extent of carbon tetrachloride in soil near boring 069SB-101;
- Define the lateral extent of carbon tetrachloride contamination in soil below a depth of 1,018 feet above mean sea level (AMSL); and
- Evaluate impacts to ground water.

Work Completed in February-March 2018. The report summarizes work done in February and March of 2018 to augment previous soil sampling done in 2012 and 2015 to support the stated goals of the Final Work Plan. The work completed in February and March of 2018 included:

- Advanced and sampled soil from four soil borings (69-1048SB-110, 69-1048SB-111, 06-1048SB-112, 69-1048SB-113). Soil borings ranged in depth from 14 feet (69-1048SB-112) to 28 feet (69-1048SB-110) bgs. Multiple soil samples were analyzed for VOCs from each of the borings;

- Collected grab ground water samples for screening purposes using direct push techniques from 17 temporary well locations (refer to attached Figure 1). The 17 temporary wells were open to various interval lengths ranging from 5 (069WP-001) to 20 feet (069WP-011) in the Unconsolidated Aquifer; and
- Installed and sampled five new permanent monitoring wells. Four wells (069MW-001, 069MW-002, 069MW-004, and 069MW-005) were screened in the Unconsolidated Aquifer and were constructed with ten-foot long screens. One well (069MW-003) was screened in the weathered portion of “weathered sandstone” and was constructed with a five-foot long screen.

COMMENTS

1. To be consistent with the Facility-Wide Groundwater Remedial Investigation and associated reports, the submitted document needs to identify the hydrostratigraphic units beneath Camp Ravenna by their accepted conventional names.

Based on the elevation of the top of the weathered sandstone (about 1,005 feet AMSL), that hydrostratigraphic unit is the Upper Sharon Aquifer. In the report, the Upper Sharon Aquifer is variously referred to “weathered sandstone”, “weathered bedrock”, or the “deep zone.” There are more than one sandstone hydrostratigraphic units beneath Camp Ravenna. For more information about the elevations of the different bedrock hydrostratigraphic units beneath Camp Ravenna, refer to the cross-sections in: the *2017 Facility-Wide Ground Water Annual Report*, and/or *RI Work Plan*, and/or *Geology and Ground Water Resources of Portage County Ohio* (Winslow and White, 1966).

2. In the report’s Summary of Findings (page 2), under the heading “Soil” (second bullet point), the report incorrectly states:

Carbon tetrachloride and chloroform were detected in soil samples above 14 feet bgs (in the brown clays, sands, and silts), which is consistent with previous investigations.

Figure 2 in the report shows that carbon tetrachloride was detected in the 2015 sample from soil boring 69-1048SB-101 at a depth of 14-15 feet bgs (4.6µg/L) and a depth of 15-16 feet Bgs (3.2 µg/L [i]).

3. In the report, isoconcentration maps of the combined parameters carbon tetrachloride and chloroform are presented in Figures 6 and 7. In these figures, two isoconcentration lines are shown: 5 µg/L (the MCL for carbon tetrachloride)

and one for 100 µg/L. The highest concentrations of carbon tetrachloride at sample locations on these maps are multiples of 100µ/L.

First, the Army needs to delineate the concentrations of carbon tetrachloride and its degradation products to their respective FWCUG concentration (e.g., 0.24 µg/L for carbon tetrachloride and 0.27 µg/L for chloroform).

Additionally, for clarity, the isoconcentration maps need to reflect the full range of concentrations of a given parameter. Also, Ohio EPA recommends isocentration maps be prepared for individual parameters instead of groups of parameters. An isocentration line equivalent to a parameter's MCL may be included for reference.

4. Ohio EPA agrees that the March 2018 water level data suggests a downward ground water gradient between the Unconsolidated and Upper Sharon Aquifers near the location of well pair 069MW-001/069MW-003.
5. Page 3 of the report claims that the gray clay layer beneath CC RVAAP-69 is limiting the vertical migration of ground water.

Given the presence of the degradation products chloroform (34 µ/L) and methylene chloride (15 µ/L) in "weathered sandstone" (Upper Sharon Aquifer) well 69MW-003 it is premature for the ARMY to make this claim.

It is unclear that the gray clay layer is laterally continuous enough and thick enough to be an effective barrier between the Unconsolidated Aquifer and the Upper Sharon Aquifer to prevent downward migration of contamination.

For more information about evaluating whether a clay or low permeability layer adequately protects underlying ground water when an overlying ground water zone is contaminated, refer to Ohio EPA's 2009 *Technical Guidance Manual Supplement* document entitled: Assessment of an Aquitard during a Ground Water Contamination Investigation.

6. The report indicates that chloroform and methylene chloride contamination in well 069mw-003 may have been introduced during drilling.

If the presence of chloroform and methylene chloride in "weathered sandstone" (Upper Sharon Aquifer) is an artifact of cross-contamination originating in the Unconsolidated Aquifer and introduced into the well 069mw-003 during its installation and not removed due to inadequate development, one would expect a detectable quantity of carbon tetrachloride to be present in that well and it is not.

If the Army believes that chloroform and methylene chloride were introduced by drilling, then it is not clear why they proposed in the report (page 5) to wait until after the June 2018 sampling event to redevelop well 069MW-003. This needs to be explained.

7. Page 4 of the report states: "Carbon tetrachloride DNAPL is unlikely to be present because dissolved concentrations in ground water are much lower than (sic) the solubility limit of 800,000 ug/l."

The facility has not adequately demonstrated that DNAPL is not present in the vicinity of Building 1048 Fire Station. According to the Interstate Technology and Regulatory Council's (ITRC's) 2015 guidance document entitled *Integrated DNAPL Site Characterization and Tools Selection*:

Historically, a 1% dissolved-phase concentration of chlorinated solvent DNAPL, based on compound-specific solubility in ground water, was thought to be indicative of potential presence of DNAPL; however, this method is now viewed as unreliable (that is, either falsely positive or falsely negative.)

It is unclear if the Army gauged any of the monitoring wells for DNAPL during sampling. This needs to be clarified. According to Chapter 10 of Ohio EPA's Technical Guidance Document (TGM) [2012]:

If the presence of NAPL is suspected, the sampling program should include devices and protocols to detect them.

If the ARMY has not gauged the CC RVAAP – 69 Building 1048 Fire Station's monitoring wells for DNAPL, it needs to gauge them to demonstrate the presence or absence of DNAPL. Protocols to detect immiscible liquids should also include the visual inspection of purge water and any equipment removed from the well.

8. The report indicates (page 3 and Figures 6 and 7) that a ground water data gap exists north of well 069MW-001. However, the Army has not proposed any additional Unconsolidated Aquifer monitoring wells in this area. This needs to be explained.
9. Ohio EPA agrees that if chlorinated methanes continue to be detected in well 069MW-003 that the Army will have to install additional wells in the Upper Sharon Aquifer in the vicinity of CC RVAAP-69 to delineate contamination in that hydrostratigraphic zone.

10. On Figure 8 and 10, the practical quantification limit (PQL) for carbon tetrachloride in the March 2018 ground water sample from well 069MW-003 is listed as 0.18 µg/L, and in Table 3 of the report the PQL for that sample is listed as 0.25 µg/L. It needs to be clarified what the PQL for carbon tetrachloride in March 2018 sample from 069MW-003 is.
11. The report contains a few typographical errors that should be corrected to improve the clarity of the report.

On page 3 under the third bullet item: "well 06MW-003" should be "well 069MW-003" and "1,016.7 feet bgs" should be "1,016.7 feet AMSL. Also, on Figure 2 soil boring "72-1048RVSB2" should be "69-1048RVSB2".

This Update and Progress Report on the Remedial Investigation at CC RVAAP-69 Building 1048 Fire Station was reviewed by personnel from Ohio EPA. Additional information is necessary to concur with approach provided for further investigation. If you have questions or would like to set up a meeting to discuss these comments, please call me at (330) 963-1292.

Sincerely,



Kevin M. Palombo
Environmental Specialist
Division of Environmental Response and Revitalization

KP/nvp

ec: Rebecca Schreffler, Chenega
Katie Tait, OHARNG RTLS
Kevin Sedlak, ARNG
Bob Princic, Ohio EPA, NEDO, DERR
Mark Johnson, Ohio EPA, NEDO, DERR
Rodney Beals, Ohio EPA, NEDO, DERR
Thomas Schneider, Ohio EPA, SWDO, DERR
Albert Muller, Ohio EPA, NEDO, DDAGW
Carrie Rasik, Ohio EPA, CO, DERR
Edward D'Amato, Ohio EPA, NEDO, DERR



NATIONAL GUARD BUREAU

111 SOUTH GEORGE MASON DRIVE
ARLINGTON VA 22204-1373

May 11, 2018

Ohio Environmental Protection Agency
DERR-NEDO
Attn: Mr. Ed D'Amato
2110 East Aurora Road
Twinsburg, OH 44087-1924

Subject: Notification of Field Work, Ravenna Additional Sampling for CC RVAAP-69 Building 1048 Fire Station and CC RVAAP-74 Building 1034-Motor Pool Hydraulic Lift, Ohio EPA ID #s 267-000859-211 and 267-000859-220

Dear Mr. D'Amato:

In accordance with the Director's Final Findings and Orders, Section XIII, #28, for the RVAAP Restoration Program, the Army National Guard (ARNG) is providing notification of field activities at Camp Ravenna/former RVAAP 15 days prior to the scheduled start date. Parsons and their subcontractors will be conducting quarterly groundwater sampling at CC RVAAP-69 Building 1048 Fire Station and CC RVAAP-74 Building 1034-Motor Pool Hydraulic Lift during the week of 4 June 2018 (anticipate two days 4 and 5 June 2018).

For additional information on the field activities, please refer to the Final Work Plan Additional Sampling for CC RVAAP-69 Building 1048 Fire Station, CC RVAAP-70 East Classification Yard, and CC RVAAP-74 Building 1034-Motor Pool Hydraulic Lift at the former Ravenna Army Ammunition Plant (RVAAP) submitted to Ohio EPA on 30 November 2017 and approved on 27 December 2017.

Please contact the undersigned at (703) 601-7785 or james.c.crowley.mil@mail.mil if there are issues or concerns with this submission.

Sincerely,

CROWLEY.JAMES.CORNELIUS.1045120399
NELIUS.1045120399

Digitally signed by
CROWLEY.JAMES.CORNELIUS.1045120399
9
Date: 2018.05.09 08:56:44 -04'00'

James C. Crowley
Lieutenant Colonel, Corps of Engineers
RVAAP Restoration Program Manager
Installations & Environment, ARNG

cc: Mark Johnson, Ohio EPA, DERR-
NEDO Bob Princic, Ohio EPA, DERR-
NEDO Tom Schneider, Ohio EPA,
SWDO Kevin Sedlak, ARNG, Camp
Ravenna Katie Tait, OHARNG, Camp
Ravenna Craig Coombs, USACE
Louisville Kevin Mieczkowski, USACE
Louisville Gail Harris, Vista Sciences
Edward Heyse, Parsons



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

December 21, 2018

Mr. David Connolly
Army National Guard Directorate
Environmental Programs Division
ARNG-ILE-CR
111 South George Mason Drive
Arlington, VA 22204

**Re: US Army Ravenna Ammunition Plant RVAAP
Remediation Response
Plans
Remedial Response
Portage County
267000859252**

Subject: Review and Concurrence of the Final Proposed Plan for Soil, Sediment, and Surface Water at RVAAP Load Lines 1,2,3,4 and 12 at the Former Ravenna Army Ammunition Plant, Portage and Trumbull Counties, Ohio: Dated October 26, 2018 (Work Activity No. 267000859252)

Dear Mr. Connolly:

The Ohio Environmental Protection Agency (Ohio EPA), Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR) has received and reviewed the "Final Proposed Plan for Soil, Sediment, and Surface Water at RVAAP Load Lines 1,2,3,4 and 12" dated October 26, 2018. This document was received by Ohio EPA, NEDO on November 6, 2018. It was prepared by Leidos. Ohio EPA concurs with the selected remedy.

If you have any questions or concerns, please do not hesitate to contact Susan Netzly-Watkins at (330) 963-1201.

Sincerely,

A handwritten signature in blue ink, appearing to read "J. Sferra", is written over the name "James Sferra".

James Sferra, Chief
Division of Environmental Response and Revitalization

JS/SN-W/nvp

ec: Nat Peters, USACE
Katie Tait/Kevin Sedlak, OHARNG RTLS
Craig Coombs, USACE
Rebecca Shreffler, Chenega
David Connolly, ARNG
Mark Johnson Ohio EPA, NEDO, DERR
Bob Princic, Ohio EPA, NEDO, DERR
Tom Schneider, Ohio EPA, SWDO, DERR
Sue Netzly-Watkins, Ohio EPA, NEDO, DERR
Carrie Rasik, Ohio EPA, DERR, CO

RECEIVED
DEC 24 2018



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

December 19, 2018

Mr. David Connolly
Army National Guard Directorate
Environmental Programs Division
ARNG-ILE-CR
111 South George Mason Drive
Arlington, VA 22204

Re: **US Army Ravenna Ammunition Plt RVAAP
Remediation Response
Project records
Remedial Response
Portage County
267000859029**

Subject: Receipt and Review of the "Draft 2017 Annual Land Use Control Monitoring Report, RVAAP-01 Ramsdell Quarry Landfill, RVAAP-05 Winklepeck Burning Grounds, RVAAP-08 – 11 Load Lines 1 – 4, and RVAAP-12 Load Line 12" at the Former Ravenna Army Ammunition Plant, Ravenna, Ohio" Dated October 11, 2018 (Work Activity No. 267000859029)

Dear Mr. Connolly:

The Ohio Environmental Protection Agency (Ohio EPA), Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR) has received and reviewed the document entitled, "*Draft 2017 Annual Land Use Control Monitoring Report, RVAAP-01 Ramsdell Quarry Landfill, RVAAP-05 Winklepeck Burning Grounds, RVAAP-08 – 11 Load Lines 1 – 4, and RVAAP-12 Load Line 12*". This document, received by Ohio EPA's NEDO on October 12, 2018, was prepared for the U.S. Army Corps of Engineers (USACE) Louisville District, by Chenega Tri-Services, LLC. Please find Ohio EPA comments listed below.

1. **Dates** – Section 2.1 reads, "This annual report covers the period of January 2017 through December 2017." However, the quarterly reports are dated April 12, 2017, for January 9 – 12, 17 – 19, 23 – 26 and 30, 2017; June 27, 2017, for April 10 – 13, 17 – 20, 24 – 27 and May 1, 2017; and May 21, 2018, for July 10-13, 17-20, and 24-27, 2017. No information has been provided to report the final quarter of 2017.

Ohio EPA requests the final quarter be presented to complete the 2017 annual report. The 2017 remedy implemented for the Winklepeck Burning Grounds Area of Concern (AOC) employed the existing facility-wide fence as a control.

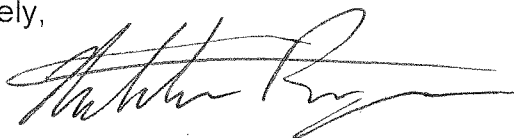
2. **Photographs** – The final picture in Appendix H (described as Load Line 4 field) appears to be identical to the photograph in Appendix I (described as Load Line

12 field). Please revise the document to include the appropriate photograph(s) for the respective area(s).

3. **Appendix A** – The sign-in sheets presented in Appendix A are not legible in certain sections, making it impossible to verify the times recorded, and the exposure associated with Ramsdell Quarry Landfill entry. Please add legible sign-in sheets to allow for a complete review.
4. **General** – General spelling errors were discovered on Page i: Section 4.0 and Section 5.0 titles.

If you have any questions or concerns, please do not hesitate to contact me at (330) 963-1235.

Sincerely,



Nicholas Roope
Site Coordinator
Division of Environmental Response and Revitalization

NCR/nvp

ec: Nat Peters, USACE
Katie Tait/Kevin Sedlak, OHARNG RTLS
Craig Coombs, USACE
Rebecca Shreffler, Chenega
David Connolly, ARNG
Mark Johnson Ohio EPA, NEDO, DERR
Bob Princic, Ohio EPA, NEDO, DERR
Tom Schneider, Ohio EPA, SWDO, DERR
Nicholas Roope, Ohio EPA, NEDO, DERR



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

October 11, 2018

Mr. David Connolly
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: Response to Comments - "Draft Proposed Plan for Soil, Sediment, and Surface Water for Load Lines 1, 2, 3, 4 and 12 the Former Ravenna Army Ammunition Plant (RVAAP)" Document, (Work Activity No. 267000859030)

Dear Mr. Connolly:

The Ohio Environmental Protection Agency (Ohio EPA) received the Draft Proposed Plan for Load Lines 1-4 and 12 on July 24, 2018. We received your responses to our August 24th comments in a letter dated September 27, 2018.

Following our review of your responses, we have no further comments and request the submittal of the Final Proposed Plan.

If you have questions, please feel free to contact me at (330) 963-1201 or Susan.Netzly-Watkins@epa.ohio.gov

Sincerely,

Sue Netzly-Watkins
Division of Environmental Response and Revitalization

SN-W/nvp

cc: Mark Johnson, Ohio EPA, NEDO, DERR
Bob Princic, Ohio EPA, NEDO, DERR
Tom Schneider, Ohio EPA, DERR, SWDO
Bill Damschroder, Legal
Carrie Rasik, Ohio EPA, DERR, CO
Nat Peters, II, USACE Louisville District
Katie Tait/Kevin Sedlak, Camp Ravenna, Newton Falls
Craig Coombs, USACE, Louisville District
David Connolly, ARNG
Rebecca Shreffler, Camp Ravenna, Chenega, Newton Falls
Jed Thomas, Leidos

RECEIVED
11 OCT 2018



NATIONAL GUARD BUREAU

111 SOUTH GEORGE MASON DRIVE
ARLINGTON VA 22204-1373

September 27, 2018

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

Subject: Responses to Comments on the Draft Proposed Plan for Soil, Sediment, and Surface Water for Load Lines 1, 2, 3, 4 and 12, Former Ravenna Army Ammunition Plant (RVAAP), Portage and Trumbull Counties (Work Activity No. 267-000-859-030)

Dear Ms. Netzly-Watkins:

The Army appreciates your time and comments (dated August 24, 2018) on the Draft Proposed Plan for Soil, Sediment, and Surface Water for Load Lines 1, 2, 3, 4 and 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) 607-7589 or david.m.connolly8.civ@mail.mil if there are issues or concerns with this submission.

Sincerely,

David Connolly
RVAAP Restoration Program Manager
Army National Guard Directorate

cc: Mark Johnson, Ohio EPA, NEDO, DERR
Bob Princic, Ohio EPA, NEDO, DERR
Tom Schneider, Ohio EPA, SWDO, DERR
Carrie Rasik, Ohio EPA, CO, DERR
Kevin Sedlak, ARNG, Camp Ravenna
Katie Tait, OHARNG, Camp Ravenna
Craig Coombs, USACE Louisville
Nathaniel Peters, II, USACE Louisville
Jed Thomas, Leidos
Rebecca Shreffler, Camp Ravenna

Subject: Ravenna Army Ammunition Plant (RVAAP) Restoration Program, Portage/Trumbull Counties, Load Lines 1, 2, 3, 4, and 12 (Work Activity No. 267-000-859-030)

Ohio EPA Comments

- 1) **Status of Proposed Plan for Wet Sediment and Surface Water for Load Line 12.** On June 21, 2018, Ohio EPA participated in the public meeting regarding the Proposed Plan for Wet Sediment and Surface Water at RVAAP-12 Load Line 12. The public comment period for the Preferred Plan was June 6, 2018 to July 6, 2018. Ohio EPA is unaware of any comments received from the public regarding the November 2017 Load Line 12 Proposed Plan for Wet Sediment and Surface Water, Section 8.0 of the November 2017 Proposed Plan, “The Army, in coordination with Ohio EPA, will select the remedy for Load Line 12 after reviewing and considering all comments submitted during the 30-day public comment period.”

If comments were received during the public comment period for Load Line 12, please provide this information to Ohio EPA.

Army Response: One written comment and one oral comment was provided during the public meeting that presented proposed plans for Load Line 7, Load Line 9, Load Line 12, Wet Storage Area, and Upper and Lower Cobbs Ponds. No other comments were provided during the public notification period.

Neither comment pertained to the no further action recommendation for the wet sediment and surface water media at Load Line 12. The written comment inquired about what happens to Sand Creek after it exits Camp Ravenna, and the oral comment inquired about how the Army addresses potential impacts during soil removal activities. Although neither of these comments is applicable to the Load Line 12 wet sediment and surface water, responses are provided in the *Record of Decision for Wet Sediment and Surface Water at RVAAP-12 Load Line 12*. This Record of Decision is currently under review by the Army and will be submitted to Ohio EPA for review.

- 2) **Applicable Land Use(s) on Load Line 12.** The November 2017 Final Preferred Plan for Wet Sediment and Surface Water at Load Line 12 recommended No Further Action (NFA) with respect to wet sediment and surface water to attain Unrestricted (Residential) Land Use on Load Line 12. However, the July 2018 draft Proposed Plan for Load Lines 1 – 4 and 12 currently recommends all the Load Lines areas be remediated to Commercial/Industrial land use.

The July 2018 Proposed Plan for Load Lines 1 – 4 and 12, Section 1.0 states that sediment and surface water at Load Line 12 is being addressed separately. We recommend further discussion in the Load Lines 1 – 4 and 12 Preferred Plan with regard to sediments and surface water in Load Line 12 to minimize confusion over the recommended remedies in the two Preferred Plans for Load Line 12 and clarify in the Preferred Plan for Load Line 1 – 4 and 12 what media a commercial/industrial land use applies in sections that deal with Load Line 12.

Subject: Ravenna Army Ammunition Plant (RVAAP) Restoration Program, Portage/Trumbull Counties, Load Lines 1, 2, 3, 4, and 12 (Work Activity No. 267-000-859-030)

Army Response: Agree. In addition to clarifying text previously provided in Section 1.0 (fifth paragraph), the following text has been added to the end of Section 3.2, where Load Line 12 is discussed:

“The no further action recommendation for sediment and surface water at Load Line 12 was presented to the public in the *Proposed Plan for Wet Sediment and Surface Water at RVAAP-12 Load Line 12* (USACE 2017b).”

Also, the first two paragraphs of Section 10.0 Preferred Alternative have been revised as follows:

“Based on the comparative analysis of the alternatives summarized in Table 4, the recommended alternative for Load Lines 1 through 4 and 12 is Alternative 3: Commercial/Industrial Land Use – Ex-situ Thermal Treatment of Soil and Administrative LUCs. This alternative addresses soil contamination that poses risk for the Industrial Receptor Use at Load Lines 1 through 4 and 12. The proposed remediation of soil will allow for Commercial/Industrial Land Use at these AOCs.

As presented in this plan, there are no COCs for sediment or surface water preventing Unrestricted (Residential) Land Use at Load Line 1, Load Line 3, and Load Line 4. The no further action recommendation for sediment and surface water at Load Line 12 is presented in the *Proposed Plan for Wet Sediment and Surface Water at RVAAP-12 Load Line 12* (USACE 2017b).

After implementation of Alternative 3, soil at Load Lines 1 through 4 and 12 and sediment at Load Line 2 (Kelly’s Pond) will not attain Unrestricted (Residential) Land Use. Accordingly, LUCs are a component of Alternative 3.

Alternative 3 had the highest score in the balancing criteria analysis. Alternative 3 meets the threshold and primary balancing criteria and is protective of the Industrial and National Guard Trainee Receptors by thermally treating explosives-, PCB-, and PAH-contaminated soil and disposing of the metals-impacted soil off-site at a licensed, engineered landfill.

The estimated cost of Alternative 3 is \$1,649,093, making it the most cost-effective alternative. In addition, Alternative 3 is a green and highly sustainable alternative for on-site treatment and implements a treatment alternative to reduce the toxicity, mobility, and volume of contamination.

In the event that a thermal treatment system is not on-site at the former RVAAP, Alternative 2: Commercial/Industrial Land Use – Excavation and Off-site Disposal of Soil and Administrative LUCs is readily available and considered for implementation by the Army.”

Subject: Ravenna Army Ammunition Plant (RVAAP) Restoration Program, Portage/Trumbull Counties, Load Lines 1, 2, 3, 4, and 12 (Work Activity No. 267-000-859-030)

- 3) **Commercial/Industrial Land Use requires LUC.** The July 2018 Proposed Plan for Load Lines 1 – 4 and 12, Section 8.3, Line 42-44 states, “Upon removing the contaminated soil, no LUCs will be required for Commercial/Industrial Land Use. This appears to be a typo because land use restrictions are required for Commercial/Industrial Use.

Army Response: Clarification and agree. Alternative 2 and Alternative 3 would achieve Commercial/Industrial Land Use and therefore would not require LUCs for this specific land use. However, to eliminate confusion, the text has been revised as follows:

“Upon removing the contaminated soil, ~~no LUCs will be required for Commercial/Industrial Land Use. However,~~ some contaminated soil will be left in place preventing Unrestricted (Residential) Land Use. Consequently, LUCs are put in place to restrict use of this AOC (i.e., no residential use).”

- 4) **Ex-Situ Thermal Treatment.** The July 2018 Proposed Plan for Load Lines 1 – 4 and 12, Sections 8.3 and Section 8.5 discuss alternatives using Ex-Situ Thermal Treatment of Soils. Provide clarification regarding the Chemicals of Concern (CoCs) that thermal treatment effectively treats and which COCs will be addressed through removal and off-property disposal if above Remedial Goal Option (RGO).

Army Response: Agree. The first paragraph of Section 8.3 has been revised as follows:

“This alternative utilizes a combination of ex situ thermal treatment and excavation with off-site disposal to achieve Commercial/ Industrial Land Use.

Soil with PAHs, PCBs, and explosives as COCs will undergo thermal treatment. Thermal treatment is not effective at reducing concentrations of inorganic chemicals in soil. Consequently, soil with inorganic chemicals as COCs will undergo excavation and off-site disposal.

Implementation of Alternative 3 will result in thermal treatment of 5,683 cubic yards of soil and excavation and off-site disposal of approximately 156 cubic yards of metals-impacted soil from Load Lines 1 through 4 and 12.”

The first paragraph of Section 8.5 has been revised as follows:

“This alternative utilizes a combination of ex situ thermal treatment for soil and sediment and excavation with off-site disposal of soil to achieve Unrestricted (Residential) Land Use.

Soil with PAHs, PCBs, and explosives as COCs will undergo thermal treatment. Thermal treatment is not effective at reducing concentrations of inorganic chemicals in soil. Consequently, soil with inorganic chemicals as COCs will undergo excavation and off-site disposal.

Upon removing and treating the contaminated soil and sediment, no additional controls will be required for any receptor. Implementation of Alternative 5 will result in thermal treatment of 30,121 cubic yards of soil and sediment and excavation and off-site disposal of

Subject: Ravenna Army Ammunition Plant (RVAAP) Restoration Program, Portage/Trumbull Counties, Load Lines 1, 2, 3, 4, and 12 (Work Activity No. 267-000-859-030)

approximately 1,327 cubic yards of metals-impacted soil from Load Lines 1 through 4 and 12.”

- 5) **Remedial Alternatives Costs.** The July 2018 Proposed Plan for Load Lines 1 – 4 and 12, Section 10 gives the reader only the costs estimates for the recommended Alternative 3. Please include in Section 10 a reference to Table 4 for a side by side cost comparison for all the alternatives, so the reader can locate this information easily.

Army Response: Agree. The first sentence in Section 10.0 has been revised as follows:

“Based on the comparative analysis of the alternatives summarized in Table 4, the recommended alternative for Load Lines 1 through 4 and 12 is Alternative 3: Commercial/Industrial Land Use – Ex-situ Thermal Treatment of Soil and Administrative LUCs.”



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

August 24, 2018

Mr. David Connolly
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: "Draft Proposed Plan for Soil, Sediment, and Surface Water for Load Lines 1, 2, 3, 4 and 12 the Former Ravenna Army Ammunition Plant (RVAAP)" Document, (Work Activity No. 267-000859-030)

Dear Mr. Connolly:

The Ohio Environmental Protection Agency (Ohio EPA) received the Draft Proposed Plan for Load Lines 1-4 and 12 on July 24, 2018. According to the 2004 Director's Findings and Orders Section 5.a.i. "a Remedial Investigation and Feasibility Study (RI/FS), a Proposed Plan, a Record of Decision or other appropriate document and a remedy for each Area of Concern (AOC) or appropriate group of AOCs at the RVAAP;" is required to be developed and implemented.

Appendix A in the 2004 Order identifies these Load Lines as AOCs. Previous investigations and remedial actions have been taken at Load Lines 1 – 4 and 12 between 1978 to the present. This most recent study targets residual contamination in soil, sediment and surface water on these AOCs.

Comments

We have the following comments regarding the "Draft Proposed Plan for Soil, Sediment, and Surface Water at Load Lines 1-4 and 12."

- **Status of Proposed Plan for Wet Sediment and Surface Water for Load Line 12.** On June 21, 2018, Ohio EPA participated in the public meeting regarding the Proposed Plan for Wet Sediment and Surface Water at RVAAP-12 Load Line 12. The public comment period for this Preferred Plan was June 6, 2018 to July 6, 2018. Ohio EPA is unaware of any comments received from the public regarding the November 2017 Load Line 12 Proposed Plan for Wet Sediment and Surface



Water. Section 8.0 of the November 2017 Proposed Plan, "The Army, in coordination with Ohio EPA, will select the remedy for Load Line 12 after reviewing and considering all comments submitted during the 30-day public comment period."

- If comments were received during the public comment period for Load Line 12, please provide this information to Ohio EPA.
- **Applicable Land Use(s) on Load Line 12.** The November 2017 Final Preferred Plan for Wet Sediment and Surface Water at Load Line 12 recommended No Further Action (NFA) with respect to wet sediment and surface water to attain Unrestricted (Residential) Land Use on Load Line 12. However, the July 2018 draft Proposed Plan for Load Lines 1 – 4 and 12 currently recommends all the Load Line areas be remediated to Commercial/Industrial land use.


The July 2018 Proposed Plan for Load Lines 1-4 and 12, Section 1.0 states that sediment and surface water at Load Line 12 is being addressed separately. We recommend further discussion in the Load Lines 1-4 and 12 Preferred Plan with regard to sediments and surface water in Load Line 12 to minimize confusion over the recommended remedies in the two Preferred Plans for Load Line 12 and clarify in the Preferred Plan for Load Line 1-4 and 12 what media a commercial/industrial land use applies in sections that deal with Load Line 12.

- **Commercial/Industrial Land Use requires LUC.** The July 2018 Proposed Plan for Load Lines 1-4 and 12, Section 8.3, Line 42-44 states, "Upon removing the contaminated soil, no LUCS will be required for Commercial/Industrial Land Use. This appears to be a typo because land use restrictions are required for Commercial/Industrial Land Use.
- **Ex-Situ Thermal Treatment.** The July 2018 Proposed Plan for Load Lines 1-4 and 12, Sections 8.3 and Section 8.5 discuss alternatives using Ex-Situ Thermal Treatment of Soils. Provide clarification regarding the Chemicals of Concern (COCs) that thermal treatment effectively treats and which COCs will be addressed through removal and off-property disposal if above Remedial Goal Option (RGO).
- **Remedial Alternatives Costs.** The July 2018 Proposed Plan for Load Lines 1-4 and 12, Section 10 gives the reader only the cost estimates for the recommended Alternative 3. Please include in Section 10 a reference to Table 4 for a side by side cost comparison for all the alternatives, so the reader can locate this information easily.

MR. CONNOLLY
ARMY NATIONAL GUARD DIRECTORATE
AUGUST 24, 2018
PAGE 3 OF 3

If you have questions regarding these comments or you would like to discuss these comments with Ohio EPA, please feel free to contact me at (330) 963-1201 or Susan.Netzly-Watkins@epa.ohio.gov

Sincerely,



Sue Netzly-Watkins
Division of Environmental Response and Revitalization

SN-W/nvp

cc: Mark Johnson, Ohio EPA, NEDO, DERR
Rod Beals, Ohio EPA, NEDO, DERR
Bob Princic, Ohio EPA, NEDO, DERR
Tom Schneider, Ohio EPA, DERR, SWDO
Bill Damschroder, Legal
Carrie Rasik, Ohio EPA, DERR, CO
Nat Peters, II, USACE Louisville District
Katie Tait/Kevin Sedlak, Camp Ravenna, Newton Falls
Craig Coombs, USACE, Louisville District
Rebecca Shreffler, Camp Ravenna, Chenega, Newton Falls
Jed Thomas, Leidos



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

September 25, 2018

Mr. David Connolly
Army National Guard Directorate
ARNGD-ILE-CR
111 South George Mason Drive
Arlington, VA 22204

Re: **US Army Ammunition Plt RVAAP
Remediation Response
Project Records
Remedial Response
Portage County
267000859214**

Subject: Ravenna Army Ammunition Plant, Portage/Trumbull Counties. Response to Ohio EPA Comments on the "Update and Progress Report on the Remedial Investigation at CC RVAAP-69 Building 1048 Fire Station" at the Former Ravenna Army Ammunition Plant, Portage and Trumbull Counties, Ohio, Dated August 28, 2018

Dear Mr. Connolly:

The Ohio Environmental Protection Agency (Ohio EPA) has received and reviewed the response to Ohio EPA comments on the "Update and Progress Report on the Remedial Investigation (RI) at CC RVAAP-69 Building 1048 Fire Station" at the former Ravenna Army Ammunition Plant, Portage and Trumbull Counties, Ohio. This response document was received at Ohio EPA's Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR), on September 4, 2018. The response was prepared for the U.S. Army Corps of Engineers on behalf of the National Guard Bureau by PARSONS.

The submitted response is to Ohio EPA's comment letter dated August 16, 2018, regarding the July 24, 2018 "Update and Progress Report on the Remedial Investigation (RI) at CC RVAAP-69 Building 1048 Fire Station." Ohio EPA provided 11 comments.

COMMENTS

The Army has satisfactorily responded, and Ohio EPA concurs with responses to comment numbers 1, 2, 4, 5, 6, 7, 8, 9, 10, and 11. Ohio EPA provides clarification of our requirements on Comment 3 below:

- 1. Ohio EPA Comment 3.** In the report, isoconcentration maps of the combined parameters carbon tetrachloride and chloroform are presented in Figures 6 and 7. In these figures two isoconcentration lines are shown: 5 µg/L (the MCL for carbon tetrachloride) and one for 100 µg/L. The highest concentrations of carbon tetrachloride at sample locations on these maps are multiples of 100µ/L.

RECEIVED
26 SEPT 2018

First, the Army needs to delineate the concentrations of carbon tetrachloride and its degradation products to their respective FWCUG concentration (e.g., 0.24 µg/L for carbon tetrachloride and 0.27 µg/L for chloroform).

Additionally, for clarity, the isoconcentration maps need to reflect the full range of concentrations of a given parameter. Also, Ohio EPA recommends isocentration maps be prepared for individual parameters instead of groups of parameters. An isocentration line equivalent to a parameter's MCL may be included for reference.

Army Response to Comment 3. *As indicated in the legend for Figures 6 and 7, the isoconcentration lines are for carbon tetrachloride, not combined carbon tetrachloride and chloroform.*

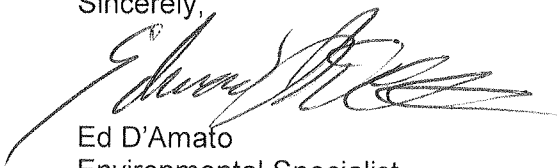
Agree that concentrations of carbon tetrachloride and its degradation products will be delineated to their respective FWCUG concentrations. Additional monitoring wells will be installed as indicated on Figure 10 to complete plume delineation. Grab sample results (Figure 6) also provide information for plume delineation.

The isoconcentration lines of 5 µg/L and 100 µg/L are an appropriate level of detail given the data collected to date. Additional contours can be added to plume maps in the RI Report after additional wells are installed and samples are analyzed.

Ohio EPA Clarification. Ohio EPA concurs with the response in the first two paragraphs; however, to clearly represent the full range of concentrations of carbon tetrachloride, which ranges from 7.3 to 1000 ug/l within the contour map presented on Figure 6, which shows the results for "Groundwater Grab Samples," a more appropriate contour interval than one that ends at 100 ug/l should be provided on future maps.

This response to Ohio EPA comments was reviewed by personnel from Ohio EPA, DERR and Ground Water reviewers. Thank you for your response. We provided minor clarification for future submittals. Ohio EPA looks forward to completion of the Remedial Investigation of the RVAAP-69 Building 1048 Fire Station. If you have questions, please call me at (330) 963-1170.

Sincerely,



Ed D'Amato
Environmental Specialist
Division of Environmental Response and Revitalization

ED/nvp

ec: Katie Tait, OHARNG RTLS
Kevin Sedlak, ARNG
Rebecca Schreffler, Chenega
Carrie Rasik, Ohio EPA, CO DERR
Thomas Schneider, Ohio EPA SWDO

Kevin Palombo, Ohio EPA, NEDO DERR
Albert Muller, Ohio EPA, NEDO DDAGW
Rodney Beals, Ohio EPA NEDO DERR
Bob Princic, Ohio EPA, NEDO DERR
Mark Johnson, Ohio EPA, NEDO DERR



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

August 28, 2018

Ohio Environmental Protection Agency
DERR-NEDO
Attn: Edward J. D'Amato, Project Coordinator
2110 East Aurora Road
Twinsburg, Ohio 44087-1924

Subject: Responses to Comments (dated August 16, 2018) on the "*Update and Progress Report on the Remedial Investigation at CC RVAAP-69 Building 1048 Fire Station*" at the Former Ravenna Army Ammunition Plant, Portage and Trumbull Counties, Ohio, Dated July 24, 2017, Ohio EPA ID# 267-000859-214

Dear Mr. D'Amato:

The Army appreciates your time and comments (dated August 16, 2018) on the *Update and Progress Report on the Remedial Investigation at CC RVAAP-69 Building 1048 Fire Station*" at the Former Ravenna Army Ammunition Plant, Portage and Trumbull Counties, Ohio, dated July 24, 2018. Enclosed are responses to your comments.

This was a Final document that was shared for informational purposes with the Ohio EPA. The Army is not planning on issuing another version of the report. However, the revisions and comments provided by the Ohio EPA will be incorporated into the investigation approach and documented in the Remedial Investigation Report once the investigation is complete.

Please contact the undersigned at (703) 607-7589 or david.m.connolly8.civ@mail.mil if there are issues or concerns with these responses.

Sincerely,

David M. Connolly
RVAAP Restoration Program Manager
Army National Guard Directorate

cc. Bob Princic, Ohio EPA, DERR-NEDO
Mark Johnson, Ohio EPA, DERR-NEDO
Tom Schneider, Ohio EPA, DERR-SWDO
Kevin Sedlak, ARNG
Katie Tait, OHARNG
Craig Coombs, USACE Louisville
Kevin Meiczkowski, USACE Louisville
Gail Harris, Vista Sciences Corp.
Ed Heyse, Parsons

Responses to Ohio EPA Comments (dated August 16, 2018)
Update and Progress Report on the Remedial Investigation at CC RVAAP-69 Building 1048
Fire Station at the Former Ravenna Army Ammunition Plant, Portage and Trumbull
Counties, Ohio, Dated July 24, 2017, Ohio EPA ID# 267-000859-214

1. To be consistent with the Facility-Wide Groundwater Remedial Investigation and associated reports, the submitted document needs to identify the hydrostratigraphic units beneath Camp Ravenna by their accepted conventional names.

Based on the elevation of the top of the weathered sandstone (about 1,005 feet AMSL), that hydrostratigraphic unit is the Upper Sharon Aquifer. In the report, the Upper Sharon Aquifer is variously referred to "weathered sandstone", "weathered bedrock", or the "deep zone." There are more than one sandstone hydrostratigraphic units beneath Camp Ravenna. For more information about the elevations of the different bedrock hydrostratigraphic units beneath Camp Ravenna, refer to the cross-sections in: the *2017 Facility-Wide Ground Water Annual Report*, and/or *RI Work Plan*, and/or *Geology and Ground Water Resources of Portage County Ohio* (Winslow and White, 1966).

Response: Agree that weathered sandstone layer is the Upper Sharon Aquifer. Text and Figures in the RI report will refer to this unit as the Upper Sharon Aquifer.

2. In the report's Summary of Findings (page 2), under the heading "Soil" (second bullet point), the report incorrectly states:

Carbon tetrachloride and chloroform were detected in soil samples above 14 feet bgs (in the brown clays, sands, and silts), which is consistent with previous investigations.

Figure 2 in the report shows that carbon tetrachloride was detected in the 2015 sample from soil boring 69-1048SB-101 at a depth of 14-15 feet bgs (4.6 µg/L) and a depth of 15-16 feet Bgs (3.2 µg/L [j]).

Response: Clarification. Please note that soil concentrations displayed in Figure 2 are in units of mg/kg, not µg/L. Agree that carbon tetrachloride was detected in samples from 69-1048SB-101 at depths of 14-15 and 15-16 feet bgs in 2015. Please note that these samples are within the brown clays, sands and silts and above the gray clay layer, which is consistent with the soil layers where carbon tetrachloride was detected in samples collected from borings installed in 2018. Please see cross-section Figure 3.

3. In the report, isoconcentration maps of the combined parameters carbon tetrachloride and chloroform are presented in Figures 6 and 7. In these figures, two isoconcentration lines are shown: 5 µg/L (the MCL for carbon tetrachloride) and one for 100 µg/L. The highest concentrations of carbon tetrachloride at sample locations on these maps are multiples of 100 µ/L.

First, the Army needs to delineate the concentrations of carbon tetrachloride and its degradation products to their respective FWCUG concentration (e.g., 0.24 µg/L for carbon tetrachloride and 0.27 µg/L for chloroform).

Additionally, for clarity, the isoconcentration [sic] maps need to reflect the full range of concentrations of a given parameter. Also, Ohio EPA recommends isocenters [sic] maps be prepared for individual parameters instead of groups of parameters. An isocentration [sic] line equivalent to a parameter's MCL may be included for reference.

Response: As indicated in the legend for Figures 6 and 7, the isoconcentration lines are for carbon tetrachloride, not combined carbon tetrachloride and chloroform.

Agree that concentrations of carbon tetrachloride and its degradation products will be delineated to their respective FWCUG concentrations. Additional monitoring wells will be installed as indicated on Figure 10 to complete plume delineation. Grab sample results (Figure 6) also provide information for plume delineation.

The isoconcentration lines of 5 µg/L and 100 µg/L are an appropriate level of detail given the data collected to date. Additional contours can be added to plume maps in the RI Report after additional wells are installed and samples are analyzed.

4. Ohio EPA agrees that the March 2018 water level data suggests a downward ground water gradient between the Unconsolidated and Upper Sharon Aquifers near the location of well pair 069MW-001/069MW-003.

Response: Comment noted.

5. Page 3 of the report claims that the gray clay layer beneath CC RVAAP-69 is limiting the vertical migration of ground water.

Given the presence of the degradation products chloroform (34 µ/L) and methylene chloride (15 µ/L) in "weathered sandstone" (Upper Sharon Aquifer) well 69MW-003 it is premature for the ARMY to make this claim.

It is unclear that the gray clay layer is laterally continuous enough and thick enough to be an effective barrier between the Unconsolidated Aquifer and the Upper Sharon Aquifer to prevent downward migration of contamination.

For more information about evaluating whether a clay or low permeability layer adequately protects underlying ground water when an overlying ground water zone is contaminated, refer to Ohio EPA's 2009 *Technical Guidance Manual Supplement* document entitled: *Assessment of an Aquitard during a Ground Water Contamination Investigation.*

Response: The report states: *"The three-foot difference in hydraulic head between these wells [069MW-001 and 069MW-003] suggests that the gray clay layer (located between the two screened intervals) is limiting vertical migration of groundwater."* This observation is a reasonable interpretation of the data at this well pair.

The Army acknowledges that the extent of the gray clay layer and its role and effectiveness as a barrier between the Unconsolidated Aquifer and the Upper Sharon Aquifer remain to be determined. To that end, the report indicates that additional soil borings (SB114 and SB115) will be completed to the top of the Upper Sharon Aquifer, and the potential for vertical migration of carbon tetrachloride decay products will be investigated by continued monitoring of well 069MW-003 and, if needed, installation of additional deep monitoring wells.

6. The report indicates that chloroform and methylene chloride contamination in well 069mw-003 may have been introduced during drilling.

If the presence of chloroform and methylene chloride in "weathered sandstone" (Upper Sharon Aquifer) is an artifact of cross-contamination originating in the Unconsolidated Aquifer and introduced into the well 069MW-003 during its installation and not removed

due to inadequate development, one would expect a detectable quantity of carbon tetrachloride to be present in that well and it is not.

If the Army believes that chloroform and methylene chloride were introduced by drilling, then it is not clear why they proposed in the report (page 5) to wait until after the June 2018 sampling event to redevelop well 069MW-003. This needs to be explained.

Response: The Army decided to wait until after the June 2018 sampling event to determine if the results of the March 2018 sampling event would be confirmed.

7. Page 4 of the report states: "Carbon tetrachloride DNAPL is unlikely to be present because dissolved concentrations in ground water are much lower than (sic) the solubility limit of 800,000 ug/l."

The facility has not adequately demonstrated that DNAPL is not present in the vicinity of Building 1048 Fire Station. According to the Interstate Technology and Regulatory Council's (ITRC's) 2015 guidance document entitled *Integrated DNAPL Site Characterization and Tools Selection*:

Historically, a 1% dissolved-phase concentration of chlorinated solvent DNAPL, based on compound-specific solubility in ground water, was thought to be indicative of potential presence of DNAPL; however, this method is now viewed as unreliable (that is, either falsely positive or falsely negative.)

It is unclear if the Army gauged any of the monitoring wells for DNAPL during sampling. This needs to be clarified. According to Chapter 10 of Ohio EPA's Technical Guidance Document (TGM) [2012]:

If the presence of NAPL is suspected, the sampling program should include devices and protocols to detect them.

If the ARMY has not gauged the CC RVAAP - 69 Building 1048 Fire Station's monitoring wells for DNAPL, it needs to gauge them to demonstrate the presence or absence of DNAPL. Protocols to detect immiscible liquids should also include the visual inspection of purge water and any equipment removed from the well.

Response: All wells are gauged with an interface probe. To date no NAPL has been detected. Wells will be gauged for DNAPL during all subsequent monitoring events. There was no indication of DNAPL in well development or purging notes, and concentrations in waste characterization samples of purge water were well below solubility.

8. The report indicates (page 3 and Figures 6 and 7) that a ground water data gap exists north of well 069MW-001. However, the Army has not proposed any additional Unconsolidated Aquifer monitoring wells in this area. This needs to be explained.

Response: Additional well 069MW-006 will be installed northwest of existing well 069MW-002 and will provide additional delineation to the north of 069MW-001. Results from new well 069MW-006 and grab sample 069WP-017 (Figure 6) are expected to provide adequate delineation on the north side of the plume.

9. Ohio EPA agrees that if chlorinated methanes continue to be detected in well 069MW-003 that the Army will have to install additional wells in the Upper Sharon Aquifer in the

vicinity of CC RVAAP-69 to delineate contamination in that hydrostratigraphic zone.

Response: Comment noted.

10. On Figure 8 and 10, the practical quantification limit (PQL) for carbon tetrachloride in the March 2018 ground water sample from well 069MW-003 is listed as 0.18 µg/L, and in Table 3 of the report the PQL for that sample is listed as 0.25 µg/L. It needs to be clarified what the PQL for carbon tetrachloride in March 2018 sample from 069MW-003 is.

Response: The detection limit was 0.18 µg/L and level of detection (LOD) was 0.25 µg/L. In accordance with the QAPP and DoD Quality Systems Manual, we will report the non-detections at the LOD (in this case, 0.25 µg/L) in all figures and tables in the RI report.

11. The report contains a few typographical errors that should be corrected to improve the clarity of the report.

On page 3 under the third bullet item: "well 06MW-003" should be "well 069MW-003" and "1,016.7 feet bgs" should be "1,016.7 feet AMSL. Also, on Figure 2 soil boring "72-1048RVSB2" should be "69-1048RVSB2".

Response: Comment noted.



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

August 16, 2018

Mr. David Connolly
Army National Guard Directorate
Environmental Programs Division
ARNG-ILE-CR
111 South George Mason Drive
Arlington, VA 22204

Re: **US Army Ammunition PLT RVAAP
Remediation Response
Project Records
Remedial Response
Portage County
267000859214**

Subject: Ravenna Army Ammunition Plant, Portage/Trumbull Counties. Ohio EPA Comments on the "Update and Progress Report on the Remedial Investigation at CC RVAAP-69 Building 1048 Fire Station" at the Former Ravenna Army Ammunition Plant, Portage and Trumbull Counties, Ohio, Dated July 24, 2018, Ohio EPA ID # 267-000859-214

Dear Mr. Connolly:

The Ohio Environmental Protection Agency (Ohio EPA) has received and reviewed the **"Update and Progress Report on the Remedial Investigation at CC RVAAP-69 Building 1048 Fire Station"** at the Former Ravenna Army Ammunition Plant, Portage and Trumbull Counties, Ohio. This document was received at Ohio EPA's Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR), on July 24, 2018. The report was prepared for the US Army Corps of Engineers on behalf of the U.S. Army National Guard Bureau by PARSONS.

The Army has not completed the assessment of the CC RVAAP-69 Building 1048 Fire Station (CC RVAAP-69). This review is based only on the work done by the Army to date, and proposed work to delineate ground water impacts in the area. Because CC RVAAP-69 ground water contamination issues are captured under the Facility-wide Groundwater Remedial Investigation, Ohio EPA requests that we have the opportunity to comment on further efforts to delineate impacts to ground water in this area as the work proceeds.

Comments on the current Update Report based on Ohio EPA review are provided below. Please provide responses to the enclosed comments in accordance with the Directors Findings and Orders.

RECEIVED
16 AUG 2018

BACKGROUND

The RVAAP-69, is the former location of Building 1048 Fire Station. It is located in the northwest quadrant of the intersection of George Road and South Service Road. No documentation was found regarding the specific years of service for the fire station. A site schematic dated 1941 shows the fire station, which was razed in 2008. The fire station is currently vacant land. Depth to ground water in this area is expected to be between 10 and 20 feet below ground surface (bgs).

Chemicals of potential concern (COPCs) associated with the fire station include carbon tetrachloride and its degradation products. Carbon tetrachloride was used through the 1950's to extinguish fires.

Previous Remedial Investigation (RI) sampling of CC RVAAP-69 Building 1048 Fire Station (CC RVAAP-69) was conducted in 2012 and 2015.

Subsurface geology beneath CC RVAAP 69 typically consists of 15 to 19 feet of interbedded brown clay, silt, and sand (surface elevation [about 1025 feet AMSL] to about 1,010 feet AMSL) overlying 5 to 7 feet of gray clay (1,010 feet AMSL to 1,003 feet AMSL) overlying "weathered brown sandstone" (1,003 to 1,005 feet AMSL).

UPDATE/PROGRESS REPORT ON RI INVESTIGATION AT CC-RVAAP-69 FIRE STATION

According to the report, the objectives of the 2017 Final Work Plan for investigations of CC RVAAP-69 are:

- Define the vertical extent of carbon tetrachloride in soil near boring 069SB-101;
- Define the lateral extent of carbon tetrachloride contamination in soil below a depth of 1,018 feet above mean sea level (AMSL); and
- Evaluate impacts to ground water.

Work Completed in February-March 2018. The report summarizes work done in February and March of 2018 to augment previous soil sampling done in 2012 and 2015 to support the stated goals of the Final Work Plan. The work completed in February and March of 2018 included:

- Advanced and sampled soil from four soil borings (69-1048SB-110, 69-1048SB-111, 06-1048SB-112, 69-1048SB-113). Soil borings ranged in depth from 14 feet (69-1048SB-112) to 28 feet (69-1048SB-110) bgs. Multiple soil samples were analyzed for VOCs from each of the borings;

- Collected grab ground water samples for screening purposes using direct push techniques from 17 temporary well locations (refer to attached Figure 1). The 17 temporary wells were open to various interval lengths ranging from 5 (069WP-001) to 20 feet (069WP-011) in the Unconsolidated Aquifer; and
- Installed and sampled five new permanent monitoring wells. Four wells (069MW-001, 069MW-002, 069MW-004, and 069MW-005) were screened in the Unconsolidated Aquifer and were constructed with ten-foot long screens. One well (069MW-003) was screened in the weathered portion of “weathered sandstone” and was constructed with a five-foot long screen.

COMMENTS

1. To be consistent with the Facility-Wide Groundwater Remedial Investigation and associated reports, the submitted document needs to identify the hydrostratigraphic units beneath Camp Ravenna by their accepted conventional names.

Based on the elevation of the top of the weathered sandstone (about 1,005 feet AMSL), that hydrostratigraphic unit is the Upper Sharon Aquifer. In the report, the Upper Sharon Aquifer is variously referred to “weathered sandstone”, “weathered bedrock”, or the “deep zone.” There are more than one sandstone hydrostratigraphic units beneath Camp Ravenna. For more information about the elevations of the different bedrock hydrostratigraphic units beneath Camp Ravenna, refer to the cross-sections in: the *2017 Facility-Wide Ground Water Annual Report*, and/or *RI Work Plan*, and/or *Geology and Ground Water Resources of Portage County Ohio* (Winslow and White, 1966).

2. In the report’s Summary of Findings (page 2), under the heading “Soil” (second bullet point), the report incorrectly states:

Carbon tetrachloride and chloroform were detected in soil samples above 14 feet bgs (in the brown clays, sands, and silts), which is consistent with previous investigations.

Figure 2 in the report shows that carbon tetrachloride was detected in the 2015 sample from soil boring 69-1048SB-101 at a depth of 14-15 feet bgs (4.6µg/L) and a depth of 15-16 feet Bgs (3.2 µg/L [j]).

3. In the report, isoconcentration maps of the combined parameters carbon tetrachloride and chloroform are presented in Figures 6 and 7. In these figures, two isoconcentration lines are shown: 5 µg/L (the MCL for carbon tetrachloride)

and one for 100 µg/L. The highest concentrations of carbon tetrachloride at sample locations on these maps are multiples of 100µ/L.

First, the Army needs to delineate the concentrations of carbon tetrachloride and its degradation products to their respective FWCUG concentration (e.g., 0.24 µg/L for carbon tetrachloride and 0.27 µg/L for chloroform).

Additionally, for clarity, the isoconcentration maps need to reflect the full range of concentrations of a given parameter. Also, Ohio EPA recommends isocentration maps be prepared for individual parameters instead of groups of parameters. An isocentration line equivalent to a parameter's MCL may be included for reference.

4. Ohio EPA agrees that the March 2018 water level data suggests a downward ground water gradient between the Unconsolidated and Upper Sharon Aquifers near the location of well pair 069MW-001/069MW-003.
5. Page 3 of the report claims that the gray clay layer beneath CC RVAAP-69 is limiting the vertical migration of ground water.

Given the presence of the degradation products chloroform (34 µ/L) and methylene chloride (15 µ/L) in "weathered sandstone" (Upper Sharon Aquifer) well 69MW-003 it is premature for the ARMY to make this claim.

It is unclear that the gray clay layer is laterally continuous enough and thick enough to be an effective barrier between the Unconsolidated Aquifer and the Upper Sharon Aquifer to prevent downward migration of contamination.

For more information about evaluating whether a clay or low permeability layer adequately protects underlying ground water when an overlying ground water zone is contaminated, refer to Ohio EPA's 2009 *Technical Guidance Manual Supplement* document entitled: Assessment of an Aquitard during a Ground Water Contamination Investigation.

6. The report indicates that chloroform and methylene chloride contamination in well 069mw-003 may have been introduced during drilling.

If the presence of chloroform and methylene chloride in "weathered sandstone" (Upper Sharon Aquifer) is an artifact of cross-contamination originating in the Unconsolidated Aquifer and introduced into the well 069mw-003 during its installation and not removed due to inadequate development, one would expect a detectable quantity of carbon tetrachloride to be present in that well and it is not.

If the Army believes that chloroform and methylene chloride were introduced by drilling, then it is not clear why they proposed in the report (page 5) to wait until after the June 2018 sampling event to redevelop well 069MW-003. This needs to be explained.

7. Page 4 of the report states: "Carbon tetrachloride DNAPL is unlikely to be present because dissolved concentrations in ground water are much lower than (sic) the solubility limit of 800,000 ug/l."

The facility has not adequately demonstrated that DNAPL is not present in the vicinity of Building 1048 Fire Station. According to the Interstate Technology and Regulatory Council's (ITRC's) 2015 guidance document entitled *Integrated DNAPL Site Characterization and Tools Selection*:

Historically, a 1% dissolved-phase concentration of chlorinated solvent DNAPL, based on compound-specific solubility in ground water, was thought to be indicative of potential presence of DNAPL; however, this method is now viewed as unreliable (that is, either falsely positive or falsely negative.)

It is unclear if the Army gauged any of the monitoring wells for DNAPL during sampling. This needs to be clarified. According to Chapter 10 of Ohio EPA's Technical Guidance Document (TGM) [2012]:

If the presence of NAPL is suspected, the sampling program should include devices and protocols to detect them.

If the ARMY has not gauged the CC RVAAP – 69 Building 1048 Fire Station's monitoring wells for DNAPL, it needs to gauge them to demonstrate the presence or absence of DNAPL. Protocols to detect immiscible liquids should also include the visual inspection of purge water and any equipment removed from the well.

8. The report indicates (page 3 and Figures 6 and 7) that a ground water data gap exists north of well 069MW-001. However, the Army has not proposed any additional Unconsolidated Aquifer monitoring wells in this area. This needs to be explained.
9. Ohio EPA agrees that if chlorinated methanes continue to be detected in well 069MW-003 that the Army will have to install additional wells in the Upper Sharon Aquifer in the vicinity of CC RVAAP-69 to delineate contamination in that hydrostratigraphic zone.

10. On Figure 8 and 10, the practical quantification limit (PQL) for carbon tetrachloride in the March 2018 ground water sample from well 069MW-003 is listed as 0.18 µg/L, and in Table 3 of the report the PQL for that sample is listed as 0.25 µg/L. It needs to be clarified what the PQL for carbon tetrachloride in March 2018 sample from 069MW-003 is.
11. The report contains a few typographical errors that should be corrected to improve the clarity of the report.

On page 3 under the third bullet item: "well 06MW-003" should be "well 069MW-003" and "1,016.7 feet bgs" should be "1,016.7 feet AMSL. Also, on Figure 2 soil boring "72-1048RVSB2" should be "69-1048RVSB2".

This Update and Progress Report on the Remedial Investigation at CC RVAAP-69 Building 1048 Fire Station was reviewed by personnel from Ohio EPA. Additional information is necessary to concur with approach provided for further investigation. If you have questions or would like to set up a meeting to discuss these comments, please call me at (330) 963-1292.

Sincerely,



Kevin M. Palombo
Environmental Specialist
Division of Environmental Response and Revitalization

KP/nvp

ec: Rebecca Schreffler, Chenega
Katie Tait, OHARNG RTLS
Kevin Sedlak, ARNG
Bob Princic, Ohio EPA, NEDO, DERR
Mark Johnson, Ohio EPA, NEDO, DERR
Rodney Beals, Ohio EPA, NEDO, DERR
Thomas Schneider, Ohio EPA, SWDO, DERR
Albert Muller, Ohio EPA, NEDO, DDAGW
Carrie Rasik, Ohio EPA, CO, DERR
Edward D'Amato, Ohio EPA, NEDO, DERR



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

November 21, 2018

Mr. David Connolly
Army National Guard Directorate
Environmental Programs Division
ARNG-ILE-CR
111 S. George Mason Dr.
Arlington, VA 22204

**Re: US Army Ravenna Ammunition Plt RVAAP
Remediation Response
Project records
Remedial Response
Portage County
267000859220**

**Subject: Final Site Inspection Report, CC-RVAAP-70 East Classification
Yard, September 13, 2018, Portage/Trumbull Counties, OHIO EPA
ID # 267-000859-220**

Dear Mr. Connolly:

The Ohio Environmental Protection Agency (Ohio EPA), Northeast District Office has reviewed the Final Site Inspection Report for CC-RVAAP-70, East Classification Yard dated and received by Ohio EPA on November 1, 2018. Ohio EPA approves the document as submitted.

If you have any questions or concerns related to this review or would like to schedule a meeting or conference call, please free feel to contact me at (330) 963-1170.

Sincerely,

Edward J. D'Amato
Project Coordinator
Ohio EPA - Division of Emergency and Remedial Response

ED/nvp

ec: Rebecca Schreffler, Chenega
Katie Tait, OHARNG RTLS
Kevin Sedlak, ARNG
Craig Coombs, USACE Louisville
Nat Peters, USACE Louisville
Mark Johnson, Manager, DERR, NEDO
Bob Princic, Supervisor, DERR, NEDO
Thomas Schneider, Ohio EPA, SWDO, DERR





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

October 23, 2018

Mr. David Connolly
Army National Guard Directorate
Environmental Programs Division
ARNG-ILE-CR
111 S. George Mason Dr.
Arlington, VA 22204

Re: **US Army Ravenna Ammunition Plt RVAAP
Remediation Response
Project records
Remedial Response
Portage County
267000859220**

**Subject: Draft Site Inspection Report, CC-RVAAP-70 East Classification Yard,
September 13, 2018, Portage/Trumbull Counties, OHIO EPA ID # 267000859220**

Dear Mr. Connolly:

The Ohio Environmental Protection Agency (Ohio EPA), Northeast District Office has reviewed the Draft Site Inspection Report for CC-RVAAP-70, East Classification Yard dated and received by Ohio EPA on September 13, 2018.

Additional sampling was conducted in accordance with the 2017 Work Plan for Additional Sampling for CC RVAAP-69 Building 1048 Fire Station, CC RVAAP-70 East Classification Yard, and CC RVAAP-74 Building 1034-Motor Pool Hydraulic Lift. Seven decision units (DUs) were defined and investigated. Ohio EPA concurs with the recommendation for further evaluation in a Remedial Investigation (RI) and has no further comments.

If you have any questions or concerns related to this review or would like to schedule a meeting or conference call, please free feel to contact me at (330) 963-1170.

Sincerely,

A handwritten signature in black ink, appearing to read "Edward J. D'Amato".

Edward J. D'Amato
Project Coordinator
Ohio EPA - Division of Emergency and Remedial Response

ED/nvp

ec: Rebecca Schreffler, Chenega
Kevin Sedlak, ARNG
Angela Schmidt, USACE Louisville
Mark Johnson, Manager, DERR, NEDO
Bob Princic, Supervisor, DERR, NEDO

Katie Tait, OHARNG RTLS
Craig Coombs, USACE Louisville
Gail Harris, Vista Sciences Corporation
Thomas Schneider, Ohio EPA, SWDO, DERR

RECEIVED
26 OCT 2018



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

October 9, 2018

Mr. David Connolly
Army National Guard Directorate
Environmental Programs Division
ARNG-ILE-CR
111 S. George Mason Dr.
Arlington, VA 22204

**Re: US Army Ravenna Ammunition PLT RVAAP
Remediation Response
Project Records
Remedial Response
Portage County
267000859244**

Subject: Final Record of Decision for RVAAP-73, Facility-wide Coal Storage, July 27, 2018

Dear Mr. Connolly:

The Ohio Environmental Protection Agency (Ohio EPA) has received and reviewed the "Final Record of Decision for RVAAP-73 Facility-wide Coal Storage," for the Ravenna Army Ammunition Plant (RVAAP), Portage/Trumbull Counties. The document, dated July 27, 2018, was received at the Northeast District Office (NEDO) on July 27, 2018. This letter serves to document Ohio EPA's concurrence regarding the proposal of No Further Action (NFA) for RVAAP-73 Facility-wide Coal Storage site as discussed in the Final Record of Decision (ROD).

Based on investigative findings documented in the Final Remedial Investigation report, human health risk assessment, and ecological risk assessment, the information contained in the Final Proposed Plan, other investigation documents/reports, and Ohio EPA's oversight participation during the investigation, Ohio EPA concurs with the ROD for the RVAAP-73 Facility-wide Coal Storage.

A public meeting was held on February 28, 2018, that was public noticed through radio stations, television stations, and newspapers. A 30-day public comment period was held between February 16, 2018 and March 17, 2018. No comments were received; therefore, the ROD contains no significant changes from the Final PP.

If you have any questions concerning the above, please feel free to contact Ed D'Amato at (330) 963-1170.

Sincerely,

A handwritten signature in blue ink, appearing to read "C. Butler", is written over a horizontal line.

Craig W. Butler
Director

RECEIVED
09 OCT 2018

CWB/ED/nvp

ec: Rebecca Schreffler, Chenega
Kevin Sedlak, ARNG
Angela Schmidt, USACE Louisville
Mark Johnson, Manager, DERR, NEDO
Bob Princic, Supervisor, DERR, NEDO

Katie Tait, OHARNG RTLS
Craig Coombs, USACE Louisville
Gail Harris, Vista Sciences Corporation
Thomas Schneider, Ohio EPA, SWDO, DERR



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

RECEIVED
2/13/2018

February 13, 2018

**Re: US Army Ravenna Ammunition PLT RVAAP
Remediation Response
Project Records
Remedial Response
Trumbull County
267000859244**

Mr. Mark Leeper, P.G., MBA
Team Lead
Cleanup and Restoration Branch
ARNG Directorate
111 George Mason St.
Arlington, VA 22204

**Subject: Final Proposed Plan for RVAAP-73, Facility-wide Coal Storage,
February 8, 2018**

Dear Mr. Leeper:

The Ohio Environmental Protection Agency (Ohio EPA) has received and reviewed the "Final Proposed Plan for RVAAP-73, Facility-wide Coal Storage" document for the Ravenna Army Ammunition Plant (RVAAP), Portage/Trumbull counties. The document, dated February 1, 2018, was received at the Northeast District Office (NEDO) on February 1, 2018. No Further Action is proposed for the site.

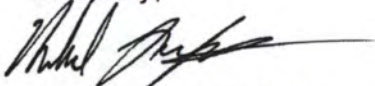
Based on the information contained in the Final Proposed Plan (PP) document, other investigation documents/reports and Ohio EPA's oversight participation during the investigation, Ohio EPA concurs with the Final PP document for RVAAP-73, Facility-wide Coal Storage.

As stated in the Final PP, the Army will offer a public comment period and hold an open house/public meeting on February 28, 2018, to present the conclusions and investigative findings for RVAAP-73, Facility-wide Coal Storage.

MR. MARK LEEPER
ARMY NATIONAL GUARD DIRECTORATE
PAGE 2

If you have any questions concerning the above, please feel free to contact Ed D'Amato at (330) 963-1170.

Sincerely,



Michael Proffitt, Chief
Division of Environmental Response and Revitalization

ED/nvp

ec: Katie Tait/Kevin Sedlak, ARNG, Camp Ravenna
Gail Harris/Rebecca Shreffler, Vista Sciences
Craig Coombs, USACE Louisville
Mark Leeper, Program Manager, ANG
Tom Schneider, Supervisor, Ohio EPA, CO, DERR
Brian Tucker/Carrie Rasik, Ohio EPA, CO, DERR
Rod Beals, Ohio EPA, NEDO, DERR
Vanessa Steigerwald Dick, Ohio EPA, NEDO, DERR
Bob Princic, Ohio EPA, NEDO, DERR
Bill Damschroder, Esq., Ohio EPA, Legal



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

November 19, 2018

Ohio Environmental Protection Agency
DERR-NEDO
Attn: Edward J. D'Amato, Project Coordinator
2110 East Aurora Road
Twinsburg, Ohio 44087-1924

Subject: Responses to Comments (dated November 15, 2018) on the *Draft Record of Decision for CC RVAAP-76 Depot Area at the Former Ravenna Army Ammunition Plant, Portage and Trumbull Counties, Ohio*, Dated October 19, 2018. Ohio EPA ID # 267-000859-243

Dear Mr. D'Amato:

The Army appreciates your time and comments (dated November 15, 2018) on the *Draft Record of Decision for CC RVAAP-76 Depot Area at the Former Ravenna Army Ammunition Plant, Portage and Trumbull Counties, Ohio*, dated October 19, 2018. Enclosed for your review are responses to your comments.

Upon final resolution of these responses to comments, the Army will update the report, and distribute final version of this report for Ohio EPA approval.

Please contact the undersigned at (703) 607-7589 or david.m.connolly8.civ@mail.mil if there are issues or concerns with this submission.

Sincerely,

 Date: 2018.11.19
11:54:29 -05'00'

Mr. David M. Connolly
RVAAP Restoration Program Manager
Army National Guard Directorate

cc. Tom Schneider, Ohio EPA, DERR-CO
Mark Johnson, Ohio EPA, DERR-NEDO
Bob Princic, Ohio EPA, DERR-NEDO
Kevin Sedlak, ARNG, Camp Ravenna
Katie Tait, ARNG, Camp Ravenna
Craig Coombs, USACE Louisville
Kevin Mieczkowski, USACE Louisville
Gail Harris, Vista Sciences
Patrick Ryan, Leidos

Responses to Ohio EPA Comments (dated November 15, 2018)
***Draft Record of Decision for CC RVAAP-76 Depot Area at the Former Ravenna Army
Ammunition Plant, Portage and Trumbull Counties, Ohio, Dated October 22, 2018. Ohio
EPA ID# 267-000859-243***

1.) Part 1, Section B Statement of Basis and Purpose

Please delete the follow language from lines 298 through 302:

"The Ohio EPA concurs with the selected remedy and that it satisfies the requirements of the Ohio EPA Director's Final Findings and Orders, dated June 10, 2004 (Ohio EPA 2004) in that the selected remedy is protective of human health and the environment and obviates the need for further corrective action under other applicable laws and regulations."

Please replace it with the sentence below, similar to language for the RVMP-001-R-02 Ramsdell Quarry Landfill Munitions Response Site Area 1 (North) NFA Proposed Plan, which was approved by Ohio EPA management:

"The Ohio EPA, the supporting state regulatory agency, reviewed and concurred with the Final Proposed Plan for RVMP-76 Depot Area (Parsons, 2018)."

Response: Correction. *The sentence has been revised to state the following:*

"The Ohio EPA, the supporting state regulatory agency, reviewed and concurred with the Proposed Plan for CC RVAAP-76 Depot Area (Parsons 2018)."

2.) Section J.8 State Acceptance

Please delete the following from lines 1002 and 1003:

"Ohio EPA concurs that Alternative 1, No Action, and Alternative 2, Land Use controls, do not provide adequate protection of human health and the environment."

This section should now read:

"State acceptance was evaluated formally after the public comment period on the Proposed Plan. Ohio EPA has expressed its support for Alternative 3, Excavation and Off-Site Disposal."

Response: Correction. *The paragraph has been revised to state the following:*

"State acceptance was evaluated formally after the public comment period on the Proposed Plan. Ohio EPA has expressed its support for Alternative 3. Excavation and Off-Site Disposal."



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

November 15, 2018

**Re: US Army Ravenna Ammunition PLT RVAAP
Remediation Response
Project Records
Remedial Response
Trumbull County
267000859243**

Mr. David Connolly
Army National Guard Directorate
Environmental Programs Division
ARNG-ILE-CR
111 S. George Mason Dr.
Arlington, VA 22204

Subject: Draft Record of Decision for RVAAP-76 Depot Area, October 19, 2018

Dear Mr. Connolly:

The Ohio Environmental Protection Agency (Ohio EPA) has received and reviewed the "Draft Decision Document for RVAAP-76 Depot Area" document for the Ravenna Army Ammunition Plant (RVAAP), Portage/Trumbull Counties. The document, dated October 19, 2018, was received at the Northeast District Office (NEDO) on October 22, 2018. Ohio EPA has the following comments:

1. Part 1, Section B Statement of Basis and Purpose

Please delete the following language from lines 298 through 302:

"The Ohio EPA concurs with the selected remedy and that it satisfies the requirements of the Ohio EPA Director's Final Findings and Orders, dated June 10, 2004 (Ohio EPA 2004) in that the selected remedy is protective of human health and the environment and obviates the need for further corrective action under other applicable laws and regulations."

Please replace it with the sentence below, similar to language for the RVAAP-001-R-02 Ramsdell Quarry Landfill Munitions Response Site Area 1 (North) NFA Proposed Plan, which was approved by Ohio EPA management:

"The Ohio EPA, the supporting state regulatory agency, reviewed and concurred with the Final Proposed Plan for RVAAP-76 Depot Area (Parsons, 2018)."

RECEIVED
16 NOV 2018

2. Section J.8 State Acceptance

Please delete the following from lines 1002 and 1003:

"Ohio EPA concurs that Alternative 1, No Action, and Alternative 2, Land Use controls, do not provide adequate protection of human health and the environment."

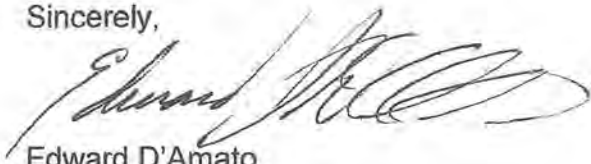
This section should now read:

"State acceptance was evaluated formally after the public comment period on the Proposed Plan. Ohio EPA has expressed its support for Alternative 3, Excavation and Off-Site Disposal."

Please note that Ohio EPA does not concur with remedies prior to the approval of the Record of Decision (ROD). Please be sure that language in future Records of Decision is consistent with these edits.

If you have any questions concerning the above, please feel free to contact Ed D'Amato at (330) 963-1170.

Sincerely,



Edward D'Amato
Site Coordinator
Division of Environmental Response and Revitalization

ED:cla

ec: Rebecca Schreffler, Chenega
Katie Tait/Kevin Sedlak, OHARNG RTLS
Craig Coombs, USACE Louisville
Nat Peters, USACE Louisville
Mark Johnson, Manager, Ohio EPA, NEDO, DERR
Bob Princic, Supervisor, Ohio EPA, NEDO, DERR
Thomas Schneider, Ohio EPA, SWDO, DERR



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

RECEIVED
2/13/2018

February 13, 2018

**Re: US Army Ravenna Ammunition PLT RVAAP
Remediation Response
Project Records
Remedial Response
Trumbull County
267000859243**

Mr. Mark Leeper, P.G., MBA
Team Lead
Cleanup and Restoration Branch
ARNG Directorate
111 George Mason St.
Arlington, VA 22204

Subject: Final Proposed Plan for RVAAP-76 Depot Area, February 1, 2018

Dear Mr. Leeper:

The Ohio Environmental Protection Agency (Ohio EPA) has received and reviewed the "Final Proposed Plan for RVAAP-76 Depot Area" document for the Ravenna Army Ammunition Plant (RVAAP), Portage/Trumbull Counties. The document, dated February 1, 2018, was received at the Northeast District Office (NEDO) on February 1, 2018. Removal and disposal of contaminated surface soil, and replacement of the excavated material with clean backfill, is the preferred alternative at this Area of Concern (AOC).

Based on the information contained in the Final Proposed Plan (PP) document, other investigation documents/reports and Ohio EPA's oversight participation during the investigation, Ohio EPA concurs with the Final PP document for RVAAP-76 Depot Area.

As stated in the Final PP, the Army will offer a public comment period and hold an open house/public meeting on February 28, 2018, to present the conclusions and investigative findings for RVAAP-76 Depot Area.

MR. MARK LEEPER
ARMY NATIONAL GUARD DIRECTORATE
February 8, 2018
PAGE 2

If you have any questions concerning the above, please feel free to contact Ed D'Amato at (330) 963-1170.

Sincerely,

A handwritten signature in black ink, appearing to read 'Michael Proffitt', with a stylized flourish at the end.

Michael Proffitt, Chief
Division of Environmental Response and Revitalization

ED:cla

ec: Katie Tait/Kevin Sedlak, ARNG, Camp Ravenna
Gail Harris/Rebecca Shreffler, Vista Sciences
Craig Coombs, USACE Louisville
Mark Leeper, Program Manager, ANG
Tom Schneider, Supervisor, Ohio EPA, Central Office, DERR
Brian Tucker/Carrie Rasik, Ohio EPA, Central Office, DERR
Rod Beals, Ohio EPA, NEDO, DERR
Vanessa Steigerwald-Dick, Ohio EPA, NEDO, DERR
Bob Princic, Ohio EPA, NEDO, DERR
Bill Damschroder, Esq., Ohio EPA, Central Office, Legal



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

November 14, 2018

Mr. David Connolly
Army National Guard Directorate
Environmental Programs Division
ARNG-ILE-CR
111 S. George Mason Dr.
Arlington, VA 22204

Re: **US Army Ravenna Ammunition Plt RVAAP
Remediation Response
Correspondence
Remedial Response
Portage County
267000859156**

**Subject: Approval of the Final Site Inspection Addendum Report, CC-RVAAP-78 Quarry
Pond Surface Dump, September 18, 2018.**

Dear Mr. Connolly:

The Ohio Environmental Protection Agency (Ohio EPA) has reviewed the Army's Final Site Inspection Addendum for CC RVAAP-78 Quarry Pond Surface Dump, dated September 19, 2018. Ohio EPA approves the document.

A typographical error was noted in the report that failed to delete a sentence that was changed on Page xvii, lines 681-683, as noted in Comment #3 in Ohio EPA's comment letter dated September 18, 2018. The error was resolved on September 28, 2018, when Ohio EPA received a replacement page for the document via e-mail.

If you have any questions or concerns related to this review or would like to schedule a meeting or conference call, please free feel to contact me at (330) 963-1170 or by e-mail at: ed.damato@epa.ohio.gov.

Sincerely,

Edward J. D'Amato, Project Coordinator
Ohio EPA - Division of Emergency and Remedial Response

ED/nvp

ec: Rebecca Schreffler, Chenega
David Connolly, ARNG
Katie Tait, OHARNG RTLS
Kevin Sedlak, ARNG
Craig Coombs, USACE Louisville
Mark Johnson, Manager, DERR, NEDO
Bob Princic, Supervisor, DERR, NEDO
Thomas Schneider, Ohio EPA, SWDO, DERR

Received
15 NOV 2018



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

September 18, 2018

Mr. David Connolly
Army National Guard Directorate
Environmental Programs Division
ARNG-ILE-CR
111 S. George Mason Dr.
Arlington, VA 22204

Re: US Army Ravenna Ammunition Plt RVAAP
Remediation Response
Correspondence
Remedial Response
Portage County
267000859156

Subject: Ohio EPA's Review of Response to Comments, Draft Site Inspection Addendum Report, CC-RVAAP-78 Quarry Pond Surface Dump, September 7, 2018.

Dear Mr. Connolly:

The Ohio Environmental Protection Agency (Ohio EPA) has reviewed the Army's response to Ohio EPA's comments on the Draft Revised Site Inspection Addendum for CC RVAAP-78 Quarry Pond Surface Dump. The response letter was received by this office on September 11, 2018. Below are the comments with the Army's response included in italics:

Ohio EPA has reviewed the document and has the following comments:

1. Page xiii, lines 491-492: It appears Figures 1 and 2 are referenced incorrectly. Figure 2 is labeled as a topographic map of the area; however, that map appears to be Figure 3-1 on which the reference points and debris piles are not labeled. It is unclear what Figure 1 is supposed to be. There is a Figure 1-1, but that is a general location map of the entire Ravenna Arsenal. Please clarify the figure references.

Army's Response: The reference to Figure 2 will be changed to Figure 3-1 and the reference to Figure 1 will be deleted.

In addition to the above response, Ohio EPA discussed the comment further in an e-mail September 13, 2018 e-mail exchange with the US Army Corps of Engineers. The comment was further clarified as follows:

Figure 3-1 in the SI Addendum will be replaced with the Figure 2-2 (from the SI) which is presented below. This should clarify the text with a figure showing the reference points.

2. Page xvii, line 623: The acronym LOD is not defined in the List of Acronyms and Abbreviations. Please clarify.



The acronym LOD will be added to the List of Acronyms and defined as follows: LOD - Limit of Detection.

3. Page xvii, Lines 681-683 state: "The soil exposure pathway was considered complete for all areas assessed in this SI Addendum except for Test Pit 5, where exposure is possible". Please clarify this statement. Is the Army saying the soil exposure pathway is complete for Test Pit 5 or that it is unclear whether or not it's complete? Please clarify this statement.

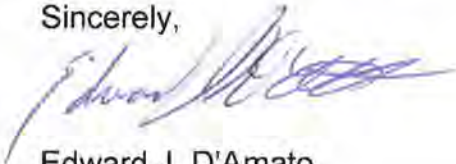
Army's Response: Current text: The soil exposure pathway was considered incomplete for all areas except Test Pit 5 where asbestos was identified and potential exposure is possible. The soil exposure pathway was considered complete for all areas assessed in this SI Addendum except for Test Pit 5, where exposure is possible.

Suggested revised text: The soil exposure pathway was considered incomplete for all areas except Test Pit 5, where asbestos was identified and therefore, potential exposure at this area is possible.

All of the Army's responses are adequate. Ohio EPA approves the document with these changes. Please submit the final document.

If you have any questions or concerns related to this review or would like to schedule a meeting or conference call, please free feel to contact me at (330) 963-1170 or by e-mail at ed.damato@epa.ohio.gov.

Sincerely,



Edward J. D'Amato
Project Coordinator
Ohio EPA - Division of Emergency and Remedial Response

ED/nvp

ec; Rebecca Schreffler, Chenega
Katie Tait, OHARNG RTLS
Kevin Sedlak, ARNG
Craig Coombs, USACE Louisville
Angela Schmidt, USACE Louisville
Gail Harris, Vista Sciences Corporation
Rod Beals, Manager, DERR, NEDO
Mark Johnson, Manager, DERR, NEDO
Bob Princic, Supervisor, DERR, NEDO
Thomas Schneider, Ohio EPA, SWDO, DERR



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

September 7, 2018

Ohio Environmental Protection Agency
DERR-NEDO
Attn: Mr. Ed D'Amato
2110 East Aurora Road
Twinsburg, OH 44087-1924

Subject: Army's responses to Ohio EPA Comments (dated August 23, 2018) on the *Draft Site Inspection Addendum for CC RVAAP-78 Quarry Pond Surface Dump, Former Ravenna Army Ammunition Plant / Camp Ravenna, Portage and Trumbull Counties, Ohio*, (Ohio EPA Work ID # 267000859156)

Dear Mr. D'Amato,

The Army appreciates your time and comments (dated August 23, 2018) on the *Draft Site Inspection Addendum for CC RVAAP-78 Quarry Pond Surface Dump, Former Ravenna Army Ammunition Plant/Camp Ravenna, Portage and Trumbull Counties, Ohio*, dated July 28, 2018. Enclosed for your review are responses to your comments. Upon your acceptance of these responses, the Army will prepare and distribute the final version of this report.

Please contact the undersigned at (703) 607-7589 or david.m.connolly8.civ@mail.mil if there are issues or concerns with this submittal.

Sincerely,

Date: 2018.09.07
09:35:16 -04'00'

David M. Connolly
RVAAP Restoration Program Manager
Army National Guard Directorate

cc: Mark Johnson, Ohio EPA, DERR-NEDO (email only)
Bob Princic, Ohio EPA, DERR-NEDO (email only)
Tom Schneider, Ohio EPA, SWDO (email only)
Kevin Sedlak, ARNG, Camp Ravenna (email only)
Katie Tait, OHARNG, Camp Ravenna (email only)
Craig Coombs, USACE Louisville (email only)
Angela Schmidt, USACE Louisville (email only)
Gail Harris, Vista Sciences Corporation
REIMS - attn. Pat Ryan, Leidos

Comments and responses:

1. Page xiii, lines 491-492: It appears Figures 1 and 2 are referenced incorrectly. Figure 2 is labeled as a topographic map of the area; however, that map appears to be Figure 3-1 on which the reference points and debris piles are not labeled. It is unclear what Figure 1 should be. There is a Figure 1-1, but that is a general location map of the RVAAP Site. Please clarify the figure references.

Army's Response:

The reference to Figure 2 will be changed to Figure 3-1 and the reference to Figure 1 will be deleted. Please see the following suggested text revisions (revised text in red):

Suggested revised text:

The topographic map of this area (Figure ~~23-1~~), shows the south end of Debris Pile A becoming one continuous slope from Reference Point 9b of Debris Pile A to Reference Point 3 of Debris Pile B ~~(Figure 1)~~. A second rusted 55-gallon drum (Drum #2) was present within Debris Pile C but was removed and disposed of during the SI investigations.

2. Page xvii, line 623: The acronym LOD is not defined in the List of Acronyms and Abbreviations. Please clarify.

Army's Response:

The acronym LOD will be added to the List of Acronyms and defined as follows:

LOD – Limit of Detection

3. Page xvii, Lines 681-683 state: "The soil exposure pathway was considered complete for all areas assessed in this SI Addendum except for Test Pit 5, where exposure is possible". Is the Army saying the soil exposure pathway is complete for Test Pit 5 or that it is unclear whether or not it is complete? Please clarify this statement.

Army's Response:

Current text:

The soil exposure pathway was considered incomplete for all areas except Test Pit 5 where asbestos was identified and potential exposure is possible. The soil exposure pathway was considered complete for all areas assessed in this SI Addendum except for Test Pit 5, where exposure is possible.

Suggested revised text (in red):

The soil exposure pathway was considered incomplete for all areas except Test Pit 5 where asbestos was identified and therefore, potential exposure at this area is possible. ~~The soil exposure pathway was considered complete for all areas assessed in this SI Addendum except for Test Pit 5, where exposure is possible.~~



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

August 23, 2018

Mr. David Connolly
Army National Guard Directorate
Environmental Programs Division
ARNG-ILE-CR
111 S. George Mason Dr.
Arlington, VA 22204

Re: **US Army Ravenna Ammunition Plt RVAAP
Remediation Response
Correspondence
Remedial Response
Portage County
267000859156**

Subject: Ohio EPA's Review of Army's Draft Site Inspection Addendum Report, CC-RVAAP-78 Quarry Pond Surface Dump, July 27, 2018.

Dear Mr. Connolly:

The Ohio Environmental Protection Agency (Ohio EPA) has reviewed the Draft Revised Site Inspection Addendum for CC-RVAAP-78 Quarry Pond Surface Dump. The document was received by this office on July 30, 2018. It was originally prepared by Environmental Chemical Corporation for the U.S. Army Corps of Engineers under contract no. W912QR-04-D-0039.

Ohio EPA has reviewed the document and has the following comments:

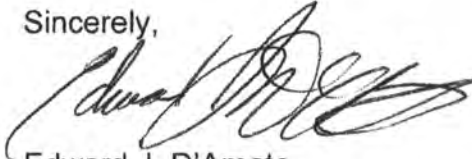
1. Page xiii, lines 491-492: It appears Figures 1 and 2 are referenced incorrectly. Figure 2 is labeled as a topographic map of the area; however, that map appears to be Figure 3-1 on which the reference points and debris piles are not labeled. It is unclear what Figure 1 should be. There is a Figure 1-1, but that is a general location map of the RVAAP Site. Please clarify the figure references.
2. Page xvii, line 623: The acronym LOD is not defined in the List of Acronyms and Abbreviations. Please clarify.
3. Page xvii, Lines 681-683 state: "The soil exposure pathway was considered complete for all areas assessed in this SI Addendum except for Test Pit 5, where exposure is possible". Is the Army saying the soil exposure pathway is complete for Test Pit 5 or that it is unclear whether or not it is complete? Please clarify this statement.

Ohio EPA concurs with the approach to, in lieu of a remedial investigation, evaluate the removal alternatives through an engineering evaluation/cost analysis (EE/CA) as the next phase of the process.

MR. DAVID CONNOLLY
ARMY NATIONAL GUARD DIRECTORATE
AUGUST 23, 2018
PAGE 2

If you have any questions or concerns related to this review or would like to schedule a meeting or conference call, please free feel to contact me at (330) 963-1170 or by e-mail at ed.damato@epa.ohio.gov.

Sincerely,



Edward J. D'Amato
Project Coordinator
Ohio EPA - Division of Emergency and Remedial Response

ED/nvp

ec: Rebecca Schreffler, Chenega
Katie Tait, OHARNG RTLS
Kevin Sedlak, ARNG
Craig Coombs, USACE Louisville
Angela Schmidt, USACE Louisville
Gail Harris, Vista Sciences Corporation
Rod Beals, Manager, DERR, NEDO
Mark Johnson, Manager, DERR, NEDO
Bob Princic, Supervisor, DERR, NEDO
Thomas Schneider, Ohio EPA, SWDO, DERR



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

October 24, 2018

Mr. David Connolly
Army National Guard Directorate
Environmental Programs Division
ARNG-ILE-CR
111 South George Mason Drive
Arlington, VA 22204

**Re: US Army Ravenna Ammunition Plt RVAAP
Remediation Response
Plans
Remedial Response
Portage County
267000859245**

Subject: Review and Concurrence of the "Final No Further Action Proposed Plan for RVAAP-016-R-01 Fuze and Booster Quarry Munitions Response Site" Former Ravenna Army Ammunition Plant, Portage and Trumbull Counties, Ohio: Dated September 18, 2018 (Work Activity No. 267000859245)

Dear Mr. Connolly:

The Ohio Environmental Protection Agency (Ohio EPA), Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR) has received and reviewed the *Final No Further Action Proposed Plan for RVAAP-016-R-01 Fuze and Booster Quarry Munitions Response Site* dated September 18, 2018. This document was received by Ohio EPA NEDO on September 18, 2018. It was prepared by HydroGeoLogic, Inc. Ohio EPA concurs with the selected remedy. Any additional future investigations will be conducted under the Installation Restoration Program.

If you have any questions or concerns, please do not hesitate to contact Nicholas Roope at (330) 963-1235.

Sincerely,

James Sferra, Chief
Division of Environmental Response and Revitalization

JS:NCR

ec: Nat Peters, USACE
Katie Tait/Kevin Sedlak, OHARNG RTLS
Craig Coombs, USACE
Rebecca Shreffler, Chenega
David Connolly, ARNG
Mark Johnson, Ohio EPA, NEDO, DERR
Bob Princic, Ohio EPA, NEDO, DERR
Nicholas Roope, Ohio EPA, NEDO, DERR
Tom Schneider, Ohio EPA, SWDO, DERR

RECEIVED
24 OCT 2018



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

June 21, 2018

Mr. David Connolly
Army National Guard Directorate
Environmental Programs Division
ARNG-ILE-CR
111 South George Mason Drive
Arlington, VA 22204

Re: **US Army Ravenna Ammunition Pit RVAAP
Remediation Response
Plans
Remedial Response
Portage County
267000859245**

Subject: Review of the "Response to Ohio EPA Comments on the Draft Proposed Plan for RVAAP-016-R-01 Fuze and Booster Quarry Munitions Response Site, Version 1.0" Former Ravenna Army Ammunition Plant, Portage and Trumbull Counties, Ohio: Dated June 4, 2018 (Work Activity No. 267000859245)

Dear Mr. Mr. Connolly:

The Ohio Environmental Protection Agency (Ohio EPA), Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR) has received and reviewed the document entitled, "Response to Ohio EPA Comments on the Draft Proposed Plan for RVAAP-016-R-01 Fuze and Booster Quarry Munitions Response Site, Version 1.0" dated June 4, 2018. This document, received by Ohio EPA's NEDO on June 8, 2018, was prepared by HydroGeoLogic, Inc.

Ohio EPA concurs with the proposed edits to the Proposed Plan, and has no further comments. Please submit the final draft of the Proposed Plan with the selected date of the public meeting.

If you have any questions or concerns, please do not hesitate to contact me at (330) 963-1235.

Sincerely,

A handwritten signature in black ink, appearing to read "Nicholas Roope", is written over a horizontal line.

Nicholas Roope, Site Coordinator
Division of Environmental Response and Revitalization

NCR/nvp

cc: Craig Coombs, USACE, Louisville District
Katie Tait/Kevin Sedlak, Camp Ravenna Environmental Office
Rebecca Shreffler, Chenega
Mark S. Johnson Jr., Ohio EPA, NEDO, DERR
Bob Princic, Ohio EPA, NEDO, DERR
Tom Schneider, Ohio EPA, SWDO, DERR

RECEIVED
22 JUN 2018



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

May 10, 2018

LTC James Crowley
ARNG-IED
ARNG Directorate
111 South George Mason Drive
Arlington, VA 22204

Re: US Army Ravenna Ammunition Plt RVAAP
Remediation Response
Plans
Remedial Response
Portage County
267000859245

Subject: Review of the "Draft Proposed Plan for RVAAP-016-R-01 Fuze and Booster Quarry MRS, Version 1.0" Former Ravenna Army Ammunition Plant, Portage and Trumbull Counties, Ohio: Dated March 21, 2018 (Work Activity No. 267-000859-245)

Dear LTC Crowley:

The Ohio Environmental Protection Agency (Ohio EPA), Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR) has received and reviewed the document entitled, "Draft Proposed Plan for RVAAP-016-R-01 Fuze and Booster Quarry MRS, Version 1.0," dated March 21, 2018. This document, received by Ohio EPA's NEDO on March 22, 2018, was prepared by HydroGeoLogic, Inc. Ohio EPA is requesting the following action:

- Add the date the public meeting will take place in the final version of the No Further Action Proposed Plan for RVAAP-016-R-01 Fuze and Booster Quarry MRS.

If you have any questions or concerns, please do not hesitate to contact me at (330) 963-1235.

Sincerely,

Nicholas Roope
Site Coordinator
Division of Environmental Response and Revitalization

NCR/nvp

cc: Craig Coombs, USACE, Louisville District
Katie Tait/Kevin Sedlak, Camp Ravenna Environmental Office
Shreffler/Harris, Camp Ravenna Environmental Office, Vista Sciences

ec: Mark Johnson, Ohio EPA, NEDO DERR
Bob Princic, Ohio EPA, NEDO DERR
Tom Schneider, Ohio EPA, SWDO DERR



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

RECEIVED
2/16/2018

February 12, 2018

Mr. Mark Leeper, P.G., MBA
Team Lead
Cleanup and Restoration Branch
ARNG Directorate
111 South George Mason Drive
Arlington, VA 22204

**Re: US Army Ravenna Ammunition Plt RVAAP
Remediation Response
Project records
Remedial Response
Portage County
267000859199**

Subject: Receipt and Review of the "Final Feasibility Study for RVAAP-016-R-01 Fuze and Booster Quarry MRS, Version 1.0," Dated January 6, 2018 (Work Activity No. 267000859199)

Dear Mr. Leeper:

The Ohio Environmental Protection Agency (Ohio EPA), Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR) has received and reviewed the document entitled, "*Final Feasibility Study for RVAAP-016-R-01 Fuze and Booster Quarry MRS, Version 1.0*," dated January 6, 2018. This document, received by Ohio EPA NEDO on January 8, 2018, was prepared for the U.S. Army Corps of Engineers (USACE) Baltimore District, by HydroGeoLogic, Inc. in response to Ohio EPA's request for the final document sent December 12, 2017.

This document was reviewed by personnel from Ohio EPA's DERR, pursuant to the Director's Findings and Orders paragraph 39 (b), and we concur with the feasibility study in its final format. Please note, the document did not contain the Disclaimer Statement at the beginning of the document. This does not affect the technical aspects of the document.

If you have any questions or concerns, please do not hesitate to contact me at (330) 963-1235.

Sincerely,

Nicholas Roope
Site Coordinator
Division of Environmental Response and Revitalization

NCR/nvp

cc: Craig Coombs, USACE, Louisville District
Katie Tait/Kevin Sedlak, Camp Ravenna Environmental Office
Shreffler/Harris, Camp Ravenna Environmental Office, Vista Sciences

ec: Rod Beals, Ohio EPA, NEDO, DERR
Bob Princic, Ohio EPA, NEDO, DERR
Tom Schneider, Ohio EPA, SWDO, DERR



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

OCT 29 2018

Mr. David Connolly
Army National Guard Directorate
Environmental Programs Division
ARNG-ILE-CR
111 South George Mason Drive
Arlington, VA 22204

**Re: US Army Ravenna Ammunition Plt RVAAP
Remediation Response
Approval
Remedial Response
Portage County
267000859202**

Subject: Concurrence with the "Final No Further Action Record of Decision, RVAAP-019-R-01 Landfill North of Winklepeck Munitions Response Site Version 1.0" Munitions Response Services at the Former Ravenna Army Ammunition Plant, Portage and Trumbull Counties, Ohio September 4, 2018 (Work Activity No. 267000859202)

Dear Mr. Connolly:

The Ohio Environmental Protection Agency (Ohio EPA), Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR) has received and reviewed the *Final No Further Action Record of Decision, RVAAP-019-R-01 Landfill North of Winklepeck Munitions Response Site Version 1.0* document dated September 4, 2018. This document was received by Ohio EPA's NEDO on September 4, 2018. It was prepared by HydroGeoLogic, Inc. (HGL).

The Military Munitions Response Program (MMRP) remedial investigation for the Landfill North of Winklepeck munitions response site (MRS) investigated the potential presence of munitions and explosives of concern (MEC) within the defined portion of the MRS. To date, no MEC has been found at the MRS. Therefore, sampling for munitions constituents was not warranted. The chemicals of concern identified in surface soil and dry sediment during previous investigations will continue to be addressed under the Installation Restoration Program. As there are no further comments or potential issues to address for the MRS, Ohio EPA concurs with the remedy of No Further Action for the MRS.

If you have any questions concerning this letter, please contact Nicholas Roope at (330) 963-1235.

Sincerely,

Craig W. Butler
Director

RECEIVED
29 OCT 2018

cc: Nat Peters, USACE
Craig Coombs, USACE
David Connolly, ARNG
Bob Princic, Ohio EPA, NEDO, DERR

Katie Tait/Kevin Sedlak, OHARNG RTLS
Rebecca Shreffler, Chenega
Mark Johnson, Ohio EPA, NEDO, DERR
Tom Schneider, Ohio EPA, SWDO, DERR



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

August 8, 2018

Mr. David Connolly
Army National Guard Directorate
Environmental Programs Division
ARNG-ILE-CR
111 South George Mason Drive
Arlington, VA 22204

Re: US Army Ravenna Ammunition Plt RVAAP
Remediation Response
Plans
Remedial Response
Portage County
267000859202

Subject: Review of the "Response to Ohio EPA Comments on the Draft No Further Action Record of Decision, RVAAP-019-R-01 Landfill North of Winklepeck Munitions Response Site" at the Former Ravenna Army Ammunition Plant, Portage and Trumbull Counties, Ohio: Dated July 17, 2018 (Work Activity No. 267000859235)

Dear Mr. Connolly:

The Ohio Environmental Protection Agency (Ohio EPA), Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR) has received and reviewed the document entitled, "Response to Ohio EPA Comments on the Draft No Further Action Record of Decision, RVAAP-019-R-01 Landfill North of Winklepeck Munitions Response Site" dated July 17, 2018. This document, received by Ohio EPA's NEDO on July 17, 2018, was prepared by HydroGeoLogic, Inc. on behalf of the US Army Corps of Engineers (USACE) – Baltimore District.

Ohio EPA concurs with the proposed edits to the Record of Decision (ROD) and has no further comments. Please submit the final draft of the ROD.

If you have any questions or concerns, please do not hesitate to contact me at (330) 963-1235.

Sincerely,

Nicholas Roope, Site Coordinator
Division of Environmental Response and Revitalization

NCR/nvp

ec: Nat Peters, USACE, Louisville District
Craig Coombs, USACE, Louisville District
Katie Tait/Kevin Sedlak, Camp Ravenna Environmental Office
Rebecca Shreffler, Chenaga
David Connolly, ARNG
Mark S. Johnson Jr., Ohio EPA, NEDO, DERR
Bob Princic, Ohio EPA, NEDO, DERR
Tom Schneider, Ohio EPA, SWDO, DERR

RECEIVED
09 Aug 2018



NATIONAL GUARD BUREAU

111 SOUTH GEORGE MASON DRIVE
ARLINGTON VA 22204-1373

July 17, 2018

Ohio Environmental Protection Agency
DERR-NEDO
Attn: Mr. Nicholas Roope
2110 East Aurora Road
Twinsburg, OH 44087-1924

Subject: Response to Ohio EPA Comments on the Draft No Further Action Record of Decision, RVAAP-019-R-01 Landfill North of Winklepeck Munitions Response Site, Former Ravenna Army Ammunition Plant, Portage and Trumbull Counties, Ohio; Contract No. W912DR-15-D-0016, Delivery Order 0001 (Ohio EPA Work Activity #267000859202)

Dear Mr. Roope:

This letter is sent to summarize the response to comments received from the Ohio EPA in a letter dated June 12, 2018. Responses to the Ohio EPA comments on the *Draft No Further Action Record of Decision for RVAAP-019-R-01 Landfill North of Winklepeck Munitions Response Site* are provided in Table 1, attached. The revisions summarized will be incorporated into the Final version of the document to be submitted upon concurrence from the Ohio EPA.

This document was prepared for the US Army Corps of Engineers (USACE) – Baltimore District by HydroGeoLogic, Inc., under Contract No. W912DR-15-D-0016.

Please contact the undersigned at (703) 607-7589 or david.m.connolly8.civ@mail.mil if there are issues or concerns with this submission.

Sincerely,

Date: 2018.07.17
11:16:01 -04'00'

Mr. David Connolly
RVAAP Restoration Program Manager
Army National Guard Directorate

cc: Mark Johnson, Ohio EPA, DERR, NEDO (one [1] electronic copy)
Bob Princic, Ohio EPA, DERR, NEDO (one [1] electronic copy)
Tom Schneider, Ohio EPA, DERR, SWDO (one [1] electronic copy)
Kevin Sedlak, ARNG, Camp Ravenna (one [1] electronic copy)
Katie Tait, OHARNG (one [1] electronic copy)
Craig Coombs, USACE – Louisville Project Manager (one [1] electronic copy)
Travis McCoun, USACE Baltimore District (one [1] electronic copy)
Gail Harris, Vista Sciences Corp. (one [1] electronic copies)

Table 1

Ohio EPA Comment	Army Response
<p>Issue A: Human Health Risk Assessment (HHRA) and Ecological Risk Assessment (ERA)</p> <p>The text in Section G.2 states, "Because the Army did not encounter DoD military munitions, concentrated areas of MD, or evidence of munitions use during either the 2007 SI or the 2015 RI conducted at the Landfill North of Winklepeck MRS, media sampling for MC-related contamination was not warranted. Therefore, the Army did not perform an HHRA or an ERA for the MRS and determined that there was no risk from MC-related contamination present at the MRS (CB&I 2015)."</p> <p>This is acceptable under the military munitions response program (MMRP); however, this does not address the chemicals potentially present related to the overlapping landfill operations under investigation through the installation restoration program (IRP).</p> <p>Please provide clarity as to how the area investigated will be addressed or has been addressed under the IRP to verify there is no risk to human health or the environment. This information will help provide transparency to the reader and support the ROD under the MMRP.</p>	<p>Concur. No edits are suggested to the text in Section G.2.</p> <p>The following text will be added to paragraph 2 of Section B. (inserted text is underlined):</p> <p>"The Landfill North of Winklepeck slightly overlaps with the RVAAP-19 Area of Concern (AOC) being investigated under the Installation Restoration Program (IRP), pursuant to CERCLA. <u>Investigation of the IRP AOC RVAAP-19 will address any potential contamination related to past industrial activities and sources (non-munitions related contamination or sources). Solid waste identified at the site will be managed under the Solid Waste Management Plan for Camp Ravenna (currently preliminary draft).</u>"</p>



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

June 12, 2018

LTC James Crowley
ARNG-IED
ARNG Directorate
111 South George Mason Drive
Arlington, VA 22204

**Re: US Army Ravenna Ammunition Plt RVAAP
Remediation Response
Plans
Remedial Response
Portage County
267000859202**

Subject: Review of the "Draft No Further Action Record of Decision, RVAAP-019-R-01 Landfill North of Winklepeck Munitions Response Site" Former Ravenna Army Ammunition Plant, Portage and Trumbull Counties, Ohio: Dated April 9, 2018 (Work Activity No. 267000859202)

Dear LTC Crowley:

The Ohio Environmental Protection Agency (Ohio EPA), Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR) has received and reviewed the document entitled, "Draft No Further Action Record of Decision, RVAAP-019-R-01 Landfill North of Winklepeck Munitions Response Site, Version 1.0" dated April 9, 2018. This document, received by Ohio EPA, NEDO on April 10, 2018, was prepared for the U.S. Army Corps of Engineers (USACE) Baltimore District, by HydroGeoLogic, Inc. Ohio EPA has identified an issue that requires your attention prior to Ohio EPA concurrence of the final record of decision (ROD).

Issue A: Human Health Risk Assessment (HHRA) and Ecological Risk Assessment (ERA)

The text in Section G.2 states, "Because the Army did not encounter DoD military munitions, concentrated areas of MD, or evidence of munitions use during either the 2007 SI or the 2015 RI conducted at the Landfill North of Winklepeck MRS, media sampling for MC-related contamination was not warranted. Therefore, the Army did not perform an HHRA or an ERA for the MRS and determined that there was no risk from MC-related contamination present at the MRS (CB&I 2015)." This is acceptable under the military munitions response program (MMRP); however, this does not address the chemicals potentially present related to the overlapping landfill operations under investigation through the installation restoration program (IRP).

Please provide clarity as to how the area investigated will be addressed or has been addressed under the IRP to verify there is no risk to human health or the



LTC JAMES CROWLEY
ARNG DIRECTORATE
JUNE 12, 2018
PAGE 2

environment. This information will help provide transparency to the reader and support the ROD under the MMRP.

If you have any questions or concerns, please do not hesitate to contact me at (330) 963-1235.

Sincerely,

A handwritten signature in black ink, appearing to read "Nicholas Roope", with a stylized flourish at the end.

Nicholas Roope
Site Coordinator
Division of Environmental Response and Revitalization

NCR/nvp

ec: Craig Coombs, USACE, Louisville District
Shreffler/Harris, Camp Ravenna Environmental Office, Vista Sciences
Mark Johnson, Ohio EPA, NEDO DERR
Bob Princic, Ohio EPA, NEDO DERR
Tom Schneider, Ohio EPA, SWDO DERR
Katie Tait/Kevin Sedlak, Camp Ravenna Environmental Office



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

October 16, 2018

Mr. David Connolly
Army National Guard Directorate
Environmental Programs Division
ARNG-ILE-CR
111 South George Mason Drive
Arlington, VA 22204

**Re: US Army Ravenna Ammunition Plt RVAAP
Remediation Response
Plans
Remedial Response
Portage County
267000859071**

Subject: Review and Concurrence of the "Final No Further Action Proposed Plan for RVAAP-032-R-01 40-mm Firing Range Munitions Response Site" Former Ravenna Army Ammunition Plant, Portage and Trumbull Counties, Ohio: Dated September 2018 (Work Activity No. 267000859071)

Dear Mr. Connolly:

The Ohio Environmental Protection Agency (Ohio EPA), Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR) has received and reviewed the "Final No Further Action Proposed Plan for RVAAP-032-R-01 40-mm Firing Range Munitions Response Site" dated September 2018. This document received by Ohio EPA, NEDO on September 17, 2018, was prepared by HydroGeoLogic, Inc. Ohio EPA concurs with the selected remedy. Any additional investigations completed in the future will be completed under the Installation Restoration Program.

If you have any questions or concerns, please do not hesitate to contact Nicholas Roope at (330) 963-1235.

Sincerely,

James Sferra, Chief
Division of Environmental Response and Revitalization

JS/NCR/nvp

ec: Nat Peters, USACE
Katie Tait/Kevin Sedlak, OHARNG RTLS
Craig Coombs, USACE
Rebecca Shreffler, Chenega
David Connolly, ARNG
Mark Johnson Ohio EPA, NEDO, DERR
Bob Princic, Ohio EPA, NEDO, DERR
Tom Schneider, Ohio EPA, SWDO, DERR
Nicholas Roope, Ohio EPA, NEDO, DERR

RECEIVED
16 OCT 2018



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

June 21, 2018

Mr. David Connolly
Army National Guard Directorate
Environmental Programs Division
ARNG-ILE-CR
111 South George Mason Drive
Arlington, VA 22204

Re: US Army Ravenna Ammunition Plt RVAAP
Remediation Response
Plans
Remedial Response
Portage County
267000859071

Subject: Review of the "Response to Ohio EPA Comments on the Draft Proposed Plan for RVAAP-032-R-01 40mm Firing Range Munitions Response Site, Version 1.0" at the Former Ravenna Army Ammunition Plant, Portage and Trumbull Counties, Ohio: Dated June 4, 2018 (Work Activity No. 267000859071)

Dear Mr. Connolly:

The Ohio Environmental Protection Agency (Ohio EPA), Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR) has received and reviewed the document entitled, "Response to Ohio EPA Comments on the Draft Proposed Plan for RVAAP-032-R-01 40mm Firing Range Munitions Response Site, Version 1.0" dated June 4, 2018. This document, received by Ohio EPA's NEDO on June 8, 2018, was prepared by HydroGeoLogic, Inc.

Ohio EPA concurs with the proposed edits to the Proposed Plan, and has no further comments. Please submit the final draft of the Proposed Plan with the selected date of the public meeting.

If you have any questions or concerns, please do not hesitate to contact me at (330) 963-1235.

Sincerely,

A handwritten signature in black ink, appearing to read "Nicholas Roope", is written over a horizontal line.

Nicholas Roope, Site Coordinator
Division of Environmental Response and Revitalization

NCR/nvp

ec: Craig Coombs, USACE, Louisville District
Katie Tait/Kevin Sedlak, Camp Ravenna Environmental Office
Rebecca Shreffler, Chenega
Mark S. Johnson Jr., Ohio EPA, NEDO, DERR
Bob Princic, Ohio EPA, NEDO, DERR
Tom Schneider, Ohio EPA, SWDO, DERR

RECEIVED
22 JUN 2018



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

May 10, 2018

LTC James Crowley
ARNG-IED
ARNG Directorate
111 South George Mason Drive
Arlington, VA 22204

**Re: US Army Ravenna Ammunition Plt RVAAP
Remediation Response
Plans
Remedial Response
Portage County
267000859071**

Subject: Review of the "Draft Proposed Plan for RVAAP-032-R-01 40mm Firing Range MRS, Version 1.0" Former Ravenna Army Ammunition Plant, Portage and Trumbull Counties, Ohio: Dated March 22, 2018 (Work Activity No. 267-000859-071)

Dear LTC Crowley:

The Ohio Environmental Protection Agency (Ohio EPA), Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR) has received and reviewed the document entitled, "Draft Proposed Plan for RVAAP-032-R-01 40mm Firing Range MRS, Version 1.0," dated March 22, 2018. This document, received by Ohio EPA's NEDO on March 23, 2018, was prepared by HydroGeoLogic, Inc. Ohio EPA is requesting the following actions:

- The text states in section 3.2, "The No Action alternative is protective of human health and the environment because no explosive hazard or unacceptable risk due to MC-related contamination is present at the MRS." Then in section 4.0 the text states, "The remedy must be protective of the receptors associated with the future land use. The future land use at the 40mm Firing Range MRS will include maintenance and natural resource activities. It will also include military training and most likely construction activities as part of military use. The likely human receptor for the future land is the Industrial Receptor."

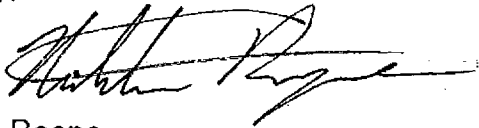
The text appears to be presenting opposing positions on the use of the site. No DoD military munitions confirmed as MEC were observed at the site and no detected analytes were identified as MC-related contamination during the RI field activities; therefore, a Human Health Risk Assessment and Ecological Risk Assessment was not required for inclusion in the Final RI Report. Based on the above information, the site should meet unlimited use/unrestricted exposure.

If additional chemicals of concern are present that do not pose an explosive hazard, but may pose a risk to human health or the environment additional action under the IRP is recommended.

- Add the date the public meeting will take place in the final version of the No Further Action Proposed Plan for RVAAP-032-R-01 40mm Firing Range MRS.

If you have any questions or concerns, please do not hesitate to contact me at (330) 963-1235.

Sincerely,



Nicholas Roope
Site Coordinator
Division of Environmental Response and Revitalization

NCR/nvp

- cc: Craig Coombs, USACE, Louisville District
Katie Tait/Kevin Sedlak, Camp Ravenna Environmental Office
Shreffler/Harris, Camp Ravenna Environmental Office, Vista Sciences
- ec: Mark Johnson, Ohio EPA, NEDO DERR
Bob Princic, Ohio EPA, NEDO DERR
Tom Schneider, Ohio EPA, SWDO DERR



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

RECEIVED
2/16/2018

February 12, 2018

Mr. Mark Leeper, P.G., MBA
Team Lead
Cleanup and Restoration Branch
ARNG Directorate
111 South George Mason Drive
Arlington, VA 22204

Re: US Army Ravenna Ammunition Plt RVAAP
Remediation Response
Project records
Remedial Response
Portage County
267000859233

Subject: Receipt and Review of the "Final Feasibility Study for RVAAP-032-R-01
40mm Firing Range Munitions Response Site, Version 1.0," Dated January
5, 2018 (Work Activity No. 267000859233)

Dear Mr. Leeper:

The Ohio Environmental Protection Agency (Ohio EPA), Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR) has received and reviewed the document entitled, "Final Feasibility Study for RVAAP-032-R-01 40mm Firing Range Munitions Response Site, Version 1.0," dated January 5, 2018. This document, received by Ohio EPA, NEDO on January 8, 2018, was prepared for the U.S. Army Corps of Engineers (USACE) Baltimore District, by HydroGeoLogic, Inc. in response to Ohio EPA's request for the final document sent December 12, 2017.

This document was reviewed by personnel from Ohio EPA's DERR, pursuant to the Director's Findings and Orders paragraph 39 (b), and we concur with the feasibility study in its final format. Please note, the document did not contain the Disclaimer Statement at the beginning of the document. This does not affect the technical aspects of the document.

If you have any questions or concerns, please do not hesitate to contact me at (330) 963-1235.

Sincerely,

Nicholas Roope
Site Coordinator
Division of Environmental Response and Revitalization

NCR/nvp

cc: Craig Coombs, USACE, Louisville District
Katie Tait/Kevin Sedlak, Camp Ravenna Environmental Office
Shreffler/Harris, Camp Ravenna Environmental Office, Vista Sciences

ec: Rod Beals, Ohio EPA, NEDO DERR
Bob Princic, Ohio EPA, NEDO DERR
Tom Schneider, Ohio EPA, SWDO DERR



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

October 18, 2018

Mr. David Connolly
Army National Guard Directorate
Environmental Program Division
111 South George Mason Drive
Arlington, VA 22204

**Re: US Army Ravenna Ammunition Plt RVAAP
Remediation Response
Approval
Remedial Response
Portage County
267000859240**

Subject: Concurrence with the "Final No Further Action Record of Decision, RVAAP-050-R-01 Atlas Scrap Yard Munitions Response Site Version 1.0" Munitions Response Services at the Former Ravenna Army Ammunition Plant, Portage and Trumbull Counties, Ohio: Dated September 5, 2018 (Work Activity No. 267000859240)

Dear Mr. Connolly:

The Ohio Environmental Protection Agency (Ohio EPA), Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR) has received and reviewed the "Final No Further Action Record of Decision, RVAAP-050-R-01 Atlas Scrap Yard Munitions Response Site Version 1.0" document dated September 5, 2018. This document was received by Ohio EPA's NEDO on September 6, 2018. It was prepared by HydroGeoLogic, Inc. (HGL).

The Military Munitions Response Program (MMRP) remedial investigation for the Atlas Scrap Yard munitions response site (MRS) investigated the potential presence of munitions and explosives of concern (MEC) within the defined portion of the MRS. To date, no MEC has been found at the MRS; therefore, sampling for munitions constituents was not warranted. The chemicals of concern identified in surface soil during previous investigations will continue to be addressed under the Installation Restoration Program. As there are no further comments, or potential issues to address for the MRS, Ohio EPA concurs with the remedy of no further action for the MRS.

If you have any questions concerning this letter, or any findings made by Ohio EPA, please contact Nicholas Roope at (330) 963-1235.

Sincerely,

Craig W. Butler, Director

CB/NCR/nvp

ec: Nat Peters, USACE
Katie Tait/Kevin Sedlak, OHARNG RTLS
Craig Coombs, USACE
Rebecca Shreffler, Chenega
David Connolly, ARNG
Mark Johnson, Ohio EPA, NEDO DERR
Bob Princic, Ohio EPA, NEDO DERR
Tom Schneider, Ohio EPA, SWDO DERR

RECEIVED
18 OCT 2018



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

July 3, 2018

Mr. David Connolly
Army National Guard Directorate
Environmental Programs Division
ARNG-ILE-CR
111 South George Mason Drive
Arlington, VA 22204

**Re: US Army Ravenna Ammunition Plt RVAAP
Remediation Response
Plans
Remedial Response
Portage County
267000859071**

Subject: Review of the "Response to Ohio EPA Comments on Draft and Submittal of Final No Further Action Record of Decision, RVAAP-050-R-01 Atlas Scrap Yard Munitions Response Site" at the Former Ravenna Army Ammunition Plant, Portage and Trumbull Counties, Ohio: Dated June 1, 2018 (Work Activity No. 267000859240)

Dear Mr. Connolly:

The Ohio Environmental Protection Agency (Ohio EPA), Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR) has received and reviewed the document entitled, "Response to Ohio EPA Comments on Draft and Submittal of Final No Further Action Record of Decision, RVAAP-050-R-01 Atlas Scrap Yard Munitions Response Site" dated June 1, 2018. This document, received by Ohio EPA's NEDO on June 2, 2018, was prepared by HydroGeoLogic, Inc. on behalf of the US Army Corps of Engineers (USACE) – Baltimore District.

Ohio EPA concurs with the proposed edits to the Record of Decision (ROD), and has no further comments. Please submit the final draft of the ROD.

If you have any questions or concerns, please do not hesitate to contact me at (330) 963-1235.

Sincerely,

A handwritten signature in black ink, appearing to read "Nicholas Roope", is written over a light blue horizontal line.

Nicholas Roope, Site Coordinator
Division of Environmental Response and Revitalization

NCR/nvp

ec: Nat Peters, USACE, Louisville District
Craig Coombs, USACE, Louisville District
Katie Tait/Kevin Sedlak, Camp Ravenna Environmental Office
Rebecca Shreffler Chenaga
David Connolly, ARNG
Mark S. Johnson Jr., Ohio EPA, NEDO DERR
Bob Princic, Ohio EPA, NEDO DERR
Tom Schneider, Ohio EPA, SWDO DERR

RECEIVED
03 JUL 2018



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

June 1, 2018

Ohio Environmental Protection Agency
DERR-NEDO
Attn: Mr. Nicholas Roope
2110 East Aurora Road
Twinsburg, OH 44087-1924

Subject: Response to Ohio EPA Comments on Draft and submittal of Final No Further Action Record of Decision, RVAAP-050-R-01 Atlas Scrap Yard Munitions Response Site, Munitions Response Services at the Former Ravenna Army Ammunition Plant, Portage and Trumbull Counties, Ohio, Contract No. W912DR-15-D-0016, Delivery Order 0001 (Ohio EPA Work Activity # 267000859240)

Dear Mr. Roope:

This letter is sent to summarize the response to comments received from the Ohio EPA comment letter dated May 10, 2018. Responses to the Ohio EPA comments on the *Draft No Further Action Record of Decision, RVAAP-050-R-01 Atlas Scrap Yard Munitions Response Site* are provided below. Revisions summarized below have been incorporated into the Final version of the document (attached) for review and concurrence by the Ohio EPA.

Ohio EPA Comment	Army Response
Page 6, Lines 395-402, Please revise the following typos: “The Army did not encounter DoD military munitions, MD, or materiel that would be considered material potentially presenting and [an] explosive hazards [hazard] (MPPEH) during SI filed activities. [...] Although DoD military munitions were not encountered, the Army’s Final SI Report recommended further investigation of the MRS with for the presence of DoD military munitions under the MMRP (e2M, 2008).”	Concur. Page 6, Section E.2.1 Site Inspection, second paragraph, first and last sentences have been revised as requested.

This document was prepared for the US Army Corps of Engineers (USACE) – Baltimore District by HydroGeoLogic, Inc., under Contract No. W912DR-15-D-0016.

Please contact the undersigned at (703) 601-7785 or james.c.crowley.mil@mail.mil if there are issues or concerns with this submission.

Sincerely,

James C. Crowley
Lieutenant Colonel, Corps of Engineers
RVAAP Restoration Program Manager
Installations & Environment, ARNG

cc:

Mark Johnson, Ohio EPA, Environmental Manager (one [1] electronic copy, one [1] hard copy)
Bob Princic, Ohio EPA, DERR (one [1] electronic copy)
Tom Schneider, Ohio EPA, DERR, SWDO (one [1] electronic copy)
Kevin Sedlak, ARNG, Camp Ravenna (one [1] electronic copy)
Katie Tait, OHARNG (one [1] electronic copy)
Craig Coombs, USACE – Louisville Project Manager (one [1] electronic copy)
Travis McCoun, USACE Baltimore District (one [1] electronic copy)
Gail Harris, Vista Science Corp. (one [1] electronic copies)



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

May 10, 2018

LTC James Crowley
ARNG-IED
ARNG Directorate
111 South George Mason Drive
Arlington, VA 22204

Re: US Army Ravenna Ammunition Plt RVAAP
Remediation Response
Plans
Remedial Response
Portage County
267000859240

Subject: Review of the "Draft No Further Action Record of Decision, RVAAP-050-R-01 Atlas Scrap Yard Munitions Response Site" Munitions Response Services at the Former Ravenna Army Ammunition Plant, Portage and Trumbull Counties, Ohio: Dated March 23, 2018 (Work Activity No. 267000859240)

Dear LTC Crowley:

The Ohio Environmental Protection Agency (Ohio EPA), Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR) has received and reviewed the, "Draft No Further Action Record of Decision, RVAAP-050-R-01 Atlas Scrap Yard Munitions Response Site," dated March 23, 2018. This document received by Ohio EPA's NEDO on March 26, 2018, was prepared by HydroGeoLogic, Inc. Ohio EPA has completed the review of the draft record of decision and requests the following typos in lines 395-402 on page 6 be corrected.

Below are the recommended edits:

"The Army did not encounter DoD military munitions, MD, or other materiel that would be considered material potentially presenting **and** [an] explosive **hazards** [hazard] (MPPEH) during SI field activities. Although DoD military munitions were not encountered, the Army's Final SI Report recommended further investigation of the MRS **with** for the presence of DoD military munitions under the MMRP (e2M, 2008)."

Please submit the final copy of the document with the recommended edits included.

Received
17 MAY 2018

LTC JAMES CROWLEY
ARNG DIRECTORATE
MAY 10, 2018
PAGE 2

If you have any questions or concerns, please do not hesitate to contact me at (330) 963-1235.

Sincerely,

A handwritten signature in black ink, appearing to read "Nicholas Roope", written in a cursive style.

Nicholas Roope
Site Coordinator
Division of Environmental Response and Revitalization

NCR/nvp

cc: Craig Coombs, USACE, Louisville District
Katie Tait/Kevin Sedlak, Camp Ravenna Environmental Office
Shreffler/Harris, Camp Ravenna Environmental Office, Vista Sciences

ec: Mark Johnson, Ohio EPA, NEDO DERR
Bob Princic, Ohio EPA, NEDO DERR
Tom Schneider, Ohio EPA, SWDO DERR



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

December 13, 2018

Mr. David Connolly
Army National Guard Directorate
Environmental Programs Division
ARNG-ILE-CR
111 South George Mason Drive
Arlington, VA 22204

**Re: US Army Ravenna Ammunition Plt RVAAP
Remediation Response
Plans
Remedial Response
Portage County
267000859241**

Subject: Review of the "Response to Comments on the Draft No Further Action Proposed Plan for RVAAP-060-R-01 Block D Igloo Munitions Response Site, Version 1.0" Former Ravenna Army Ammunition Plant, Portage and Trumbull Counties, Ohio: Dated November 20, 2018 (Work Activity No. 267000859241)

Dear Mr. Connolly:

The Ohio Environmental Protection Agency (Ohio EPA), Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR) has received and reviewed the document entitled "Response to Comments on the Draft No Further Action Proposed Plan for RVAAP-060-R-01 Block D Igloo Munitions Response Site, Version 1.0" dated November 20, 2018. This document, received by Ohio EPA's NEDO on November 20, 2018, was prepared by HydroGeoLogic, Inc.

The responses provided to Ohio EPA comments are satisfactory. Please submit the proposed plan in its final format. If you have any questions or concerns, please do not hesitate to contact me at (330) 963-1235.

Sincerely,

Nicholas Roope
Site Coordinator
Division of Environmental Response and Revitalization

NCR/nvp

ec: Nat Peters, USACE
Katie Tait/Kevin Sedlak, OHARNG RTLS
Craig Coombs, USACE
Rebecca Shreffler, Chenega
David Connolly, ARNG
Mark Johnson Ohio EPA, NEDO, DERR
Bob Princic, Ohio EPA, NEDO, DERR
Tom Schneider, Ohio EPA, SWDO, DERR

RECEIVED
DEC 14 2018



NATIONAL GUARD BUREAU

111 SOUTH GEORGE MASON DRIVE
ARLINGTON VA 22204-1373

November 20, 2018

Ohio Environmental Protection Agency
Attn: Mr. Nicholas Roope, DERR-NEDO
2110 East Aurora Road
Twinsburg, OH 44087-1924

Subject: Responses to comments on the Draft No Further Action Proposed Plan for RVAAP-060-R-01, Block D Igloo Munitions Response Site, Version 1.0, Munitions Response Services at the Former Ravenna Army Ammunition Plant, Portage and Trumbull Counties, Ohio, Contract No. W912DR-15-D-0016, Delivery Order 0001 (Ohio EPA Work Activity # 267-000859-245)

Dear Mr. Roope:

As indicated in the letter received from the Ohio EPA dated September 26, 2018, the Ohio EPA has completed review of the Draft No Further Action Proposed Plan for RVAAP-060-R-01, Block D Igloo Munitions Response Site. This letter provides responses to those comments as summarized in Table 1, attached.

This document was prepared for the US Army Corps of Engineers (USACE) – Louisville District by HydroGeoLogic, Inc., under Contract No. W912DR-15-D-0016.

Please contact the undersigned at (703) 607-7589 or David.M.Connolly8.civ@mail.mil if there are issues or concerns with this submission.

Sincerely,

Date: 2018.11.19
16:04:55 -05'00'

David Connolly
RVAAP Restoration Program Manager
Army National Guard Directorate

cc:

Mark Johnson, Ohio EPA, Project Manager (one [1] electronic copy)
Tom Schneider, Ohio EPA, DERR, CO (one [1] electronic copy)
Kevin Sedlak, ARNG, Camp Ravenna (one [1] electronic copy)
Katie Tait, OHARNG (one [1] electronic copy)
Craig Coombs, USACE – Louisville Project Manager (one [1] electronic copy)
Travis McCoun, USACE Baltimore District (one [1] electronic copy)
Gail Harris, Vista Science Corp. (one [1] electronic copy)

Comment Number	Topic	Comment	Response to Comment
1	Land Use	<p>The site inspection (SI) and remedial investigation (RI) resulted in munitions debris (MD) and munitions and explosives of concern (MEC) being encountered at a maximum depth of eight inches below the ground surface as documented through instrument-assisted unexploded ordinance surveys. Therefore, the preferred alternative of surface and subsurface removal of potential MD and MEC to a depth of four feet is expected to result in a significant reduction to the risk of exposure to MEC/MD. This supports the industrial land use designation. However, this removal action does not address potential MEC/MD that may reside deeper than four feet below ground surface. Therefore, the Block-D-Igloo munitions response site (MRS) does not appear to meet the unrestricted (residential) land use designation without additional information being supplied to support the absence of MEC/MD below four feet. Ohio EPA requests additional language that corresponds with Environmental Protection Agency Regarding No Further Action Determinations and Unrestricted or Residential Use - May 17, 2018, teleconference minutes.</p> <p>Further, Ohio EPA does not agree with the determination of unlimited use/unrestricted exposure (UU/UE) with respect to the anticipated land use for the Block D Igloo Munitions</p>	<p>Based on the findings in the RI, neither MEC nor MD is expected to be present below 4-ft.</p> <p>The RI data shows the maximum depth of recovery for MPPEH was 8 inches for MD and 6 inches for MEC. A total of 3,140 MPPEH items were recovered during the RI, all at 8 inches bgs or less. The shallow MPPEH depth is attributable to the release mechanism of the explosion. When the explosion occurred in the igloo, MPPEH was released via aerial dispersion. These items did not have sufficient force to penetrate deeper into the ground. Considering the RI findings, a removal at a depth less than 4-ft would be considered protective. However, a clearance to a depth of 4 feet was selected to meet Ravenna-specific requirements for future land-use.</p> <p>The Army maintains that the site will meet UU/UE criteria following the clearance of MEC and MDAS (i.e., MD). As stated above, there is no reason to suspect MPPEH deeper than 4ft. The RI findings (MPPEH at 8 inches bgs or less) are consistent with the conceptual site model: MPPEH present in the shallow subsurface as a result of aerial dispersion.</p> <p>Additionally, the Final RI Report (CB&I, 2015) indicated that no known or suspected risks associated with MC-related contamination exists at the MRS, including evaluation for the Unrestricted (Residential) Land Use. As shown in the RI, there is an incomplete pathway for exposure to MC in all media, including groundwater. The facility-wide groundwater</p>

Comment Number	Topic	Comment	Response to Comment
		<p>Response Site (MRS). Unrestricted use/unrestricted exposure applies when there are no restrictions placed on the potential future use of land or other natural resources. At the MRS, the future land use appears to be industrial. Additionally, the determination of UU/UE appears to be premature due to the ongoing facility-wide ground water investigation.</p> <p>If additional information can be provided to support the preferred alternative resulting in residential standards being met, Ohio EPA recommends replacing all references to UU/UE with unrestricted (residential) land use as defined in the "Final Technical Memorandum: Land Uses and Revised Risk Assessment Process for the Ravenna Army Ammunition Plant (RVAAP) Installation Restoration Program, Portage/Trumbull Counties, Ohio".</p>	<p>investigation will not change the risk assessments and conclusions for the MRS.</p> <p>The Army recommends not to replace UU/UE with unrestricted (residential) land use. UU/UE is industry standard CERLCA language. The document will be updated, however, to indicate that UU/UE will also meet the requirements for unrestricted (residential) land use as defined in <i>"Final Technical Memorandum: Land Uses and Revised Risk Assessment Process for the Ravenna Army Ammunition Plant (RVAAP) Installation Restoration Program, Portage/Trumbull Counties, Ohio"</i>. This update will be incorporated on Table 1 and included in the glossary.</p> <p>Additional language will be added to the Proposed Plan in the following sections:</p> <p>Sections 4.0 and 8.2: “Though there are no current plans for the MRS to change from an industrial land use to a residential land use, there are no unacceptable risks to a potential future residential receptor from explosive hazards or MC-related contamination.” (note this is the language previously concurred to on the May 17, 2018 conference call conducted for a different MRS)</p> <p>Section 3.3.1, beginning of first paragraph “A total of 3,140 subsurface DoD military munitions were encountered during intrusive investigations at a maximum depth of 8 inches below ground surface (bgs). The UXO-qualified personnel determined that 3,135 of</p>

Comment Number	Topic	Comment	Response to Comment
			<p>these items were MDAS (i.e., MD) and 5 of the items were MEC.”</p> <p>Section 7.4, pg 15, 1st paragraph “Once anomalies are investigated and military munitions or metallic debris are removed, the digital magnetometer will be used to verify the anomaly has been removed.”</p>
2		<p>In section 3.3.1, an additional MEC item was discovered from an unknown munitions type, which indicates that the MEC item discovered may not be associated with the historical M-41 20-lb fragmentation bombs. Please discuss where the MEC item may have originated in relation to the MRS.</p>	<p>This item was reported to be a fuze of an unknown type associated with fragmentation bombs but different than the fuze type used in the 20 lbs bombs that exploded at Block D Igloo. It was found in the shallow subsurface (0.08 feet bgs). The origin of this MEC item is unknown.</p> <p>A sentence was added to the first paragraph of Section 3.3.1: “The origin of this unknown type of fuze associated with fragmentation bombs (different than the fuze type used in the 20-lb bombs that exploded at Block D Igloo) is unknown.”</p>
3		<p>Please add the date the public meeting will take place in the final version of the proposed plan for the MRS.</p>	<p>Concur, the date will be added to the Final Proposed Plan when agreed to by the participants.</p>



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

September 26, 2018

Mr. David Connolly
Army National Guard Directorate
Environmental Programs Division
ARNG-ILE-CR
111 South George Mason Drive
Arlington, VA 22204

**Re: US Army Ravenna Ammunition Plt RVAAP
Remediation Response
Plans
Remedial Response
Portage County
267000859241**

Subject: Review of the "Draft No Further Action Proposed Plan for RVAAP-060-R-01 Block D Igloo Munitions Response Site, Version 1.0" Former Ravenna Army Ammunition Plant, Portage and Trumbull Counties, Ohio; Dated July 27, 2018 (Work Activity No. 267000859241)

Dear Mr. Connolly:

The Ohio Environmental Protection Agency (Ohio EPA), Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR) has received and reviewed the document entitled, "*Draft No Further Action Proposed Plan for RVAAP-060-R-01 Block D Igloo Munitions Response Site, Version 1.0*" dated July 27, 2018. This document, received by Ohio EPA's NEDO on July 31, 2018, was prepared by HydroGeoLogic, Inc. This document is not approvable as currently submitted. Ohio EPA is requesting further clarification on the following issues:

Comment 1: Land Use

The site inspection (SI) and remedial investigation (RI) resulted in munitions debris (MD) and munitions and explosives of concern (MEC) being encountered at a maximum depth of eight inches below the ground surface as documented through instrument-assisted unexploded ordinance surveys. Therefore, the preferred alternative of surface and subsurface removal of potential MD and MEC to a depth of four feet is expected to result in a significant reduction to the risk of exposure to MEC/MD. This supports the industrial land use designation. However, this removal action does not address potential MEC/MD that may reside deeper than four feet below ground surface. Therefore, the Block-D-Igloo munitions response site (MRS) does not appear to meet the unrestricted (residential) land use designation without additional information being supplied to support the absence of MEC/MD below four feet. Ohio EPA requests additional language that corresponds with the *Discussion with the Ohio Environmental Protection Agency Regarding No Further Action Determinations and Unrestricted or Residential Use – May 17, 2018*, teleconference minutes.

RECEIVED
26 SEP 2018

Further, Ohio EPA does not agree with the determination of unlimited use/unrestricted exposure (UU/UE) with respect to the anticipated land use for the Block D Igloo Munitions Response Site (MRS). Unrestricted use/unrestricted exposure applies when there are no restrictions placed on the potential future use of land or other natural resources. At the MRS, the future land use appears to be industrial. Additionally, the determination of UU/UE appears to be premature due to the ongoing facility-wide ground water investigation.

If additional information can be provided to support the preferred alternative resulting in residential standards being met, Ohio EPA recommends replacing all references to UU/UE with unrestricted (residential) land use as defined in the *"Final Technical Memorandum: Land Uses and Revised Risk Assessment Process for the Ravenna Army Ammunition Plant (RVAAP) Installation Restoration Program, Portage/Trumbull Counties, Ohio"*.

Comment 2: Unknown Munitions Type

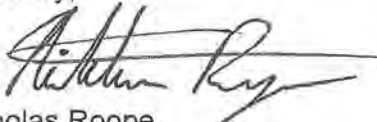
In section 3.3.1, an additional MEC item was discovered from an unknown munitions type, which indicates that the MEC item discovered may not be associated with the historical M-41 20-lb fragmentation bombs. Please discuss where the MEC item may have originated in relation to the MRS.

Comment 3: Land Use

Please add the date the public meeting will take place in the final version of the proposed plan for the MRS.

If you have any questions or concerns, please do not hesitate to contact me at (330) 963-1235.

Sincerely,



Nicholas Roope
Site Coordinator
Division of Environmental Response and Revitalization

NCR/nvp

ec: Nat Peters, USACE
Katie Tait/Kevin Sedlak, OHARNG RTLS
Craig Coombs, USACE
Rebecca Shreffler, Chenega
David Connolly, ARNG
Mark Johnson Ohio EPA, NEDO, DERR
Bob Princic, Ohio EPA, NEDO, DERR
Tom Schneider, Ohio EPA, SWDO, DERR



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

July 5, 2018

Mr. David Connolly
Army National Guard Directorate
Environmental Programs Division
ARNG-ILE-CR
111 South George Mason Drive
Arlington, VA 22204

**Re: US Army Ravenna Ammunition Plt RVAAP
Remediation Response
Plans
Remedial Response
Portage County
267000859235**

Subject: Review of the "Response to Ohio EPA Comments on Draft No Further Action Record of Decision, RVAAP-061-R-01 Block D Igloo-TD Munitions Response Site" at the Former Ravenna Army Ammunition Plant, Portage and Trumbull Counties, Ohio: Dated June 18, 2018 (Work Activity No. 267000859235)

Dear Mr. Connolly:

The Ohio Environmental Protection Agency (Ohio EPA), Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR) has received and reviewed the document entitled, "Response to Ohio EPA Comments on Draft No Further Action Record of Decision, RVAAP-061-R-01 Block D Igloo-TD Munitions Response Site" dated June 18, 2018. This document, received by Ohio EPA's NEDO on June 25, 2018, was prepared by HydroGeoLogic, Inc. on behalf of the US Army Corps of Engineers (USACE) – Baltimore District.

Ohio EPA concurs with the proposed edits to the Record of Decision (ROD), and has no further comments. Please submit the final draft of the ROD.

If you have any questions or concerns, please do not hesitate to contact me at (330) 963-1235.

Sincerely,

A handwritten signature in black ink, appearing to read "Nicholas Roope".

Nicholas Roope, Site Coordinator
Division of Environmental Response and Revitalization

NCR/nvp

ec: Nat Peters, USACE, Louisville District
Craig Coombs, USACE, Louisville District
Katie Tait/Kevin Sedlak, OHARNG RTLS
Rebecca Shreffler, Chenega
David Connolly, ARNG
Mark Johnson, Ohio EPA, NEDO DERR
Bob Princic, Ohio EPA, NEDO DERR
Tom Schneider, Ohio EPA, SWDO DERR

RECEIVED
06 JUL 2018



NATIONAL GUARD BUREAU

111 SOUTH GEORGE MASON DRIVE
ARLINGTON VA 22204-1373

June 18, 2018

Ohio Environmental Protection Agency

DERR-NEDO

Attn: Mr. Nicholas Roope

2110 East Aurora Road

Twinsburg, OH 44087-1924

Subject: Response to Ohio EPA Comments on Draft No Further Action Record of Decision, RVAAP-061-R-01 Block D Igloo-TD Munitions Response Site, Munitions Response Services at the Former Ravenna Army Ammunition Plant, Portage and Trumbull Counties, Ohio, Contract No. W912DR-15-D-0016, Delivery Order 0001 (Ohio EPA Work Activity # 267000859235)

Dear Mr. Roope:

This letter is sent to summarize the response to comments received from the Ohio EPA comment letter dated June 6, 2018. Responses to the Ohio EPA comments on the *Draft No Further Action Record of Decision, RVAAP-061-R-01 Block D Igloo-TD Munitions Response Site* are provided below. Revisions have been incorporated into the document which will be submitted as Final after concurrence by the Ohio EPA to the edits summarized below:

Ohio EPA Comment	Army Response
The text in the abstract states, "Investigations have found no MPPEH or concentrated areas of munitions debris, and no potential source of munitions constituents exists at the MRS." Ohio EPA recommends changing the material potentially presenting an explosive hazard (MPPEH) to munitions and explosives of concern or material documented as an explosive hazard in the final submittal.	Concur. The Abstract listed in Section 14 of Standard Form 298 (Page 3 of the PDF), third sentence has been revised as requested for the Final submittal: "Investigations have found no munitions and explosives of concern or concentrated areas of munitions debris, and no potential source of munitions constituents exists at the MRS."

This document was prepared for the US Army Corps of Engineers (USACE) – Baltimore District by HydroGeoLogic, Inc., under Contract No. W912DR-15-D-0016.

Please contact the undersigned at (703) 607-7955 or david.m.connolly8.civ@mail.mil if there are issues or concerns with this submission.

Sincerely,

Kathryn S. Tait for

Mr. David Connolly
RVAAP Restoration Program Manager
Army National Guard Directorate

cc:

Mark Johnson, Ohio EPA, Environmental Manager (one [1] electronic copy, one [1] hard copy)
Bob Princic, Ohio EPA, DERR (one [1] electronic copy)
Tom Schneider, Ohio EPA, DERR, CO (one [1] electronic copy)
Kevin Sedlak, ARNG, Camp Ravenna (one [1] electronic copy)
Katie Tait, OHARNG (one [1] electronic copy)
Craig Coombs, USACE – Louisville Project Manager (one [1] electronic copy)
Travis McCoun, USACE Baltimore District (one [1] electronic copy)
Gail Harris, Vista Science Corp. (one [1] electronic copies)



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

June 6, 2018

LTC James Crowley
ARNG-IED
ARNG Directorate
111 South George Mason Drive
Arlington, VA 22204

Re: **US Army Ravenna Ammunition Plant RVAAP
Remediation Response
Project records
Remedial Response
Portage County
267000859196**

Subject: Review of the "Final Feasibility Study for RVAAP-060-R-01 Block D Igloo Munitions Response Site, Version 1.0" at the Former Ravenna Army Ammunition Plant; Ravenna, Ohio: Dated April 23, 2018 (Work Activity No. 267000859196)

Dear LTC Crowley:

The Ohio Environmental Protection Agency (Ohio EPA), Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR) has received and reviewed the document entitled, "Final Feasibility Study for RVAAP-060-R-01 Block D Igloo Munitions Response Site, Version 1.0," dated April 23, 2018. This document, received by Ohio EPA, NEDO on April 24, 2018, was prepared for the U.S. Army Corps of Engineers (USACE) Baltimore District, by HydroGeoLogic, Inc. Ohio EPA has no comments and accepts the final feasibility study in its final format.

If you have any questions or concerns, please do not hesitate to contact me at (330) 963-1235.

Sincerely,

A handwritten signature in black ink, appearing to read "Nicholas Roope". The signature is fluid and cursive, with a long horizontal stroke extending to the right.

Nicholas Roope
Site Coordinator
Division of Environmental Response and Revitalization

NCR/nvp

ec: Craig Coombs, USACE, Louisville District
Shreffler/Harris, Camp Ravenna Environmental Office, Vista Sciences
Mark Johnson, Ohio EPA, NEDO DERR
Bob Princic, Ohio EPA, NEDO DERR
Tom Schneider, Ohio EPA, SWDO DERR
Katie Tait/Kevin Sedlak, Camp Ravenna Environmental Office

08 JUN 2018



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

RECEIVED
4/10/2018

April 2, 2018

Mr. Mark Leeper, P.G., MBA
Team Lead
Cleanup and Restoration Branch
ARNG Directorate
111 South George Mason Drive
Arlington, VA 22204

Re: US Army Ravenna Ammunition Plt RVAAP
Remediation Response
Project records
Remedial Response
Portage County
267000859196

Subject: Review of the "Response to Comments Received on the Draft Feasibility Study for RVAAP-060-R-01 Block D Igloo Munitions Response Site, Version 1.0" at the Former Ravenna Army Ammunition Plant; Ravenna, Ohio: Dated February 22, 2018 (Work Activity No. 267000859196)

Dear Mr. Leeper:

The Ohio Environmental Protection Agency (Ohio EPA), Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR) has received and reviewed the document entitled, "Response to Comments Received on the Draft Feasibility Study for RVAAP-060-R-01 Block D Igloo Munitions Response Site, Version 1.0" (RTCs), dated February 22, 2018. This document was received by Ohio EPA, NEDO on February 26, 2018. It was prepared in response to comments issued by Ohio EPA on December 4, 2017. Following the review of the response to comments, Ohio EPA concurs with the responses and requests the submittal of the final document with the edits outlined in the RTCs.

If you have any questions or concerns, please do not hesitate to contact me at (330) 963-1235.

Sincerely,

Nicholas Roope
Site Coordinator
Division of Environmental Response and Revitalization

NCR/nvp

cc: Craig Coombs, USACE, Louisville District
Katie Tait/Kevin Sedlak, Camp Ravenna Environmental Office
Shreffler/Harris, Camp Ravenna Environmental Office, Vista Sciences

ec: Rod Beals, Ohio EPA, NEDO DERR
Bob Princic, Ohio EPA, NEDO DERR
Tom Schneider, Ohio EPA, SWDO DERR



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

January 2, 2019

Mr. David Connolly
Army National Guard Directorate
Environmental Programs Division
ARNG-ILE-CR
111 South George Mason Drive
Arlington, VA 22204

Re: US Army Ravenna Ammunition Plt RVAAP
Remediation Response
Plans
Remedial Response
Portage County
267000859241

Subject: Administrative Update to the Proposed Plan for RVAAP-060-R-01; the Block D Igloo Munitions Response Site at the Former Ravenna Army Ammunition Plant, Portage and Trumbull Counties, Ohio (Work Activity No. 267000859241)

Dear Mr. Connolly:

The Ohio Environmental Protection Agency (Ohio EPA) noted an issue within our administrative records pertaining to the Block D Igloo Site (the "Site"). All records of correspondence pertaining to the Site between September 26, 2018, to present day reference "No Further Action" in the title; when in fact, the draft proposed plan is recommending "Surface and Subsurface Removal" as the preferred alternative. We are sending this document to correct the administrative record and request all future submittals pertaining to the Site be sent to Ohio EPA with the appropriate preferred alternative in the title of the document.

If you have any questions or concerns, please do not hesitate to contact me at (330) 963-1235.

Sincerely,

A handwritten signature in black ink, appearing to read "Nicholas Roope", is written over a horizontal line.

Nicholas Roope
Site Coordinator
Division of Environmental Response and Revitalization

NCR/nvp

ec: Nat Peters, USACE
Katie Tait/Kevin Sedlak, OHARNG RTLS
Craig Coombs, USACE
Rebecca Shreffler, Chenega
Mark Johnson Ohio EPA, NEDO, DERR
Bob Princic, Ohio EPA, NEDO, DERR
Tom Schneider, Ohio EPA, SWDO, DERR

RECEIVED
JAN 03 2019



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

November 7, 2018

Mr. David Connolly
Army National Guard Directorate
Environmental Programs Division
ARNG-ILE-CR
111 South George Mason Drive
Arlington, VA 22204

**Re: US Army Ravenna Ammunition Plt RVAAP
Remediation Response
Approval
Remedial Response
Portage County
267000859235**

**Subject: Concurrence with the "Final No Further Action Record of Decision for
RVAAP-061-R-01 Block D Igloo-TD Munitions Response Site Version 1.0"
Munitions Response Services at the Former Ravenna Army Ammunition
Plant, Portage and Trumbull Counties, Ohio: Dated September 14, 2018
(Work Activity No. 267000859235)**

Dear Mr. Connolly:

The Ohio Environmental Protection Agency (Ohio EPA) Northeast District Office (NEDO) Division of Environmental Response and Revitalization (DERR) has received and reviewed the "*Final No Further Action Record of Decision for RVAAP-061-R-01 Block D Igloo-TD Munitions Response Site Version 1.0*" document dated September 14, 2018. This document was received by Ohio EPA's NEDO on September 14, 2018. It was prepared by HydroGeoLogic, Inc. (HGL).

The Military Munitions Response Program (MMRP) remedial investigation for the Block D Igloo-TD munitions response site (MRS) investigated the potential presence of munitions and explosives of concern (MEC) within the defined portion of the MRS. To date, no MEC has been found or is suspected to be present at the MRS. Therefore, sampling for munitions constituents was not warranted. As there are no further comments, or potential issues to address for the MRS, Ohio EPA concurs with the remedy of no further action for the MRS.

If you have any questions concerning this letter, please contact Nicholas Roope at (330) 963-1235.

Sincerely,

Craig W. Butler
Director

RECEIVED
8 NOV 2018

cc: Nat Peters, USACE
Craig Coombs, USACE
David Connolly, ARNG
Bob Princic, Ohio EPA, NEDO DERR

Katie Tait/Kevin Sedlak, OHARNG RTLS
Rebecca Shreffler, Chenega
Mark Johnson, Ohio EPA, NEDO DERR
Tom Schneider, Ohio EPA, SWDO DERR



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

July 5, 2018

Mr. David Connolly
Army National Guard Directorate
Environmental Programs Division
ARNG-ILE-CR
111 South George Mason Drive
Arlington, VA 22204

Re: US Army Ravenna Ammunition Plt RVAAP
Remediation Response
Plans
Remedial Response
Portage County
267000859235

Subject: Review of the "Response to Ohio EPA Comments on Draft No Further Action Record of Decision, RVAAP-061-R-01 Block D Igloo-TD Munitions Response Site" at the Former Ravenna Army Ammunition Plant, Portage and Trumbull Counties, Ohio: Dated June 18, 2018 (Work Activity No. 267000859235)

Dear Mr. Connolly:

The Ohio Environmental Protection Agency (Ohio EPA), Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR) has received and reviewed the document entitled, "Response to Ohio EPA Comments on Draft No Further Action Record of Decision, RVAAP-061-R-01 Block D Igloo-TD Munitions Response Site" dated June 18, 2018. This document, received by Ohio EPA's NEDO on June 25, 2018, was prepared by HydroGeoLogic, Inc. on behalf of the US Army Corps of Engineers (USACE) – Baltimore District.

Ohio EPA concurs with the proposed edits to the Record of Decision (ROD), and has no further comments. Please submit the final draft of the ROD.

If you have any questions or concerns, please do not hesitate to contact me at (330) 963-1235.

Sincerely,

A handwritten signature in black ink, appearing to read "Nicholas Roope", is written over a light blue horizontal line.

Nicholas Roope, Site Coordinator
Division of Environmental Response and Revitalization

NCR/nvp

ec: Nat Peters, USACE, Louisville District
Craig Coombs, USACE, Louisville District
Katie Tait/Kevin Sedlak, OHARNG RTLS
Rebecca Shreffler, Chenega
David Connolly, ARNG
Mark Johnson, Ohio EPA, NEDO DERR
Bob Princic, Ohio EPA, NEDO DERR
Tom Schneider, Ohio EPA, SWDO DERR

RECEIVED
06 JUL 2018



NATIONAL GUARD BUREAU

111 SOUTH GEORGE MASON DRIVE
ARLINGTON VA 22204-1373

June 18, 2018

Ohio Environmental Protection Agency

DERR-NEDO

Attn: Mr. Nicholas Roope

2110 East Aurora Road

Twinsburg, OH 44087-1924

Subject: Response to Ohio EPA Comments on Draft No Further Action Record of Decision, RVAAP-061-R-01 Block D Igloo-TD Munitions Response Site, Munitions Response Services at the Former Ravenna Army Ammunition Plant, Portage and Trumbull Counties, Ohio, Contract No. W912DR-15-D-0016, Delivery Order 0001 (Ohio EPA Work Activity # 267000859235)

Dear Mr. Roope:

This letter is sent to summarize the response to comments received from the Ohio EPA comment letter dated June 6, 2018. Responses to the Ohio EPA comments on the *Draft No Further Action Record of Decision, RVAAP-061-R-01 Block D Igloo-TD Munitions Response Site* are provided below. Revisions have been incorporated into the document which will be submitted as Final after concurrence by the Ohio EPA to the edits summarized below:

Ohio EPA Comment	Army Response
The text in the abstract states, "Investigations have found no MPPEH or concentrated areas of munitions debris, and no potential source of munitions constituents exists at the MRS." Ohio EPA recommends changing the material potentially presenting an explosive hazard (MPPEH) to munitions and explosives of concern or material documented as an explosive hazard in the final submittal.	Concur. The Abstract listed in Section 14 of Standard Form 298 (Page 3 of the PDF), third sentence has been revised as requested for the Final submittal: "Investigations have found no munitions and explosives of concern or concentrated areas of munitions debris, and no potential source of munitions constituents exists at the MRS."

This document was prepared for the US Army Corps of Engineers (USACE) – Baltimore District by HydroGeoLogic, Inc., under Contract No. W912DR-15-D-0016.

Please contact the undersigned at (703) 607-7955 or david.m.connolly8.civ@mail.mil if there are issues or concerns with this submission.

Sincerely,

Kathryn S. Tait for

Mr. David Connolly
RVAAP Restoration Program Manager
Army National Guard Directorate

cc:

Mark Johnson, Ohio EPA, Environmental Manager (one [1] electronic copy, one [1] hard copy)
Bob Princic, Ohio EPA, DERR (one [1] electronic copy)
Tom Schneider, Ohio EPA, DERR, CO (one [1] electronic copy)
Kevin Sedlak, ARNG, Camp Ravenna (one [1] electronic copy)
Katie Tait, OHARNG (one [1] electronic copy)
Craig Coombs, USACE – Louisville Project Manager (one [1] electronic copy)
Travis McCoun, USACE Baltimore District (one [1] electronic copy)
Gail Harris, Vista Science Corp. (one [1] electronic copies)



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

June 6, 2018

LTC James Crowley
ARNG-IED
ARNG Directorate
111 South George Mason Drive
Arlington, VA 22204

Re: **US Army Ravenna Ammunition Plt RVAAP
Remediation Response
Plans
Remedial Response
Portage County
267000859235**

Subject: Review of the "Draft No Further Action Record of Decision for RVAAP-061-R-01 Block D Igloo-TD Munitions Response Site, Version 1.0" Former Ravenna Army Ammunition Plant, Portage and Trumbull Counties, Ohio: Dated April 26, 2018 (Work Activity No. 267000859235)

Dear LTC Crowley:

The Ohio Environmental Protection Agency (Ohio EPA), Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR) has received and reviewed the document entitled, "*Draft No Further Action Record of Decision for RVAAP-061-R-01 Block D Igloo-TD Munitions Response Site, Version 1.0*," dated April 26, 2018. This document, received by Ohio EPA's NEDO on May 1, 2018, was prepared by HydroGeoLogic, Inc. Ohio EPA identified an issue with the abstract statement.

The text in the abstract states, "Investigations have found no MPPEH or concentrated areas of munitions debris, and no potential source of munitions constituents exists at the MRS." Ohio EPA recommends changing the material potentially presenting an explosive hazard (MPPEH) to munitions and explosives of concern or material documented as an explosive hazard in the final submittal.

If you have any questions or concerns, please do not hesitate to contact me at (330) 963-1235.

Sincerely,

Nicholas Roope
Site Coordinator
Division of Environmental Response and Revitalization

NCR/nvp

ec: Craig Coombs, USACE, Louisville District
Shreffler/Harris, Camp Ravenna Environmental Office, Vista Sciences
Mark Johnson, Ohio EPA, NEDO, DERR
Bob Princic, Ohio EPA, NEDO, DERR
Tom Schneider, Ohio EPA, SWDO, DERR
Katie Tait/Kevin Sedlak, Camp Ravenna Environmental Office

08 JUN 2018



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

April 28, 2017

Mr. Mark Leeper, P.G., MBA
Cleanup and Restoration Branch
ARNG Directorate
Environmental Programs Division
111 South George Mason Drive
Arlington, VA 22204

Re: **US Army Ravenna Ammunition Plt RVAAP
Remediation Response
Plans
Remedial Response
Portage County
267000859235**

Subject: Review of the "Draft No Further Action Proposed Plan for RVAAP-061-R-01 Block D Igloo-TD Munitions Response Site, Version 1.0" Former Ravenna Army Ammunition Plant, Portage and Trumbull Counties, Ohio: Dated March 3, 2017 (Work Activity No. 267000859235)

Dear Mr. Leeper:

The Ohio Environmental Protection Agency (Ohio EPA), Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR) has received and reviewed the document entitled, "*Draft No Further Action Proposed Plan for RVAAP-061-R-01 Block D Igloo-TD Munitions Response Site, Version 1.0*," dated March 3, 2017. This document, received by Ohio EPA's NEDO on March 20, 2017, was prepared by HydroGeoLogic, Inc. Ohio EPA is requesting the following actions:

- Update the document distribution table to replace Kelly Kaletsky with Tom Schneider.
- Add the date the public meeting will take place in the final version of the No Further Action Proposed Plan for RVAAP-061-R-01 Block D Igloo-TD Munitions Response Site.

If you have any questions or concerns, please do not hesitate to contact me at (330) 963-1235.

Sincerely,

Nicholas Roope
Site Coordinator
Division of Environmental Response and Revitalization

NCR/nvr

cc: Craig Coombs, USACE, Louisville District
Katie Tait/Kevin Sedlak, Camp Ravenna Environmental Office, Newton Falls
Shreffler/Harris, Camp Ravenna Environmental Office, Vista Sciences, Newton Falls

ec: Rod Beals, Ohio EPA, NEDO, DERR
Tom Schneider, Ohio EPA, SWDO, DERR





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

October 24, 2018

Mr. David Connolly
Army National Guard Directorate
Environmental Programs Division
ARNG-ILE-CR
111 South George Mason Drive
Arlington, VA 22204

**Re: US Army Ravenna Ammunition Plt RVAAP
Remediation Response
Plans
Remedial Response
Portage County
267000859253**

**Subject: Receipt and Review of the "Draft No Further Action Proposed Plan for
RVAAP-001-R-01 Ramsdell Quarry Landfill Munitions Response Site Area 2
(South), Version 1.0" Dated September 19, 2018 (Work Activity No.
267000859253)**

Dear Mr. Connolly:

The Ohio Environmental Protection Agency (Ohio EPA), Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR) has received and reviewed the document entitled *Draft No Further Action Proposed Plan for RVAAP-001-R-01 Ramsdell Quarry Landfill Munitions Response Site Area 2 (South), Version 1.0*, dated September 19, 2018. This document, received by Ohio EPA NEDO on September 19, 2018, was prepared for the U.S. Army Corps of Engineers (USACE) Baltimore District, by HydroGeoLogic, Inc. Ohio EPA has identified no issues that need to be addressed. Please submit the final version of the proposed plan (PP).

If you have any questions or concerns, please do not hesitate to contact me at (330) 963-1235.

Sincerely,

Nicholas Roope
Site Coordinator
Division of Environmental Response and Revitalization

NCR:cla

ec: Nat Peters, USACE
Katie Tait/Kevin Sedlak, OHARNG RTLS
Craig Coombs, USACE
Rebecca Shreffler, Chenega
David Connolly, ARNG
Mark Johnson, Ohio EPA, NEDO, DERR
Bob Princic, Ohio EPA, NEDO, DERR
Tom Schneider, Ohio EPA, SWDO, DERR

RECEIVED
26 OCT 2018



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

OCT 29 2018

Mr. David Connolly
Army National Guard Directorate
Environmental Programs Division
ARNG ILE-CR
111 South George Mason Drive
Arlington, VA 22204

Re: US Army Ravenna Ammunition Plt RVAAP
Remediation Response
Approval
Remedial Response
Portage County
267000859204

Subject: Concurrence with the "Final No Further Action Record of Decision for RVAAP-001-R-02 Ramsdell Quarry Landfill Munitions Response Site Area 1 (North) Version 1.0" Munitions Response Services at the Former Ravenna Army Ammunition Plant, Portage and Trumbull Counties, Ohio: Dated September 13, 2018 (Work Activity No. 267000859204)

Dear Mr. Connolly:

The Ohio Environmental Protection Agency (Ohio EPA), Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR) has received and reviewed the *Final No Further Action Record of Decision for RVAAP-001-R-02 Ramsdell Quarry Landfill Munitions Response Site Area 1 (North) Version 1.0* document dated September 13, 2018. This document received by Ohio EPA NEDO on September 14, 2018, and was prepared by HydroGeoLogic, Inc. (HGL).

The Military Munitions Response Program (MMRP) remedial investigation for the Ramsdell Quarry Landfill (RQL) Munitions Response Site (MRS) Area 1 (North) investigated the potential presence of munitions and explosives of concern (MEC) within the defined portion of the MRS. To date, no MEC has been found at the RQL MRS North Area of Concern (AOC). Therefore, sampling for munitions constituents was not warranted. The chemicals of concern identified in surface soil and dry sediment during previous investigations will continue to be addressed under the Installation Restoration Program. As there are no further comments or potential issues to address for the RQL MRS North AOC, Ohio EPA concurs with the remedy of No Further Action for this AOC.

If you have any questions concerning this letter, or any findings made by Ohio EPA, please contact Nicholas Roope at (330) 963-1235.

Sincerely,

Craig W. Butler
Director

RECEIVED
29 OCT 2018

cc: Nat Peters, USACE
Craig Coombs, USACE
David Connolly, ARNG
Bob Princic, Ohio EPA, NEDO, DERR

Katie Tait/Kevin Sedlak, OHARNG RTLS
Rebecca Shreffler, Chenega
Mark Johnson, Ohio EPA, NEDO, DERR
Tom Schneider, Ohio EPA, SWDO, DERR



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

June 6, 2018

LTC James Crowley
ARNG-IED
ARNG Directorate
111 South George Mason Drive
Arlington, VA 22204

Re: US Army Ravenna Ammunition Plt RVAAP
Remediation Response
Plans
Remedial Response
Portage County
267000859204

Subject: Review of the "Draft No Further Action Record of Decision, RVAAP-001-R-02 Ramsdell Quarry Landfill Munitions Response Site Area 1 (North)" Former Ravenna Army Ammunition Plant, Portage and Trumbull Counties, Ohio: Dated April 23, 2018

Dear LTC Crowley:

The Ohio Environmental Protection Agency (Ohio EPA), Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR) has received and reviewed the "Draft No Further Action Record of Decision, RVAAP-001-R-02 Ramsdell Quarry Landfill Munitions Response Site Area 1 (North)," dated April 23, 2018. This document received by Ohio EPA's NEDO on April 24, 2018, was prepared by HydroGeoLogic, Inc. as a result of the investigation completed under the military munitions response program. Ohio EPA has reviewed the document and requests a final version of the document be submitted.

If you have any questions or concerns, please do not hesitate to contact Nicholas Roope at (330) 963-1235.

Sincerely,

A handwritten signature in black ink, appearing to read "Nicholas Roope", is written over a horizontal line.

Nicholas Roope
Site Coordinator
Division of Environmental Response and Revitalization

NCR/nvp

ec: Craig Coombs, USACE, Louisville District
Shreffler/Harris, Camp Ravenna Environmental Office, Vista Sciences
Mark Johnson, Ohio EPA, NEDO DERR
Bob Princic, Ohio EPA, NEDO DERR
Tom Schneider, Ohio EPA, SWDO DERR
Katie Tait/Kevin Sedlak, Camp Ravenna Environmental Office

RECEIVED
08 JUN 2018



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

RECEIVED
2/21/2018

February 16, 2018

Mr. Mark Leeper, P.G., MBA
Team Lead, Cleanup and Restoration
Branch ARNG Directorate
111 South George Mason Drive
Arlington, VA 22204

Re: **US Army Ravenna Ammunition Plt RVAAP
Remediation Response
Project Records
Remedial Response
Portage County
267000859239**

**Subject: Receipt and Review of the "Final Feasibility Study for RVAAP-001-R-01
Ramsdell Quarry Landfill Munitions Response Site Area 2 (South), Version
1.0," Dated January 17, 2018 (Work Activity No. 267000859239)**

Dear Mr. Leeper:

The Ohio Environmental Protection Agency (Ohio EPA), Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR) has received and reviewed the document entitled *Final Feasibility Study for RVAAP-001-R-01 Ramsdell Quarry Landfill Munitions Response Site Area 2 (South), Version 1.0*, dated January 17, 2018. This document, received by Ohio EPA NEDO on January 18, 2018, was prepared for the U.S. Army Corps of Engineers (USACE) Baltimore District, by HydroGeoLogic, Inc. in response to Ohio EPA's request for the final document sent January 3, 2018.

This document was reviewed by personnel from Ohio EPA, DERR, pursuant to the Director's Findings and Orders paragraph 39 (b), and we concur with the feasibility study in its final format. Please note, the document did not contain the Disclaimer Statement at the beginning of the document. This does not affect the technical aspects of the document.

If you have any questions or concerns, please do not hesitate to contact me at (330) 963-1235.

Sincerely,

Nicholas Roope
Site Coordinator
Division of Environmental Response and Revitalization

NCR:cla

cc: Craig Coombs, USACE, Louisville District
Katie Tait/Kevin Sedlak, Camp Ravenna Environmental Office
Shreffler/Harris, Camp Ravenna Environmental Office, Vista Sciences

ec: Rod Beals, Ohio EPA, NEDO, DERR
Bob Princic, Ohio EPA, NEDO, DERR
Tom Schneider, Ohio EPA, SWDO, DERR



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

RECEIVED
1/9/2018

January 3, 2018

Mr. Mark Leeper, P.G., MBA
Team Lead
Cleanup and Restoration Branch
ARNG Directorate
111 South George Mason Drive
Arlington, VA 22204

Re: US Army Ravenna Ammunition Plt RVAAP
Remediation Response
Project records
Remedial Response
Portage County
267000859239

Subject: Receipt and Review of the "Draft Feasibility Study for RVAAP-001-R-01 Ramsdell Quarry Landfill Munitions Response Site Area 2 (South), Version 1.0," Dated December 19, 2017 (Work Activity No. 267000859239)

Dear Mr. Leeper:

The Ohio Environmental Protection Agency (Ohio EPA), Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR) has received and reviewed the document entitled, "*Draft Feasibility Study for RVAAP-001-R-01 Ramsdell Quarry Landfill Munitions Response Site Area 2 (South), Version 1.0*," dated December 19, 2017. This document, received by Ohio EPA NEDO on December 20, 2017, was prepared for the U.S. Army Corps of Engineers (USACE) Baltimore District, by HydroGeoLogic, Inc. This document as submitted can be finalized.

If you have any questions or concerns, please do not hesitate to contact me at (330) 963-1235.

Sincerely,

Nicholas Roope
Site Coordinator
Division of Environmental Response and Revitalization

NCR/nvp

- cc: Craig Coombs, USACE, Louisville District
Katie Tait/Kevin Sedlak, Camp Ravenna Environmental Office
Shreffler/Harris, Camp Ravenna Environmental Office, Vista Sciences
- ec: Rod Beals, Ohio EPA, NEDO DERR
Bob Princic, Ohio EPA, NEDO DERR
Tom Schneider, Ohio EPA, SWDO DERR



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

December 13, 2018

Mr. David Connolly
Army National Guard Directorate
Environmental Programs Division
ARNG-ILE-CR
111 South George Mason Drive
Arlington, VA 22204

Re: **US Army Ravenna Ammunition Plt RVAAP
Remediation Response
Plans
Remedial Response
Portage County
267000859256**

**Subject: Review of the "Response to Comments on the Draft Proposed Plan for
RVAAP-002-R-01 Erie Burning Grounds Munitions Response Site, Version
1.0" Dated December 5, 2018 (Work Activity No. 267000859256)**

Dear Mr. Connolly:

The Ohio Environmental Protection Agency (Ohio EPA), Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR) has received and reviewed the document entitled "Response to Comments on the Draft Proposed Plan for RVAAP-002-R-01 Erie Burning Grounds Munitions Response Site, Version 1.0" dated December 5, 2018. This document, received by Ohio EPA's NEDO on December 5, 2018, was prepared by HydroGeoLogic, Inc.

The responses provided to Ohio EPA comments are satisfactory. Please submit the proposed plan in its final format. If you have any questions or concerns, please do not hesitate to contact me at (330) 963-1235.

Sincerely,

A handwritten signature in black ink, appearing to read "Nicholas Roope", is written over a light blue horizontal line.

Nicholas Roope
Site Coordinator
Division of Environmental Response and Revitalization

NCR/nvp

cc: Nat Peters, USACE
Katie Tait/Kevin Sedlak, OHARNG RTLS
Craig Coombs, USACE
Rebecca Shreffler, Chenega
David Connolly, ARNG
Mark Johnson Ohio EPA, NEDO, DERR
Bob Princic, Ohio EPA, NEDO, DERR
Tom Schneider, Ohio EPA, SWDO, DERR

RECEIVED
DEC 14 2018



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

December 5, 2018

Ohio Environmental Protection Agency
Attn: Mr. Nicholas Roope, DERR-NEDO
2110 East Aurora Road
Twinsburg, OH 44087-1924

Subject: Responses to comments on the Draft Proposed Plan for RVAAP-002-R-01 Erie Burning Grounds Munitions Response Site, Version 1.0, Munitions Response Services at the Former Ravenna Army Ammunition Plant, Portage and Trumbull Counties, Ohio, Contract No. W912DR-15-D-0016, Delivery Order 0001 (Ohio EPA Work Activity # 267-000859-256)

Dear Mr. Roope:

As indicated in the letter dated October 11, 2018, the Ohio EPA has completed review of the above-referenced Proposed Plan. A conference call was also held, on October 4, 2018, to discuss Ohio EPA concerns. This letter provides responses to the Ohio EPA comments received as summarized in Table 1 and shown in the enclosures listed below. To assist Ohio EPA with review of the responses to comments, the teleconference minutes and the red-lined/strikeout revised pages are enclosed. The revised Figures 5, 6a, and 6b are also provided for review.

This document was prepared for the US Army Corps of Engineers (USACE) – Louisville District by HydroGeoLogic, Inc., under Contract No. W912DR-15-D-0016. Please contact the undersigned at (703) 607-7589 or David.M.Connolly8.civ@mail.mil if there are issues or concerns with this submission.

Sincerely,

SEDLAK.KEVIN.MI
CHAEI.12544401
71
FOR David Connolly
RVAAP Restoration Program Manager
Army National Guard Directorate

Digitally signed by
SEDLAK.KEVIN.MICHAEL.12544
40171
Date: 2018.12.05 10:49:35
-05'00'

cc:

Mark Johnson, Ohio EPA, Project Manager (one [1] electronic copy)
Tom Schneider, Ohio EPA, DERR, CO (one [1] electronic copy)
Kevin Sedlak, ARNG, Camp Ravenna (one [1] electronic copy)
Katie Tait, OHARNG (one [1] electronic copy)
Craig Coombs, USACE – Louisville Project Manager (one [1] electronic copy)
Travis McCoun, USACE Baltimore District (one [1] electronic copy)
Gail Harris, Vista Science Corp. (one [1] electronic copy)

Enclosures:

Table 1: Responses to Comments

Minutes of October 4, 2018, teleconference

Revised Proposed Plan Page 4

Revised Proposed Plan Page 5

Revised Proposed Plan Page 7

Revised Figure 5, Erie Burning Grounds Digital Geophysical Mapping Transects

Revised Figure 6a, 2014 Remedial Investigation Intrusive Investigation Results North Section of
Erie Burning Grounds

Revised Figure 6b, 2014 Remedial Investigation Intrusive Investigation Results South Section of
Erie Burning Grounds

**Table 1 – Summary of Responses to Ohio EPA Comments
On the Draft Proposed Plan for Erie Burning Grounds Munitions Response Site**

Comment Number	Section / Page	Comment	Response to Comment
Issue A: Munitions Response Site Prioritization Protocol	Section 2.4 / Page 3	The text in the last paragraph of Section 2.4 states, "Because no explosive hazards were found during the RI [Remedial Investigation] no MEC [Munitions and Explosives of Concern] hazard assessment was required. The MRS [Munitions Response Site] was assigned a Munitions Response Site Prioritization Protocol (MRSP) priority of 5 based on the evaluation of site characteristic in three hazard modules: explosive, materiel, and health hazards." This appears to be inconsistent with the final version of the RI and Feasibility Study (FS), which lists the MRSP priority value as seven (7). Please revise this discrepancy in the final PP.	Concur, the sentence was revised to state: "The MRS was assigned a Munitions Response Site Prioritization Protocol (MRSP) priority of <u>7</u> based on the evaluation of site characteristics . . ."
Issue B: Demonstration of Adequate Investigation and Protection of Receptors	Various	Ohio EPA, DERR-NEDO and DERR-SWDO participated in a conference call on October 4, 2018, with the RVAAP and USAGE staff to discuss the general coverage of the investigation completed at the MRS. The text in the PP does not provide enough supporting information to prevent misinterpretation of the attached figures. Ohio EPA requested additional text focusing on the statistical analysis to support the figures presented in greater detail. In addition, Ohio EPA recommended including any limitations on training in a Category 3 wetland to provide additional support for the selected remedy.	Concur, revisions are summarized below. The teleconference minutes are attached to these responses to comments. In addition, the listed revisions to the text were made and the revised pages and figures are attached for review: <ul style="list-style-type: none"> • Section 2.4 Remedial Investigation Results was revised to include additional summary information of the previous RI conclusions and to provide additional detail on the field activities and the statistical evaluation of the characterization data. • A new Figure 5 was added to the Proposed Plan to demonstrate geophysical survey transect coverage. The presentation of the legend items on Figures 6a and 6b (previously Figure 5a and 5b) were reorganized to more clearly demonstrate the anomalies identified as munitions debris and the anomalies that were non-munitions related metal or other debris. • A sentence was added to paragraph 4.0 where land use is described: "The Erie Burning Grounds MRS is within a larger area designated for military training; however, the high-quality wetlands present within the MRS will preclude some types of access and military training at the MRS."

MINUTES
MUNITIONS RESPONSE SERVICES AT THE
FORMER RAVENNA ARMY AMMUNITION PLANT
PORTAGE AND TRUMBULL COUNTIES, OHIO

Discussion with the Ohio Environmental Protection Agency
Regarding review and comment for
Erie Burning Grounds Munitions Response Site
No Further Action Proposed Plan, dated August 2018

Meeting Date: October 4, 2018
Meeting Time: 9:00 am Central time / 10:00 am Eastern time
Meeting Location: Dial-in: 1-866-740-1260 Passcode: 8286684

Attendees: Nicholas Roope, Ohio Environmental Protection Agency (EPA)
Tom Schneider, Ohio EPA
Bob Princic, Ohio EPA
Kevin Sedlak, Ohio Army National Guard (OHARNG)
Kathryn Tait, OHARNG
Travis McCoun, U.S. Army Corps of Engineers (USACE) Baltimore District
Kimberly Vaughn, HydroGeoLogic, Inc. (HGL)

Discussion Topics

Mr. Roope made an introduction to explain the purpose of this teleconference call which is being held at Ohio EPA's request. Mr. Roope explained that the Ohio EPA has concerns about the amount of metallic debris left in place at the Erie Burning Grounds MRS. Mr. Roope noted the Ohio EPA has questions about the level of investigation and the survey coverage that was achieved (20%) and also questions about leaving metallic debris present in the wetlands. Reviewing the Proposed Plan at this point, it appears that no further action is presented as the selected remedy. Mr. Roope noted that Ohio EPA has questions about the exposure potential for the anomalies that were not able to be investigated, Ohio EPA is asking what the exposure could potentially be. There are statements made in the FS pointing to why UXO personnel would not want to intrusively investigate them (dig them up) when those employees had a potential risk of exposure. The final future land use of the site is to be a residential land use for the current conclusions of the Proposed Plan, which proposes no further action (NFA) and proposes that UU/UE is achieved.

Ms. Vaughn summarized that the current wording in the Feasibility Study and the Proposed Plan correctly states that 6.8 acres of the 33.98 acre site was covered by geophysical survey during the RI. However, Ms. Vaughn noted that this coverage is actually excellent for characterization data, as the parallel spaced geophysical survey transects were collected across the entire MRS, providing excellent coverage to identify any target or impact areas that would be present from training activities. The transects placed gave the Remedial Investigation team excellent coverage of the entire MRS, which can be seen in the actual transect figure shown in Figure 4-2 of the remedial investigation report. Additionally, the Remedial Investigation Report accomplished a statistical evaluation of the field investigation results and concluded that the DGM survey coverage was

statistically sufficient to characterize the entire MRS. Ms. Vaughn also briefly summarized the intrusive results (“dig” results) from the RI field activities. For instance, 3,824 anomalies total were identified from the geophysical survey data. Of those, approximately two-thirds were “clusters” of anomalies in high density areas where trenches were used to investigate (“dig”) and 14 trenches were dug. In the low anomaly density areas (part land and part saturated areas), there were 1,052 anomalies identified. Of those, 350 were able to be investigated and the remaining anomalies were in saturated areas, underneath the sediment. There was no MEC identified at any of the trenches dug or at the single point anomaly locations that were investigated. Of the trenches and the single locations that were dug, there were 33 MD items identified at 5 of the trenches and a 29 MD items found at the single point locations. The majority of material recovered was non-munitions related metal. Though some anomalies were not able to be dug, under water and under sediment, enough “dig” data was collected for statistical confidence to conclude that remaining points are not explosively hazardous munitions.

The question was asked, on Figure 5a and 5b, for instance, the locations that are shown as the “Anomaly Type Unknown” the green dots, it appears based on the figure only, that there are still data gaps or a lack of data that would imply lack of confidence to recommend no further action. Ms. Vaughn noted that the RI dig results from other locations within the MRS are data points that give the team confidence that, though unknown, those buried items are not explosively hazardous.

Mr. McCoun noted that at this point in the deliverables process, the Proposed Plan, we are now evaluating the remedial investigation results and proceeding based on how confident we are in those previous investigation conclusions. In the review of the remedial investigation (being performed in the Feasibility Study and summarized in the Proposed Plan), the Remedial Investigation did meet, and in fact exceeded the statistical confidence levels. Even though while doing the RI investigation, yes there may have been anomalies that we couldn’t get to; however, we made adjustments to collect sufficient data such that the statistical confidence is still relevant. We made those conclusions at the RI phase that the lack of an explosive hazard is still a relevant conclusion from the RI because we didn’t find evidence of MEC or MPPEH, from all the digs performed. It is kind of natural to review an investigation like this and see that we didn’t dig up every piece of metal. We either trust the conclusions that were done in the RI Report, or not, and if those conclusions are statistically valid, we move forward.

Mr. Schneider asked the question, for this Proposed Plan, for example, a one-page briefing is required for Ohio EPA management to accomplish approval. When viewing the details of the Proposed Plan, as summarized, and this figure 5a showing all the green dots that are uninvestigated anomalies, the question arises, is this safe for soldiers to use. What real military training is going to be done in a Category 3 wetland as well. These are concerns with the data as presented.

Mr. McCoun noted that it is probably best to proceed with one of two options, try to do a better job to present the data visually to show that we’re confident that characterization of the MRS has been achieved. Mr. McCoun also proposed that the use of the land and the wetlands status can also be expanded on in the Proposed Plan. Mr. Schneider and Mr. Roope asked about the Category 3 wetland status and whether that is a designated wetland.

Ms. Tait noted that the choice to proceed with UU/UE is appropriate due to there being no explosive hazard and no MC contamination. First, there is no mechanism within the CERCLA as applied to the MMRP (the program for this site) to place a land use control LUC on a site that doesn't have any risks present. And second, Ravenna can't create a LUC that is specific for a Category 3 wetland. There won't be any military training occurring on this MRS, there will only be some regular maintenance and natural resources land use. Ms. Tait noted that we can't create a conclusion in these documents when there is no risk present, in order to put a LUC in place on the MRS. Mr. McCoun asked if there is a way to explain that there was not a release that occurred; there is no hazard and there is no risk; therefore, LUCs are not appropriate, and then state that this area is a wetland and is being managed as such by the installation. Therefore, there won't be any disturbances to the wetland, as a secondary precaution.

Mr. Roope noted that more clearly presenting the details of the technical/statistical evaluation that was performed in the RI Report will help, as Mr. Schneider had said. Mr. Schneider noted that most of the MMRP RODs that have arrived so far have been pretty cut and dried in their conclusions. This is a little more complex when visually looking at the data collected and knowing the information gathered from the trenches, etc.

Mr. Roope and Mr. Schneider suggested revising the figure and/or also definitely revise definitely the sentence: "Approximately 27 acres were determined to be inaccessible" phrase that is in the Proposed Plan.

Mr. Princic mentioned the area (Hemlock Gorge), that has some protected status due to wetlands present. Ms. Tait noted that there aren't any special interest areas that have any management being done by a special interest condition. Ms. Tait notes that the installation does know how to manage the wetlands present on installation, as there is an active wetlands management ongoing by Ravenna.

Ms. Tait noted that this site is somewhat similar to Paris Windham with the slope, (slope made the area not conducive for most types of military training). Ms. Tait stated the team can consider using similar language here that the wetlands is the driver that the area will not be used for military training. The question was asked as to why not bank these wetlands and Ms. Tait responded that this are just isn't one that we've look at for that purposes. There is a lot of monitoring that goes on with the banking of wetlands and this would add costs. There are larger areas that are a better fit within the installation for the purposes of wetland mitigation banks.

Travis notes that the data presented previously in the RI Report is good and valid data, we can present the data better in this Proposed Plan, and describe the statistical evaluation in more detail.

The site wide probability study was discussed by Ms. Tait and Mr. McCoun and they confirmed that this MRS is always evaluated and will continue to be evaluated as a low probability site.

The goals following this call will be to revise the figure and revise the text to better present the statistical evaluation of hazard from the RI. The team will determine if the wetlands previously prevented investigation of the area, can we then conclude that the wetlands prevent training in the area?

The team agreed that Ohio EPA will go ahead and submit their written comment letter. Mr. McCoun noted at this time it appears the recommendation will be that there has been no release of MEC or MC and site will be restricted from military training through other means (due to a non CERCLA program). The language will be inserted in a way that it provides a description of the process as a compromise. Ohio EPA noted that their comment letter will also be presented in a generic way. Mr. McCoun stated that he will work with HydroGeoLogic to make the revisions and come up with a work product that will meet the request for revisions.

Recommendations were made in the Final SI Report to further characterize the entire MRS with respect to MEC and MC (in pond sediment only) under the MMRP (CB&I, 2014).

2.4 Remedial Investigation Results

The Army conducted an RI at the Erie Burning Grounds MRS in 2014 to characterize the nature and extent of any military munitions and MC-related contamination potentially present within the MRS. Field activities included a **digital geophysical mapping** survey of 6.8 acres, intrusive investigation of 350 individual anomalies and 14 exploratory trenches, and sampling for MC-related contamination. ~~Approximately 27 acres were determined to be inaccessible due to a combination of dense vegetation and water that includes high quality wetlands.~~ The RI field activity results (**Figure 5a** and **Figure 5b**) are discussed below:

Digital geophysical surveys identified 2,233 clusters of high **anomaly** density around the shoreline of the northern pond. Two-hundred anomaly clusters were within 3 feet of one another and were merged together to form one target. A total of 266 anomaly clusters and 1,076 individual anomalies were identified outside of the high anomaly density areas. Another 49 anomaly clusters also located outside of the high-density area were found to be related to cultural features (i.e., underground utilities) or nails placed by the field teams for quality control purposes. The transects were placed in parallel lines across the MRS. The coverage exceeded the proposed sampling coverage and was sufficient to identify any munitions use areas that may not have been previously identified. The transect coverage of the MRS is shown in Figure 5. Based on the geophysical data collected, two types of intrusive investigation (digging) were completed during the RI field activities: trench investigations and individual anomaly investigation. The RI geophysical data indicates that the anomaly density across the MRS is relatively low, and the areas on either side of the railroad embankment and near Burn Area D are the locations with high anomaly densities. No significant patterns indicating a target area or impact area were located. In the high anomaly

density areas trenches were used to investigate anomaly clusters. In low anomaly density areas individual anomalies were selected for intrusive investigation.

Trench Investigation

Intrusive investigation of the high anomaly density areas was conducted using mechanical excavation techniques at 14 trench locations. From the 14 trenches, non-explosively hazardous fragments classified as munitions debris (MD) were located in five of the trenches. Thirty-three **munitions debris (MD)** items weighing approximately 910-pounds were removed from trench locations. ~~MD recovered from trench locations were associated with the AN M64A1-series 500lb General Purpose bomb.~~ Fragments recovered from trench locations were various parts associated with an AN-M64A1-series 500lb General Purpose bomb. The fragments were determined to have no explosive hazard and were classified as MD. The trenches were placed in biased locations within the areas of the highest concentrations of subsurface metal shown in the geophysical survey data. No explosively hazardous items were found in any of the 14 trenches.

Individual Anomaly Investigation

Outside the high anomaly density areas, in the low anomaly density areas, a total of 1,052 individual anomalies of interest were selected for intrusive investigation by hand digging. From these individual locations, 350 were able to be dug, as the remaining anomalies were buried too deep in the sediment and could not be safely investigated. Intrusive investigation teams must be able to see the items that are being excavated. From the 350 locations investigated, twenty-nine MD items weighing approximately 385-pounds were removed from point-source target locations. Fragments recovered from point-source locations were associated with the M48-series 75 millimeter (mm) high explosive projectile and M309-series 75mm projectile. These fragments had no explosive hazards and were classified as MD. No explosively hazardous items were found in any of the 350 locations.

Intrusive Investigation Summary

In the areas of the highest anomaly density (the most concentrated areas of subsurface metal), fourteen trenches were excavated, and no explosively hazardous items were identified. The 350 individual anomalies that were investigated in the low anomaly density areas provided additional characterization data to identify what items are in the subsurface at this MRS. No explosively hazardous items were identified, and the majority of items identified were non-munitions related debris (road base slag, metal rods, hinges, steel rails, cans, scrap metal, rebar, wire, pipes and miscellaneous scrap metal).

No MEC was identified during the RI and the RI Report concluded that the data collected met the required 95-percent confidence level that the potential presence of MEC at the MRS is statistically low. As established in the Feasibility Study, under CERCLA as applied to MMRP, if no explosive hazard is found, there is no basis for a remedial action. As there is no exposure to potential hazards present at the MRS, no remedial action is necessary to ensure protection of human health.

Munitions Constituents Sampling

Six wet sediment samples were collected using Incremental Sampling Methodology (ISM). Three samples were collected from the North Surface Water basin, two from the South Surface Water Basin, and one from the East Surface Water Basin. Wet sediment ISM sample depths were collected between sediment surface and 0.5-feet below sediment surface. Three surface water samples were also collected, one from each main surface water basin. All samples were analyzed for metals, explosives, nitrocellulose, semi-volatile organic compounds, and pH. Wet sediment samples were also analyzed for polychlorinated biphenyl and total organic carbon. Based on the analytical results, 22 site-related chemicals were identified as potential MC at the Erie Burning Grounds MRS (CB&I, 2014).

No DoD military munitions confirmed to be MEC were found during the intrusive investigation; however, high density areas of MD were encountered. Therefore, additional environmental samples for MC-related contamination were collected from the bottom of

two trenches at depths between 3 and 4 feet below ground surface (CB&I, 2014).

The Army completed a **human health risk assessment** and an **ecological risk assessment** to determine if the identified site-related chemicals posed a risk to future **receptors**. Iron was identified as a chemical of concern (COC) for residential receptors in wet sediment; however, evidence suggests that one elevated iron concentration is most likely associated with background conditions and does not pose a hazard. Two chemicals of potential ecological concern (COPECs) were identified in surface water and 10 COPECs were identified in wet sediment for ecological receptors. The ecological risk assessment determined that impacts to ecological receptors are minimal and adverse effects to these **upper-trophic level receptor** populations are not expected. The Human Health and Ecological Risk Assessments concluded that no MC hazards exist at the Erie Burning Grounds MRS (CB&I, 2014).

Based on the results of the RI fieldwork, the project team concluded that the nature and extent of DoD military munitions and MC at the Erie Burning Grounds MRS (**Figures 5a and 5b**) had been adequately characterized. No explosive safety hazards or potential sources of DoD military munitions confirmed as MEC were found within the MRS. The Human Health and Ecological Risk Assessments concluded that the site related chemicals in surface water, wet sediment, and subsurface soil are not present at concentrations great enough to pose risks to human and ecological receptors at the MRS (CB&I, 2014). As there is no unacceptable risk due to MC-related contamination at the MRS, no remedial action is necessary to ensure protection of the environment.

Because no **explosive hazards** were found during the RI no MEC hazard assessment was required. The MRS was assigned a **Munitions Response Site Prioritization Protocol (MRSP)** priority of 7 of 5—based on the evaluation of site characteristics in three hazard modules: explosive, materiel, and health hazards. MRSP priority ranking ranges from 1 to 8 (highest to lowest hazard priority, respectively), with alternative ratings of Evaluation Pending, No

the requirements for, and availability of, specific equipment and technical specialists. The No Action alternative does not involve active remediation. Therefore, technical feasibility is not a consideration. No services or equipment are necessary to implement No Action. This alternative will not interfere with any planned remedial action in the future. The No Action alternative is administratively feasible to OHARNG/Camp Ravenna because no explosive hazard or unacceptable risk due to MC-related contamination is present on the MRS. The No Action alternative is expected to receive Ohio EPA concurrence because no explosive hazard or unacceptable risk due to MC-related contamination is present at the MRS.

Cost – Capital and long-term management costs are estimated under this criterion. The No Action alternative has no capital or long-term management costs associated with it.

Modifying Criteria

State Acceptance – This criterion will be evaluated during incorporation of regulatory review comments into this PP and future ROD.

Community Acceptance – This criterion will be evaluated when the PP is presented to the public for review and comment.

3.2 Overall Evaluation

The NFA alternative is technically and administratively implementable and there are no costs. The No Action alternative is protective of human health and the environment because no explosive hazard or unacceptable risk due to MC-related contamination is present at the MRS.

The MRSPP tables were updated during the FS in accordance with the MRSPP Primer. The revised FS MRSPP priority is “No Longer Required” (HGL, 2018).

4.0 SCOPE AND ROLE OF RESPONSE ACTION

The results of the RI fieldwork and evaluation in the Final FS for the Erie Burning Grounds MRS support the selection of NFA as the preferred remedy for the MRS. The remedy must be protective of the receptors associated with future land use. The future land use of the MRS is

maintenance, natural resources management (beaver dam removal), and environmental sampling. The likely **human receptor** for the future land use is the Industrial Receptor. The Erie Burning Grounds MRS is within a larger area designated for military training; however, the high-quality wetlands present within the MRS will preclude some types of access and military training at the MRS. The NFA determination is protective of other potential future human receptors (such as residential receptors). Though there are no current plans for the MRS to change from an industrial land use to a residential land use, there are no unacceptable risks to a potential future residential receptor from explosive hazards. **Environmental receptors** for the future land use include aquatic biota, muskrat, duck, mink, heron, and **benthic invertebrates** (HGL, 2018).

DoD military munitions confirmed to be MEC were not identified, only non-explosively hazardous MD are present at the MRS. The MC-related contamination identified at the MRS does not pose a risk to human or ecological receptors. Therefore, there is no source material or impacted environmental media resulting from historical DoD munitions-related activities at the MRS.

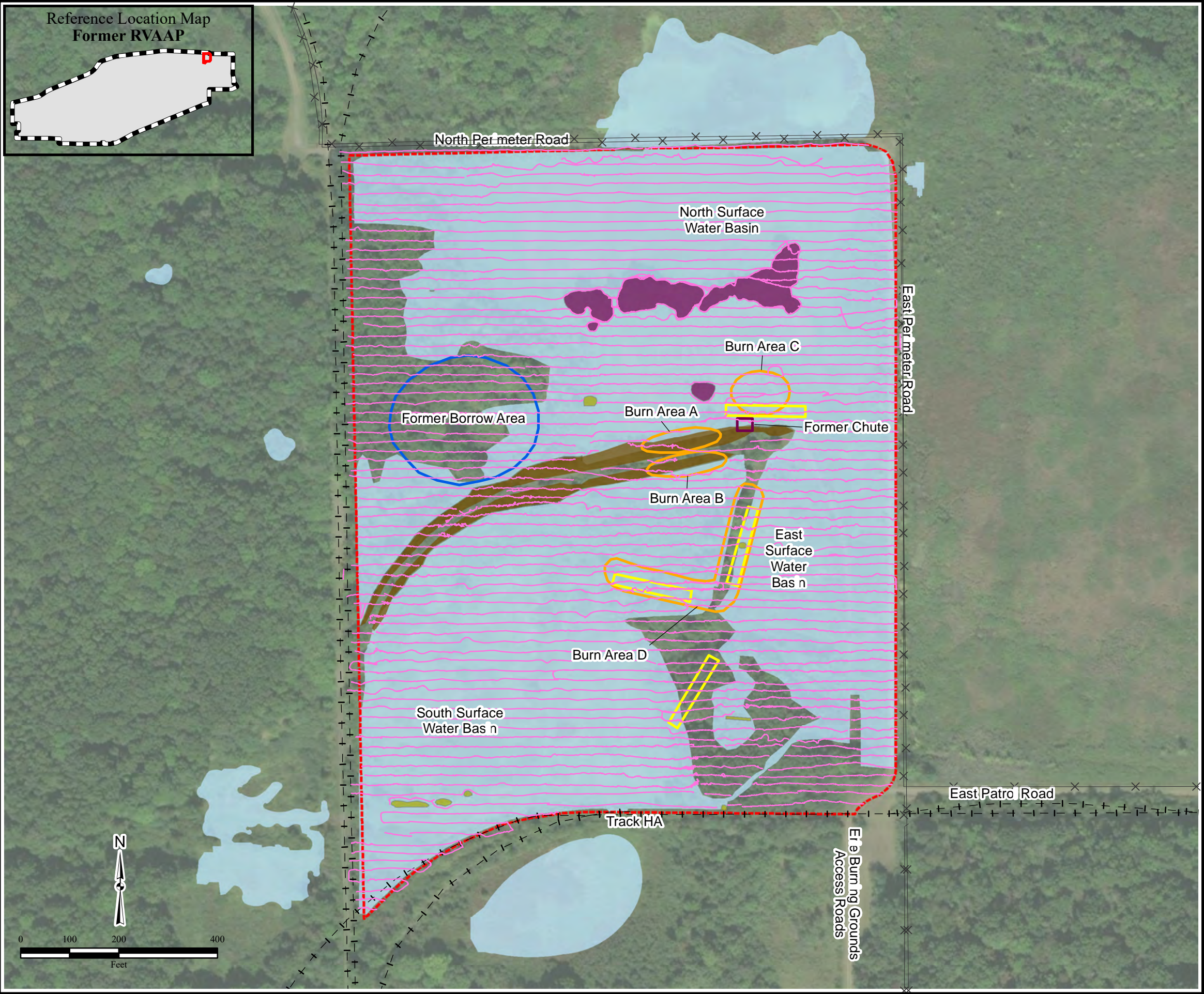
Several site-related chemicals were identified and determined to be COCs during the human health and ecological risk assessments. However, since the COCs are present in low concentrations it was determined that the COCs do not pose a threat to human or ecological receptors.

Although not anticipated, if any additional hazards are identified at the MRS, they would be addressed under the MMRP as a separate response action. No other investigations are ongoing at the MRS under the MMRP.

5.0 SUMMARY OF HUMAN AND ECOLOGICAL RISKS

Under the MMRP, a recommendation of NFA must be protective of the human and environmental receptors at the MRS. The Security Guard/Maintenance Worker, Hunter/Trapper and Fire/Dust Suppression Worker were evaluated as potential receptors at the MRS. The evaluation of COCs for these

Figure 5
2014 Remedial Investigation
Digital Geophysical Mapping
Transect Coverage



Legend

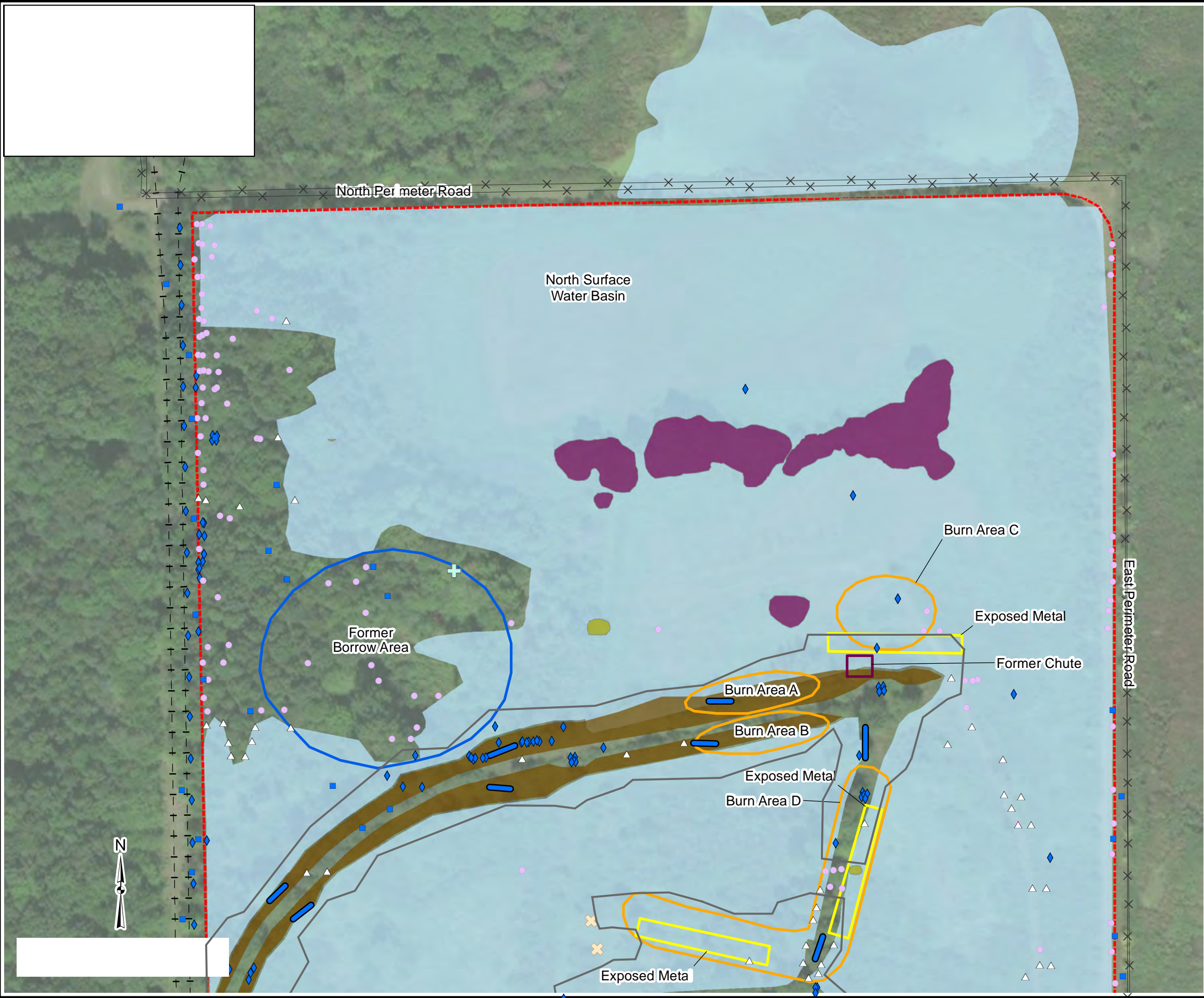
- DGM Transect
- Fence
- Former Railroad
- Former Burn Area
- Exposed Metal (Historical)
- Former Borrow Area
- Former Chute
- Vegetation Area
- Island
- Steep Slope
- Surface Water (CB& I, 2014)
- MRS
- Installation Boundary

Notes:
DGM=digital geophysical mapping
MRS=munitions response site
RVAAP=Ravenna Army Ammunition Plant

\\Gst-srv-01\HGLGIS\Ravenna_AAP\ErieBG\PP\05\EBG_DGMTransects.mxd
11/8/2018 JAR
Source: HGL, CB&I, USACE, e2M, CB&I, 2014. Final Remedial Investigation Report for RVAAP-002-R-01 Erie Burning Grounds MRS, Version 1.0. Former Ravenna Army Ammunition Plant, Portage and Trumbull Counties, Ohio. August.
ArcGIS Online Imagery



Figure 6a
2014 Remedial Investigation
Intrusive Investigation Results
North Section
Erie Burning Grounds
Former RVAAP
Portage and Trumbull
Counties, Ohio



- Legend**
- MD (no explosive hazard) Identified
- Fragments of 500lb GP, AN-M64A1¹
- Visual Survey MD (no explosive hazard) Identified
- Fragments of 500lb GP, AN-M64A1¹
- Non Munitions Related Items
- Other Debris Identified
 - Cultural Feature
 - Metal Feature
 - Quality Control Position (Nail)
 - Trench (No MEC or Munitions Debris)
 - Fence
 - Former Railroad
 - Former Burn Area
 - Exposed Metal (Historical)
 - Former Borrow Area
 - Former Chute
 - High Anomaly Density Area
 - Vegetation Area
 - Island
 - Steep Slope
 - Surface Water (CB&I, 2014)
 - MRS
 - Installation Boundary

Notes:
¹Fragments were classified as MD (no explosive hazard) from the 500lb GP bomb, AN-M64A1.
GP=General Purpose
MD=munition debris
MEC=munitions and explosives of concern
MRS=munitions response site
RVAAP=Ravenna Army Ammunition Plant

\\Gst-srv-01\HGLGIS\Ravenna_AAP\ErieBG\PP\06a)EBG_Intrusive_North.mxd
11/20/2018 JAR

Source: HGL, CB&I, USACE, e2M, CB&I, 2014. Final Remedial Investigation Report for RVAAP-002-R-01 Erie Burning Grounds MRS, Version 1.0. Former Ravenna Army Ammunition Plant, Portage and Trumbull Counties, Ohio. August. ArcGIS Online Imagery



Figure 6b
2014 Remedial Investigation
Intrusive Investigation Results
South Section
Erie Burning Grounds
Former RVAAP
Portage and Trumbull
Counties, Ohio

Legend

MD (no explosive hazard) Identified

- Fragments of 500lb GP, AN-M64A1¹
- Fragments from a Projectile, 75mm, HE, M309
- Fragments from a Projectile, 75mm, HE, M48

Visual Survey MD (no explosive hazard) Identified

- Ordnance Components
- Fragments of 500lb GP, AN-M64A1¹

Non Munitions Related Items

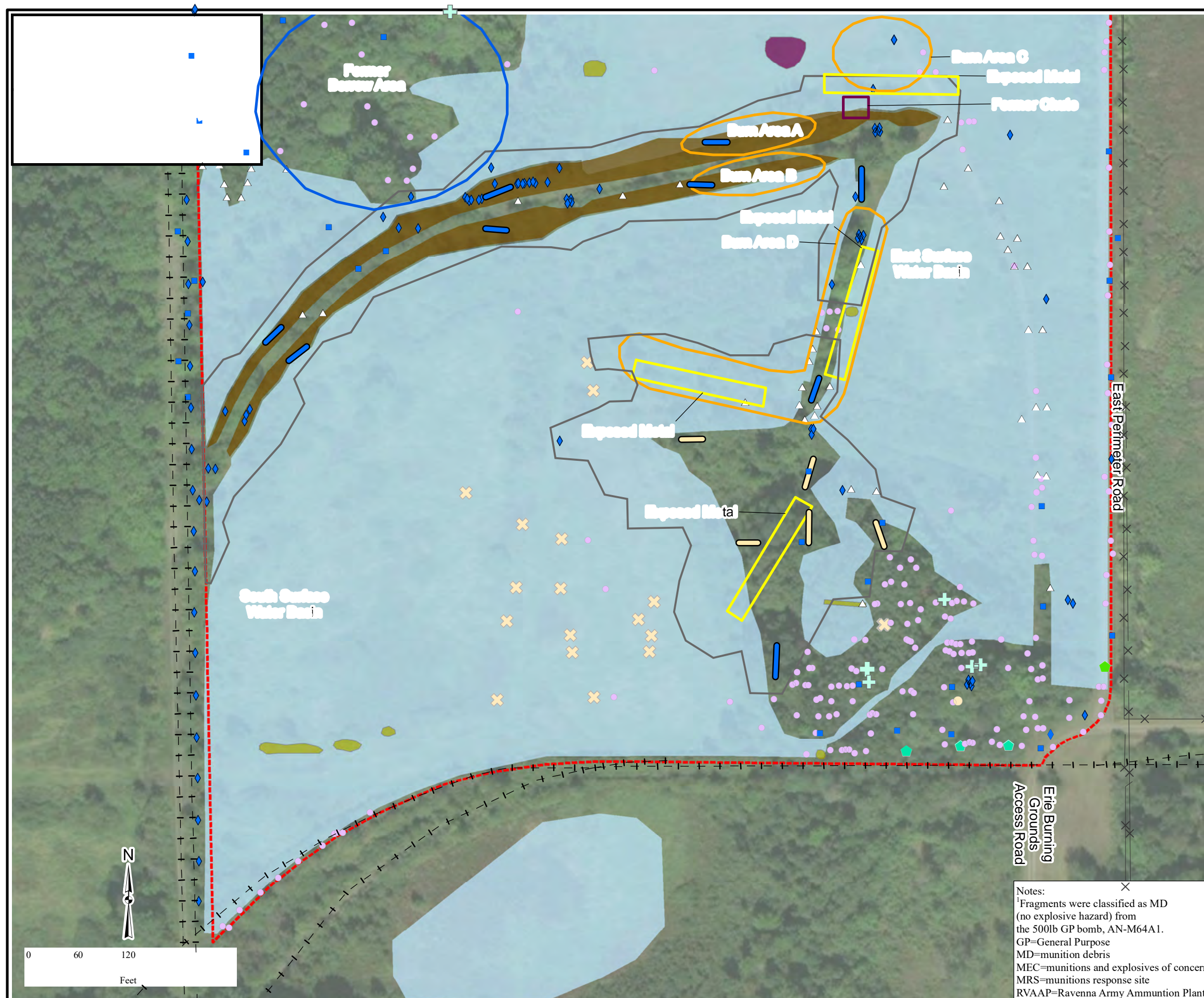
- Other Debris Identified
- Cultural Feature
- Metal Feature
- Quality Control Position (Nail)
- Trench (Munitions Debris Identified)
- Trench (No MEC or Munitions Debris)
- Fence
- Former Railroad
- Former Burn Area
- Exposed Metal (Historical)
- Former Borrow Area
- Former Chute
- High Anomaly Density Area
- Vegetation Area
- Island
- Steep Slope
- Surface Water (CB&I, 2014)
- MRS
- Installation Boundary

Notes:

¹Fragments were classified as MD (no explosive hazard) from the 500lb GP bomb, AN-M64A1.
 GP=General Purpose
 MD=munition debris
 MEC=munitions and explosives of concern
 MRS=munitions response site
 RVAAP=Ravenna Army Ammunition Plant

\\Gst-srv-01\HGLGIS\Ravenna_AAP\ErieBG\PP\06b\EBG_Intrusive_South.mxd
 11/20/2018 JAR

Source: HGL, CB&I, USACE, e2M, CB&I, 2014. Final Remedial Investigation Report for RVAAP-002-R-01 Erie Burning Grounds MRS, Version 1.0. Former Ravenna Army Ammunition Plant, Portage and Trumbull Counties, Ohio. August.
 ArcGIS Online Imagery





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

October 11, 2018

Mr. David Connolly
Army National Guard Directorate
Environmental Programs Division
ARNGD-ILE-CR
111 South George Mason Drive
Arlington, VA 22204

**Re: US Army Ammunition Plt RVAAP
Remediation Response
Plans
Remedial Response
Portage County
267000859256**

**Subject: Receipt and Review of the "Draft Proposed Plan for RVAAP-002-R-01
Erie Burning Grounds Munitions Response Site, Version 1.0" Dated
August 22, 2018 (Work Activity No. 267-000859-256)**

Dear Mr. Connolly:

The Ohio Environmental Protection Agency (Ohio EPA), Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR) has received and reviewed the document entitled "*Draft Proposed Plan for RVAAP-002-R-01 Erie Burning Grounds Munitions Response Site, Version 1.0*" dated August 22, 2018. This document, received by Ohio EPA, NEDO on August 23, 2018, was prepared for the U.S. Army Corps of Engineers (USACE) Baltimore District, by HydroGeoLogic, Inc. Ohio EPA has identified issues that needs to be addressed prior to Ohio EPA's concurrence with the final version of the proposed plan (PP).

Issue A: Munitions Response Site Prioritization Protocol (MRSP)

The text in the last paragraph of Section 2.4 states, "Because no explosive hazards were found during the RI [Remedial Investigation] no MEC [Munitions and Explosives of Concern] hazard assessment was required. The MRS [Munitions Response Site] was assigned a Munitions Response Site Prioritization Protocol (MRSP) priority of 5 based on the evaluation of site characteristic in three hazard modules: explosive, materiel, and health hazards." This appears to be inconsistent with the final version of the RI and Feasibility Study (FS), which lists the MRSP priority value as seven (7). Please revise this discrepancy in the final PP.

Issue B: Demonstration of Adequate Investigation and Protection of Receptors

Ohio EPA, DERR-NEDO and DERR-SWDO participated in a conference call on October 4, 2018, with the RVAAP and USACE staff to discuss the general coverage of the investigation completed at the MRS. The text in the PP does not provide



enough supporting information to prevent misinterpretation of the attached figures. Ohio EPA requested additional text focusing on the statistical analysis to support the figures presented in greater detail. In addition, Ohio EPA recommended including any limitations on training in a Category 3 wetland to provide additional support for the selected remedy.

If you have any questions or concerns, please do not hesitate to contact me at (330) 963-1235.

Sincerely,

A handwritten signature in black ink, appearing to read "Nicholas Roope", with a stylized, cursive script.

Nicholas Roope
Site Coordinator
Division of Environmental Response and Revitalization

NCR/nvp

cc: Nat Peters, USACE
Katie Tait/Kevin Sedlak, OHARNG RTLS
Craig Coombs, USACE
Rebecca Shreffler, Chenega
David Connolly, ARNG
Mark Johnson, Ohio EPA, NEDO, DERR
Bob Princic, Ohio EPA, NEDO, DERR
Tom Schneider, Ohio EPA, SWDO, DERR



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

August 28, 2018

Mr. David Connolly
Army National Guard Directorate
Environmental Programs Division
ARNG-ILE-CR
111 S. George Mason Dr.
Arlington, VA 22204

Re: **US Army Ravenna Ammunition Plt RVAAP
Remediation Response
Correspondence
Remedial Response
Portage County
267000859197**

Subject: Receipt and Review of the "Final Feasibility Study for RVAAP-002-R-01 Erie Burning Grounds MRS, Version 1.0" Dated August 17, 2018 (Work Activity No. 267-0008590-197)

Dear Mr. Connolly:

The Ohio Environmental Protection Agency (Ohio EPA), Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR) has received and reviewed the document entitled, "Final Feasibility Study for RVAAP-002-R-01 Erie Burning Grounds MRS, Version 1.0" dated August 17, 2018. This document, received by Ohio EPA, NEDO on August 17, 2018, was prepared for the U.S. Army Corps of Engineers (USACE) Baltimore District, by HydroGeoLogic, Inc. in response to Ohio EPA's request for the final document sent August 10, 2018.

This document was reviewed by personnel from Ohio EPA's DERR, pursuant to the Director's Findings and Orders paragraph 39 (b), and we concur with the feasibility study in its final format.

If you have any questions or concerns, please do not hesitate to contact me at (330) 963-1235.

Sincerely,

A handwritten signature in black ink, appearing to read "Nicholas Roope", is written over a light blue horizontal line.

Nicholas Roope
Site Coordinator
Division of Environmental Response and Revitalization

NCR/nvp

RECEIVED
28 AUG 2018

cc: Nat Peters, USACE
Katie Tait/Kevin Sedlak, OHARNG RTLS
Craig Coombs, USACE
Rebecca Shreffler, Chenega
David Connolly, ARNG
Mark Johnson, Ohio EPA, NEDO DERR
Bob Princic, Ohio EPA, NEDO DERR
Tom Schneider, Ohio EPA, SWDO DERR



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

August 10, 2018

Mr. David Connolly
Army National Guard Directorate
Environmental Programs Division
ARNG-ILE-CR
111 South George Mason Drive
Arlington, VA 22204

Re: US Army Ravenna Ammunition Plt RVAAP
Remediation Response
Plans
Remedial Response
Portage County
267000859047

Subject: Receipt and Review of the "Response to Ohio EPA Comments on the Draft Feasibility Study Version 1.0 for RVAAP-002-R-01 Erie Burning Grounds Munitions Response Site" Dated July 12, 2018 (Work Activity No. 267000859047)

Dear Mr. Connolly:

The Ohio Environmental Protection Agency (Ohio EPA), Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR) has received and reviewed the document entitled, "Response to Ohio EPA Comments on the Draft Feasibility Study Version 1.0 for RVAAP-002-R-01 Erie Burning Grounds Munitions Response Site," dated July 12, 2018. This document, received by Ohio EPA, NEDO on July 13, 2018, was prepared by HydroGeoLogic, Inc.

This document was reviewed by personnel from Ohio EPA, DERR, pursuant to the Director's Findings and Orders. Ohio EPA concurs with the responses and requests the final version of the feasibility study. If you have any questions or concerns, please do not hesitate to contact me at (330) 963-1235.

Sincerely,

A handwritten signature in black ink, appearing to read "Nicholas Roope".

Nicholas Roope, Site Coordinator
Division of Environmental Response and Revitalization

NCR/nvp

ec: Nat Peters, USACE
Katie Tait/Kevin Sedlak, OHARNG RTLS
Craig Coombs, USACE
Rebecca Shreffler, Chenega
David Connolly, ARNG
Mark Johnson, Ohio EPA, NEDO DERR
Bob Princic, Ohio EPA, NEDO DERR
Tom Schneider, Ohio EPA, SWDO DERR

RECEIVED
13 AUG 2018



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

July 12, 2018

Ohio Environmental Protection Agency
DERR-NEDO
Attn: Mr. Nicholas Roope
2110 East Aurora Road
Twinsburg, OH 44087-1924

Subject: Response to Ohio EPA Comments on the Draft Feasibility Study Version 1.0 for RVAAP-002-R-01 Erie Burning Grounds Munitions Response Site, Munitions Response Services at the Former Ravenna Army Ammunition Plant, Portage and Trumbull Counties, Ohio, Contract No. W912DR-15-D-0016, Delivery Order 0001 (Ohio EPA Work Activity # 267000859047)

Dear Mr. Roope:

This letter is sent to summarize the response to comments received from the Ohio EPA in a letter dated June 6, 2018. Responses to the Ohio EPA comments on the *Draft Feasibility Study for RVAAP-002-R-01 Erie Burning Grounds Munitions Response Site* are provided below. The revisions summarized will be incorporated into the Final version of the document to be submitted upon concurrence from the Ohio EPA.

Ohio EPA Comment	Army Response
ISSUE A: The text in the last paragraph of page ES-1, and the top of ES-2, states the Munitions Response Site (MRS) was assigned a MRSP priority of five (5). This appears to be inconsistent with the final version of the Remedial Investigation (RI), which lists the MRSP priority value as seven (7). Please revise this discrepancy in the final FS.	Concur, the text in the first paragraph on page ES-2 was revised to state: “During the RI, the MRS was assigned a MRSP priority of <u>7</u> .”
ISSUE B: Based on the information presented, no munitions of explosive concern (MEC), and no unacceptable risks due to munitions constituents (MC)-related contamination was found. The anticipated result of this information would be unrestricted use/unlimited exposure (UU/UE), and the selection of no further action would be acceptable. However, the text makes it appear the site will be limited to industrial land use. Please provide clarification regarding the future land use.	Concur, the following sentence was added to the second paragraph on page ES-2: “ <u>No Further Action is protective of other potential future human receptors (such as residential receptors); however, there are no current plans for the MRS to change from an industrial land use to a residential land use.</u> ” Additionally, based on teleconference held for a separate MRS, the following sentences will be added to paragraph 3.2.4:

Ohio EPA Comment	Army Response
	<p><u>“The NFA determination is protective of other potential future human receptors (such as residential receptors). Though there are no current plans for the MRS to change from an industrial land use to a residential land use, there are no unacceptable risks to a potential future residential receptor from explosive hazards.”</u></p>
<p>ISSUE C: The review of the RI and the FS has revealed solid waste (railroad debris) not related to munitions investigated during the MMRP. Please provide clarity as to how this waste will be addressed or has been addressed under the IRP, or in the solid waste plan. This information will help provide transparency to the reader.</p>	<p>Concur. The following statement will be added to the fourth paragraph on page ES-1:</p> <p><u>“The railroad ties and miscellaneous debris will be managed under the Solid Waste Management Plan for Camp Ravenna (currently being produced).”</u></p>

This document was prepared for the US Army Corps of Engineers (USACE) – Baltimore District by HydroGeoLogic, Inc., under Contract No. W912DR-15-D-0016.

Please contact the undersigned at (703) 607-7589 or david.m.connolly8.civ@mail.mil if there are issues or concerns with this submission.

Sincerely,

Mr. David Connolly
RVAAP Restoration Program Manager
Army National Guard Directorate

cc:

Mark Johnson, Ohio EPA, Environmental Manager (one [1] electronic copy, one [1] hard copy)
Bob Princic, Ohio EPA, DERR (one [1] electronic copy)
Tom Schneider, Ohio EPA, DERR, CO (one [1] electronic copy)
Kevin Sedlak, ARNG, Camp Ravenna (one [1] electronic copy)
Katie Tait, OHARNG (one [1] electronic copy)
Craig Coombs, USACE – Louisville Project Manager (one [1] electronic copy)
Travis McCoun, USACE Baltimore District (one [1] electronic copy)
Gail Harris, Vista Science Corp. (one [1] electronic copies)



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

June 6, 2018

LTC James Crowley
ARNG-IED
ARNG Directorate
111 South George Mason Drive
Arlington, VA 22204

**Re: US Army Ravenna Ammunition Plt RVAAP
Remediation Response
Project records
Remedial Response
Portage County
267000859047**

**Subject: Receipt and Review of the "Draft Feasibility Study for RVAAP-002-R-01 Erie Burning Grounds Munitions Response Site, Version 1.0,"
Dated April 6, 2018 (Work Activity No. 267000859047)**

Dear LTC Crowley:

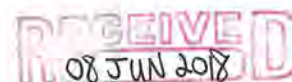
The Ohio Environmental Protection Agency (Ohio EPA), Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR) has received and reviewed the document entitled, "Draft Feasibility Study for RVAAP-002-R-01 Erie Burning Grounds Munitions Response Site, Version 1.0," dated April 6, 2018. This document, received by Ohio EPA, NEDO on April 9, 2018, was prepared for the U.S. Army Corps of Engineers (USACE) Baltimore District, by HydroGeoLogic, Inc. Ohio EPA has identified multiple issues that need to be addressed prior to concurrence of the final version of the feasibility study (FS).

Issue A: Munitions Response Site Prioritization Protocol (MRSP)

The text in the last paragraph of page ES-1, and the top of ES-2, states the Munitions Response Site (MRS) was assigned a MRSP priority of five (5). This appears to be inconsistent with the final version of the Remedial Investigation (RI), which lists the MRSP priority value as seven (7). Please revise this discrepancy in the final FS.

Issue B: Receptor Identification and No Further Action

Based on the information presented, no munitions of explosive concern (MEC), and no unacceptable risks due to munitions constituents (MC)-related contamination was found. The anticipated result of this information would be unrestricted use/unlimited exposure (UU/UE), and the selection of no further action would be acceptable. However, the text makes it appear the site will be



limited to industrial land use. Please provide clarification regarding the future land use.

Issue C: Installation Restoration Program (IRP)

The review of the RI and the FS has revealed solid waste (railroad debris) not related to munitions investigated during the MMRP. Please provide clarity as to how this waste will be addressed or has been addressed under the IRP, or in the solid waste plan. This information will help provide transparency to the reader.

If you have any questions or concerns, please do not hesitate to contact me at (330) 963-1235.

Sincerely,



Nicholas Roope
Site Coordinator
Division of Environmental Response and Revitalization

NCR/nvp

ec: Mark Johnson, Ohio EPA, NEDO, DERR
Bob Princic, Ohio EPA, NEDO, DERR
Tom Schneider, Ohio EPA, SWDO, DERR
Katie Tait/Kevin Sedlak, Camp Ravenna
Craig Coombs, USACE, Louisville District
Shreffler/Harris, Camp Ravenna Environmental Office, Vista Sciences



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

December 10, 2018

Ohio Environmental Protection Agency
DERR-NEDO
Attn: Mr. Mark Johnson
2110 East Aurora Road
Twinsburg, OH 44087-1924

Subject: Ravenna Army Ammunition Plant (RVAAP) Restoration Program, Portage/Trumbull Counties,
Ohio, Monthly Activity Report – November 2018

Dear Mr. Johnson:

Enclosed for your review is the "RVAAP Restoration Program - DFFO Monthly Summary Report - November 2018". The report summarizes the Restoration Program activities conducted at the former RVAAP for the period from November 1, 2018 through November 30, 2018. This report is being submitted to the Ohio EPA to comply with the Ohio EPA Director's Final Findings and Orders, Section XVI, paragraphs 36 and 37.

This electronic letter and attachment are being sent to meet the deadline for submittal. A hardcopy of this letter and attachment for your records will follow.

Please contact the undersigned at (703) 607-7589 or david.m.connolly8.civ@mail.mil if there are issues or concerns with this submission.

Sincerely,

Date:

2018.12.10

10:55:12 -05'00'

Mr. David Connolly
RVAAP Restoration Program Manager
Army National Guard Directorate

Attachment

cc: Bob Princic, Ohio EPA, DERR
Thomas Schneider, Ohio EPA, DERR
Kevin Sedlak, ARNG, Camp Ravenna
Katie Tait, ARNG, Camp Ravenna
Craig Coombs, USACE – Louisville

RVAAP RESTORATION PROGRAM - DFFO MONTHLY SUMMARY REPORT
November 2018

A. Status of project activities for reporting period (November 2018)

PROJECT NAME	USACE TECH MGR /Contractor	PROJECT STATUS
2015 RI/FS Completion Contract for IRP AOCs	N. Peters / Leidos	<p>NACA Test Area RI-FS Report: In a letter dated November 2, 2018, the Army issued responses to Ohio EPA's October 17, 2018 comment letter. This letter also summarized agreements made during the October 26, 2018 resolution meeting. In a letter dated November 9, 2018, Ohio EPA concurred with the responses to comments regarding the Geophysical Investigation Letter Report and approved the Final Phase II RI/FS Report.</p> <p>C-Block Quarry RI-FS Report: Leidos received the CBLmw-001 to CBLmw-004 groundwater data collected by TEC-Weston in June 2018 and used the data to begin drafting responses to Ohio EPA's letter dated August 14, 2018.</p> <p>Leidos issued the Predraft FS for Atlas Scrap Yard to the Army for review on November 21, 2018.</p> <p>On November 16, 2018, Leidos submitted the Final PP for Load Lines 1-4 & 12 to Ohio EPA for concurrence.</p> <p>On November 20, 2018, Leidos submitted the Pre-Draft PP for Bldgs F-15 and F-16 to the Army for review.</p> <p>Leidos is developing the Pre-draft PP for Sediment and Surface Water Sites.</p> <p>On November 16, 2018, Leidos submitted the Pre-Draft PP for NACA Test Area to the Army for review.</p> <p>RODs for Load Line 7, Load Line 9, Load Line 12, Wet Storage Area, and Upper/Lower Cobbs Pond: On November 1, 2018, Leidos provided responses to all Army comments on the Pre-draft RODs, and on November 29, 2018, Leidos submitted the Draft RODs to Ohio EPA for review.</p>
RVAAP-34, Sand Creek Disposal Road Landfill	A. Schmidt / CELRL	The Army received Ohio EPA comments on the Draft EE/CA on September 28, 2018. The Army prepared Responses to Comments and submitted them to the Ohio EPA.
CC RVAAP-78 Quarry Pond Surface Dump	A. Schmidt / CELRL	The Army received funding for the CC-RVAAP-78 EE/CA.
RVAAP-66 Facility Wide Ground Water Monitoring – Weston Contract	K. Sedlak / Weston	Army comments were sent to the contractor on November 2, 2018 for the spring sampling Tech Memo. The Draft Tech Memo is being prepared for Ohio EPA review.

RVAAP RESTORATION PROGRAM - DFFO MONTHLY SUMMARY REPORT
November 2018

PROJECT NAME	USACE TECH MGR /Contractor	PROJECT STATUS
2018 Environmental Program Support Services	N. Peters / Chenega	<p>Chenega prepared for and administered a Restoration Advisory Board (RAB) meeting on November 7, 2018. Began preparation of Draft RAB meeting minutes for stakeholder review.</p> <p>Chenega conducted annual Land Use Control Inspections for Ramsdell Quarry Landfill, Winklepeck Burning Grounds, Load Lines 1-4, and partial inspection for Load Line 12.</p> <p>Chenega conducted quarterly inspection of Ramsdell Quarry Landfill and submitted Inspection checklist to the Ohio EPA.</p>
Identification of Solid Waste Management Units at Former RVAAP/Camp Ravenna	David Connolly / AECOM	Received comments from Ohio EPA on the Draft SWMP on 26 November 2018. The Contractor is preparing response to the Ohio EPA comments.
TCRA at ODA2	Travis McCoun / CENAB	All stepout grids were completed. Recovery in stepout grids were as follows: 358 lbs. of MDAS, 291 lbs. of CD, and 1 MPPEH item. Source area work resumed on 7 November and seven grids were completed. There are 53 grids remaining to be cleared. Remaining grids are in disposal areas and have high anomaly saturation. Total recovery to date is as follows: 68,481 lbs. of MDAS, 2,427 lbs. of CD, and 632 MPPEH items.
PBA16 - MMRP Sites	Kimberly Gross and Craig Coombs / CENAB / HGL	Letter summarizing the responses to comments for the Block D Igloo proposed plan were submitted to Ohio EPA on November 20, 2018.
PBA 16 Compliance Cleanup Sites	K. Mieczkowski / Parsons	<p>The CC RVAAP-70 East Classification Yard, Final SI was approved by the Ohio EPA on November 21, 2018. The Final report was submitted to stakeholders on November 28, 2018.</p> <p>The Ohio EPA accepted the Draft CC RVAAP-73 Facility Wide Coal Storage ROD on October 9, 2018. On October 10, 2018 the Draft CC RVAAP-73 ROD was submitted to Army legal for review. Comments have been resolved as of November 26, 2018 and pending Army signature.</p> <p>Parsons submitted the Draft ROD for CC RVAAP-76 Depot Area to the Ohio EPA on October 25, 2018 for review. On November 26, 2018 the draft ROD was submitted to ACSIM for review with Ohio EPA concurrence letter included.</p> <p>The Contractor resolved Army comments on the Preliminary Draft RI Report for CC RVAAP-79 DLA Ore Storage Sites and provided a redline version for Army review. The Army completed review and provided comments to contractor on November 30, 2018.</p>
RVAAP-66 Facility Wide Ground Water Monitoring	J. Trumble / Leidos	Leidos completed the well sampling as part of the Fall 2018 FWGWMP, on November 2, 2018.

RVAAP RESTORATION PROGRAM - DFFO MONTHLY SUMMARY REPORT
November 2018

FY17 VEG Remediation Contract	N. Peters/ Alaniz-Endpoint JV	USACE continued working on a contract modification to clarify the scope of the contract.

B. Describe difficulties encountered during the reporting period and actions taken to rectify any difficulties

None

C. Identify changes in key personnel

None

D. List target and actual completion dates for each element of activity, including project completion

The actual completion dates and target dates where applicable are provided with the status of activities in Section A.

E. Provide an explanation for any deviation from applicable schedules

None

F. Indicate how much soil and groundwater was generated and/or transported and disposed as part of RVAAP restoration activities

Leidos generated 11 liquid and 5 solid drums of IDW as part of the FWGWMP sampling and well installation activities in November 2018. The IDW is being tracked, inspected and managed per facility guidelines. The waste is Pending Analysis.

G. Describe activities planned for the following month (December 2018)

1. Parsons plans to complete additional fieldwork including collecting soil samples from two borings and installation and monitoring of four monitoring wells. Also groundwater sampling is scheduled for December 10, 2018.
2. Upon receipt of the executed copy (by ARNG) of the ROD by ARNG, Parson's will prepare and distributed a final version of the CC RVAAP-73 Facility Wide Coal Storage ROD.
3. Upon receipt of the executed copy (by ARNG) of the ROD by ARNG, Parson's will prepare and distributed a final version of the CC RVAAP-76 Depot Area ROD.
4. Parsons plans to resolve USACE comments and submit the draft RI Report for CC RVAAP-79 DLA Ore Storage Sites to the Ohio EPA for review.
5. Leidos plans to submit the compiled Final RI-FS Report for NACA Test Area to the Administrative Record.
6. Leidos plans to email a response letter (on December 4, 2018) to Ohio EPA comments on the RTC letter for the C Block Quarry RI-FS Report and submit the Final report in December, if the response is accepted.

RVAAP RESTORATION PROGRAM - DFFO MONTHLY SUMMARY REPORT
November 2018

7. Leidos plans to receive Army comments on the Preliminary Draft Feasibility Study for Atlas Scrap Yard and submit the Draft version for Ohio EPA review.
8. Leidos plans to receive Army comments on the Pre-Draft Proposed Plans for Landfill North of Winklepeck Burning Grounds, Buildings F-15 and F-16, and NACA Test Area and prepare and submit the Draft PPs for Ohio EPA review.
9. Leidos anticipates receiving Ohio EPA concurrence on the Final PP for Load Lines 1 - 4 & 12.
10. Leidos plans to submit the Pre-Draft PP for Sediment and Surface Water Sites for Army review.
11. Leidos anticipates receiving Ohio EPA comments on the Draft RODs for Load Line 7, Load Line 9, Load Line 12, Wet Storage Area and Upper/Lower Cobbs Ponds and plans to submit the Final RODs.
12. Leidos will submit the draft 2018 FWGWMP report for Army review.
13. Leidos will submit the draft 2019 FWGWMP Addendum for Army review
14. Work on the ODA2 TCRA will continue. USACE Baltimore has completed the stepout grids and will continue to clear the saturated central grids that remain.
15. USACE will address any additional Ohio EPA comments on the Draft EE/CA for the RVAAP-34 Sand Creek Disposal Road Landfill and submit to Ohio EPA. Depending upon Ohio EPA acceptance of responses, the Army will finalize the EE/CA.
16. Chenega plans to submit the response to comments for Remedial Design for RVAAP-51 Dump Along Paris-Windham Road.
17. Chenega plans to submit Final Property Management Plan Appendices.
18. Chenega plans to submit the Final 2017 Annual Land Use Control Report for Winklepeck Burning Grounds, Ramsdell Quarry Landfill, and Load Lines 1-4 and 12.

Chenega plans to complete the 2018 annual Land Use Control (LUC) inspections for Winklepeck Burning Grounds, Ramsdell Quarry Landfill, Load lines 1-4 and 12, prepare the report, and submit preliminary draft report for Army review.
19. Chenega plans to continue working on groundwater monitoring well maintenance and access support, specifically bollard and well casing painting, and concrete pad replacement.
20. HGL will complete the Final Ramsdell Quarry Landfill Area 1 (North) MRS Record of Decision, Final Landfill North of Winklepeck MRS Record of Decision, Final Atlas Scrap Yard MRS Record of Decision, and Final Block D Igloo TD MRS Record of Decision pending Col Myer's signature.
21. HGL will complete the Final Atlas Scrap Yard Record of Decision, pending Col Myer's signature.
22. HGL will complete the Final Record of Decision will be completed, pending Col Myer's signature.
23. Weston will submit the Draft Technical Memorandum for the June 2018 FWGWMP Semi-Annual sampling event to Ohio EPA.
24. Weston will abandon monitoring well FWGmw-017, which was placed on an adjacent private property.
25. The Final Block D Igloo-TD Record of Decision will be submitted by HGL once concurrence from Ohio EPA is received.



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

November 8, 2018

Ohio Environmental Protection Agency
DERR-NEDO
Attn: Mr. Mark Johnson
2110 East Aurora Road
Twinsburg, OH 44087-1924

Subject: Ravenna Army Ammunition Plant (RVAAP) Restoration Program, Portage/Trumbull Counties,
Ohio, Monthly Activity Report – October 2018

Dear Mr. Johnson:

Enclosed for your review is the "RVAAP Restoration Program - DFFO Monthly Summary Report - October 2018". The report summarizes the Restoration Program activities conducted at the former RVAAP for the period from October 1, 2018 through October 31, 2018. This report is being submitted to the Ohio EPA to comply with the Ohio EPA Director's Final Findings and Orders, Section XVI, paragraphs 36 and 37.

This electronic letter and attachment are being sent to meet the deadline for submittal. A hardcopy of this letter and attachment for your records will follow.

Please contact the undersigned at (703) 607-7589 or david.m.connolly8.civ@mail.mil if there are issues or concerns with this submission.

Sincerely,

Mr. David Connolly
RVAAP Restoration Program Manager
Army National Guard Directorate

Attachment

cc: Bob Princic, Ohio EPA, DERR
Thomas Schneider, Ohio EPA, DERR
Kevin Sedlak, ARNG, Camp Ravenna
Katie Tait, ARNG, Camp Ravenna
Craig Coombs, USACE – Louisville

RVAAP RESTORATION PROGRAM - DFFO MONTHLY SUMMARY REPORT
October 2018

A. Status of project activities for reporting period (October 2018)

PROJECT NAME	USACE TECH MGR /Contractor	PROJECT STATUS
2015 RI/FS Completion Contract for IRP AOCs	N. Peters / Leidos	<p>NACA Test Area RI-FS Report: Ohio EPA provided comments to the RI/FS and geophysical investigation letter report in a letter dated October 18, 2018. The Army and Ohio EPA met to discuss the comments on October 26, 2018.</p> <p>Leidos submitted the Predraft Proposed Plan for the Landfill North of Winklepeck Burning Grounds for Army review on October 3, 2018.</p> <p>Ohio EPA concurred with the Army's responses to comments on the Draft Proposed Plan for Load Lines 1-4, 12 on October 11, 2018.</p>
RVAAP-34, Sand Creek Disposal Road Landfill	A. Schmidt / CELRL	The Army received Ohio EPA comments on the Draft EE/CA on September 28, 2018. The Army prepared Responses to Comments and is preparing to submit to the Ohio EPA.
CC RVAAP-78 Quarry Pond Surface Dump	A. Schmidt / CELRL	The Army is working to secure the funding for the CC-RVAAP-78 EE/CA
RVAAP-66 Facility Wide Ground Water Monitoring – Weston Contract	K. Sedlak / Weston	<p>On October 26, 2018, the FWGWMP Technical Memorandum for First 2018 Semi-Annual Sampling Event was submitted to the Army. Army comments were received on October 29, 2018.</p> <p>In support of the November 2018 mobilization to abandon FWGmw-17, a 15-day field work notification was submitted to Ohio EPA on October 30, 2018 and the ODOT Permit for work along State Route 5 was approved on October 22, 2018.</p>
2018 Environmental Program Support Services	N. Peters / Chenega	<p>Chenega submitted the Draft Annual Land Use Control (LUC) Report for WBG and Load Lines 1-4 & 12, for Ohio EPA review on October 11, 2018.</p> <p>Chenega submitted the Draft Property Management Plan Appendices for Ohio EPA review on October 11, 2018.</p>
Identification of Solid Waste Management Units at Former RVAAP/Camp Ravenna	David Connolly / AECOM	The contractor submitted the Draft SWMP to the Ohio EPA on October 5, 2018.
TCRA at ODA2	Travis McCoun / CENAB	Low probability clearance in stepout grids at ODA2 resumed on October 2, 2018. 25 of 37 stepout grids have been completed totaling 241 lbs. of MDAS, 71 lbs. of CD, and 1 MPPEH item. There are 60 grids remaining in source area to be cleared. Remaining grids are in disposal areas and have high anomaly saturation.

RVAAP RESTORATION PROGRAM - DFFO MONTHLY SUMMARY REPORT
October 2018

PROJECT NAME	USACE TECH MGR /Contractor	PROJECT STATUS
PBA16 - MMRP Sites	Kimberly Gross and Craig Coombs / CENAB / HGL	<p>The Atlas Scrap Yard, Final ROD Version 1 with Ohio EPA concurrence, submitted October 19, 2018.</p> <p>The Fuze & Booster Quarry, Final NFA PP Version 1, with Ohio EPA concurrence, submitted October 25, 2018.</p> <p>The 40mm Firing Range, Final NFA PP Version 1, with Ohio EPA concurrence, submitted October 18, 2018.</p>
PBA 16 Compliance Cleanup Sites	K. Mieczkowski / Parsons	<p>The CC RVAAP-70 Final SI was submitted to Ohio EPA on October 31, 2018.</p> <p>The Ohio EPA accepted the Draft CC RVAAP-73 ROD on October 9, 2018. On October 10, 2018 the Draft CC RVAAP-73 ROD was submitted to Army legal for review.</p> <p>Parsons submitted the Draft ROD for CC RVAAP-76 to the Ohio EPA on October 25, 2018 for review.</p> <p>The Contractor resolved Army comments on the Preliminary Draft RI Report for CC RVAAP-79 DLA Ore Storage Sites and provided a redline version for Army review.</p>
RVAAP-66 Facility Wide Ground Water Monitoring	J. Trumble / Leidos	<p>Leidos completed the annual well gauging as part of the Fall 2018 FWGWMP, and most of the well sampling.</p> <p>Leidos submitted the access plan on October 17, 2018 for the installation of temporary GW monitoring wells at ODA-1, Electric Substation No. 3, and permanent wells at Sand Creek Landfill Dump.</p> <p>Leidos installed the groundwater wells at ODA1, West Substation and Sand Creek Landfill.</p>
FY17 VEG Remediation Contract	N. Peters/ Alaniz-Endpoint JV	USACE worked on a contract modification to clarify the scope of the contract.

B. Describe difficulties encountered during the reporting period and actions taken to rectify any difficulties

None

C. Identify changes in key personnel

None

D. List target and actual completion dates for each element of activity, including project completion

RVAAP RESTORATION PROGRAM - DFFO MONTHLY SUMMARY REPORT
October 2018

The actual completion dates and target dates where applicable are provided with the status of activities in Section A.

E. Provide an explanation for any deviation from applicable schedules

None

F. Indicate how much soil and groundwater was generated and/or transported and disposed as part of RVAAP restoration activities

Leidos has produced 10 liquid and 5 solid drums of IDW as part of the FWGWMP sampling and well installation activities. The IDW is being tracked, inspected and managed per facility guidelines. The waste is Pending Analysis.

G. Describe activities planned for the following month (November 2018)

1. Parsons plans to complete and submit the Draft SI for CC RVAAP-70.
2. Parsons plans to address Ohio EPA comments on the Draft ROD for CC RVAAP-73 when received.
3. Parsons plans to resolve ARNG legal comments on the Preliminary Draft ROD for CC RVAAP-76 (when received) and submit the Draft ROD for Ohio EPA review.
4. Parsons plans to submit a redline version of the Preliminary Draft RI Report for CC RVAAP-79 for Army review and prepare and submit the Draft version for Ohio EPA review.
5. Leidos is awaiting Ohio EPA approval on the RI-FS Report for NACA Test Area.
6. Leidos plans to respond to Ohio EPA comments on the RTC letter for the C Block Quarry RI-FS Report and submit the Final report.
7. Leidos plans to submit the Preliminary Draft Feasibility Study for Atlas Scrap Yard for Army review.
8. Leidos plans to submit the Preliminary Draft Proposed Plans for Landfill North of Winklepeck Burning Grounds for Ohio EPA review.
9. Leidos plans to submit the Final PP for Load Lines 1 - 4 & 12.
10. Leidos plans to submit the Preliminary Draft PP for Buildings F-15 and F-16.
11. Leidos plans to finalize and submit the Draft RODs for Load Line 12 and Wet Storage Area.
12. Leidos plans to finalize and submit the Draft RODs for Load Line 7, Load Line 9, and Upper/Lower Cobbs Ponds.
13. Leidos will complete activities related to the groundwater sampling in support of the Facilitywide GW RI, and the FWGWMP.
14. Work on the ODA2 TCRA will continue. USACE Baltimore has completed the stepout grids and will move to the saturated central grids that remain.
15. USACE will send Responses to Ohio EPA's comments on Draft EE/CA for the RVAAP-34 Sand Creek Disposal Road Landfill to Ohio EPA for review.
16. Chenega plans to submit the Draft Remedial Design and Operations and Maintenance Plan for

RVAAP RESTORATION PROGRAM - DFFO MONTHLY SUMMARY REPORT
October 2018

RVAAP-51 Dump Along Paris-Windham Road for Ohio EPA review.

17. HGL will complete the Final Ramsdell Quarry Landfill Area 1 (North) MRS Record of Decision, pending Col Myer's signature.
18. HGL will complete the Final Atlas Scrap Yard Record of Decision, pending Col Myer's signature.
19. HGL will complete the Final Record of Decision will be completed, pending Col Myer's signature.
20. HGL will submit the Final Block D Igloo-TD Record of Decision once concurrence from Ohio EPA is recieved.
21. HGL will submit the Final Ramsdell Quarry Landfill Area 2 (South) Proposed Plan, once the public meeting date is confirmed.
22. HGL will submit the Draft Block D Igloo Proposed Plan responses to comments letter.
23. Weston will submit the Draft Technical Memorandum for the June 2018 FWGWMP Semi-Annual sampling event to Ohio EPA.
24. AECOM is awaiting comments on the Draft Solid Waste Management Plan.
25. The Draft Block D Igloo Proposed Plan responses to comments letter will be submitted b HGL.
26. **The** Final Block D Igloo-TD Record of Decision will be submitted once concurrence from Ohio EPA is received.



NATIONAL GUARD BUREAU

111 SOUTH GEORGE MASON DRIVE
ARLINGTON VA 22204-1373

October 10, 2018

Ohio Environmental Protection Agency
DERR-NEDO
Attn: Mr. Mark Johnson
2110 East Aurora Road
Twinsburg, OH 44087-1924

Subject: Ravenna Army Ammunition Plant (RVAAP) Restoration Program, Portage/Trumbull Counties,
Ohio, Monthly Activity Report – September 2018

Dear Mr. Johnson:

Enclosed for your review is the "RVAAP Restoration Program - DFFO Monthly Summary Report - September 2018". The report summarizes the Restoration Program activities conducted at the former RVAAP for the period from September 1, 2018 through September 30, 2018. This report is being submitted to the Ohio EPA to comply with the Ohio EPA Director's Final Findings and Orders, Section XVI, paragraphs 36 and 37.

This electronic letter and attachment are being sent to meet the deadline for submittal. A hardcopy of this letter and attachment for your records will follow.

Please contact the undersigned at (703) 607-7589 or david.m.connolly8.civ@mail.mil if there are issues or concerns with this submission.

Sincerely,

Date:

2018.10.09

15:59:48 -04'00'

Mr. David Connolly
RVAAP Restoration Program Manager
Army National Guard Directorate

Attachment

cc: Bob Princic, Ohio EPA, DERR
Thomas Schneider, Ohio EPA, DERR
Kevin Sedlak, ARNG, Camp Ravenna
Katie Tait, ARNG, Camp Ravenna
Craig Coombs, USACE – Louisville

RVAAP RESTORATION PROGRAM - DFFO MONTHLY SUMMARY REPORT
September 2018

A. Status of project activities for reporting period (September 2018)

PROJECT NAME	USACE TECH	
2015 RI/FS Completion Contract for IRP AOCs	N. Peters / Leidos	<p>NACA Test Area RI-FS Report: Leidos submitted the geophysical investigation letter report to the Army for review on September 28, 2018.</p> <p>C Block Quarry RI-FS Report: In an e-mail dated August 29, 2018 from Kevin Sedlak, the Army requested an extension to respond to comments when groundwater well sample results are validated and available. This request was approved by Ohio EPA.</p> <p>Leidos continued developing the PreDraft FS for Atlas Scrap Yard. On September 6, 2018 samples of the incinerator brick were collected for characterization purposes and results were provided to Leidos on September 27, 2018.</p> <p>Leidos continued developing the Proposed Plan for the Landfill North of Winklepeck Burning Grounds.</p> <p>Leidos began developing the Proposed Plans for Buildings F-15 and F-16, the Sediment and Surface Water AOCs, and NACA Test Area.</p> <p>On September 27, 2018, the Army provided responses to Ohio EPA comments on the Draft Proposed Plan for Load Lines 1-4, 12.</p> <p>The Army provided comments on the Predraft RODs for Load Line 7, Load Line 9, and Upper and Lower Cobbs Ponds, and Leidos began developing responses.</p> <p>Leidos submitted the Predraft Wet Storage Area ROD to the Army for review on September 7, 2018.</p>
RVAAP-34, Sand Creek Disposal Road Landfill	A. Schmidt / CELRL	The Army received Ohio EPA comments on the Draft EE/CA on September 28, 2018.
CC RVAAP-78 Quarry Pond Surface Dump	A. Schmidt / CELRL	<p>The Army received approval of Ohio EPA comments on September 19, 2018 on the Draft SI Addendum.</p> <p>The Army submitted the Final SI Addendum on September 27, 2018.</p>
RVAAP-66 Facility Wide Ground Water Monitoring – Weston Contract	K. Sedlak / Weston	Weston is currently evaluating and validating the groundwater data from the June 2018 semi-annual sampling event.

RVAAP RESTORATION PROGRAM - DFFO MONTHLY SUMMARY REPORT
September 2018

PROJECT NAME	USACE TECH	
2018 Environmental Program Support Services	N. Peters / Chenega	<p>Chenega responded to Army comments and continued developing the Draft Annual Land Use Control (LUC) Report for WBG and Load Lines 1-4 & 12.</p> <p>Chenega responded to Army comments and continued developing the Draft Property Management Plan Appendices.</p>
Identification of Solid Waste Management Units at Former RVAAP/Camp Ravenna	David Connolly / AECOM	<p>The contractor responded to Army comments on the Preliminary Draft SWMP. AECOM began assembling the Draft version of the report.</p>
TCRA at ODA2	Travis McCoun / CENAB	<p>Range clearance activities in support of the OHARNG MPMG range construction were completed. Activities at ODA2 were on hold and restarted on October 1, 2018. There are 60 grids remaining in source area to be cleared. Remaining grids are in disposal areas and have high anomaly saturation. There are 34 stepout grids remaining.</p>
PBA16 - MMRP Sites	Kimberly Gross and Craig Coombs / CENAB / HGL	<p>The following deliverables were submitted to Ohio EPA this month:</p> <ul style="list-style-type: none"> • Ramsdell Quarry Landfill MRS Area 1 (North), (RVAAP-001-R-02), Final Record of Decision (ROD) submitted September 13, 2018; • Atlas Scrap Yard (RVAAP-050-R-01), Final ROD submitted September 5, 2018; • Landfill North of Winklepeck (RVAAP-019-R-01), Final ROD submitted September 4, 2018; • Block D Igloo TD (RVAAP-061-R-01), Final ROD submitted September 17, 2018; • Ramsdell Quarry Landfill Area 2 (South) (RVAAP-001-R-01), Draft No Further Action (NFA) Proposed Plan (PP) submitted September 19, 2018; • Erie Burning Grounds (RVAAP-002-R-01), Draft PP submitted August 23, 2018; • Fuze & Booster Quarry (RVAAP-016-R-01), Final NFA PP submitted September 18, 2018; • 40mm Firing Range RVAAP-032-R-01, Final NFA PP submitted September 17, 2018.

RVAAP RESTORATION PROGRAM - DFFO MONTHLY SUMMARY REPORT
September 2018

PROJECT NAME	USACE TECH	
PBA 16 Compliance Cleanup Sites	K. Mieczkowski / Parsons	<p>On July 24, 2018, Parsons submitted the CC RVAAP-69 update and progress report to the Ohio EPA and the Army. The report provides a summary of the data collected through March 2018 along with recommendations for additional sampling in order to complete the RI. On August 16, 2018, Ohio EPA provided comments on the CC RVAAP-69 update and progress report. On August 28, 2018 the contractor provided responses to comments. On September 26, 2018 Ohio EPA accepted all responses with minor clarifications. Field work to complete the additional monitoring wells is anticipated to commence in October.</p> <p>Parsons received Army comments on the Preliminary Draft SI for CC RVAAP-70 and resolved all comments.</p> <p>Parsons submitted the Draft ROD for CC RVAAP-73 to Ohio EPA on July 27, 2018. Review comments are pending.</p> <p>Parsons resolved the Army comments on the Preliminary Draft ROD for CC RVAAP-76 and it was submitted for ARNG legal review.</p> <p>The Contractor resolved Army comments on the Preliminary Draft RI Report for CC RVAAP-79 DLA Ore Storage Sites and provided a redline version for Army review.</p>
RVAAP-66 Facility Wide Ground Water Monitoring	J. Trumble / Leidos	<p>Leidos submitted a notification letter on September 20, 2018, for the start of fieldwork, set to begin with mobilization on October 8, 2018.</p> <p>Leidos received Army acceptance on responses to the Accident Prevention Plan comments on September 27, 2018, and is finalizing the document.</p>

B. Describe difficulties encountered during the reporting period and actions taken to rectify any difficulties

None

C. Identify changes in key personnel

None

D. List target and actual completion dates for each element of activity, including project completion

The actual completion dates and target dates where applicable are provided with the status of activities in Section A.

E. Provide an explanation for any deviation from applicable schedules

The groundwater report on the spring sampling has been delayed from its original due date of September 22, 2018. There was an issue with some of the analytical data from the laboratory which is being addressed.

RVAAP RESTORATION PROGRAM - DFFO MONTHLY SUMMARY REPORT
September 2018

F. Indicate how much soil and groundwater was generated and/or transported and disposed as part of RVAAP restoration activities

Approximately 20 gallons of IDW (water) was generated during the sampling of the monitoring wells at CC RVAAP-74 by Parsons. The IDW was finalized on September 10, 2018. The waste was determined to be Nonhazardous and was transported and disposed on September 19, 2018.

G. Describe activities planned for the following month (October 2018)

1. Parsons plans to complete and submit the Draft SI for CC RVAAP-70.
2. Parsons plans to address Ohio EPA comments on the Draft ROD for CC RVAAP-73 when received.
3. Parsons plans to resolve ARNG legal comments on the Preliminary Draft ROD for CC RVAAP-76 (when received) and submit the Draft ROD for Ohio EPA review.
4. Parsons plans to submit a redline version of the Preliminary Draft RI Report for CC RVAAP-79 for Army review and prepare and submit the Draft version for Ohio EPA review.
5. Leidos plans to submit geophysical investigation report, supporting the RI-FS Report for NACA Test Area, for Ohio EPA review.
6. Leidos plans to respond to Ohio EPA comments on the RTC letter for the C Block Quarry RI-FS Report and submit the Final report.
7. Leidos plans to submit the Preliminary Draft Feasibility Study for Atlas Scrap Yard for Army review.
8. Leidos plans to submit the Preliminary Draft Proposed Plans for Landfill North of Winklepeck Burning Grounds and for Buildings F-15 and F-16 for Army review.
9. Leidos plans to submit the Final PP for Load Lines 1 - 4 & 12 upon receiving Ohio EPA concurrence with Army RTCs.
10. Leidos plans to finalize and submit the Draft RODs for Load Line 12 and Wet Storage Area.
11. Leidos plans to finalize and submit the Draft RODs for Load Line 7, Load Line 9, and Upper/Lower Cobbs Ponds.
12. Leidos will conduct permanent and temporary well installations, well gauging, and well sampling in support of the Facilitywide GW RI, and the FWGWMP.
13. Work on the ODA2 TCRA will resume. USACE Baltimore will start with the stepout grids and then move to the saturated central grids that remain.
14. USACE will send Responses to Ohio EPA's comments on the Draft SI Addendum for CC RVAAP-78 Quarry Pond Surface Dump to Ohio EPA for review.
15. The Ohio EPA will continue their review of the Draft EE/CA for the RVAAP-34 Sand Creek Disposal Road Landfill.
16. Chenega plans to submit the Draft 2017 Annual Land Use Control Report.
17. Chenega plans to submit the Draft Remedial Design and Operations and Maintenance Plan for RVAAP-51 Dump Along Paris-Windham Road for Ohio EPA review.

RVAAP RESTORATION PROGRAM - DFFO MONTHLY SUMMARY REPORT
September 2018

18. HGL will submit the following deliverables pending review by Ohio EPA:
 - Ramsdell Quarry Landfill MRS Area 1 (North) (RVAAP-001-R-02), Final ROD;
 - Atlas Scrap Yard (RVAAP-050-R-01), Final ROD;
 - Landfill North of Winklepeck (RVAAP-019-R-01), Final ROD;
 - Ramsdell Quarry Landfill Area 2 (South) (RVAAP-001-R-01), Draft NFA PP;
 - Fuze & Booster Quarry (RVAAP-016-R-01), Final NFA PP;
 - 40mm Firing Range (RVAAP-032-R-01), Final NFA PP.
19. HGL will prepare responses to comments from Ohio EPA, once received, for Block D Igloo TD (RVAAP-061-R-01), Final ROD.
20. Conference call with Ohio EPA, HGL and Army will be held on October 4, 2018 to discuss Erie Burning Grounds (RVAAP-002-R-01), Draft PP.
21. Weston will submit the Preliminary Draft Technical Memorandum for the June 2018 FWGWMP Semi-Annual sampling event.
22. AECOM will submit the Draft Solid Waste Management Plan to the Ohio EPA for review.



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

September 10, 2018

Ohio Environmental Protection Agency
DERR-NEDO
Attn: Mr. Mark Johnson
2110 East Aurora Road
Twinsburg, OH 44087-1924

Subject: Ravenna Army Ammunition Plant (RVAAP) Restoration Program, Portage/Trumbull Counties,
Ohio, Monthly Activity Report – August 2018

Dear Mr. Johnson:

Enclosed for your review is the "RVAAP Restoration Program - DFFO Monthly Summary Report - August 2018". The report summarizes the Restoration Program activities conducted at the former RVAAP for the period from August 1, 2018 through August 31, 2018. This report is being submitted to the Ohio EPA to comply with the Ohio EPA Director's Final Findings and Orders, Section XVI, paragraphs 36 and 37.

This electronic letter and attachment are being sent to meet the deadline for submittal. A hardcopy of this letter and attachment for your records will follow.

Please contact the undersigned at (703) 607-7589 or david.m.connolly8.civ@mail.mil if there are issues or concerns with this submission.

Sincerely,

SEDLAK,KEVIN.MI
CHAE.L12544401
71

Digitally signed by
SEDLAK,KEVIN.MICHAEL.12544
40171
Date: 2018.09.10 09:48:06
-04'00'

FOR Mr. David Connolly
RVAAP Restoration Program Manager
Army National Guard Directorate

Attachment

cc: Bob Princic, Ohio EPA, DERR
Thomas Schneider, Ohio EPA, DERR
Kevin Sedlak, ARNG, Camp Ravenna
Katie Tait, ARNG, Camp Ravenna
Craig Coombs, USACE – Louisville

RVAAP RESTORATION PROGRAM - DFFO MONTHLY SUMMARY REPORT
August 2018

A. Status of project activities for reporting period (August 2018)

PROJECT NAME	USACE TECH MGR /Contractor	PROJECT STATUS
2015 RI/FS Completion Contract for IRP AOCs	N. Peters / Leidos	<p>In a letter dated August 14, 2018, Ohio EPA provided a new request to collect surface water samples of down gradient seeps and springs from C Block Quarry. In an e-mail dated August 29, 2018 from Kevin Sedlak, the Army requested an extension to respond to comments when groundwater well sample results are validated and available. This request was approved by Ohio EPA.</p> <p>In a letter dated August 15, 2018, Ohio EPA approved the Final RI Report for the Landfill North of Winklepeck Burning Grounds.</p> <p>In a letter dated August 1, 2018, Ohio EPA approved the Final RI Report for Buildings F-15 and F-16.</p> <p>Leidos continued developing the PreDraft FS for Atlas Scrap Yard.</p> <p>Leidos continued developing the Proposed Plan for the Landfill North of Winklepeck Burning Grounds.</p> <p>In a letter dated August 24, 2018, Ohio EPA provided comments on the Draft Proposed Plan for Load Lines 1-4, 12.</p> <p>Leidos submitted the Predraft Load Line 7 ROD to the Army for review on August 16, 2018.</p> <p>Leidos submitted the Predraft Load Line 9 ROD to the Army for review on August 20, 2018.</p> <p>Leidos submitted the Predraft Load Line 12 ROD to the Army for review on August 24, 2018.</p> <p>Leidos submitted the Predraft Upper and Lower Cobbs Pond ROD to the Army for review on August 8, 2018.</p>
RVAAP-34, Sand Creek Disposal Road Landfill	A. Schmidt / CELRL	The Draft EE/CA was submitted to the Ohio EPA on August 10, 2018.
CC RVAAP-78 Quarry Pond Surface Dump	A. Schmidt / CELRL	The Draft SI Addendum was submitted to the Ohio EPA on July 27, 2018. The Ohio EPA sent comments on the Draft SI Addendum on August 24, 2018. USACE is preparing responses to the Ohio EPA's comments.
RVAAP-66 Facility Wide Ground Water Monitoring – Weston	K. Sedlak / Weston	The Final FWGWMP Annual Report for 2018 was sent to the Ohio EPA on July 31, 2018. The Ohio EPA approved the report on August 16, 2018. Weston is currently evaluating and validating the groundwater data from the June 2018 semi-annual sampling event.

RVAAP RESTORATION PROGRAM - DFFO MONTHLY SUMMARY REPORT
August 2018

PROJECT NAME	USACE TECH MGR /Contractor	PROJECT STATUS
PMP	N. Peters / CELRL	The Ohio EPA conditionally approved the Final PMP document in a letter dated May 9, 2018. The Army responded in a letter dated July 12, 2018. The Ohio EPA accepted the Army's response in a letter dated August 13, 2018. Preparation and updates of PMP appendices is being handled with the Chenega contract.
2018 Environmental Program Support Services	N. Peters / Chenega	<p>On August 10, 2018, Chenega submitted the Preliminary Draft Annual Land Use Control (LUC) Report for WBG and Load Lines 1-4 & 12 for Army review.</p> <p>On August 17, 2018 Chenega submitted the Preliminary Draft Property Management Plan Appendices for Army review.</p> <p>On August 31, 2018, Chenega submitted the Preliminary Draft Remedial Design for RVAAP-51 Dump Along Paris-Windham Road for Army review.</p>
PBA 13 Supplemental RI for multiple AOCs	N. Peters / Leidos	This contract has been completed and is being closed out. The PP and ROD for Load Lines 1 - 4, and 12 will be prepared under Leidos' 2015 RI Completion Contract. The Army is working on a modification to Leidos' 2015 contract for PP and ROD (or ROD amendments) for the four surface water and wet sediment sites (RVAAP-01, RVAAP-04, RVAAP-16, and RVAAP-001-R-01).
Identification of Solid Waste Management Units at Former RVAAP/Camp Ravenna	David Connolly / AECOM	The contractor received Army comments on the Preliminary Draft SWMP. AECOM began drafting responses to comments and assembling the Draft version of the report.
TCRA at ODA2	Travis McCoun / CENAB	NAB remobilized to the site on July 23, 2018. Three step out grids were cleared on the border of the MRS. Recoveries to date (current as of June 22, 2018): 65,284 pounds of MDAS/MD, 2,136 pounds of cultural debris, and 598 MPPEH items have been found during TCRA activities. There are 60 grids remaining to be cleared. Remaining grids are in disposal areas and have high anomaly saturation. NAB is currently conducting range clearance activities in support of the OHARNG MPMG range construction. Activities at ODA2 are currently on hold.
PBA16 - MMRP Sites	Kimberly Gross and Craig Coombs / CENAB / HGL	<p>The Final Erie Burning Grounds (RVAAP-002-R-01) MRS Feasibility Study was submitted to Ohio EPA on August 17, 2018.</p> <p>The Draft Erie Burning Grounds (RVAAP-002-R-01) MRS Proposed Plan was submitted to Ohio EPA for review on August 22, 2018.</p> <p>The Draft Block D Igloo (RVAAP-060-R-01) MRS Proposed Plan was submitted to Ohio EPA for review on August 1, 2018.</p>

RVAAP RESTORATION PROGRAM - DFFO MONTHLY SUMMARY REPORT
August 2018

PROJECT NAME	USACE TECH MGR /Contractor	PROJECT STATUS
PBA 16 Compliance Cleanup Sites	K. Mieczkowski / Parsons	<p>On July 24, 2018, Parsons submitted the CC RVAAP-69 update and progress report to the Ohio EPA and the Army. The report provides a summary of the data collected through March 2018 along with recommendations for additional sampling in order to complete the RI. On August 16, 2018, Ohio EPA provided comments on the CC RVAAP-69 update and progress report.</p> <p>Parsons received Army comments on the Preliminary Draft SI for CC RVAAP-70 and resolved all comments.</p> <p>Parsons submitted the Draft ROD for CC RVAAP-73 to Ohio EPA on July 27, 2018.</p> <p>Parsons resolved the Army comments on the Preliminary Draft ROD for CC RVAAP-76 and it was submitted for ARNG legal review.</p> <p>The Contractor resolved Army comments on the Preliminary Draft RI Report for CC RVAAP-79 DLA Ore Storage Sites and provided a redline version for Army review.</p>
RVAAP-66 Facility Wide Ground Water Monitoring	J. Trumble / Leidos	<p>On August 30, 2018, Liedos submitted the Draft Accident Prevention Plan for Army review. A field visit to check out the former production wells was conducted on August 30, 2018.</p>

B. Describe difficulties encountered during the reporting period and actions taken to rectify any difficulties

None

C. Identify changes in key personnel

None

D. List target and actual completion dates for each element of activity, including project completion

The actual completion dates and target dates where applicable are provided with the status of activities in Section A.

E. Provide an explanation for any deviation from applicable schedules

None

F. Indicate how much soil and groundwater was generated and/or transported and disposed as part of RVAAP restoration activities

None

G. Describe activities planned for the following month (September 2018)

1. Parsons plans to complete and submit the Draft SI for CC RVAAP-70.

RVAAP RESTORATION PROGRAM - DFFO MONTHLY SUMMARY REPORT
August 2018

2. Parsons plans to address Ohio EPA comments on the Draft ROD for CC RVAAP-73 when received.
3. Parsons is scheduled to conduct the third quarterly groundwater sampling event for the RI for CC RVAAP-74 in September 2018.
4. Parsons plans to resolve ARNG legal comments on the Preliminary Draft ROD for CC RVAAP-76 (when received) and submit the Draft ROD for Ohio EPA review.
5. Parsons plans to submit a redline version of the Preliminary Draft RI Report for CC RVAAP-79 for Army review and prepare and submit the Draft version for Ohio EPA review.
6. Leidos plans to respond to Ohio EPA comments on the Final Revised RI-FS Report for NACA Test Area.
7. Leidos plans to submit the response to comment letter for the revised Draft C Block Quarry RI-FS Report.
8. Leidos plans to respond to Ohio EPA comments on the Draft PP for Load Lines 1 - 4 & 12 and submit the Final PP for review.
9. Leidos plans to finalize and submit the Preliminary Draft ROD for Wet Storage Area.
10. Leidos plans to finalize and submit the Preliminary Draft Feasibility Study for Atlas Scrap Yard for Army review.
11. Leidos plans to finalize and submit the Draft RODs for Load Line 7, Load Line 9, Load Line 12, and Upper/Lower Cobbs Ponds.
12. USACE Baltimore will assist the OHARNG in completing the range clearance activities at Winklepeck Burning Grounds for the future MPMG range. Work on the ODA2 TCRA is currently on hold while range clearance activities at Winklepeck are performed.
13. USACE will send Responses to Ohio EPA's comments on the Draft SI Addendum for CC RVAAP-78 Quarry Pond Surface Dump to Ohio EPA for review.
14. The Ohio EPA will continue their review of the Draft EE/CA for the RVAAP-34 Sand Creek Disposal Road Landfill.
15. Chenega plans to submit the Draft 2017 Annual Land Use Control Report.
16. Chenega plans to submit the Preliminary Draft Remedial Design and Operations and Maintenance Plan for RVAAP-51 Dump Along Paris-Windham Road for Army review.
17. HGL will submit the Final Fuze and Booster Quarry MRS and 40mm Firing Range MRS Proposed Plans when the date of the Proposed Plan Public Meeting is confirmed.
18. HGL will submit the Final Ramsdell Quarry Landfill MRS Area 1 (North) and Landfill North of Winklepeck MRS Record of Decisions.
19. HGL plans to receive Ohio EPA concurrence on the Final Erie Burning Grounds Feasibility Study, comments on the Draft Erie Burning Grounds Proposed Plan, concurrence on the Final Atlas Scrap Yard MRS Record of Decision and concurrence on the Final Landfill North of Winklepeck MRS Record of Decision.

RVAAP RESTORATION PROGRAM - DFFO MONTHLY SUMMARY REPORT
August 2018

20. Weston will submit the Preliminary Draft Technical Memorandum for the June 2018 FWGWMP Semi-Annual sampling event.
21. AECOM will submit the Draft Solid Waste Management Plan to the Ohio EPA for review.



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

August 10, 2018

Ohio Environmental Protection Agency
DERR-NEDO
Attn: Mr. Mark Johnson
2110 East Aurora Road
Twinsburg, OH 44087-1924

Subject: Ravenna Army Ammunition Plant (RVAAP) Restoration Program, Portage/Trumbull Counties, Ohio, Monthly Activity Report – July 2018

Dear Mr. Johnson:

Enclosed for your review is the "RVAAP Restoration Program - DFFO Monthly Summary Report - July 2018". The report summarizes the Restoration Program activities conducted at the former RVAAP for the period from July 1, 2018 through July 31, 2018. This report is being submitted to the Ohio EPA to comply with the Ohio EPA Director's Final Findings and Orders, Section XVI, paragraphs 36 and 37.

This electronic letter and attachment are being sent to meet the deadline for submittal. A hardcopy of this letter and attachment for your records will follow.

Please contact the undersigned at (703) 607-7589 or david.m.connolly8.civ@mail.mil if there are issues or concerns with this submission.

Sincerely,

Date: 2018.08.09
09:40:13 -04'00'

Mr. David Connolly
RVAAP Restoration Program Manager
Army National Guard Directorate

Attachment

cc: Bob Prinic, Ohio EPA, DERR
Thomas Schneider, Ohio EPA, DERR
Kevin Sedlak, ARNG, Camp Ravenna
Katie Tait, ARNG, Camp Ravenna
Craig Coombs, USACE – Louisville

RVAAP RESTORATION PROGRAM - DFFO MONTHLY SUMMARY REPORT
July 2018

A. Status of project activities for reporting period (July 2018)

PROJECT NAME	USACE TECH MGR /Contractor	PROJECT STATUS
2015 RI/FS Completion Contract for IRP AOCs	N. Peters / Leidos	<p>On July 24, 2018, the Contractor submitted, for Ohio EPA review, the Final RI-FS Report for NACA Test Area using supplemental soil, sediment, and groundwater data collected after Ohio EPA comments on the draft report.</p> <p>The Army reviewed a contractor-prepared response to comment letter and a revised Section 6 (Contaminant Fate and Transport) for the Revised Draft RI-FS report for C-Block Quarry.</p> <p>On June 15, 2018, the Ohio EPA issued a comment letter on the Final RI Report for the Landfill North of Winklepeck Burning Grounds. The letter required a soil cap and land use controls even though a previous letter from Ohio EPA had concurred with the Draft and requested the Army to issue the Final. The Army provided a response letter to the Ohio EPA on July 18, 2018.</p> <p>The Ohio EPA provided an approval letter, dated June 19, 2018, for the Final RI Report for Buildings F-15 and F-16. This approval letter provided stipulations regarding removal of solid waste prior to issuance of the CERCLA Proposed Plan. The Army issued a response letter to Ohio EPA on June 29, 2018. On August 1, 2018, the Ohio EPA issued a letter approving the RI indicating no further action to attain unrestricted use under CERCLA.</p> <p>The Contractor began preparing the Feasibility Study for Atlas Scrap Yard. This FS will account for the revised USEPA RSLs for PAHs.</p> <p>The Contractor continued preparation of the Proposed Plan for Landfill North of Winklepeck Burning Grounds. The Draft will be submitted after Ohio EPA concurrence on the RI Report is received.</p> <p>The Contractor submitted the Draft PP for Load Lines 1 - 4 & 12 to Ohio EPA on July 24, 2018 and began preparing the Pre Draft PP for NACA Test Area.</p> <p>A Public Meeting was conducted on June 21, 2018 for the PPs on Load Lines 7, 9, and 12, Wet Storage Area, and Upper and Lower Cobbs Ponds. The public comment period ended on July 6, 2018.</p> <p>The Contractor provided copies of signed, approved, Final RODs for Load Lines 5, 6, 8, and 11 to stakeholders on July 12, 2018.</p> <p>Contractor continued developing Draft RODs for Load Lines 7, 9, and 12, Wet Storage Area, and Upper and Lower Cobbs Ponds.</p>

RVAAP RESTORATION PROGRAM - DFFO MONTHLY SUMMARY REPORT
July 2018

PROJECT NAME	USACE TECH MGR /Contractor	PROJECT STATUS
RVAAP-34, Sand Creek Disposal Road Landfill	A. Schmidt / CELRL	The Army received final approval for the Final RI on April 4, 2017. A Preliminary Draft version of an EE/CA was prepared by USACE-LRL. The Draft is currently being prepared to submit to the Ohio EPA.
CC RVAAP-78 Quarry Pond Surface Dump	A. Schmidt / CELRL	CC RVAAP-78 Quarry Pond Surface Dump – The SI for this project is complete. The Draft SI Addendum was completed and sent to the Ohio EPA for review on July 24, 2018.
RVAAP-66 Facility Wide Ground Water Monitoring	K. Sedlak / Weston	The approval for the RTCs on the Draft Annual Groundwater monitoring report was received on July 18, 2018. The Final Report was sent to the Ohio EPA and all stakeholders on July 31, 2018.
PMP	N. Peters / CELRL	The Ohio EPA conditionally approved the Final PMP document in a letter dated May 9, 2018. The Army responded in a letter dated July 12, 2018.
2018 Environmental Program Support Services	N. Peters / Chenega	Chenega conducted annual Land Use Control (LUC) inspections for Load Lines 1-4 & 12 and began preparing the Annual LUC Inspection Report for 2017.
PBA 13 Supplemental RI for multiple AOCs	N. Peters / Leidos	This contract has been completed and is being closed out. The PP and ROD for Load Lines 1 - 4, and 12 will be prepared under Leidos' 2015 RI Completion Contract. The contract mechanism for PPs and RODs (or ROD amendments) for the four surface water and wet sediment sites (RVAAP-01, RVAAP-04, RVAAP-16, and RVAAP-001-R-01) has yet to be determined.
Identification of Solid Waste Management Units at Former RVAAP/Camp Ravenna	David Connolly / AECOM	Received Army comments on the Preliminary Draft SWMP on July 27, 2018. AECOM began drafting responses to comments.
TCRA at ODA2	Travis McCoun / CENAB	NAB was on break weeks of 2-22 July. There were no updates to recoveries to date (current as of June 22, 2018): 65,284 pounds of MDAS/MD, 2,136 pounds of cultural debris, and 598 MPPEH items have been found during TCRA activities. There are 60 grids remaining to be cleared. Remaining grids are in disposal areas and have high anomaly saturation. NAB personnel re-mobilized to the site on 23 July 2018.

RVAAP RESTORATION PROGRAM - DFFO MONTHLY SUMMARY REPORT
July 2018

PROJECT NAME	USACE TECH MGR /Contractor	PROJECT STATUS
PBA16 - MMRP Sites	Kimberly Gross and Craig Coombs / CENAB / HGL	<p>The RVAAP-019-R-01, Landfill North of Winklepeck, Draft ROD Version 1 summary of responses to Ohio EPA comments letter was submitted to Ohio EPA on July 17, 2018.</p> <p>The RVAAP-061-R-01, Block D igloo-TD MRS Draft ROD was approved by the Ohio EPA on July 5, 2018. The Draft ROD is in ACSIM review.</p> <p>The RVAAP-002-R-01, Erie Burning Grounds, Draft FS Version 1, summary of responses to Ohio EPA comments letter was submitted to Ohio EPA on July 13, 2018.</p> <p>The RVAAP-060-R-01, Draft Block D Igloo MRS Proposed Plan for Ohio EPA review was submitted July 31, 2018.</p> <p>HGL discussed with the Army team the proposed date for public meetings for the pending Final Proposed Plan submittals for two MRSS: RVAAP-016-R-01 Fuze and Booster Quarry and RVAAP-032-R-01 40mm Firing Range.</p>
PBA 16 Compliance Cleanup Sites	K. Mieczkowski / Parsons	<p>On July 24, 2018, Parsons submitted the CC RVAAP-69 update and progress report to the Ohio EPA and the Army. The report provides a summary of the data collected through March 2018 along with recommendations for additional sampling in order to complete the RI.</p> <p>The Army reviewed the Preliminary Draft SI for CC RVAAP-70 which was submitted by the Contractor on June 22, 2018.</p> <p>Parsons resolved Army comments on the Preliminary Draft ROD for CC RVAAP-73.</p> <p>The Army provided review comments on the Preliminary Draft ROD for CC RVAAP-76. The Army decided to move forward with the selected remedy in the current PP (excavation and offsite disposal), rather than modify the remedy to use ex-situ thermal treatment.</p> <p>The Contractor resolved Army comments on the Preliminary Draft RI Report for CC RVAAP-79 DLA Ore Storage Sites.</p>
RVAAP-66 Facility Wide Ground Water Monitoring	J. Trumble / Leidos	The Army team reviewed the Draft PMP and QCP, both internal documents to the Army.

B. Describe difficulties encountered during the reporting period and actions taken to rectify any difficulties

None

C. Identify changes in key personnel

NoneD. List target and actual completion dates for each element of activity, including project completion

The actual completion dates and target dates where applicable are provided with the status of

RVAAP RESTORATION PROGRAM - DFFO MONTHLY SUMMARY REPORT
July 2018

activities in Section A.

E. Provide an explanation for any deviation from applicable schedules

None

F. Indicate how much soil and groundwater was generated and/or transported and disposed as part of RVAAP restoration activities

On July 17, 2018, one drum of Nonhazardous, liquid IDW was picked up and properly transported and disposed by PennOhio Corporation. The IDW was generated by Parsons as part of the second quarterly sampling event for the newly installed groundwater wells at CC-69 and CC-74 in June 2018.

Four 55-gallon drums of purge and decon water were generated in June 2018 as part of the semi-annual groundwater sampling event for the FWGWMP. The drums were sampled and found to be Nonhazardous as documented in the Final IDW report dated July 11, 2018. . The drums were picked up and properly transported and disposed by EnviroServe on July 20, 2018.

G. Describe activities planned for the following month (August 2018)

1. Parsons plans to address Army comments on the Preliminary Draft SI for CC RVAAP-70.
2. Parsons plans to address Army comments on the Preliminary Draft ROD for CC RVAAP-76.
3. Parsons plans to address Army comments on the Preliminary Draft RI Report for CC RVAAP-79.
4. Leidos plans to respond to Ohio EPA comments or approval of the Final Revised RI-FS Report for NACA Test Area.
5. Leidos plans to submit the response to comment letter for the revised Draft C Block Quarry RI-FS Report, in accordance with the comment resolution meeting held May 22, 2018.
6. Leidos plans to respond to Ohio EPA comments on the Draft PP for Load Lines 1 - 4 & 12 and submit the Final PP for review.
7. Leidos plans to submit a response to comment letter on the Final RI Report for the Landfill North of Winklepeck Burning Grounds and continue developing the Preliminary Draft PP.
8. Leidos plans to continue development of the Preliminary Draft PP for NACA Test Area.
9. Leidos plans to continue developing the Preliminary Draft Feasibility Study for Atlas Scrap Yard for Army review.
10. Leidos plans to finalize and submit the Draft RODs for Load Lines 7 and 9 and continuing developing the Draft RODs for Load Line 12, Wet Storage Area, and Upper/Lower Cobbs Ponds.
11. The TCRA at ODA2 will continue as additional funds to complete the project were received. USACE Baltimore will assist the OHARNG in completing the range clearance activities at Winklepeck Burning Grounds for the future MPMG range. This may delay clearance activities at ODA2 for 2 months.
12. USACE sent the Draft SI Addendum for CC RVAAP-78 Quarry Pond Surface Dump to Ohio EPA on July 27, 2018 for review. The Ohio EPA will continue their review.
13. The Army will submit the Draft EE/CA for the RVAAP-34 Sand Creek Disposal Road Landfill to the Ohio EPA for review.

RVAAP RESTORATION PROGRAM - DFFO MONTHLY SUMMARY REPORT
July 2018

14. Chenega plans to begin preparation of the Remedial Design for RVAAP-51 Dump Along Paris Windham Road.
15. HGL will submit the Final Fuze and Booster Quarry MRS Proposed Plan when the date of the Proposed Plan Public Meeting is confirmed.
16. HGL will submit the Final 40mm Firing Range MRS Proposed Plan when the date of the Proposed Plan Public Meeting is confirmed.
17. HGL will submit the Draft Ramsdell Quarry Landfill MRS Area 2 (South) Proposed Plan upon approval by Army.
18. HGL will submit the Final Erie Burning Grounds Feasibility Study upon Ohio EPA approval of Draft responses to comments.
19. HGL will submit the Draft Erie Burning Grounds Proposed Plan once the Feasibility Study is finalized.
20. HGL will submit the Final Atlas Scrap Yard MRS Record of Decision.
21. HGL will submit the Final Ramsdell Quarry Landfill MRS Area 1 (North) Record of Decision.
22. HGL will submit the Final Block D Igloo-TD MRS Record of Decision.
23. HGL will submit the Final Landfill North of Winklepeck MRS Record of Decision if Ohio EPA concurrence to responses to comments is received.



NATIONAL GUARD BUREAU

111 SOUTH GEORGE MASON DRIVE
ARLINGTON VA 22204-1373

July 10, 2018

Ohio Environmental Protection Agency
DERR-NEDO

Attn: Mr. Mark Johnson
2110 East Aurora Road
Twinsburg, OH 44087-1924

Subject: Ravenna Army Ammunition Plant (RVAAP) Restoration Program, Portage/Trumbull Counties,
Ohio, Monthly Activity Report – June 2018

Dear Mr. Johnson:

Enclosed for your review is the "RVAAP Restoration Program - DFFO Monthly Summary Report - June 2018". The report summarizes the Restoration Program activities conducted at the former RVAAP for the period from June 1, 2018 through June 30, 2018. This report is being submitted to the Ohio EPA to comply with the Ohio EPA Director's Final Findings and Orders, Section XVI, paragraphs 36 and 37.

This electronic letter and attachment are being sent to meet the deadline for submittal. A hardcopy of this letter and attachment for your records will follow.

Please contact the undersigned at (703) 601-7785 or david.m.connolly8.civ@mail.mil if there are issues or concerns with this submission.

Sincerely,

Mr. David Connolly
RVAAP Restoration Program Manager
Army National Guard Directorate

Attachment

cc: Bob Princic, Ohio EPA, DERR
Thomas Schneider, Ohio EPA, DERR
Kevin Sedlak, ARNG, Camp Ravenna
Katie Tait, ARNG, Camp Ravenna
Craig Coombs, USACE – Louisville

RVAAP RESTORATION PROGRAM - DFFO MONTHLY SUMMARY REPORT
June 2018

A. Status of project activities for reporting period (June 2018)

PROJECT NAME	USACE TECH MGR /Contractor	PROJECT STATUS
2015 RI/FS Completion Contract for IRP AOCs	N. Peters / Leidos	<p>On June 3, 2018, the Contractor submitted, for Army review, the revised RI-FS Report for NACA Test Area using supplemental soil, sediment, and groundwater data collected from sampling conducted during November 2017.</p> <p>On June 25, 2018, the Contractor submitted, for Army review, a response to comment letter and a revised Section 6 (Contaminant Fate and Transport) for the Revised Draft RI-FS report for C-Block Quarry.</p> <p>On June 15, 2018, the Ohio EPA issued a comment letter on the Final RI Report for the Landfill North of Winklepeck Burning Grounds. The letter required a soil cap and land use controls even though a previous letter from Ohio EPA had concurred with the Draft and requested the Army to issue the Final. The Contractor provided a draft response letter for Army review on June 29, 2018.</p> <p>The Ohio EPA provided an approval letter, dated June 19, 2018, for the Final RI Report for Buildings F-15 and F-16. This approval letter provided stipulations regarding removal of solid waste prior to issuance of the CERCLA Proposed Plan. The Army issued a response letter to Ohio EPA on June 29, 2018.</p> <p>On June 12, 2018, USACE issued a contract modification to the Contractor to prepare the Feasibility Study for Atlas Scrap Yard. This new FS will account for the revised USEPA RSLs for PAHs.</p> <p>The Contractor continued preparation of the Proposed Plan for Landfill North of Winklepeck Burning Grounds. The Draft will be submitted after Ohio EPA concurrence on the RI Report is received.</p> <p>The Contractor began preparing the Draft PP for Load Lines 1 - 4 & 12 in accordance with Army review comments.</p> <p>A Public Meeting was conducted on June 21, 2018 for the PPs on Load Lines 7, 9, and 12, Wet Storage Area, and Upper and Lower Cobbs Ponds. Public notification period commenced on June 6, 2018.</p> <p>The Final ROD for Load Line 8 was signed by the Army on June 16, 2018.</p> <p>Contractor continued developing Draft RODs for Load Lines 7, 9, and 12, Wet Storage Area, and Upper and Lower Cobbs Ponds.</p>
RVAAP-34, Sand Creek Disposal Road Landfill	A. Schmidt / CELRL	<p>The Army received final approval for the Final RI on April 4, 2017. A Preliminary Draft version of an EE/CA was prepared by USACE-LRL and is currently under review by the Army.</p>

RVAAP RESTORATION PROGRAM - DFFO MONTHLY SUMMARY REPORT
June 2018

PROJECT NAME	USACE TECH MGR /Contractor	PROJECT STATUS
CC RVAAP-78 Quarry Pond Surface Dump	A. Schmidt / CELRL	CC RVAAP-78 Quarry Pond Surface Dump – The SI for this project is complete. The Preliminary Draft SI Addendum is currently under review by the Army.
RVAAP-66 Facility Wide Ground Water Monitoring	K. Sedlak / Weston	The Draft FWGWMP Annual Report for 2017 and Draft FWGWMP Addendum for 2018 were submitted for Ohio EPA review on March 30, 2018. The Ohio EPA asked for and received an extension for review until June 15, 2018. Comments were received from the Ohio EPA on the Draft Addendum on May 17, 2018. The response to the comments was transmitted back to the Ohio EPA on June 1, 2018. The approval of the responses to comments was received on June 8, 2018. Comments on the Draft FWGWMP Annual Report for 2017 were received from the Ohio EPA on June 8, 2018. Completed the Semi-Annual groundwater sampling event.
PMP	N. Peters / CELRL	The Ohio EPA conditionally approved the Final PMP document in a letter dated May 9, 2018. The Army is preparing the required change pages.
RVAAP-05, Winklepeck Burning Grounds and other post closure LUC work	J. Trumble / CELRL	Approval on the Fourth Quarter LUC report was received on June 6, 2018 from the Ohio EPA. The Annual LUC Report/Inspection for 2017 is currently being prepared by Chenega.
RVAAP-51, Dump Along Paris Windham Road	N. Peters / Chenega	Implementation of LUCs selected in the ROD was incorporated in the Environmental Services Contract that was awarded in May 2018. Chenega is currently preparing the RD.
PBA 13 Supplemental RI for multiple AOCs	N. Peters / Leidos	This contract has been completed and is being closed out. The PP and ROD for Load Lines 1 - 4, and 12 will be prepared under Leidos' 2015 RI Completion Contract. The contract mechanism for PPs and RODs (or ROD amendments) for the four surface water and wet sediment sites (RVAAP-01, RVAAP-04, RVAAP-16, and RVAAP-001-R-01) has yet to be determined.
Identification of Solid Waste Management Units at Former	K. Sedlak / AECOM	The Preliminary Draft SWMP was submitted on June 22, 2018 for Army review.

RVAAP RESTORATION PROGRAM - DFFO MONTHLY SUMMARY REPORT
June 2018

PROJECT NAME	USACE TECH MGR /Contractor	PROJECT STATUS
TCRA at ODA2	Travis McCoun / CENAB	NAB continued clearance activities in moderate to high probability areas. Recoveries to date (June 22, 2018): 65,284 pounds of MDAS/MD, 2,136 pounds of cultural debris, and 598 MPPEH items have been found during TCRA activities. There are 60 grids remaining to be cleared. Remaining grids are in disposal areas and have high anomaly saturation. Demo operations were conducted June 18-21, 2018; all MPPEH on-site (448 items) was destroyed. Funding for the completion of the TCRA was received in June 2018 and work will continue in July.
PBA16 - MMRP Sites	Kimberly Gross and Craig Coombs / CENAB / HGL	<p>RVAAP-050-R-01 – The Ohio EPA provided a comment letter on May 17, 2018 on the Draft ROD. The response to comments letter summarizing edits made to the document was submitted June 1, 2018.</p> <p>RVAAP-019-R-01 – The Ohio EPA provided a comment letter on the Draft ROD on June 12, 2018.</p> <p>RVAAP-060-R-01 - The Final FS for Block D Igloo was submitted on June 21, 2018.</p> <p>RVAAP-002-R-01 – The Ohio EPA provided comments on the Draft Feasibility Study on June 6, 2018. Legal review comments on the Preliminary Draft Proposed Plan were received June 26, 2018.</p>

RVAAP RESTORATION PROGRAM - DFFO MONTHLY SUMMARY REPORT
June 2018

PROJECT NAME	USACE TECH MGR /Contractor	PROJECT STATUS
PBA 16 Compliance Cleanup Sites	K. Mieczkowski / Parsons	<p>Parsons received comments on the submitted Preliminary Draft letter work plan for CC RVAAP-69 to the Army. The addendum letter provided details of next field effort in the delineation of the nature and extent at this AOC consistent with final approved work plan. The updated work plan addendum is anticipated to be completed in July. The second quarter groundwater sampling event was completed in June.</p> <p>The Preliminary Draft SI for CC RVAAP-70 was submitted to the Army for review on June 22, 2018.</p> <p>CC RVAAP-73: The Army submitted comments to the contractor on the Preliminary Draft ROD.</p> <p>CC RVAAP-74: The Second quarterly groundwater sampling event was completed on June 4, 2018.</p> <p>CC RVAAP-76: The Preliminary Draft ROD was submitted to the Army in April 2018. This AOC is included as part of the VEG contract and USACE legal reviewed the document in order to suggest the best way to incorporate on-site thermal treatment as the selected remedy. Based on legal review, the PP would need to be revised to include the on-site thermal treatment option which would require another public meeting. The Army is discussing potentially moving forward with the selected remedy in the current PP (excavation and offsite disposal) as it would be the most efficient and cost effective.</p> <p>The Contractor submitted the Preliminary Draft RI Report for CC RVAAP-79 DLA Ore Storage Sites for Army review on May 25, 2018.</p> <p>Ohio EPA indicated that there were concerns about the management of residual munitions at RVAAP-03 in early February 2018. Army has discussed potential options with USACE Baltimore. A funds request has been submitted to conduct a munitions evaluation/cleanup at the site.</p>
RVAAP-66 Facility Wide Ground Water Monitoring	J. Trumble / Leidos	<p>Contract award to Leidos was completed on June 30, 2018 to complete activities under the FWGWMP (the background study, RI, well abandonment continued sampling etc).</p>

B. Describe difficulties encountered during the reporting period and actions taken to rectify any difficulties

None

C. Identify changes in key personnel

Notification of a change in ARNG Program Manager for the RVAAP Restoration Program was sent to the Ohio EPA on June 13, 2018. Mr. Dave Connolly will be replacing LTC James Crowley as the ARNG Program Manager.

D. List target and actual completion dates for each element of activity, including project completion

RVAAP RESTORATION PROGRAM - DFFO MONTHLY SUMMARY REPORT
June 2018

The actual completion dates and target dates where applicable are provided with the status of activities in Section A.

E. Provide an explanation for any deviation from applicable schedules

None

F. Indicate how much soil and groundwater was generated and/or transported and disposed as part of RVAAP restoration activities

Approximately 10 gallons of purge water was generated by Parsons as part of the second quarterly sampling event for the newly installed groundwater wells at CC-69 and CC-74 in June 2018. The IDW was sampled and found to be Nonhazardous and is being inspected on a weekly basis at Building 1036 while awaiting proper transport and disposal.

Four 55-gallon drums of purge and decon water were generated in June 2018 as part of the semi-annual groundwater sampling event for the FWGWMP. The drums were sampled and are Pending Analysis. The drums are being inspected on a weekly basis at Building 1036 while awaiting analytical results and proper transport and disposal.

G. Describe activities planned for the following month (July 2018)

1. Parsons plans to address Army comments on the Preliminary Draft SI for CC RVAAP-70.
2. Parsons will finalize the letter work plan update for CC RVAAP-69.
3. Leidos plans to address Army comments and submit the Final Revised RI-FS Report for NACA Test Area.
4. Leidos plans to address Army comments and submit the response to comment letter for the revised Draft C Block Quarry RI-FS Report, in accordance with the comment resolution meeting held May 22, 2018.
5. Leidos plans to respond to Army comments on the Preliminary Draft PP for Load Lines 1 - 4 & 12 and submit the Draft PP to the Ohio EPA for review.
6. Leidos Plans to submit a response to comment letter on the Final RI Report for the Landfill North of Winklepeck Burning Grounds and continue developing the Preliminary Draft PP.
7. Leidos plans to continue developing the Feasibility Study for Atlas Scrap Yard.
8. Leidos plans to send compiled, signed versions of Final RODs for Load Lines 5, 6, 8, and 11 to stakeholders for records.
9. Leidos plans to continue developing the RODs for Load Lines 7, 9, and 12, Wet Storage Area, and Upper/Lower Cobbs Ponds for submittal after the public comment period.
10. The TCRA at ODA2 will continue as additional funds to complete the project were received.
11. USACE will continue to revise the Preliminary Draft SI Addendum for the RVAAP-78 Quarry Pond Surface Dump to address the Army's comments and submit to the Ohio EPA for review.
12. The Army will continue preparing the Draft EECA for the RVAAP-34 Sand Creek Disposal Road Landfill.

RVAAP RESTORATION PROGRAM - DFFO MONTHLY SUMMARY REPORT
June 2018

13. The Army will review the Preliminary Draft Solid Waste Management Plan.
14. Weston will respond to Ohio EPA comments on the 2017 Annual Groundwater Monitoring Report.
15. Weston will submit the Final FWGWMP Addendum to the Ohio EPA.
16. RVAAP-001-R-02 - The Final Ramsdell Quarry Landfill Area 1 (North) MRS ROD will be submitted once ACSIM review is received.
17. RVAAP-050-R-01 - The Final Atlas Scrap Yard ROD will be submitted once ACSIM review is received.
18. RVAAP-019-R-01 – A response to comments letter on the Draft Landfill North of Winklepeck ROD will be prepared and submitted to Ohio EPA.
19. RVAAP-016-R-01 - The Final Fuze and Booster Quarry PP and responses to Ohio EPA comments will be prepared and submitted upon confirmation of the Public Meeting date.
20. RVAAP-002-R-01 - Responses to Ohio EPA comments on the Draft Erie Burning Grounds MRS FS will be prepared and submitted.
21. RVAAP-032-R-01 - The Final 40mm Firing Range PP will be prepared and submitted upon confirmation of the Public Meeting date.
22. RVAAP-060-R-01 - The Preliminary Draft Block D Igloo PP and response to comments will be prepared and submitted.
23. RVAAP-063-R-01 - The Preliminary Draft Group 8 MRS FS (redline) will be prepared and submitted to the Army.



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

June 11, 2018

Ohio Environmental Protection Agency
DERR-NEDO
Attn: Mr. Mark Johnson
2110 East Aurora Road
Twinsburg, OH 44087-1924

Subject: Ravenna Army Ammunition Plant (RVAAP) Restoration Program, Portage/Trumbull Counties,
Ohio, Monthly Activity Report – May 2018

Dear Mr. Johnson:

Enclosed for your review is the "RVAAP Restoration Program - DFFO Monthly Summary Report - May 2018". The report summarizes the Restoration Program activities conducted at the former RVAAP for the period from May 1, 2018 through May 31, 2018. This report is being submitted to the Ohio EPA to comply with the Ohio EPA Director's Final Findings and Orders, Section XVI, paragraphs 36 and 37.

This electronic letter and attachment are being sent to meet the deadline for submittal. A hardcopy of this letter and attachment for your records will follow.

Please contact the undersigned at (703) 601-7785 or james.c.crowley.mil@mail.mil if there are issues or concerns with this submission.

Sincerely,

CROWLEY.JAMES.C
ORNELIUS.1045120
399

Digitally signed by
CROWLEY.JAMES.CORNELIUS.10
45120399
Date: 2018.06.06 16:55:43 -04'00'

James C. Crowley
Lieutenant Colonel, Corps of Engineers
RVAAP Restoration Program Manager
Installations & Environment, ARNG

Attachment

cc: Bob Princic, Ohio EPA, DERR
Thomas Schneider, Ohio EPA, DERR
Kevin Sedlak, ARNG, Camp Ravenna
Katie Tait, ARNG, Camp Ravenna
Craig Coombs, USACE – Louisville

CAMP RAVENNA RESTORATION PROGRAM - DFFO MONTHLY SUMMARY REPORT
May 2018

A. Status of project activities for reporting period (May 2018)

PROJECT NAME	USACE TECH MGR /Contractor	PROJECT STATUS
2015 RI/FS Completion Contract for IRP AOCs	N. Peters / Leidos	<p>The Contractor continued updating the RI-FS Report for NACA Test Area using supplemental soil, sediment, and groundwater data collected from sampling conducted during November 2017.</p> <p>A comment resolution meeting on the Revised Draft RI-FS report for C-Block Quarry was held on May 22, 2018. The outstanding comments were resolved. Contractor began developing a response letter that will include a new Section 6 (Contaminant Fate and Transport) for review prior to submittal of the Final RI-FS.</p> <p>The Contractor submitted the Final RI Report for the Landfill North of Winklepeck Burning Grounds to Ohio EPA on April 25, 2018. Ohio EPA concurrence is pending.</p> <p>In an email on April 30, 2018, the Ohio EPA requested a 30-day extension to review the Final RI Report for Buildings F-15 and F-16. Ohio EPA concurrence is pending.</p> <p>There was no Army activity on the Revised Facility-wide Sewer RI Report. This report will be submitted after completion of the non-time critical removal action described in the EE/CA.</p> <p>The Contractor continued preparation of the Proposed Plan for Landfill North of Winklepeck Burning Grounds. The Draft will be submitted after Ohio EPA concurrence on the Final RI Report is received.</p> <p>The Preliminary Draft PP for Load Lines 1 - 4 & 12 is in ARNG legal review. Other Army stakeholders have completed their review.</p> <p>A Public Meeting was set for June 21, 2018 for the PPs on Load Lines 7, 9, and 12, Wet Storage Area, and Upper and Lower Cobbs Ponds. Meeting will be at Shearer Community Center. Public notification period was set for June 6 to July 6, 2018.</p> <p>Final RODs for Load Lines 6 and 11 were signed by the Army on May 12, 2018.</p> <p>Contractor began developing Draft RODs for Load Lines 7, 9, and 12, Wet Storage Area, and Upper and Lower Cobbs Ponds.</p>
RVAAP-34, Sand Creek Disposal Road Landfill	A. Schmidt / CELRL	<p>The Army received final approval for the Final RI on April 4, 2017. A Preliminary Draft version of an EE/CA was prepared by USACE-LRL and is currently under review by the Army.</p>

CAMP RAVENNA RESTORATION PROGRAM - DFFO MONTHLY SUMMARY REPORT
May 2018

PROJECT NAME	USACE TECH MGR /Contractor	PROJECT STATUS
CC RVAAP-78 Quarry Pond Surface Dump	A. Schmidt / CELRL	CC RVAAP-78 Quarry Pond Surface Dump – The SI for this project is complete. The Preliminary Draft SI Addendum is currently under review by the Army.
RVAAP-66 Facility Wide Ground Water Monitoring	K. Sedlak / Weston	The Draft FWGWMP Annual Report for 2017 and Draft FWGWMP Addendum for 2018 were submitted for Ohio EPA review on March 30, 2018. The Ohio EPA asked for and received an extension for review until June 15, 2018. Comments were received from the Ohio EPA on the Draft Addendum on May 17, 2018. The response to the comments was transmitted back to the Ohio EPA on June 1, 2018.
PMP	N. Peters / CELRL	The Ohio EPA conditionally approved the Final PMP document in a letter dated May 9, 2018. The Army is preparing the required change pages.
RVAAP-05, Winklepeck Burning Grounds and other post closure LUC work	J. Trumble / CELRL	Approval on the Fourth Quarter LUC report was received on June 6, 2018 from the Ohio EPA.
RVAAP-51, Dump Along Paris Windham Road	N. Peters / CELRL	Implementation of LUCs selected in the ROD was incorporated in the Environmental Services Contract that was awarded in May 2018. Implementation of the LUCs is in the planning and logistics stage.
PBA 13 Supplemental RI for multiple AOCs	N. Peters / Leidos	This contract has been completed and is being closed out. The PP and ROD for Load Lines 1 - 4, and 12 will be prepared under Leidos' 2015 RI Completion Contract. The contract mechanism for PPs and RODs (or ROD amendments) for the four surface water and wet sediment sites (RVAAP-01, RVAAP-04, RVAAP-16, and RVAAP-001-R-01) has yet to be determined.
Identification of Solid Waste Management Units at Former RVAAP/Camp Ravenna	K. Sedlak / AECOM	AECOM continued production of the Preliminary Draft Solid Waste Management Plan. The Preliminary Draft SWMP will be submitted on June 22, 2018 for Army review.
TCRA at ODA2	Travis McCoun / CENAB	NAB continued clearance activities in moderate to high probability areas. Recoveries to date (May 18, 2018): 64,529 pounds of MDAS/MD, 1,416 pounds of cultural debris, and 595 MPPEH items have been found during TCRA activities. There are 74 grids remaining to be cleared. Remaining grids are in disposal areas and have high anomaly saturation.

CAMP RAVENNA RESTORATION PROGRAM - DFFO MONTHLY SUMMARY REPORT
May 2018

PROJECT NAME	USACE TECH MGR /Contractor	PROJECT STATUS
PBA16 - MMRP Sites	Kimberly Gross and Craig Coombs / CENAB / HGL	Update with HGL I have sent you their monthly update.No deliverables were submitted to Ohio EPA during this reporting period.
PBA 16 Compliance Cleanup Sites	K. Mieczkowski / Parsons	<p>Parsons received comments on the submitted preliminary draft letter work plan for CC RVAAP-69 to the Army. The addendum letter is to provide communication of next effort in the delineation of the nature and extent consistent with final approved work plan. The updated work plan will be resubmitted to the USACE in early June.</p> <p>The Contractor continues preparing the preliminary draft SI report for CC RVAAP-70. Anticipate submitting to Army for review next month.</p> <p>CC RVAAP-73: The Preliminary Draft ROD is currently under review by USACE. Review should be complete in early June. Contractor to prepare responses in June.</p> <p>CC RVAAP-74: Notification sent to Ohio EPA of second quarterly sampling event anticipated to be conducted the first week of June.</p> <p>The CC RVAAP-76: Preliminary Draft ROD was submitted to USACE legal to receive guidance on best way to incorporate on-site thermal treatment into the selected remedy.</p> <p>The Contractor submitted on May 25, 2018 the Preliminary Draft RI Report for CC RVAAP-79 DLA Ore Storage Sites for USACE review.</p> <p>Ohio EPA indicated that there were concerns about the management of residual munitions at RVAAP-03 in early February 2018. Army has discussed potential options with USACE Baltimore A funds request has been submitted to conduct a munitions evaluation/cleanup at the site.</p>

B. Describe difficulties encountered during the reporting period and actions taken to rectify any difficulties

None

C. Identify changes in key personnel

None **D. List target and actual completion dates for each element of activity, including project completion**

The actual completion dates and target dates where applicable are provided with the status of activities in Section A.

E. Provide an explanation for any deviation from applicable schedules

None

F. Indicate how much soil and groundwater was generated and/or transported and disposed as part

CAMP RAVENNA RESTORATION PROGRAM - DFFO MONTHLY SUMMARY REPORT
May 2018

of RVAAP restoration activities

Approximately 50 gallons of IDW/purge water was generated during the August 2017 FWGWMP sampling event. The IDW was sampled at the end of the event and found to be Nonhazardous. The IDW was properly transported and disposed on 29 May 2018.

G. Describe activities planned for the following month (June 2018)

1. Parson's plans to finalize and submit the Preliminary Draft SI for CC RVAAP-70.
2. Address Army comments on letter work plan update for CC RVAAP-69.
3. Parsons plans to incorporate comments by Army on the Preliminary Draft RODs for sites CC RVAAP-73 and CC RVAAP-76 and submit them for Army review.
4. Parsons plans to conduct the second quarter groundwater sampling at CC RVAAP-69 and CC RVAAP-74.
5. Leidos plans to submit Final Revised RI-FS Report for NACA Test Area.
6. Leidos plans to provide the Army and Ohio EPA with a response letter in accordance with the comment resolution meeting on the revised Draft C Block Quarry RI-FS Report held May 22, 2018.
7. Leidos plans to receive and resolve ARNG legal comments on the Preliminary Draft PP for Load Lines 1 - 4 & 12 and submit the Draft PP to the Ohio EPA for review.
8. Leidos Plans to submit compiled final versions of PPs for Load Lines 7, 9, and 12, Wet Storage Area, and Upper/Lower Cobbs Ponds for submit review and conduct the Public Meeting on June 21, 2018.
9. Leidos plans to send compiled, signed versions of Final RODs for Load Lines 5, 8, and 11 to stakeholders for records.
10. Leidos plans to continue developing the RODs for Load Lines 7, 9, and 12, Wet Storage Area, and Upper/Lower Cobbs Ponds.
11. The TCRA at ODA2 will continue until the end of June 2018 when USACE will button up the site and await further funding to complete the TCRA. Munitions demolition ops are scheduled for 11 – 22 June 2018.
12. USACE will continue to revise the Preliminary Draft SI Addendum for the RVAAP-78 Quarry Pond Surface Dump to address the Army's comments.
13. The Army will continue preparing the Preliminary EECA for the RVAAP-34 Sand Creek Disposal Road Landfill.
14. AECOM will submit the Preliminary Draft Solid Waste Management Plan to the Army.
15. Anticipate submitting responses to Ohio EPA comments and the Final Atlas Scrap Yard Record of Decision for backcheck review on June 1, 2018.
16. Anticipate Ohio EPA comment on the Draft Ramsdell Quarry Landfill MRS Area 1 (North) Record of Decision on June 6, 2018. Submit responses to Ohio EPA comments received on June 15, 2018.
17. Anticipate Ohio EPA comments on the Draft Block D Igloo-TD Record of Decision on June 11, 2018. Submit Responses to Ohio EPA Comments received on June 18, 2018.

CAMP RAVENNA RESTORATION PROGRAM - DFFO MONTHLY SUMMARY REPORT
May 2018

18. Anticipate submittal of responses to Ohio EPA comments on the Draft 40mm Firing Range Proposed Plan on June 4, 2018. Submit Final Proposed Plan in July 2018.
19. Submit the Draft Block D Igloo Proposed Plan for Ohio EPA review on June 25, 2018.
20. Submit Draft Group 8 MRS Feasibility Study for Ohio EPA review in June 2018.
21. Weston will submit the Final Annual Groundwater Monitoring report to the Ohio EPA.
22. Weston plans to submit the Final Groundwater Addendum to the Ohio EPA.
23. Weston plans to conduct the semi-annual sampling of the FWGWMP.



NATIONAL GUARD BUREAU

111 SOUTH GEORGE MASON DRIVE
ARLINGTON VA 22204-1373

May 9, 2018

Ohio Environmental Protection Agency

DERR-NEDO

Attn: Mr. Mark Johnson

2110 East Aurora Road

Twinsburg, OH 44087-1924

Subject: Ravenna Army Ammunition Plant (RVAAP) Restoration Program, Portage/Trumbull Counties,
Ohio, Monthly Activity Report – April 2018

Dear Mr. Johnson:

Enclosed for your review is the "RVAAP Restoration Program - DFFO Monthly Summary Report - April 2018". The report summarizes the Restoration Program activities conducted at the former RVAAP for the period from April 1, 2018 through April 30, 2018. This report is being submitted to the Ohio EPA to comply with the Ohio EPA Director's Final Findings and Orders, Section XVI, paragraphs 36 and 37.

This electronic letter and attachment are being sent to meet the deadline for submittal. A hardcopy of this letter and attachment for your records will follow.

Please contact the undersigned at (703) 601-7785 or james.c.crowley.mil@mail.mil if there are issues or concerns with this submission.

Sincerely,

CROWLEY.JAMES.CO
RNELIUS.1045120399

Digitally signed by
CROWLEY.JAMES.CORNELIUS.104
5120399
Date: 2018.05.09 09:14:48 -04'00'

James C. Crowley
Lieutenant Colonel, Corps of Engineers
RVAAP Restoration Program Manager
Installations & Environment, ARNG

Attachment

cc: Bob Princic, Ohio EPA, DERR
Thomas Schneider, Ohio EPA, DERR
Kevin Sedlak, ARNG, Camp Ravenna
Katie Tait, ARNG, Camp Ravenna
Craig Coombs, USACE – Louisville

CAMP RAVENNA RESTORATION PROGRAM - DFFO MONTHLY SUMMARY REPORT
April 2018

A. Status of project activities for reporting period (April 2018)

PROJECT NAME	USACE TECH MGR /Contracto	PROJECT STATUS
2015 RI/FS Completion Contract for IRP AOCs	N. Peters / Leidos	<p>The Contractor continued updating the RI-FS Report for NACA Test Area using supplemental soil, sediment, and groundwater data collected from sampling conducted during November 2017.</p> <p>The Army provided a response to Ohio EPA comments on the Revised Draft RI-FS report for C-Block Quarry on March 9, 2018. In an email dated April 27, 2018, Ohio EPA requested the Army provide potential meeting dates.</p> <p>In a letter dated April 2, 2018, Ohio EPA indicated there were no comments on the Revised Draft RI Report for the Landfill North of Winklepeck Burning Grounds. The Contractor submitted the Final RI Report to Ohio EPA on April 25, 2018.</p> <p>The Contractor submitted the Final RI Report for Buildings F-15 and F-16 to Ohio EPA on April 9, 2018. In an email on April 30, 2018, the Ohio EPA requested a 30-day extension to review the document.</p> <p>There was no Army activity on the Revised Facility-wide Sewer RI Report. This report will be submitted after completion of the non-time critical removal action described in the EE/CA.</p> <p>The Contractor issued an updated Revised Final Proposed Plan for Load Line 7 to the Ohio EPA on March 16, 2018. Ohio EPA concurrence was provided in a letter dated April 16, 2018.</p> <p>The Contractor provided the Final PP for the Wet Storage Area to Ohio EPA on February 22, 2018. Ohio EPA concurrence was provided in a letter dated April 25, 2018.</p> <p>The Contractor initiated preparation of the Preliminary Draft PP for Landfill North of Winklepeck Burning Grounds.</p> <p>The Contractor provided the Preliminary Draft PP for Load Lines 1 - 4 & 12 for Army review on April 17, 2018.</p>
RVAAP-34, Sand Creek Disposal Road Landfill	A. Schmidt / CELRL	<p>The Army received final approval for the Final RI on April 4, 2017. A Preliminary Draft version of an EE/CA was prepared by USACE-LRL and is currently under review by the Army.</p>
CC RVAAP-78 Quarry Pond Surface Dump	A. Schmidt / CELRL	<p>CC RVAAP-78 Quarry Pond Surface Dump – The SI for this project is complete. The Preliminary Draft RI has been reviewed by the Army, and the Draft RI is being prepared.</p>

CAMP RAVENNA RESTORATION PROGRAM - DFFO MONTHLY SUMMARY REPORT
April 2018

PROJECT NAME	USACE TECH MGR /Contracto	PROJECT STATUS
RVAAP-66 Facility Wide Ground Water Monitoring	K. Sedlak / Weston	The Draft FWGWMP Annual Report for 2017 and Draft FWGWMP Addendum for 2018 were submitted for Ohio EPA review on March 30, 2018. The OEPA asked for and received an extension for review until June 15, 2018.
PMP	N. Peters / CELRL	USACE submitted the updated Final PMP document electronically to the Ohio EPA on March 30, 2018. The Army is awaiting approval of the Final from the Ohio EPA.
RVAAP-05, Winklepeck Burning Grounds RA and other post closure LUC work	N. Peters / CELRL J. Trumble / CELRL	<p>The Ohio EPA concurred with the Final RACR for the Winklepeck Burning Grounds RA in a letter dated March 23, 2018. The revised Land Use Controls published in the approved ESD and the Revised Final Property Management Plan, Version 2.0, will be implemented.</p> <p>On September 13, 2017, the Ohio EPA approved the Draft 4th Quarter LUC report, and requested that a Final be sent. Production of the final report is on hold pending contract renewal.</p>
RVAAP-51, Dump Along Paris Windham Road	N. Peters / CELRL	Implementation of LUCs selected in the ROD was incorporated in the Environmental Services Contract that will be awarded in May 2018.
PBA 13 Supplemental RI for multiple AOCs	N. Peters / Leidos	This contract has been completed and is being closed out. The PP and ROD for Load Lines 1 - 4, and 12 will be prepared under Leidos' 2015 RI Completion Contract. The contract mechanism for PPs and RODs (or ROD amendments) for the four surface water and wet sediment sites (RVAAP-01, RVAAP-04, RVAAP-16, and RVAAP-001-R-01) has yet to be determined.
Identification of Solid Waste Management Units at Former RVAAP/Camp Ravenna	K. Sedlak / AECOM	Held teleconference to discuss preliminary draft fact sheets with the Army on May 7, 2018. AECOM will continue production of the Preliminary Draft Solid Waste Management Plan.
TCRA at ODA2	Travis McCoun / CENAB	NAB continued clearance activities in moderate to high probability areas. Recoveries to date (April 20, 2018): 58,316 pounds of MDAS/MD, 1,416 pounds of cultural debris, and 574 MPPEH items have been found during TCRA activities. There are 95 grids remaining to be cleared.

CAMP RAVENNA RESTORATION PROGRAM - DFFO MONTHLY SUMMARY REPORT
April 2018

PROJECT NAME	USACE TECH MGR /Contracto	PROJECT STATUS
PBA16 - MMRP Sites	Kimberly Gross and Craig Coombs / CENAB / HGL	<ul style="list-style-type: none"> The Draft Ramsdell Quarry Landfill MRS Area 1 (North), Record of Decision was submitted to Ohio EPA on April 23, 2018. The Draft Landfill North of Winklepeck MRS Record of Decision was submitted to Ohio EPA on April 10, 2018. The Draft Block D Igloo-TD MRS Record of Decision was submitted on April 26, 2018. The Draft Erie Burning Grounds MRS Feasibility Study was submitted to Ohio EPA on April 9, 2018. The Final Block D Igloo MRS Feasibility Study was submitted on April 24, 2018.
PBA 16 Compliance Cleanup Sites	K. Mieczkowski / Parsons	<p>The Contractor transported and disposed of 23 drums of soil IDW and 12 drums of IDW from drilling and decontamination of equipment generated from sampling at CC RVAAP-69, 70 and 74.</p> <p>Parsons submitted the letter work plan for CC RVAAP-69 to the Army. The addendum letter is to provide communication of next effort in the delineation of the nature and extent consistent with final approved work plan.</p> <p>The Contractor commenced preparing the preliminary draft SI report for CC RVAAP-70. Anticipate submitting to Army for review next month.</p> <p>The CC RVAAP-76 Preliminary Draft ROD was submitted to USACE legal to receive guidance on best way to incorporate on-site thermal treatment into the selected remedy.</p> <p>The Contractor continued with preparation of the Preliminary Draft RI Report for CC RVAAP-79 DLA Ore Storage Sites.</p> <p>Ohio EPA indicated that there were concerns about the management of residual munitions at RVAAP-03 in early February 2018. Army has discussed potential options with USACE Baltimore and a final alternative is still pending.</p>

B. Describe difficulties encountered during the reporting period and actions taken to rectify any difficulties

None

C. Identify changes in key personnel

Mr. Mark Leeper's last day was April 13, 2018. LTC James Crowley was appointed as the ARNG Program Manager. The Ohio EPA was notified of the change in a letter dated April 18, 2018.

D. List target and actual completion dates for each element of activity, including project completion

The actual completion dates and target dates where applicable are provided with the status of activities in Section A.

CAMP RAVENNA RESTORATION PROGRAM - DFFO MONTHLY SUMMARY REPORT
April 2018

E. Provide an explanation for any deviation from applicable schedules

None

F. Indicate how much soil and groundwater was generated and/or transported and disposed as part of RVAAP restoration activities

Approximately 50 gallons of IDW/purge water was generated during the August 2017 FWGWMP sampling event. The IDW was sampled at the end of the event and found to be Nonhazardous. The IDW is being inspected on a weekly basis while stored at Building 1036 and awaiting disposal.

Twelve drums of decontamination water, rinse water, and well development water and 23 drums of soil cuttings and a 20-yard container of sediment/debris from the maintenance pit at CC RVAAP-70 were generated from the Parsons fieldwork activities at AOCs CC-69, CC-70, and CC-74. The waste was found to be Nonhazardous and was properly transported and disposed on April 13, 2018 and April 27, 2018.

G. Describe activities planned for the following month (May 2018)

1. Parsons plans to finalize the Preliminary Draft SI for CC RVAAP-70.
2. Parsons plans to resolve comments by Army (due May 18, 2018) on the Preliminary Draft RODs for sites CC RVAAP-73 and CC RVAAP-76 and submit them for Army review.
3. Parsons plans to prepare for second quarter groundwater sampling at CC RVAAP-69 and CC RVAAP-74.
4. Leidos plans to continue preparing Revised RI-FS Report for NACA Test Area.
5. Leidos plans to conduct a comment resolution meeting on the revised Draft C Block Quarry RI-FS Report with Army and Ohio EPA.
6. Leidos plans to receive and resolve remaining Army comments on the Preliminary Draft PP for Load Lines 1 - 4 & 12 and submit the Draft PP to the Ohio EPA for review.
7. Leidos plans to schedule the public meeting and public comment period for the PPs for Load Lines 7, 9, and 12 and Wet Storage Area. Anticipated dates are in June.
8. Leidos Plans to send signed, compiled final version of Load Line 5 ROD to stakeholders for records.
9. Leidos plans to receive Army signature on Final RODs for Load Lines 6, 8, and 11 and send compiled, signed final versions to stakeholders for records.
10. The TCRA at ODA2 will continue.
11. USACE will continue to revise the Preliminary Draft RI for the RVAAP-78 Quarry Pond Surface Dump to address the Army's comments.
12. The Army will continue reviewing the Preliminary EECA for the RVAAP-34 Sand Creek Disposal Road Landfill.
13. AECOM will submit the Preliminary Draft Solid Waste Management Plan to the Army.



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

December 19, 2018

Mr. David Connolly
Army National Guard Directorate
Environmental Programs Division
ARNG-ILE-CR
111 South George Mason Drive
Arlington, VA 22204

Re: **US Army Ravenna Ammunition Plt RVAAP
Remediation Response
Project records
Remedial Response
Portage County
267000859029**

Subject: Receipt and Review of the "Draft 2017 Annual Land Use Control Monitoring Report, RVAAP-01 Ramsdell Quarry Landfill, RVAAP-05 Winklepeck Burning Grounds, RVAAP-08 – 11 Load Lines 1 – 4, and RVAAP-12 Load Line 12" at the Former Ravenna Army Ammunition Plant, Ravenna, Ohio" Dated October 11, 2018 (Work Activity No. 267000859029)

Dear Mr. Connolly:

The Ohio Environmental Protection Agency (Ohio EPA), Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR) has received and reviewed the document entitled, "*Draft 2017 Annual Land Use Control Monitoring Report, RVAAP-01 Ramsdell Quarry Landfill, RVAAP-05 Winklepeck Burning Grounds, RVAAP-08 – 11 Load Lines 1 – 4, and RVAAP-12 Load Line 12*". This document, received by Ohio EPA's NEDO on October 12, 2018, was prepared for the U.S. Army Corps of Engineers (USACE) Louisville District, by Chenega Tri-Services, LLC. Please find Ohio EPA comments listed below.

1. **Dates** – Section 2.1 reads, "This annual report covers the period of January 2017 through December 2017." However, the quarterly reports are dated April 12, 2017, for January 9 – 12, 17 – 19, 23 – 26 and 30, 2017; June 27, 2017, for April 10 – 13, 17 – 20, 24 – 27 and May 1, 2017; and May 21, 2018, for July 10-13, 17-20, and 24-27, 2017. No information has been provided to report the final quarter of 2017.

Ohio EPA requests the final quarter be presented to complete the 2017 annual report. The 2017 remedy implemented for the Winklepeck Burning Grounds Area of Concern (AOC) employed the existing facility-wide fence as a control.

2. **Photographs** – The final picture in Appendix H (described as Load Line 4 field) appears to be identical to the photograph in Appendix I (described as Load Line

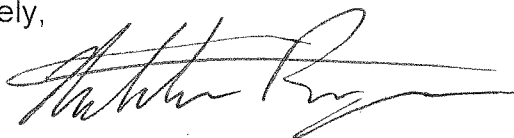
RECEIVED
DEC 20 2018

12 field). Please revise the document to include the appropriate photograph(s) for the respective area(s).

3. **Appendix A** – The sign-in sheets presented in Appendix A are not legible in certain sections, making it impossible to verify the times recorded, and the exposure associated with Ramsdell Quarry Landfill entry. Please add legible sign-in sheets to allow for a complete review.
4. **General** – General spelling errors were discovered on Page i: Section 4.0 and Section 5.0 titles.

If you have any questions or concerns, please do not hesitate to contact me at (330) 963-1235.

Sincerely,



Nicholas Roope
Site Coordinator
Division of Environmental Response and Revitalization

NCR/nvp

ec: Nat Peters, USACE
Katie Tait/Kevin Sedlak, OHARNG RTLS
Craig Coombs, USACE
Rebecca Shreffler, Chenega
David Connolly, ARNG
Mark Johnson Ohio EPA, NEDO, DERR
Bob Princic, Ohio EPA, NEDO, DERR
Tom Schneider, Ohio EPA, SWDO, DERR
Nicholas Roope, Ohio EPA, NEDO, DERR



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

December 13, 2018

Mr. David Connolly
Army National Guard Directorate
ARNGD-IED
111 South George Mason Drive
Arlington, VA 22204

**Re: US Army Ammunition Plt RVAAP
Remediation Response
Project Records
Remedial Response
Portage County
267000859029**

**Subject: Ravenna Army Ammunition Plant, Portage/Trumbull Counties.
Comments on the "Draft 2018 Property Management Plan, Appendix
A, Section 2- No Further Action Sites" at the Former Ravenna Army
Ammunition Plant, Ravenna, Ohio, Dated October 11, 2018 Ohio EPA
ID # 267-000859-029**

Dear Mr. Connolly:

The Ohio Environmental Protection Agency (Ohio EPA) has received the **"Draft 2018 Property Management Plan, Appendix A, Section 2- No Further Action Sites"** at the Former Ravenna Army Ammunition Plant, Ravenna, Ohio. The document was received at Ohio EPA's Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR) on October 12, 2018. The document was prepared for the U.S. Army Corps of Engineers on behalf of the Army National Guard Directorate by Chenega Tri-Services, LLC. Ohio EPA has provided one comment on the Draft document.

The comment on the document based on Ohio EPA review is provided below. You may simply make the change and provide a final plan that will accompany the final main text of the Property Management Plan.

COMMENTS

1. The Appendix A, Section 2 of the Property Management Plan did not provide an introductory statement. Please provide a brief introduction to the Appendix that explains that the sites listed in the Appendix are those sites that have Records of Decision as of 2015. New sites will be added to this Appendix as they are completed, and the Appendix will be updated annually.

**RECEIVED
DEC 14 2018**

MR. DAVID CONNOLLY
ARMY NATIONAL GUARD DIRECTORATE
DECEMBER 13, 2018
PAGE 2

If you have any questions, or wish to set up a meeting to discuss, please call me at (330) 963-1292.

Sincerely,

A handwritten signature in black ink, appearing to read 'Kevin M. Palombo', written in a cursive style.

Kevin M. Palombo
Environmental Specialist
Division of Environmental Response and Revitalization

KP/nvp

ec: Rebecca Shreffler, Chenega Tri-Services LLC
Bob Princic, Ohio EPA, NEDO DERR
Mark Johnson, Ohio EPA NEDO DERR
Thomas Schneider, Ohio EPA, SWDO DERR
Kevin Sedlak, ARNG
Katie Tait, OHARNG RTLS
Craig Coombs, USACE, Louisville District



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

November 21, 2018

Mr. David Connolly
Army National Guard Directorate
Environmental Programs Division
ARNG-ILE-CR
111 South George Mason Drive
Arlington, VA 22204

**Re: US Army Ammunition Plt RVAAP
Remediation Response
Project Records
Remedial Response
Portage County
267000859230**

**Subject: Ravenna Army Ammunition Plant, Portage/Trumbull Counties.
Comments on the Draft Solid Waste Management Plan-Evaluation,
Identification, and Management of Potential Solid Waste Sites at the
Former Ravenna Army Ammunition Plant, Ravenna, Ohio, Dated
October 3, 2018, Ohio EPA ID # 267-000859-230**

Dear Mr. Connolly:

The Ohio Environmental Protection Agency (Ohio EPA) has provided comments on the Draft Solid Waste Management Plan - Evaluation, Identification, and Management of Potential Solid Waste Sites at the Former Ravenna Army Ammunition Plant (RVAAP), Ravenna, Ohio. This document was received at Ohio EPA's Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR) on October 9, 2018. The report was prepared for the National Guard Bureau by AECOM Technical Services, Inc. under Contract Number W9133L-14-D-0001.

Comments on the document based on Ohio EPA review are provided below. Please provide responses to the enclosed comments in accordance with the Directors Findings and Orders.

Statement

This Draft Solid Waste Management Plan (SWMP) for the Evaluation, Identification, and Management of Potential Solid Waste Disposal Sites is based on the identification of 150 potential solid waste dump sites or disposal areas at the former RVAAP (Currently Camp James A. Garfield). This list of identified areas was identified and recorded in the Final Visual Assessment Survey Report (VASR), dated August 29, 2017. The Executive Summary for this Draft SWMP states, "Applicable waste classification and waste management guidance was provided in the Ohio EPA memorandum (Ohio EPA, 2014). These definitions and



regulations are used as decision points in the evaluations of the sites and in management recommendations. This Solid Waste Management Plan (SWMP) identified and catalogued 28 Solid Waste Management Sites..." This SWMP clearly describes the individual sites chosen to be included but does not clearly describe the rationale for why certain sites were selected to be included, or more importantly, why sites were eliminated from this SWMP. Also, the Plan states throughout that "waste will be removed and disposed of properly as funds become available." It does not provide definite schedules for debris removal or inspections of areas where debris may be eroding out of site "landfills" or dumps.

Comments:

1. Ohio EPA understood that based on our approval of the VASR, a certain number of the 150 potential dump sites or disposal areas would be carried through to the SWMP. A statement providing some detail should be included in the Executive Summary that explains the rationale for including or eliminating sites on the list that originally numbered 150.
2. The Draft VASR included 44 sites to be carried through to the Solid Waste Management Plan. Based on Ohio EPA comments and discussions on the Draft VASR, a Final VASR was provided that included Tables ES-1 and Table 3-1. These tables identified 88 sites that would be carried through the VASR. This Draft SWMP states that 28 sites are included. Ohio EPA understands that only a portion of the list of 150 would be included in the SWMP. Please provide the rationale for determining which sites were eliminated from the lists. Ohio EPA recommends using a table with the original 150 sites and a column that explains why a site or area was eliminated.
3. The Executive Summary, Page ES-1, lines 24 and 25 state that the SWMP identified and catalogued 28 Solid Waste Management Sites at CRJMTTC as shown on Figure ES-1. Ohio EPA counted 27 sites identified on Figure ES-1. Please clarify.
4. Page 1-2, the section entitled "Intrusive Investigations" should clearly state that these activities were initiated in compliance with the approved VASR. It would help the reader understand the timing of these activities. Also, please provide the reason for eliminating the geophysical survey and proceeding to excavation.
5. Page 1-2, lines 18 and 19 refers the reader to Table 1-1. This table identifies 40 sites to be moved forward to the SWMP. This number is inconsistent with numbers identified in the Draft and Final VASR. Please clarify. Also, there is a typographical error on line 19, "concern."
6. Page 1-2, lines 32 and 33. This sentence references Table 1-3 as the Solid Waste Management Sites which are the only sites that will be carried forward under the SWMP. The number of sites appears to be 32. Based on this table, it is again not clear which of the sites on previous lists are not being carried forward and why not.

7. Section 3.1.1, page 3-1, Last line. References are made to Section 4 Fact Sheets. The fact sheets should be given individual figure numbers.
8. Section 3.1 is titled, Buried Waste Only Sites. However, Section 3.1.2 describes Fuze and Booster Quarry Landfill/Ponds, and on page 3-2, lines 29-31 states that it is also a Troop Labor Site where surface debris will be removed. Should it be categorized as both a surficial and buried waste area? Anywhere where a site is described as a landfill, it is assumed inspections will occur to assure debris is not eroding out, and covers are maintained.
9. Section 3.2.1, Page 3-4, lines 9 and 10 state that surficial waste at sites RVAAP-21 and RVAAP-76 "...will be removed and disposed of properly when funds become available". What is the mechanism through which Ohio EPA will be informed when this removal will occur? Is there a funding schedule or estimated schedule and tracking method? This situation is also described throughout this Management Plan in Section 3.2.2, 3.2.3, 3.2.4....
10. Section 3.2.3 NACA Test Area. This site is categorized as a Surficial Waste Only site. While it is clear some surficial waste does occur at this location, recent investigations and descriptions (page 3-5, lines 28 and 29) indicated that buried debris is also present. Is this site categorized correctly? Ohio EPA would want to be assured that it is understood that development should not take place on this area where debris is buried.
11. Where disposal areas are located adjacent to surface water bodies, Ohio EPA recommends removal occur as soon as possible.
12. For ease of review, please place dividers between appendices.

If you wish to discuss these comments, let me know and we will set up a meeting. If you have any other questions, please call me at (330) 963-1292.

Sincerely,



Kevin M. Palombo, Environmental Specialist
Division of Environmental Response and Revitalization

KP/nvp

ec:	Katie Tait, OHARNG RTLS	Bob Princic, Ohio EPA, NEDO, DERR
	Craig Coombs, USACE	Mark Johnson, Ohio EPA, NEDO, DERR
	Kevin Sedlak, ARNG	Thomas Schneider, Ohio EPA, SWDO, DERR
	Rebecca Schreffler, Chenega	Joshua Adams, Ohio EPA, NEDO, DMWM



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

November 5, 2018

Ohio Environmental Protection Agency
DERR-NEDO
Attn: Mr. Ed D'Amato
2110 East Aurora Road
Twinsburg, OH 44087-1924

Subject: Notification of Field Work, Ravenna Army Ammunition Plant (RVAAP) Restoration Program, Portage/Trumbull Counties, Additional Sampling for CC RVAAP-69 Building 1048 Fire Station and CC RVAAP-74 Building 1034-Motor Pool Hydraulic Lift, Ohio EPA ID #s 267-000859-214 and 267-000859-211

Dear Mr. D'Amato:

In accordance with the Director's Final Findings and Orders, Section XIII, #28, for the RVAAP Restoration Program, the Army National Guard (ARNG) is providing notification of field activities at Camp Garfield / former RVAAP 15 days prior to the scheduled start date. Parsons and their subcontractors will be conducting field activities including additional sampling and quarterly groundwater sampling at CC RVAAP-69 Building 1048 Fire Station and quarterly groundwater sampling at CC RVAAP-74 Building 1034-Motor Pool Hydraulic Lift beginning the week of 26 November 2018 through approximately 7 December 2018.

For additional information on the field activities, please refer to the *Final Work Plan Additional Sampling for CC RVAAP-69 Building 1048 Fire Station, CC RVAAP-70 East Classification Yard, and CC RVAAP-74 Building 1034-Motor Pool Hydraulic Lift at the former Ravenna Army Ammunition Plant (RVAAP)* submitted to Ohio EPA on 30 November 2017 and approved on 27 December 2017, and the *Final Update and Progress Report on Remedial Investigation at CC RVAAP-69 Building 1048 Fire Station, Ravenna Army Ammunition Plant Restoration Program*, dated 24 July 2018.

Please contact the undersigned at (703) 607-7589 or david.m.connolly8.civ@mail.mil if there are issues or concerns with this submission.

Sincerely,

SEDLAK,KEVIN.MIC Digitally signed by
SEDLAK,KEVIN.MICHAEL.1254440171
Date: 2018.10.30 12:51:30 -0400
HAEL.1254440171

FOR Mr. David M. Connolly
RVAAP Restoration Program Manager
Army National Guard Directorate

cc: Mark Johnson, Ohio EPA, DERR-NEDO
Bob Princic, Ohio EPA, DERR-NEDO
Tom Schneider, Ohio EPA, SWDO
Kevin Sedlak, ARNG, Camp Ravenna
Katie Tait, OHARNG, Camp Ravenna
Craig Coombs, USACE Louisville
Kevin Mieczkowski, USACE Louisville

Gail Harris, Vista Sciences
Edward Heyse, Parsons



NATIONAL GUARD BUREAU

111 SOUTH GEORGE MASON DRIVE
ARLINGTON VA 22204-1373

October 11, 2018

Ohio Environmental Protection Agency
DERR-NEDO

Attn: Mr. Kevin Palombo
2110 East Aurora Road
Twinsburg, OH 44087-1924

Subject: Ravenna Army Ammunition Plant Restoration Program
DRAFT 2018 Property Management Plan No Further Action Appendices,
Camp Ravenna, Portage/Trumbull Counties, Ohio
(Ohio EPA ID No. 267-000859-029)

Dear Mr. Palombo:

Enclosed for your review is one (1) hard copy and one (1) electronic copy of the *Draft 2018 Property Management Plan (PMP) Appendix A, Section A.2 No Further Action (NFA) Sites* appendices. Upon final approval, these appendices are to be added to the previously reviewed and approved *Final Revised Property Management Plan for the Designated Areas of Concern and Munitions Response Sites, Version 2.0*. Included in these draft appendices are NFA appendices for RVAAP-13 Building 1200 and RVAAP-48 Anchor Test Area that have been previously reviewed and approved by the Ohio EPA.

These appendices were prepared in support of the Environmental Program Support Services project at the former Ravenna Army Ammunition Plant (RVAAP, currently known as Camp Ravenna Joint Military Training Center [Camp Ravenna]) in Portage and Trumbull counties, Ohio. This document was prepared for the US Army Corps of Engineers (USACE) – Louisville District by Chenega Tri-Services Contract No. W912QR-18C-0013.

Please contact the undersigned at (703) 607-7589 or david.m.connolly8.civ@mail.mil if there are issues or concerns with this submission.

Sincerely,

Date:

2018.10.10

11:51:25 -04'00'

David M. Connolly
RVAAP Restoration Program Manager
Army National Guard Directorate

cc: Tom Schneider, Ohio EPA, DERR (cover letter via email only)
Bob Princic, Ohio EPA, NEDO (cover letter via email only)
Mark Johnson, Ohio EPA, DERR (cover letter via email only)
Kevin Sedlak, ARNG, Camp Ravenna (one [1] electronic copy)

Katie Tait, OHARNG, Camp Ravenna (one [1] electronic copy)
Nathaniel Peters, USACE – Louisville (one [1] electronic copy)
Craig Coombs, USACE – Louisville (cover letter via email only)
Susan Oliver, Management Solutions, LLC (cover letter via email only)
Gail Harris, Vista Science Corp. (one [1] electronic copy, one [1] hard copy)

AOC/MRS SITES THAT HAVE ACHIEVED NO FURTHER ACTION (NFA) STATUS

AOC/MRS	Appendix Tab	No Further Action Details	Date Section Added to the PMP	Revision or Update
RVAAP-02 Erie Burning Grounds	RVAAP-02	Record of Decision for soil and dry sediment approved in 2007.	August 2018	
RVAAP-04 Open Demolition Area #2	RVAAP-04	Record of Decision for soil and dry sediment approved in 2007.	August 2018	
RVAAP-08- R Load Line 1A MRS	RVAAP- 008-R-01	Record of Decision approved in 2015.	August 2018	
RVAAP-13 Building 1200	RVAAP-13	Record of Decision approved in 2014.	August 2018	
RVAAP-33- R-01 Firestone Test Facility MRS	RVAAP- 033-R-01	Record of Decision approved in 2015.	August 2018	
RVAAP-34- R-01 Sand Creek Dump MRS	RVAAP-34- R-01	Record of Decision approved in 2015.	August 2018	
RVAAP-48 Anchor Test Area	RVAAP-48	Record of Decision approved in 2014.	August 2018	
RVAAP-49 Central Burn Pits	RVAAP-49	Record of Decision for soil and dry sediment approved in 2009.	August 2018	
RVAAP-62- R-01 Water Works No. 4 MRS	RVAAP- 062-R-01	Record of Decision approved in 2015.	August 2018	

Appendix A.2-02: Erie Burning Grounds (RVAAP-02) – No Further Action (NFA) Status for Soil and Dry Sediment

A.2-02.1 Background, Site Location and Description

Erie Burning Grounds (EBG), designated as RVAAP-02, covers approximately 35 acres in the northeastern corner of the facility. The EBG area may have been used for brick manufacturing prior to its acquisition by the US Army in 1940. From 1941 to 1951, the Area of Concern (AOC) was used to perform open burning of propellants, bulk explosives, and explosives-contaminated materials, such as rags, paper, and sawdust. Metal items contaminated with explosives were also burned to make them safe for salvaging or recycling. Once burned, the metal items were recovered and processed as scrap. Ash residues were not removed. A wooden chute at the east end of Track 49 was used to move material to a burn area immediately north of the rail spur. A burning area, enclosed by water-filled ditches for fire control, was constructed south of Track 49. This area is informally called the T-Area. A borrow area between Tracks 49 and 10 may have also been used for open burning.

In the 1990s, the area became inundated due to sedimentation, vegetation growth, and beaver activity, which plugged some drainage culverts and small streams that drained EBG. The resulting wetlands now cover approximately 60% of the AOC. The eastern end of the Track 49 embankment, the former burn area, the northern part of the gravel access road, and the T-Area are where most burning activities are known or suspected to have occurred.

A.2-02.2 Publications

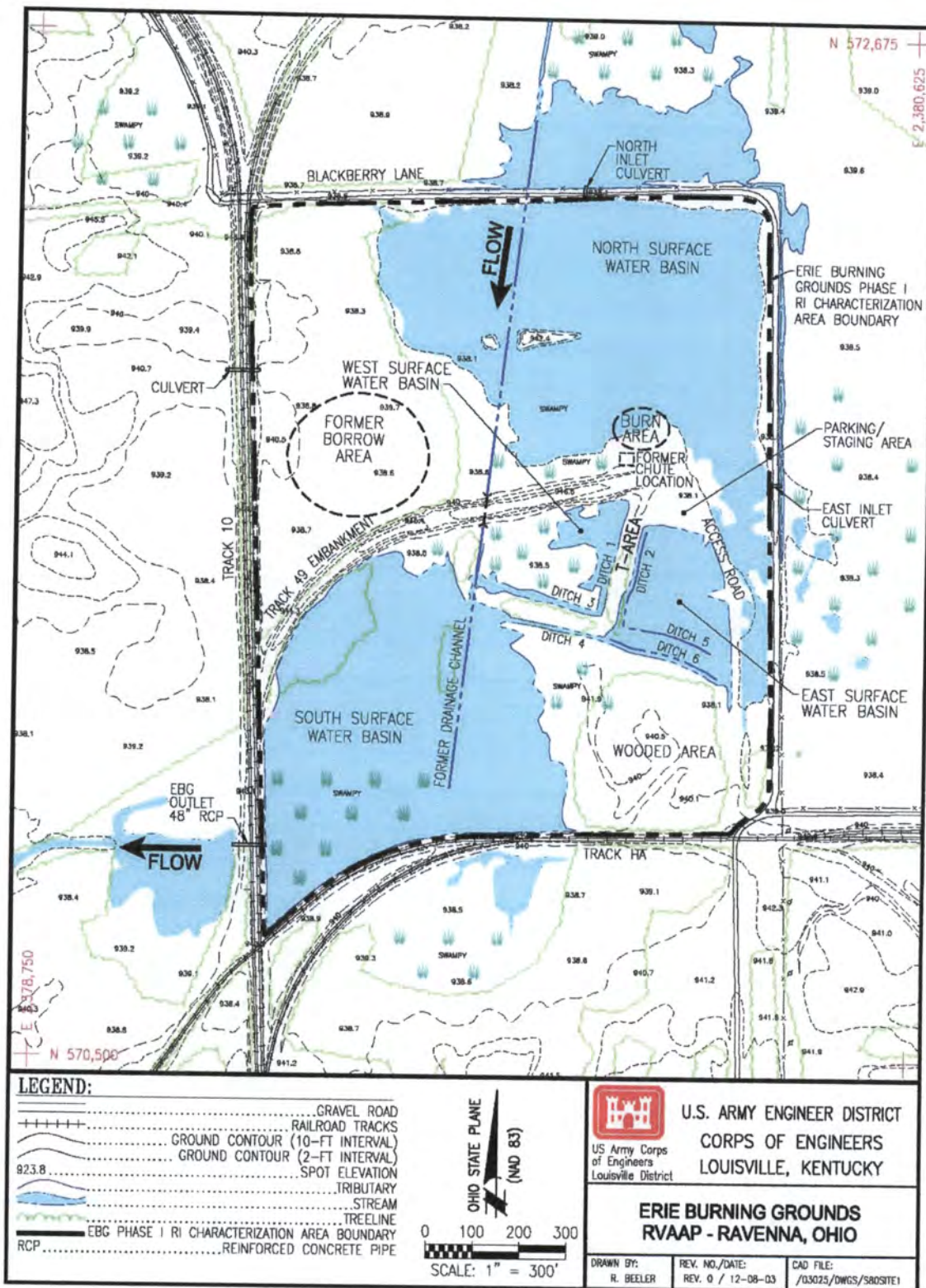
The following publications relevant to the Record of Decision (ROD) for EBG can be located on www.RVAAP.org or in established RVAAP information repositories:

- Final Phase II Remedial Investigation Report for RVAAP- 02 Erie Burning Grounds at Ravenna Army Ammunition Plant. SAIC. 26 September 2005.
- Final Addendum to the Phase II Remedial Investigation Report for RVAAP- 02 Erie Burning Grounds at Ravenna Army Ammunition Plant. SAIC. 25 September 2006.
- Final Proposed Plan for Soil and Dry Sediment at RVAAP- 02 Erie Burning Grounds at Ravenna Army Ammunition Plant. SAIC. 22 February 2007.
- Final Record of Decision for Soil and Dry Sediment at RVAAP- 02 Erie Burning Grounds at Ravenna Army Ammunition Plant. SAIC. 19 September 2007b.

A.2-02.3 No Further Action Required

No Further Action (NFA) under CERCLA is necessary for soil and dry sediment at EBG. Groundwater and surface water at EBG will be addressed under future CERCLA decisions. Land use controls will not be implemented as part of this decision as no contaminants of concern (COCs) were identified in soil and dry sediment for the representative receptor (Hunter/Trapper and Fire/Dust Suppression Worker) and Resident Subsistence Farmer.

NFA for soil and dry sediment is protective of human health and the environment and meets the statutory requirements for cleanup standards established in Section 121 of CERCLA. Because contamination in soil and dry sediment at EBG does not pose a potential risk to human health or the environment, five-year reviews will not be required for soil and dry sediment (SAIC, 2007b).



**Appendix A.2-04: Open Demolition Area #2 (ODA2) (RVAAP-04) – No Further Action (NFA)
Status for Soil and Dry Sediment**

A.2-04.1 Background, Site Location and Description

ODA2, designated as RVAAP-04, is situated in the central portion of the facility and is 25 acres. Starting in 1948, the US Army used ODA2 as a location to detonate bombs, various caliber munitions, and off-specification bulk explosives that could not be destroyed through any other means due to their condition at the RVAAP. Materials to be destroyed by open detonation were typically placed in pits excavated to depths of at least 4 ft, then covered with 2 ft of soil, and detonated. Following detonation, the Area of Concern (AOC) was searched for scrap metal, shrapnel, or Munitions and Explosives of Concern (MEC). MEC has been found several thousand feet from the detonation site and throughout ODA2. Other operations at this AOC included the burial of MEC and a munitions firing area. Known historical areas of operation within ODA2 include:

- Open Detonation Areas [including the Resource Conservation and Recovery Act (RCRA)-permitted unit]: Following detonation and the removal of metal pieces, the pits were backfilled, mulched, and seeded.
- Open Burning Area: From 1981 to 1986, the US Army used this area within the RCRA unit to thermally destroy explosives-contaminated sludges and residues from other RVAAP production areas.
- 40-mm Projectile Prototype Testing Range: The US Army fired projectiles into targets in this area.
- Three explosive storage bunkers: Buildings 1501, 1502, and 1503.
- Burial Sites 1 and 2: Burial Site 1 is located approximately 200 ft northeast of Building 1501 and is approximately 2 acres in size. Burial Site 2 is located approximately 100 ft north of Building 1503 and is approximately 1 acre in size. MEC was likely buried at both areas.
- A MEC disposal area located along a 70-ft embankment northeast of Building 1503 overlooking Sand Creek. MEC exists at the ground surface in this part of the AOC.

Elevations across ODA2 range from approximately 1,017 to 1,071 ft above mean sea level. ODA2 is characterized by gently to steeply sloping topography. The AOC is bisected by Sand Creek. Structures at ODA2 include three above-ground explosive storage bunkers and gravel access and paved roads. Access to ODA2 is restricted by a locked gate on the main access road that enters the AOC from the south.

A.2-04.2 Publications

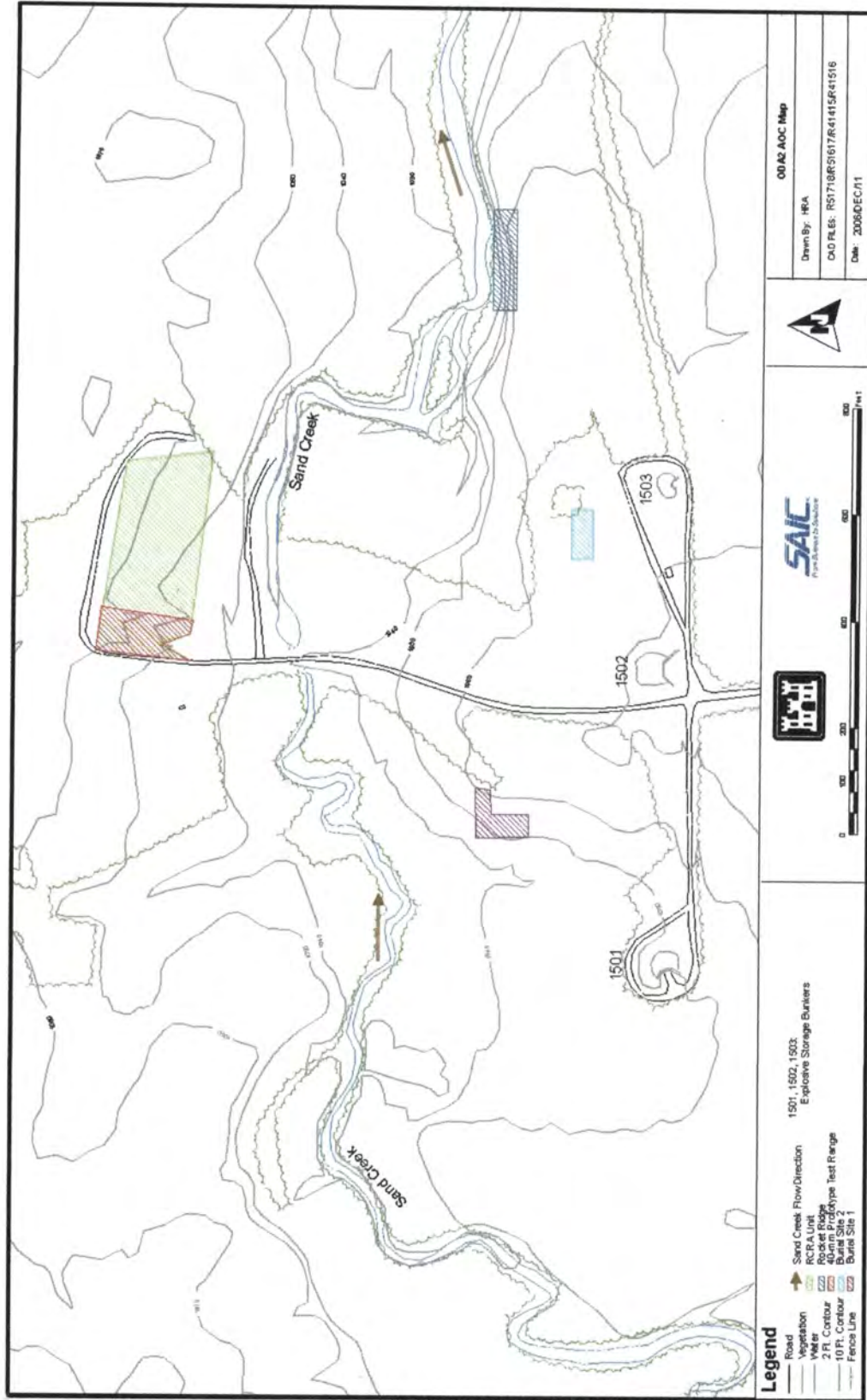
The following publications relevant to the Record of Decision (ROD) for ODA2 can be located on www.RVAAP.org or in established RVAAP information repositories:

- Final Phase II Remedial Investigation Report for RVAAP- 04 Open Demolition Area #2 at Ravenna Army Ammunition Plant, Volumes 1 & 2. SpecPro. 27 September 2005.
- Final Addendum to the Phase II Remedial Investigation Report for RVAAP-04 Open Demolition Area #2 at Ravenna Army Ammunition Plant. SAIC. 12 September 2006.
- Final Proposed Plan for Soil and Dry Sediment at RVAAP-04 Open Demolition Area #2 at Ravenna Army Ammunition Plant. SAIC. 23 February 2007.
- Final Record of Decision for Soil and Dry Sediment at RVAAP- 04 Open Demolition Area #2 at Ravenna Army Ammunition Plant. SAIC. 19 September 2007b.

A.2-04.3 No Further Action Required

No Further Action (NFA) under CERCLA is necessary for soil and dry sediments at ODA2. Groundwater and surface water at ODA2 will be addressed under future CERCLA decisions. Land use controls will not be implemented as part of this decision because chemicals in soil and dry sediment do not exceed cleanup goals for the intended land use. Land use is currently restricted at ODA2 because of the documented presence of MEC. ODA2 will be maintained as restricted access under intended future land use. The Army will address land use controls for ODA2 under the Military Munitions Response Program (MMRP), as part of future response actions for MEC. The Army will maintain current interim use restrictions at ODA2 until such time that final actions are completed under the MMRP.

NFA for soil and sediment is protective of human health under the intended future land use and is protective of the environment. NFA meets the statutory requirements for cleanup standards established in Section 121 of CERCLA. The Army will address requirements for periodic reviews under the MMRP, as part of future response actions for MEC (SAIC, 2007b).



Appendix A.2-008-R-01: Load Line 1A Munitions Response Site (MRS) (RVAAP-008-R-01) No Further Action (NFA) Status

A.2-008.1 Background, Site Location and Description

The Load Line #1A MRS is located at the north end of the former Load Line #1, which is situated at the eastern portion of Camp Ravenna. The former Load Line #1 is approximately 164 acres in area and was used to melt and load TNT and Composition B explosives into large-caliber shells during World War II and the Korean War. Activities initially conducted near the MRS included packing and shipping. After munitions manufacturing ceased at Load Line #1, the later activities near the MRS included the demilitarization of primers containing propellants at a former popping furnace.

The MRS was originally referred to as "Load Line #1 MRS" during the previous investigations and activities that occurred at the MRS under the Military Munitions Response Program (MMRP) and prior to the Remedial Investigation (RI) field work. In coordination with the Ohio EPA and the Army National Guard (ARNG), the designation for the current MRS area was revised to "Load Line #1A MRS" following the RI field work due to propellants that have since been observed outside the current MRS boundary.

A.2-008.2 Publication

The following publications relevant to the Record of Decision (ROD) for Load Line 1A MRS can be located on www.RVAAP.org or in established RVAAP information repositories:

- Final Site Inspection Report, Ravenna Army Ammunition Plant, Military Munitions Response Sites. Environmental and Engineering Management, LLC (e2M). 13 May 2008.
- Final Work Plan for Military Munitions Response Program Remedial Investigation, Ravenna Army Ammunition Plant Ravenna, Ohio, Shaw Environmental & Infrastructure, Inc., (Shaw) March 2011.
- Final Remedial Investigation Report for RVAAP-008-R-01 Load Line #1A MRS Version 2.0. CB&I Federal Services. LLC, 28 August 2014.
- Final No Further Action Proposed Plan for RVAAP-008-R-01 Load Line #1A Munitions Response Site Version 1.0. CB&I Federal Services, LLC, 06 May 2015.
- Final No Further Action Record of Decision for RVAAP-008-R-01 Load Line #1A Munitions Response Site Version 1.0. CB&I Federal Services, LLC, 14 August 2015b.

A.2-008.3 No Further Action Required

No Further Action (NFA) under CERCLA is necessary for the Load Line #1A MRS under the MMRP. No evidence of munitions and explosives of concern (MEC) was found at the MRS during the Remedial Investigation (RI) field work that was conducted under the MMRP. The MRS was further evaluated for munitions constituents (MC) at locations specified in the Final Work Plan for Military Munitions Response Program Remedial Investigation Environmental Services (Shaw, 2011), and no chemicals of concern (COCs) or chemicals of potential ecological concern (COPECs) that presented potential risks to human or environmental receptors, respectively, were found. The MRS is collocated with a designated Installation Response Program (IRP) Area of Concern (AOC), RVAAP-08 Load Line #1. COCs identified in the environmental media at the collocated AOC, if any, have either already been addressed or will continue to be addressed under future CERCLA decisions to be carried out under the IRP.

No MEC were encountered at the Load Line #1A MRS, and there are no explosive hazards or sources for MC. The recommendation of NFA at the MRS under the MMRP is protective of human health and the environment and meets the statutory requirements for cleanup standards established in Section 121 of CERCLA (CB&I Federal Services, 2015b).



H:\MAMMS\Ravenna\GIS_Documents\Project_Maps\MMR\PRIF\SRIFS_LoadLine1A\April_2014_Rev1\RVAAP_LL1_000_Fig_6_SiteFeatures_r1.mxd, Analyst: jdkrkr, Date: 4/25/2014 4:54:08 PM

Appendix A.2-13: Building 1200 – (RVAAP-13) – No Further Action (NFA) STATUS for Soil, Sediment, and Surface Water

A.2-13.1 Background

The Building 1200 Area of Concern (AOC) was designated as the Ammunition Sectioning Area. From 1941 to 1971, three buildings served as a quality assurance (QA) inspection station that encompassed disassembly of production line munitions items, including explosive melt-pour operations. The primary operations building was Building 1200, which was a 30 by 20 ft combined reinforced concrete and transite panel frame structure. The steam melt-out process generated explosives-contaminated wastewater (pink water), which discharged from the building via a pipe, through a crushed slag gravel bed, and into a ditch connected to a 0.5-acre, unlined settling pond (located approximately 415 ft northeast of Building 1200). The depth of the settling pond is less than 3 ft. Overflow from the settling pond discharged directly to the ground surface southeast of the pond; there is no documented evidence of a discharge drainage ditch exiting the settling pond and flowing to a surface water body.

Building demolition activities took place between November 2004 and August 2005, and no buildings or structures remain at the AOC. The remaining surface features include the access road, drainage ditch from the former operations area to the former settling pond, and the former settling pond and associated discharge area.

A.2-13.2 Publications

The following publications can be located on <www.RVAAP.org> or in established RVAAP information repositories:

- Final Quality Control Plan for the Phase I Remedial Investigation for High Areas of Concern at RVAAP, June 1996.
- Final Phase I Remedial Investigation Sampling and Analysis Plan Addendum for High Areas of Concern for the Ravenna Army Ammunition Plant, July 1996.
- Final Phase I Remedial Investigation Site Safety and Health Plan Addendum for High Priority Areas of Concern for the Ravenna Army Ammunition Plant, July 1996.
- Final Public Meeting Briefing Phase I Remedial Investigation of High Priority Areas of Concern at the Ravenna Army Ammunition Plant, September 1997.
- Phase I Remedial Investigation Report for High Priority Areas of Concern at the Ravenna Army Ammunition Plant, Ravenna, Ohio, February 1998.
- Final Sampling and Analysis Plan Addendum for the Characterization of 14 RVAAP AOCs at RVAAP, October 2004.
- Final Characterization of 14 AOCs at Ravenna Army Ammunition Plant, March 2007.

- Final Quality Assurance Surveillance Plan for the 2008 Performance-Based Acquisition of Environmental Investigation and Remediation at Ravenna Army Ammunition Plant, September 2008.
- Final Project Management Plan for the 2008 Performance-Based Acquisition of Environmental Investigation and Remediation, September 2008.
- Final Work Plan Performance-Based Acquisition for Environmental Investigation and Remediation MEC Avoidance/Removal Services, September 2009.
- Final PBA 2008 Supplemental Investigation Sampling and Analysis Plan Addendum No. 1 at Ravenna Army Ammunition Plant, December 2009.
- Final Remedial Investigation/Feasibility Study Report for Soil, Sediment, and Surface Water at RVAAP-13 Building 1200, March 2012.
- Final Proposed Plan for Soil, Sediment and Surface Water at RVAAP-13 Building 1200, April 2013.
- Final Record of Decision for Soil, Sediment, and Surface Water at RVAAP-13 Building 1200, March 2014.
- Final Remedial Design for Soil, Sediment, and Surface Water at RVAAP-13 Building 1200 and RVAAP-48 Anchor Test Area, August 2014.
- Final Remedial Action Report for Soil, Sediment, and Surface Water at RVAAP-13 Building 1200, May 2015.

A.2-13.3 Site Location and Description

The Building 1200 AOC is a former operational facility designated as RVAAP-13. The AOC is approximately 7.7 acres and is situated in the eastern portion of Camp Ravenna. Building demolition activities took place between November 2004 and August 2005, and no buildings or structures remain at the AOC. The remaining surface features include the access road, drainage ditch from the former operations area to the former settling pond, and the former settling pond and associated discharge area.

The topography at the Building 1200 AOC gently slopes radially from a high point just southwest of the former operations buildings. Ground elevations at the AOC range from 990 to 1004 ft above mean sea level (amsl). Intermittent surface water flows in the drainage ditch from the former operations area east to the former settling pond during precipitation events and periods of snow melt. The ditch tends to hold water for extended periods of time due to the low permeability of soil. Surface water discharge from the former settling pond occurs via an outlet channel to the southeast. Discharge flow is diffuse and enters into a heavily wooded area to the south of the pond. The nearest defined surface water conveyance (large ditch line or tributary flowing southwest to Sand Creek) that receives surface water flow lies approximately 1,000 ft to the southeast of the settling pond discharge area.

The Building 1200 AOC is on a local bedrock high. The AOC is underlain by a thin unconsolidated interval generally less than 3 ft thick. The underlying bedrock formation observed at the AOC is the Pennsylvanian age Pottsville Formation, Sharon Sandstone Member. The sandstone unit of the Sharon member (informally referred to as the Sharon Conglomerate) is a highly porous, loosely

cemented, permeable, cross-bedded, frequently fractured and weathered orthoquartzite sandstone, which is locally conglomeritic. The Sharon Conglomerate exhibits locally occurring thin shale lenses in the upper portion of the unit. Upper members of the Pottsville Formation are not present at the AOC.

A.2-13.4 Land Use and Activities

The AOC will be used for Military Training. The selected and implemented remedy for soil, sediment, and surface water allows for Unrestricted (Residential) Land Use, which also allows for Military Training Land Use.

A.2-13.5 Remedy Objectives

The *Record of Decision for Soil, Sediment, and Surface Water at RVAAP-13 Building 1200* (USACE 2014) documented that no further action (NFA) was required for sediment and surface water at the AOC. Manganese in soil was identified as a chemical of concern (COC) requiring remediation to attain Unrestricted (Residential) Land Use. Remedial activities were conducted in December 2014 and January 2015 and were summarized in the *Remedial Action Report for Soil, Sediment, and Surface Water at RVAAP-13 Building 1200* (USACE 2015). A total of 376 tons of contaminated soil was excavated from two contaminated areas within the AOC and transported and disposed at a local landfill. Confirmation sampling results and concurrence from the Ohio Environmental Protection Agency (EPA) concluded that the AOC met the criteria for Unrestricted (Residential) Land Use after implementation of the remedial action.

A.2-13.6 Land Use Controls

Land use controls (LUCs) are not required for soil, sediment, and surface water at the Building 1200 AOC. The remedial action achieved the remedial action objective (RAO) for manganese in soil to attain Unrestricted (Residential) Land Use, and NFA was required for sediment and surface water. Other media (i.e., groundwater) will be addressed as part of future actions.

A.2-13.7 Monitoring and Reporting

Five-year reviews are not required for soil, sediment, and surface water at the Building 1200 AOC, which is compliant with Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Section 121(c).

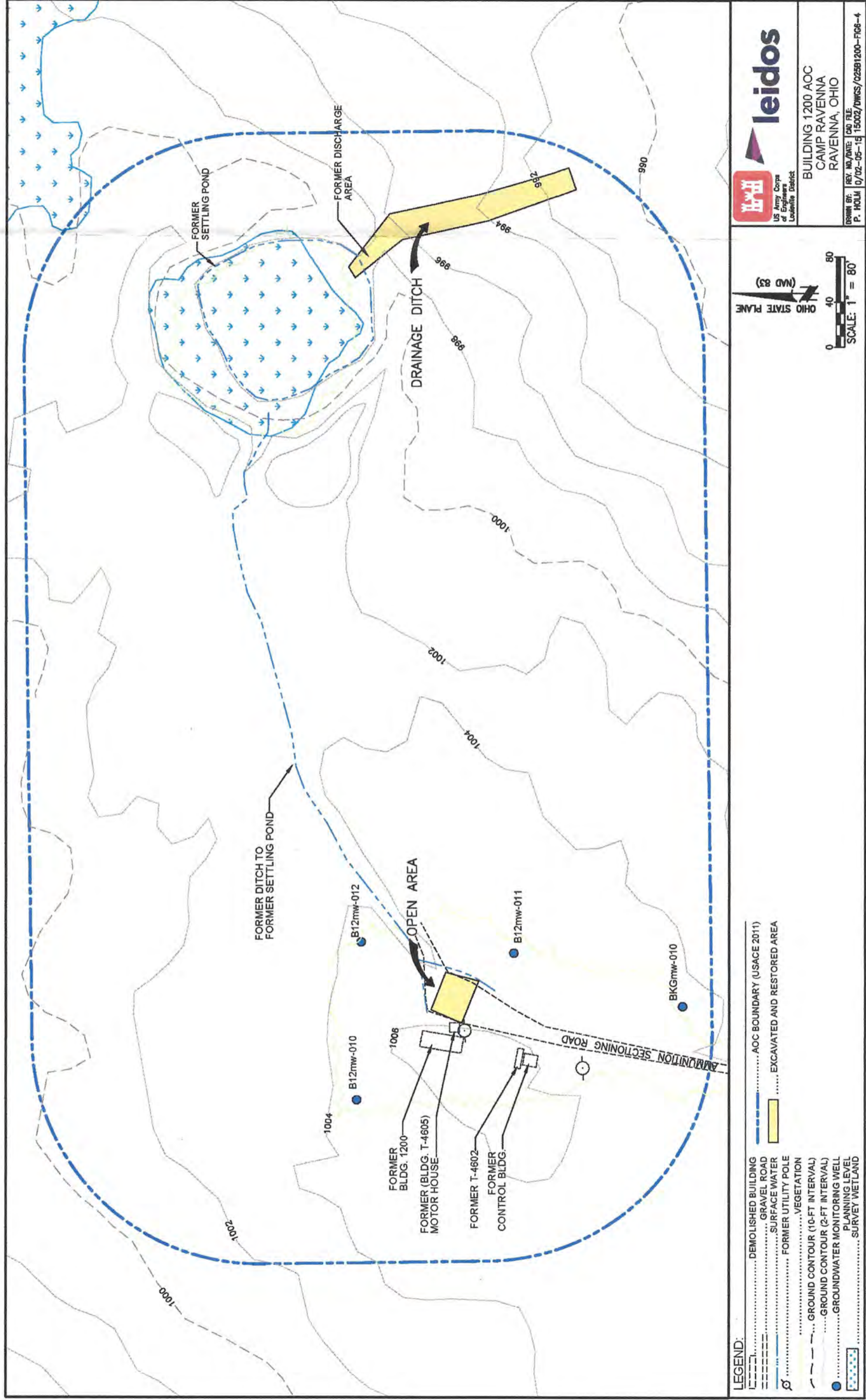


Figure A.13-1. Features of the Building 1200 AOC

Appendix A.2-033-R-01: Firestone Test Facility Munitions Response Site (MRS) (RVAAP-033-R-01) – No Further Action (NFA) Status

A.2-033.1 Background, Site Location and Description

The Firestone Test Facility was originally an approximately 1-acre area that consisted of three buildings, a test pond, and a suspected test range. Two of the buildings were used as a test chamber for tube-launched, optically-tracked, wire-guided missiles and Dragon missiles, while shaped charges were tested under water at the test pond. Due to the classified nature of the research that was conducted at the Firestone Test Facility, there is little available information regarding the activities that occurred or how the tests were conducted (SAIC, 1996). The tests that were conducted were reportedly contained, which limited any release of Munitions and Explosives of Concern (MEC) (engineering-environmental Management, Inc. [e2M], 2007). A third, smaller building was located adjacent to the former test pond that was used for testing shaped charges. The building, which measured 10 feet high and 10 feet square, was constructed of reinforced concrete and fitted with steel plates and was surrounded by a barricade constructed of railroad ties. All three buildings have been removed, and the areas have been cleared of surface construction debris. Some buried construction debris is evident in the area around the former test pond due to mounded areas with rebar protruding through the ground surface. The MRS is currently 0.41 acres and is the location of the former building and area around the former test pond. The MRS is currently undeveloped, vacant land with no improvements.

A.2-033.2 Publications

The following publications relevant to the Firestone Test Facility MRS can be located on www.RVAAP.org or in established RVAAP information repositories:

- Final Site Inspection Report, Ravenna Army Ammunition Plant, Ohio. Environmental and Engineering Management, LLC (e2M). May 2008.
- Final Remedial Investigation Report for RVAAP-033-R-01 Firestone Test Facility MRS, Version 1.0. CB&I Federal Services, LLC, 26 August 2014.
- Final No Further Action Proposed Plan for RVAAP-033-R-01 Firestone Test Facility Munitions Response Site, Version 1.0. CB&I Federal Services, LLC, 06 May 2015.
- Final No Further Action Record of Decision for RVAAP-033-R-01 Firestone Test Facility Munitions Response Site. CB&I Federal Services, LLC, 14 August 2015.

A.2-033.3 No Further Action Required

No Further Action (NFA) under CERCLA is necessary for the Firestone Test Facility MRS under the Military Munitions Response Program (MMRP). No evidence of MEC was found at the MRS during the Remedial Investigation (RI) field work that was conducted under the MMRP. The MRS was further evaluated for munitions constituents (MC) at locations specified in the Final Work Plan for Military Munitions Response Program Remedial Investigation Environmental Services (Work Plan; Shaw Environmental & Infrastructure, Inc. [Shaw], 2011), and no chemicals of concern (COCs) or chemicals of potential ecological concern (COPECs) that presented potential risks to human or environmental receptors, respectively, were found.

No MEC were encountered at the Firestone Test Facility MRS, and there are no explosive hazards or sources for MC. The recommendation of NFA at the MRS under the MMRP is protective of human health and the environment and meets the statutory requirements for cleanup standards established in Section 121 of CERCLA (CB&I Federal Services, LLC., 2015).



RVAAP-033-R-01 Firestone Test Facility MRS **FIGURE 3 SITE FEATURES MAP**

Appendix A.2-034-R-01: Sand Creek Dump Munitions Response Site (MRS) (RVAAP-034-R-01) – No Further Action (NFA) Status

A.2-034.1 Background, Site Location and Description

The Sand Creek Dump MRS is collocated with an Installation Restoration Program (IRP) Area of Concern (AOC) known as the Sand Creek Disposal Road, or RVAAP-34. The site is a former open dump area that operated from 1950 to 1960. In general, it is assumed that the construction- and debris-type materials were delivered and dumped over an embankment located immediately adjacent to Sand Creek. The dump site extended along the embankment for approximately 1,200 feet and varied in width from 20 to 40 feet from the top of the bank to the bottom. The bank slopes from east to west towards Sand Creek at 40 to 60 degrees from horizontal (CB&I, 2015b).

Two demilitarized 75mm projectiles were found following the 2003 Removal Action (RA) at the collocated AOC and were considered munitions debris (MD). Evaluation of the Sand Creek Dump as an MRS was initiated under the Military Munitions Response Program (MMRP) following the MD findings during the RA. A 105mm projectile was observed in Sand Creek during the 2008 Site Investigation (SI) field work; however, it is not known from where the projectile originated. The projectile appeared to be empty, but it was not inspected to determine the explosive safety status as either "safe" or "hazardous." The projectile was not observed in the creek during the RI field work, and the disposition of this projectile is unknown. The 2015 Remedial Investigation (RI) field work confirmed the results of previous investigations at and outside the MRS where no munitions and explosives of concern (MEC) have ever been found; therefore, an explosive safety hazard is not present at the Sand Creek Dump MRS. Based on the results of MEC investigation, it was determined that no potential source of munitions constituents (MC) was present at the Sand Creek Dump MRS.

A.2-034.2 Publications

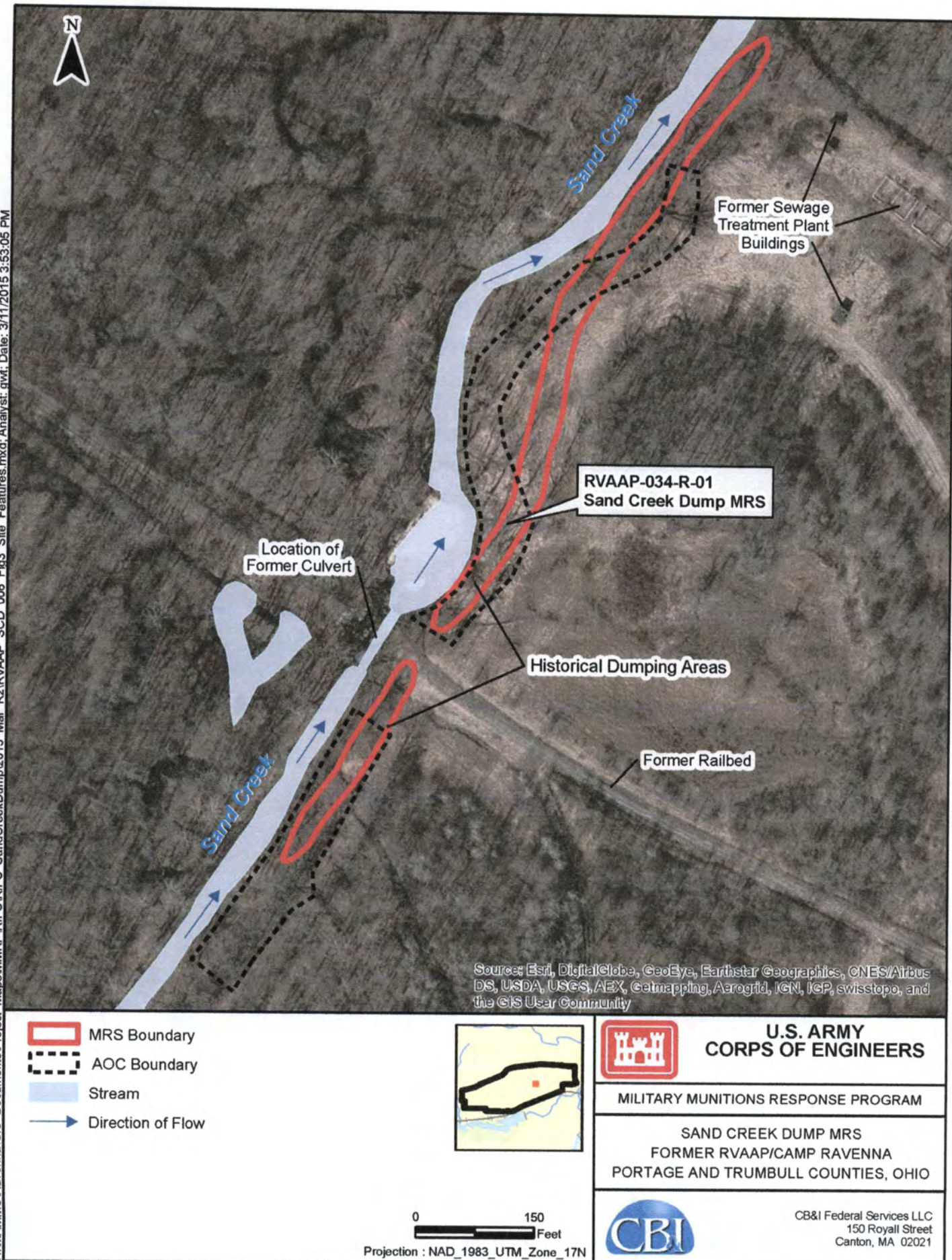
The following publications relevant to the Record of Decision (ROD) for the Sand Creek Dump MRS can be located on www.RVAAP.org or in established RVAAP information repositories:

- Final Remedial Design/Removal Action Plan for RVAAP- 34 Sand Creek Disposal Road Landfill at Ravenna Army Ammunition Plant. MKM Engineers, Inc. 01 March 2004.
- Final Site Inspection Report, Ravenna Army Ammunition Plant, Ohio. environmental-engineering management, Inc. (e2M). May 2008.
- Final Remedial Investigation Report for RVAAP-034-R-01 Sand Creek Dump MRS. CB&I Federal Services, LLC. 25 March 2015a.
- Final No Further Action Proposed Plan for RVAAP-034-R-01 Sand Creek Dump Munitions Response Site, Version 1.0. CB&I Federal Services, LLC. 28 May 2015b.
- Final No Further Action Record of Decision for RVAAP-034-R-01 Sand Creek Dump Munitions Response Site, Version 1.0. CB&I Federal Services, LLC. 29 September 2015.

A.2-034.3 No Further Action Required

No Further Action (NFA) under CERCLA is necessary for the Sand Creek Dump MRS under the Military Munitions Response Program (MMRP). No evidence of munitions and explosives of concern (MEC) or a source of munitions constituents (MC) from MEC or munitions-related activities were found at the MRS during the Remedial Investigation (RI) field work that was conducted under the MMRP.

No MEC were encountered at the Sand Creek Dump MRS, and there are no explosive hazards or sources for MC. The recommendation of NFA at the MRS under the MMRP is protective of human health and the environment and meets the statutory requirements for cleanup standards established in Section 121 of CERCLA (CB&I Federal Services, 2015).



Appendix A.2-48: Anchor Test Area – (RVAAP-48) – No Further Action (NFA) STATUS for Soil, Sediment, and Surface Water

A.2-48.1 Background

Although operational information is relatively limited about this former research and development area used by the Firestone Tire and Rubber Company Defense Research Division, it is believed that Anchor Test Area was used for testing explosives-driven soil anchoring devices. These devices typically consisted of metal rods driven into the ground and attached via a cable to stabilize structures or anchor them to the ground. The dates this Area of Concern (AOC) was used are unknown; however, a 1961 drawing shows the final design for the AOC; therefore, it is likely it was not active until after the early 1960s. Aerial photographs from 1966 confirm the construction of AOC features, but it is unknown whether Anchor Test Area was active at the time of the photographs.

A.2-48.2 Publications

The following publications can be located on <www.RVAAP.org> or in established Ravenna Army Ammunition Plant (RVAAP) information repositories:

- Hazardous and Medical Waste Study No. 37-EF-5360-99 Relative Risk Site Evaluation for Newly Added Sites, October 1998.
- Final Sampling and Analysis Plan Addendum for the Characterization of 14 RVAAP AOCs, October 2004.
- Final Characterization of 14 AOCs at Ravenna Army Ammunition Plant, March 2007.
- Final Quality Assurance Surveillance Plan for the 2008 Performance-Based Acquisition of Environmental Investigation and Remediation at Ravenna Army Ammunition Plant, September 2008.
- Final Project Management Plan for the 2008 Performance-Based Acquisition of Environmental Investigation and Remediation, December 2008.
- Final Work Plan Performance-Based Acquisition for Environmental Investigation and Remediation MEC Avoidance/Removal Services, September 2009.
- Final PBA 2008 Supplemental Investigation Sampling and Analysis Plan Addendum No. 1 at Ravenna Army Ammunition Plant, December 2009.
- Final Remedial Investigation/Feasibility Study Report for Soil, Sediment, and Surface Water at the RVAAP-48 Anchor Test Area, Ravenna Army Ammunition Plant, Ravenna, Ohio, January 2012.
- Final Proposed Plan for Soil, Sediment, and Surface Water at RVAAP-48 Anchor Test Area, May 2013.
- Final Record of Decision for Soil, Sediment, and Surface Water at RVAAP-48 Anchor Test Area, March 2014.
- Final Remedial Design for Soil, Sediment, and Surface Water at RVAAP-13 Building 1200 and RVAAP-48 Anchor Test Area, August 2014.

- Final Remedial Action Report for Soil, Sediment, and Surface Water at RVAAP-48 Anchor Test Area, April 2015.

A.2-48.3 Site Location and Description

Anchor Test Area is approximately 0.5 acres and is located approximately 50-75 ft west of Wilcox-Wayland Road and 2,500 ft south of Newton Falls Road (Figures 2-2 and 2-3). The distinct surface features of the AOC are the former earthen blast wall (dirt mounds) and a nearby 12 by 36 ft sandpit. The anchor tests were likely performed within the sandpit. The adjacent dirt mounds functioned as blast walls. One mound is approximately 8-10 ft high while the others are only 1-2 ft high. The dirt mounds are still observable, although the mounds are overgrown with vegetation and small trees. The sandpit is no longer visually distinct due to vegetative growth. Metal debris is visible in the area, and a section of concrete culvert can be seen in one of the dirt mounds.

The immediate vicinity is heavily forested with the exception of the large wetland approximately 500 ft to the south. No perennial surface water or drainage conveyance features are present at the AOC. Sediment and surface water are not considered media of concern at Anchor Test Area. Surface water occurs only intermittently as overland storm water runoff associated with heavy rainfall events and generally flows towards the wetland located 500 ft to the south. The wetland is drained to the south by an unnamed stream which enters the west branch of the Mahoning River.

Anchor Test Area is located on the southern edge of a small topographic high isolated from other former operational areas at an elevation of approximately 1004 ft above mean sea level (amsl). From this topographic high, the elevation gently slopes downward towards the south and west to approximately 998 ft amsl.

A.2-48.4 Land Use and Activities

The AOC will be used for Military Training. The selected and implemented remedy for soil allows for Unrestricted (Residential) Land Use, which also allows for Military Training Land Use.

A.2-48.5 Remedy Objectives

The *Record of Decision for Soil, Sediment, and Surface Water at RVAAP-48 Anchor Test Area* (USACE 2014) documented that sediment and surface water are not present at the AOC. Arsenic in soil was identified as a chemical of concern (COC) requiring remediation to attain Unrestricted (Residential) Land Use. Remedial activities were conducted in November 2014 and were summarized in the *Remedial Action Report for Soil, Sediment, and Surface Water at RVAAP-48 Anchor Test Area* (USACE 2015). A total of 45 tons of contaminated soil was excavated from within the AOC and transported and disposed at a local landfill. Confirmation sampling results and concurrence from the Ohio Environmental Protection Agency (Ohio EPA) concluded that the AOC met the criteria for Unrestricted (Residential) Land Use after implementing the remedial action.

A.2-48.6 Land Use Controls

Land use controls (LUCs) are not required for soil, sediment, or surface water. The remedial action achieved the remedial action objective (RAO) for arsenic in soil to attain Unrestricted (Residential) Land Use. Sediment and surface water are not present at Anchor Test Area. Other media (i.e., groundwater) will be addressed as part of future actions.

A.2-48.7 Monitoring and Reporting

Five-year reviews are not required for soil, sediment, and surface water at Anchor Test Area, which is compliant with Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Section 121(c).

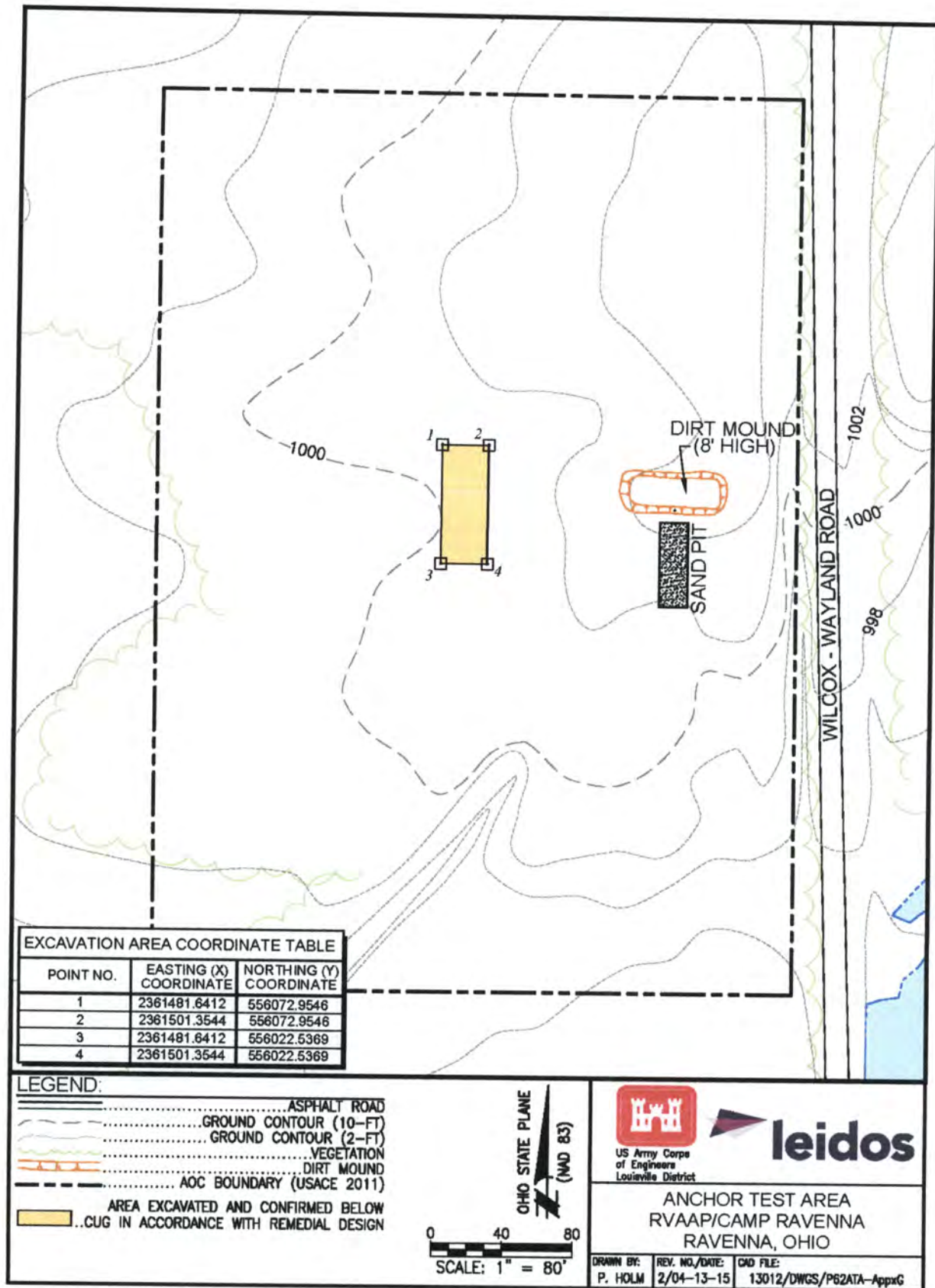


Figure A.48-1. Features of Anchor Test Area

Appendix A.2-49: Central Burn Pits (RVAAP-49) – No Further Action (NFA) Status for Soil and Dry Sediment

A.2-49.1 Background, Site Location and Description

The Central Burn Pits (CBP) is in the east-central area at the intersection of Paris-Windham Road and Lumber Yard Road and is approximately 20 acres in size. The Area of Concern (AOC) is bordered by former railroad tracks to the north (Track 39) and south (Track 33), and Sand Creek to the west-northwest. The topography across the majority of CBP is relatively flat due to historical grading and fill activities. Undisturbed topography is characterized by gently undulating contours.

CBP, designated as AOC RVAAP-49, was originally used as a lumber and building materials storage area. CBP was later used for open burning of non-explosive wastes, electrical components, wooden boxes and other combustible scrap. Operation of the burn pits is believed to have started shortly after RVAAP began operations and continued until the mid 1970s, although actual dates are unknown. In addition, disposal of non-hazardous waste material (e.g., concrete, metal, excess fill dirt and gravel) occurred at CBP; these materials were placed in various piles and elongated berms throughout the AOC.

A.2-49.2 Publications

The following publications relevant to the Record of Decision (ROD) for the CBP can be located on www.RVAAP.org or in established RVAAP information repositories:

- Final Remedial Investigation Report for RVAAP-49 Central Burn Pits at Ravenna Army Ammunition Plant. MKM Engineers, Inc./SAIC. 20 September 2005.
- Final Engineering Evaluation/Cost Analysis for RVAAP-49 Central Burn Pits at Ravenna Army Ammunition Plant. SAIC. 24 January 2007.
- Final Action Memorandum for RVAAP-49 Central Burn Pits at Ravenna Army Ammunition Plant. SAIC. 20 June 2007.
- Final Remedial Investigation Report Addendum No. 1 for the RVAAP- 49 Central Burn Pits at Ravenna Army Ammunition Plant. SAIC. 27 June 2008b.
- Final Proposed Plan for Soil and Dry Sediment at the RVAAP- 49 Central Burn Pits at Ravenna Army Ammunition Plant. SAIC. 24 October 2008.
- Final Removal Action Report for the RVAAP- 49 Central Burn Pits at Ravenna Army Ammunition Plant. SAIC. 05 December 2008.
- Final Record of Decision for Soil and Dry Sediment at RVAAP- 49 Central Burn Pits at Ravenna Army Ammunition Plant. SAIC. 21 April 2009.

A.2-49.3 No Further Action required

No Further Action (NFA) under CERCLA is necessary for soil and dry sediment at CBP. Groundwater and surface water at CBP will be addressed under future CERCLA decisions. Land use controls will not be implemented as part of this decision. No chemicals of concern (COCs) were above cleanup goals [as established in the Remedial Investigation Report Addendum No. 1 for RVAAP-49 Central Burn Pits (SAIC, 2008b)] in soil and dry sediment for the most likely foreseeable future land use (National Guard Trainee) and the residential land use (Resident Subsistence Farmer).

NFA for soil and dry sediment is protective of human health and the environment and meets the statutory requirements for cleanup standards established in Section 121 of CERCLA. Because no contaminants of concern in soil and dry sediment at CBP exceeded cleanup goals for the most likely foreseeable future land use and the residential land use, and exposure does not pose a potential risk to human health or the environment, five-year reviews will not be required for soil and dry sediment (SAIC, 2009).

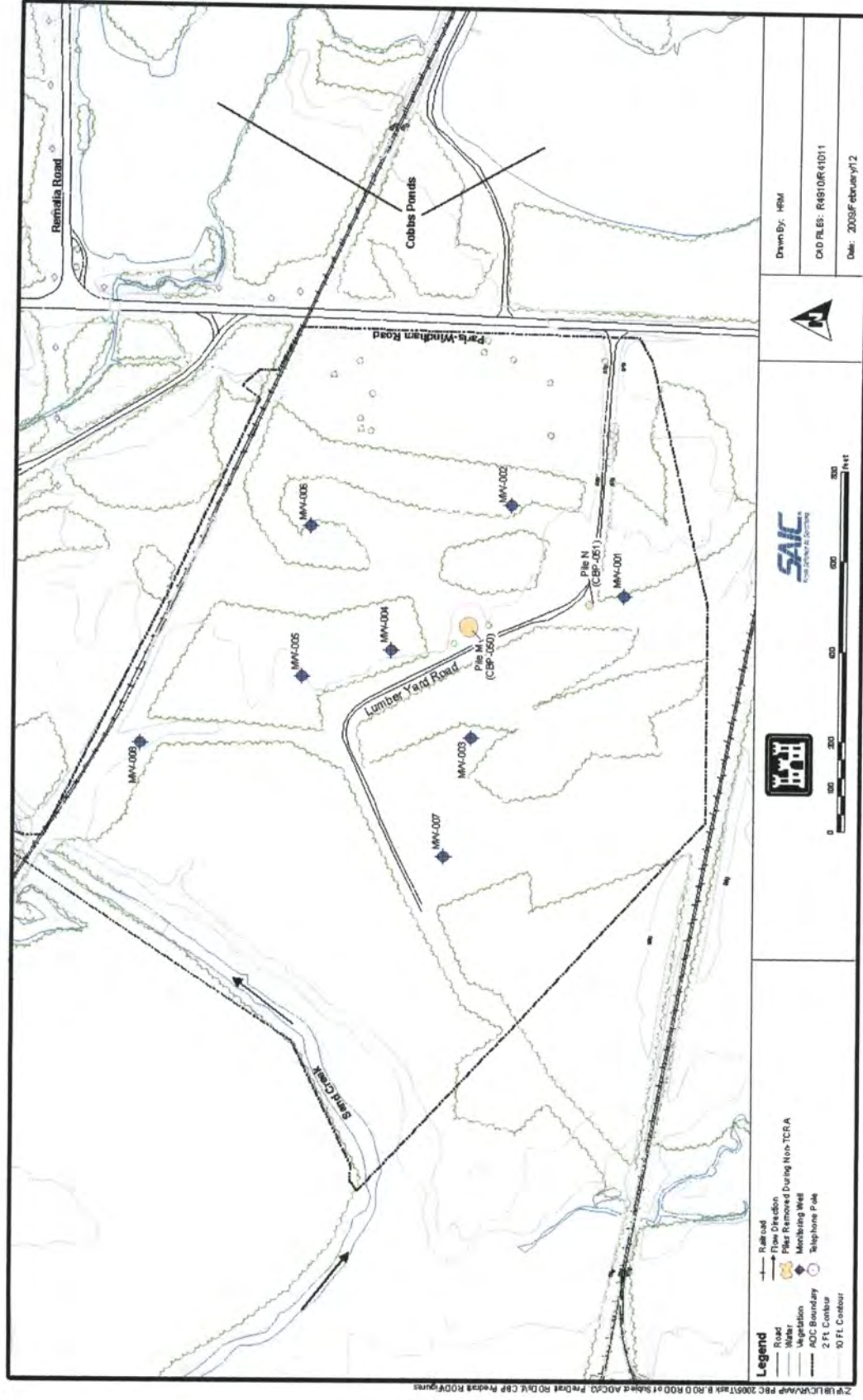


Figure 3. Central Burn Pits Area of Concern Map

Appendix A.2-062-R-01: Water Works No. 4 Dump Munitions Response Site (MRS) (RVAAP-062-R-01) – No Further Action (NFA) Status

A.2-062.1 Background, Site Location and Description

The Water Works #4 Dump MRS is 0.77 acres in size and is located in the south-central portion of Camp Ravenna. The MRS consists of an open cleared area that is currently undeveloped vacant land with no improvements. The Water Works #4 Dump MRS was presumably used for the intentional dumping of nonexplosive metal parts of large caliber ordnance rounds. These dumping activities reportedly occurred from 1941 to 1949. Large-caliber casings were previously found scattered lying on the ground surface and partially buried throughout the wooded area north of the clearing, as were metal parts identified as ogives from World War I-era 155-millimeter (mm) Mk I shrapnel projectiles (engineering-environmental Management, Inc. [e 2 M], 2007).

A.2-062.2 Publications

The following publications relevant to the Record of Decision (ROD) for the Water Works No. 4 Dump MRS can be located on www.RVAAP.org or in established RVAAP information repositories:

- Final Military Munitions Response Program Historical Records Review, Ravenna Army Ammunition Plant, Ohio. engineering-environmental Management, Inc. (e2 M). January 2007.
- Final Site Inspection Report, Ravenna Army Ammunition Plant, Ohio. engineering-environmental Management, Inc. (e2 M). May 2008.
- Final Remedial Investigation Report for RVAAP-062-R-01 Water Works #4 Dump Munitions Response Site. CB&I Federal Services, LLC. 10 March 2015.
- Final No Further Action Proposed Plan for RVAAP-062-R-01 Water Works #4 Dump Munitions Response Site, Version 1.0. CB&I Federal Services, LLC. 28 May 2015.
- Final No Further Action Record of Decision for RVAAP-062-R-01 Water Works #4 Dump Munitions Response Site, Version 1.0. CB&I Federal Services, LLC. 29 September 2015b.

A.2-062.3 No Further Action Required

No Further Action (NFA) under CERCLA is necessary for the Water Works #4 Dump MRS under the MMRP. No evidence of munitions and explosives of concern (MEC) or a source of munitions constituents (MC) from MEC or munitions-related activities were found at the MRS during the Remedial Investigation (RI) field work that was conducted under the MMRP.

No MEC were encountered at the Water Works #4 Dump MRS, and there are no explosive hazards or sources for MC. The recommendation of NFA at the MRS under the Military Munitions Response Program (MMRP) is protective of human health and the environment and meets the statutory requirements for cleanup standards established in Section 121 of CERCLA (CB&I Federal Services, 2015b).

H:\MMSRavenna\GIS_Documents\Project_Maps\Map\PRJES\RIIFS_VWAAP_008_Fig3_MRS_Features_2.mxd Analyst gwl Date 3/9/2015 2:58:22 PM





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

August 13, 2018

Mr. David Connolly
Army National Guard Directorate
Environmental Programs Division
ARNGD-ILE-CR
111 South George Mason Drive
Arlington, VA 22204

**Re: US Army Ammunition Plt RVAAP
Remediation Response
Project Records
Remedial Response
Portage County
267000859029**

Subject: Ravenna Army Ammunition Plant, Portage/Trumbull Counties. Response to Ohio EPA Comments on the Approval with Modifications of the "Final, Revised Property Management Plan for the Designated Areas of Concern and Munitions Response Sites" at the Former Ravenna Army Ammunition Plant, Ravenna, Ohio, Dated July 12, 2018, Ohio EPA ID # 267-000859-029

Dear Mr. Connolly:

The Ohio Environmental Protection Agency (Ohio EPA) has received the response to Ohio EPA comments on the Approval with Modifications of the "Final, Revised Property Management Plan for the Designated Areas of Concern and Munitions Response Sites" at the Former Ravenna Army Ammunition Plant, Ravenna, Ohio. The document was received at Ohio EPA's Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR) on July 13, 2018. The response was prepared for the Army National Guard Directorate by the U.S. Army Corps of Engineers. The document is approved upon the following modifications. The Property Management Plan (PMP) is intended to serve as the Land Use Control Implementation Plan (LUC).

Ohio EPA's letter of May 9, 2018, "approved with modifications" the Final Revised PMP. Ohio EPA provided four comments that provide clarifying language on Ohio EPA's understanding of the purpose of the Plan. We appreciate the Army's response.

Ohio EPA Comment 1. "Ohio EPA notes that the PMP will be the repository for all final and interim agreements related to all AOCs, even those that do not require LUCs or specific restrictions."

Army Response: *Agreed. The Army agrees with this stipulation. The next to last paragraph of Section 1.1 begins with the following two sentences: "Appendix A shall include an individual section for each AOC/MRS with LUCs. The AOCs/MRSs which do not require LUCs will also be included in Appendix A in order to document the final remedial decisions and facilitate overall installation management by the OHARNG. [Ohio Army National Guard]."*

The Army is currently working with one of our contractors to develop Property Management Plan (PMP) appendices for all sites which have final remedial decisions, including those which



do not require remedial actions. There will also be appendices for sites that have had or will have remedies that result in no Land Use Controls being required. The Army plans to submit these additional appendices with the annual update to the PMP.

No changes to the current PMP text are proposed.

Ohio EPA concurs with the Army's response to Comment 1.

Ohio EPA Comment #2: "This PMP will also memorialize the location of all site-wide solid waste disposal areas on the property, based on recent agreements. This information will be updated after the Solid Waste Management Plan is completed."

Army Response: Acknowledged. The Army is hesitant to use the PMP to "memorialize the location of all site-wide solid waste disposal areas" for the following reasons: The PMP is intended to serve as the Army's Land Use Controls Implementation Plan (LUCIP). As such, the Army has agreed to document all LUCs that are required by Final Records of Decision (RODs) and approved Remedial Designs (RDs). Consequently, the Army has previously agreed with the Ohio EPA that the PMP is enforceable under the Director's Final Findings and Orders as a CERCLA document. (See the second paragraph on page 2 of the PMP.) Solid Waste is being managed under applicable Solid Waste Management Regulations, but not under CERCLA. Additionally, many of the identified solid waste disposal areas consist of surface debris which the Army or the Ohio Army National Guard intend to clean up in the near term. Many of those sites will not require long-term management.

The Army proposes that, once the Solid Waste Management Plan is complete, an Appendix will be added to the end of the PMP. This Appendix will state that the following solid waste sites are being managed in accordance with the Solid Waste Management Plan and will list those sites. The PMP appendix will provide the complete reference for the Solid Waste Management Plan (full name, date, and version number, if applicable). The Appendix will direct readers to the Solid Waste Management Plan for further information, including any long-term management requirements, and will state that the Army will update the list if any sites are cleaned up and removed from the Solid Waste Management Plan.

Ohio EPA concurs with the Army's response to Comment 2.

Ohio EPA Comment #3: "As described, the PMP will be updated annually."

Army Response:

Agreed. The Army proposes that the annual update to the PMP be provided together with the annual LUC Inspection Report. The fourth paragraph on page 2 of the PMP states, "This PMP is a dynamic document and will be continually updated/revised/and amended as needed." Consequently, while remedial decisions are still being made, updating the plan at least annually would be a minimum requirement. After remedies are in place at all AOCs or MRSs, annual updates may not be needed. Therefore, no text changes are proposed for the PMP document.

Ohio EPA concurs with the Army's response to Comment 3.

MR. DAVID CONNOLLY
ARMY NATIONAL GUARD DIRECTORATE
AUGUST 13, 2018
PAGE 3

Ohio EPA Comment #4: Ohio EPA also notes that the contact information for Mark Leeper remains as the RVAAP Program Manager for the Army National Guard Directorate. Since Mark has recently left this position, we recommend these sections be updated with the new contact name or left with only the title of Program Manager."

Army Response: Agreed. Mark Leeper's name will be removed from the signature page and will be replaced with David Connolly, the current Program Manager, because the Final Revised PMP was not signed before Mr. Leeper left the ARNG. The Points of Contact listed in Section 9 of the PMP are each represented as a title, rather than as a specifically named individual, so no change is required for that section.

Ohio EPA concurs with the Army's response to Comment 4.

Based on the Army's response to our comments, Ohio EPA anticipates a few minor changes to the text of the final document, and a replacement for the signature page. If you have any questions, please call me at (330) 963-1292.

Sincerely,



Kevin M. Palombo
Environmental Specialist
Division of Environmental Response and Revitalization

KP/nvp

cc: Rebecca Shreffler, Chenega

ec: Bob Prinic, Ohio EPA, NEDO, DERR
Rodney Beals, Ohio EPA, NEDO, DERR
Mark Johnson, Ohio EPA NEDO, DERR
Thomas Schneider, Ohio EPA, SWDO, DERR
Carrie Rasik, Ohio EPA, CO, DERR
Kevin Sedlak, ARNG
Katie Tait, OHARNG RTLS
Craig Coombs, USACE, Louisville District
Nat Peters, USACE, Louisville, District



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

August 1, 2018

Mr. David Connolly
Army National Guard Directorate
Environmental Programs Division
ARNGD-ILE-CR
111 South George Mason Drive
Arlington, VA 22204

**Re: US Army Ammunition Plt RVAAP
Remediation Response
Correspondence
Remedial Response
Portage County
267000859115**

**Subject: Ravenna Army Ammunition Plant, Portage/Trumbull Counties.
Potential Order Milestones for Fiscal Year 2019**

Dear Mr. Connolly:

On July 16, 2018, the Ohio Environmental Protection Agency (Ohio EPA) and Army National Guard Representatives participated in a conference call to discuss the Potential Order Milestones for Fiscal Year 2019 (FY19 Milestones). Ohio EPA agrees with the list of FY19 Milestones that was provided.

If you have any questions, please call me at (330) 963-1293.

Sincerely,

A handwritten signature in black ink, appearing to read "M. S. Johnson, Jr.", is written over a light blue horizontal line.

Mark S. Johnson, Jr.
Environmental Manager
Division of Environmental Response and Revitalization

MJ/nvp

ec: Rebecca Shreffler, Chenega
Nat Peters, USACE
Mark Johnson, Ohio EPA NEDO DERR
Tom Schneider, Ohio EPA, SWDO DERR
Bob Princic, Ohio EPA, NEDO DERR
Katie Tait/Kevin Sedlak OHARNG RTLS
Craig Coombs, USACE
David Connolly, ARNG

RECEIVED
1 Aug 2018

.RVAAP.Order Milestones FY19 TASK filter: Order Milestones FY19.		PROPOSED FY19 DFFO MILESTONES Oct. 1, 2018 thru Sept. 30, 2019						Sheet 1 of 1	
Activity ID	Activity Name	Current Scheduled Date	Agreed to Order Date	Status	Order Date Variance	Program	Contractor	Act Comments	
IRP-RVAAP RAVENNA - Update (DD 07-17-18)									
Surface Water / Wet Sediment									
(PP) TASK 02.1 - PROPOSED PLANS FOR AOC'S 1-10									
SW0840a	(FY19 MLS) Issue Draft PP Report	29-Dec-18	28-Feb-19		82	IRP	AAA		
RVAAP-19 LANDFILL NORTH OF WBG									
(PP) PROPOSED PLAN									
PBA13-261	(FY19 MLS) DRAFT PP SUBMITTAL	30-Nov-18	31-Dec-18		50	IRP	Leido		
RVAAP-46, BUILDING F-15 AND F-16									
(ROD) RECORD OF DECISION									
PBA11-441	(FY19 MLS) DRAFT ROD SUBMITTAL	15-Jun-19	31-Aug-19		77	IRP	Leido		
RVAAP-51, (L) PARIS WINDHAM DUMP									
(RD) REMEDIAL DESIGN									
B6RD150	(FY19 MLS) DRAFT RD SUBMITTAL	01-Oct-18	30-Nov-18		60	IRP	CHEN		
RVAAP-66, GROUNDWATER & ENV INVESTIGATION SERVICES									
(GW) FY18 GW ANNUAL REPORT									
GW-18345	(FY19 MLS) FW GW DRAFT ANNUAL REPORT	31-Dec-18*	15-Feb-19		46	IRP	AAA		
(GW) FY18 GW ADDENDUM									
GW-18645	(FY19 MLS) FWGWMP DRAFT ADDENDUM REPORT	31-Dec-18*	15-Feb-19		46	IRP	AAA		
CC RVAAP-76, DEPOT AREAS									
(RD) REMEDIAL DESIGN									
RV76A2620	(FY19 MLS) DRAFT RD SUBMITTAL	30-Dec-18	31-Mar-19		91	CR	EA-JV		
RVAAP-002-R-01 ERIE BURNING GROUNDS									
(PP) PROPOSED PLAN									
MAMMS02786	(FY19 MLS) Draft PP SUBMITTAL	02-Nov-18	31-Jan-19		90	MMRP	HGL		
RVAAP-063-R-01 Group 8 MRS									
(PP) PROPOSED PLAN									
MAMMS5786	(FY19 MLS) Draft PP SUBMITTAL	06-Feb-19	31-Jan-19		27	MMRP	HGL		
Data Date 17-Jul-18 Run Date 25-Jul-18		118064 - 18R0 IRP-RVAAP RAVENNA - Update (DD 07-17-18)			Under Final Review by Ohio EPA				



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

July 12, 2018

Ohio Environmental Protection Agency
DERR-NEDO
Attn: Mr. Kevin Palombo
2110 East Aurora Road
Twinsburg, OH 44087-1924

Subject: Response to Ohio EPA's "Approval with Modifications Letter" dated May 9, 2018 on the *Final Revised Property Management Plan for the Designated Areas of Concern and Munitions Response Sites*, at the Former Ravenna Army Ammunition Plant / Camp Ravenna, Portage and Trumbull Counties, Ohio, (Ohio EPA Work ID # 267-000859-029)

Dear Mr. Palombo,

The Army received your approval letter, dated May 9, 2018 on the *Final Revised Property Management Plan for the Designated Areas of Concern and Munitions Response Sites, Version 2.0* (dated March 30, 2018). The Army recognizes that your approval is contingent upon a few minor modifications being acknowledged or provided in the form of replacement pages. The following paragraphs acknowledge and respond to each modification requested.

Ohio EPA Comment #1:

"Ohio EPA notes that the PMP will be the repository for all final and interim agreements related to all AOCs, even those that do not require LUCs or specific restrictions."

Army Response:

Agreed. The Army agrees with this stipulation. The next to last paragraph of Section 1.1 begins with the following two sentences:

"Appendix A shall include an individual section for each AOC/MRS with LUCs. The AOCs/MRSs which do not require LUCs will also be included in Appendix A in order to document the final remedial decisions and facilitate overall installation management by the OHARNG."

The Army is currently working with one of our contractors to develop Property Management Plan (PMP) appendices for all sites which have final remedial decisions, including those which do not require remedial actions. There will also be appendices for sites that have had or will have remedies that result in no Land Use Controls being required. The Army plans to submit these additional appendices with the annual update to the PMP.

No changes to the current PMP text are proposed.

Subject: Response to Ohio EPA's "Approval with Modifications Letter" dated May 9, 2018 on the *Final Revised Property Management Plan for the Designated Areas of Concern and Munitions Response Sites*, at the Former Ravenna Army Ammunition Plant / Camp Ravenna, Portage and Trumbull Counties, Ohio, (Ohio EPA Work ID # 267-000859-029)

Ohio EPA Comment #2:

"This PMP will also memorialize the location of all site-wide solid waste disposal areas on the property, based on recent agreements. This information will be updated after the Solid Waste Management Plan is completed."

Army Response:

Acknowledged. The Army is hesitant to use the PMP to "memorialize the location of all site-wide solid waste disposal areas" for the following reasons: The PMP is intended to serve as the Army's Land Use Controls Implementation Plan (LUCIP). As such, the Army has agreed to document all LUCs that are required by Final Records of Decision (RODs) and approved Remedial Designs (RDs). Consequently, the Army has previously agreed with the Ohio EPA that the PMP is enforceable under the Director's Final Findings and Orders as a CERCLA document. (See the second paragraph on page 2 of the PMP.) Solid Waste is being managed under applicable Solid Waste Management Regulations, but not under CERCLA. Additionally, many of the identified solid waste disposal areas consist of surface debris which the Army or the Ohio Army National Guard intend to clean up in the near term. Many of those sites will not require long-term management.

The Army proposes that, once the Solid Waste Management Plan is complete, an Appendix will be added to the end of the PMP. This Appendix will state that the following solid waste sites are being managed in accordance with the Solid Waste Management Plan and will list those sites. The PMP appendix will provide the complete reference for the Solid Waste Management Plan (full name, date, and version number, if applicable). The Appendix will direct readers to the Solid Waste Management Plan for further information, including any long-term management requirements, and will state that the Army will update the list if any sites are cleaned up and removed from the Solid Waste Management Plan.

Ohio EPA Comment #3:

"As described, the PMP will be updated annually."

Army Response:

Agreed. The Army proposes that the annual update to the PMP be provided together with the annual LUC Inspection Report. The fourth paragraph on page 2 of the PMP states, "This PMP is a dynamic document and will be continually updated/revised/and amended as needed." Consequently, while remedial decisions are still being made, updating the plan at least annually would be a minimum requirement. After remedies are in place at all AOCs or MRSs, annual updates may not be needed. Therefore, no text changes are proposed for the PMP document.

Subject: Response to Ohio EPA's "Approval with Modifications Letter" dated May 9, 2018 on the *Final Revised Property Management Plan for the Designated Areas of Concern and Munitions Response Sites*, at the Former Ravenna Army Ammunition Plant / Camp Ravenna, Portage and Trumbull Counties, Ohio, (Ohio EPA Work ID # 267-000859-029)

Ohio EPA Comment #4:

Ohio EPA also notes that the contact information for Mark Leeper remains as the RVAAP Program Manager for the Army National Guard Directorate. Since Mark has recently left this position, we recommend these sections be updated with the new contact name or left with only the title of Program Manager."

Army Response:

Agreed. Mark Leeper's name will be removed from the signature page and will be replaced with David Connolly, the current Program Manager, because the Final Revised PMP was not signed before Mr. Leeper left the ARNG. The Points of Contact listed in Section 9 of the PMP are each represented as a title, rather than as a specifically named individual, so no change is required for that section.

The replacement for the signature page, with Army signatures, will be provided after the Army receives concurrence with this response letter.

Thank you for your review of the PMP. We look forward to your review of this letter. Please contact the undersigned at (703) 607-7589 or david.m.connolly8.civ@mail.mil if there are issues or concerns with this submittal.

Sincerely,

David M. Connolly
RVAAP Restoration Program Manager
Army National Guard Directorate

cc: Mark Johnson, Ohio EPA, DERR-NEDO (email only)
Bob Princic, Ohio EPA, DERR-NEDO (email only)
Tom Schneider, Ohio EPA, SWDO (email only)
Kevin Sedlak, ARNG, Camp Ravenna (email only)
Katie Tait, OHARNG, Camp Ravenna (email only)
Craig Coombs, USACE Louisville (email only)
Nat Peters, USACE Louisville (email only)
Gail Harris, Vista Sciences Corporation
REIMS - attn. Pat Ryan, Leidos

.RVAAP.Order Milestones FY19 TASK filter: Order Milestones FY19.		PROPOSED FY19 DFFO MILESTONES Oct. 1, 2018 thru Sept. 30, 2019						Sheet 1 of 1	
Activity ID	Activity Name	Current Scheduled Date	Agreed to Order Date	Status	Order Date Variance	Program	Contractor	Act Comments	
IRP-RVAAP RAVENNA - Update (DD 07-17-18)									
Surface Water / Wet Sediment									
(PP) TASK 02.1 - PROPOSED PLANS FOR AOC'S 1-10									
SW0840a	(FY19 MLS) Issue Draft PP Report	29-Dec-18	28-Feb-19		82	IRP	AAA		
RVAAP 19 LANDFILL NORTH OF WBG									
(PP) PROPOSED PLAN									
PBA13-261	(FY19 MLS) DRAFT PP SUBMITTAL	30-Nov-18	31-Dec-18		50	IRP	Leido		
RVAAP 46, BUILDING F 15 AND F 16									
(ROD) RECORD OF DECISION									
PBA11-441	(FY19 MLS) DRAFT ROD SUBMITTAL	15-Jun-19	31-Aug-19		77	IRP	Leido		
RVAAP 51, (L) PARIS WINDHAM DUMP									
(RD) REMEDIAL DESIGN									
B6RD150	(FY19 MLS) DRAFT RD SUBMITTAL	01-Oct-18	30-Nov-18		60	IRP	CHEN		
RVAAP 66, GROUNDWATER & ENV INVESTIGATION SERVICES									
(GW) FY18 GW ANNUAL REPORT									
GW-18345	(FY19 MLS) FW GW DRAFT ANNUAL REPORT	31-Dec-18*	15-Feb-19		46	IRP	AAA		
(GW) FY18 GW ADDENDUM									
GW-18645	(FY19 MLS) FWGWMP DRAFT ADDENDUM REPORT	31-Dec-18*	15-Feb-19		46	IRP	AAA		
CC RVAAP 76, DEPOT AREAS									
(RD) REMEDIAL DESIGN									
RV76A2620	(FY19 MLS) DRAFT RD SUBMITTAL	30-Dec-18	31-Mar-19		91	CR	EA-JV		
RVAAP 002 R 01 ERIE BURNING GROUNDS									
(PP) PROPOSED PLAN									
MAMMS02786	(FY19 MLS) Draft PP SUBMITTAL	02-Nov-18	31-Jan-19		90	MMRP	HGL		
RVAAP 063 R 01 Group 8 MRS									
(PP) PROPOSED PLAN									
MAMMS5786	(FY19 MLS) Draft PP SUBMITTAL	06-Feb-19	31-Jan-19		27	MMRP	HGL		
Data Date 17-Jul-18 Run Date 25-Jul-18		118064 - 18R0 IRP-RVAAP RAVENNA - Update (DD 07-17-18)			Under Final Review by Ohio EPA				



NATIONAL GUARD BUREAU

111 SOUTH GEORGE MASON DRIVE
ARLINGTON VA 22204-1373

June 13, 2018

Ohio Environmental Protection Agency
DERR-NEDO
Attn: Mr. Mark Johnson District Environmental
Manager
2110 East Aurora Road
Twinsburg, OH 44087-1924

Subject: Ravenna Army Ammunition Plant (RVAAP) Restoration Program
Portage/Trumbull Counties, Change in Project Manager Responsibilities

Dear Mr. Beals:

The purpose of this letter is to notify you of a change in the Army Project Manager (PM) at the Ravenna Army Ammunition Plant's cleanup program in accordance with Article XV, paragraph 33 of the Ohio Environmental Protection Agency's (EPA) Director's Final Findings and Orders (DFFOs) dated June 10, 2004. Mr. David Connolly of the Army National Guard (ARNG) Headquarters Office will be the Army PM under the DFFOs as of June 15, 2018. LTC James Crowley is transferring his PM activities to Mr. Connolly. Mr. Connolly's contact information is:

Mr. David Connolly
Army National Guard Directorate
Environmental Programs Division
ARNG-ILE-CR
703.607.7955
111 South George Mason Drive
Arlington, VA 22204

Please contact the undersigned (703) 607-7955 or david.m.connolly8.civ@mail.mil if there are issues or concerns with this submission.

Sincerely,

Mr. David Connolly
RVAAP Restoration Program Manager
Army National Guard Directorate

cc: Tom Schneider, Ohio EPA SWDO
Bob Princic, Ohio EPA, NEDO DERR
Kevin Sedlak, ARNG, Camp Ravenna
Katie Tait, OHARNG Camp Ravenna
Craig Coombs, USACE Louisville
Gail Harris, Vista Sciences



NATIONAL GUARD BUREAU

111 SOUTH GEORGE MASON DRIVE
ARLINGTON VA 22204-1373

May 11, 2018

Ohio Environmental Protection Agency
DERR-NEDO
Attn: Mr. Ed D'Amato
2110 East Aurora Road
Twinsburg, OH 44087-1924

Subject: Notification of Field Work, Ravenna Additional Sampling for CC RVAAP-69 Building 1048 Fire Station and CC RVAAP-74 Building 1034-Motor Pool Hydraulic Lift, Ohio EPA ID #s 267-000859-211 and 267-000859-220

Dear Mr. D'Amato:

In accordance with the Director's Final Findings and Orders, Section XIII, #28, for the RVAAP Restoration Program, the Army National Guard (ARNG) is providing notification of field activities at Camp Ravenna/former RVAAP 15 days prior to the scheduled start date. Parsons and their subcontractors will be conducting quarterly groundwater sampling at CC RVAAP-69 Building 1048 Fire Station and CC RVAAP-74 Building 1034-Motor Pool Hydraulic Lift during the week of 4 June 2018 (anticipate two days 4 and 5 June 2018).

For additional information on the field activities, please refer to the Final Work Plan Additional Sampling for CC RVAAP-69 Building 1048 Fire Station, CC RVAAP-70 East Classification Yard, and CC RVAAP-74 Building 1034-Motor Pool Hydraulic Lift at the former Ravenna Army Ammunition Plant (RVAAP) submitted to Ohio EPA on 30 November 2017 and approved on 27 December 2017.

Please contact the undersigned at (703) 601-7785 or james.c.crowley.mil@mail.mil if there are issues or concerns with this submission.

Sincerely,

CROWLEY.JAMES.CORNELIUS.1045120399
NELIUS.1045120399

Digitally signed by
CROWLEY.JAMES.CORNELIUS.1045120399
9
Date: 2018.05.09 08:56:44 -04'00'

James C. Crowley
Lieutenant Colonel, Corps of Engineers
RVAAP Restoration Program Manager
Installations & Environment, ARNG

cc: Mark Johnson, Ohio EPA, DERR-
NEDO Bob Princic, Ohio EPA, DERR-
NEDO Tom Schneider, Ohio EPA,
SWDO Kevin Sedlak, ARNG, Camp
Ravenna Katie Tait, OHARNG, Camp
Ravenna Craig Coombs, USACE
Louisville Kevin Mieczkowski, USACE
Louisville Gail Harris, Vista Sciences
Edward Heyse, Parsons



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

May 9, 2018

LTC James Crowley
Army National Guard Directorate
ARNGD-IED
111 South George Mason Drive
Arlington, VA 22204

Re: **US Army Ammunition Plt RVAAP
Remediation Response
Project Records
Remedial Response
Portage County
267000859029**

Subject: Ravenna Army Ammunition Plant, Portage/Trumbull Counties. Approval with Modifications of the “Final, Revised Property Management Plan for the Designated Areas of Concern and Munitions Response Sites” at the Former Ravenna Army Ammunition Plant, Ravenna, Ohio, Dated March 30, 2018, Ohio EPA ID # 267-000859-029

Dear LTC Crowley:

The Ohio Environmental Protection Agency (Ohio EPA) has received the **“Final, Revised Property Management Plan for the Designated Areas of Concern and Munitions Response Sites”** at the Former Ravenna Army Ammunition Plant, Ravenna, Ohio. The document was received at Ohio EPA’s Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR) on April 9, 2018. The report was prepared for the Army National Guard Directorate by the U.S. Army Corps of Engineers. The document is approved upon the following modifications.

The Property Management Plan (PMP) is an important document as it describes the Land Use Controls (LUC) and restrictions for specific Areas of Concern/Munitions Response Sites (AOCs/MRSs) at the Former Ravenna Army Ammunition Plant. This information is memorialized in the specific Record of Decision (ROD) that is prepared for each AOC/MRS.

Ohio EPA notes that the PMP will be the repository for all final and interim agreements related to all AOCs, even those that do not require LUCs or specific restrictions. This PMP will also memorialize the location of all site-wide solid waste disposal areas identified on the property, based on recent agreements (please see Ohio EPA letter dated September 7, 2017). This information will be updated after the Solid Waste Management Plan is completed. As described, the PMP will be updated annually. Ohio EPA also notes the contact information for Mark Leeper remains as the RVAAP Program Manager for the Army National Guard Directorate. Since Mark has recently left this position, we recommend these sections be updated with the new contact name

LTC JAMES CROWLEY
ARMY NATIONAL GUARD DIRECTORATE
MAY 9, 2018
PAGE 2

or left with only the title of Program Manager. Our approval is based on these modifications being acknowledged, or provided, in the form of replacement pages.

If you have any questions, or wish to set up a meeting to discuss, please call me at (330) 963-1292.

Sincerely,



Kevin M. Palombo
Environmental Specialist
Division of Environmental Response and Revitalization

KP/nvp

cc: Rebecca Shreffler/Gail Harris, VISTA Sciences Corp.

ec: Bob Princic, Ohio EPA, NEDO DERR
Rodney Beals, Ohio EPA, NEDO DERR
Mark Johnson, Ohio EPA NEDO DERR
Thomas Schneider, Ohio EPA, SWDO DERR
Carrie Rasik, Ohio EPA, CO DERR
Kevin Sedlak, ARNG
Katie Tait, OHARNG RTLS
Craig Coombs, USACE, Louisville District



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

RECEIVED
1/11/2018

January 9, 2018

Mr. Mark Leeper, P.G., MBA
Team Lead
Cleanup and Restoration Branch
ARNG Directorate
111 George Mason St.
Arlington, VA 22204

Re: US Army Ravenna Ammunition Plt RVAAP
Remediation Response
Correspondence
Remedial Response
Portage County
267000859067

Subject: Ravenna Army Ammunition Plant, Portage/Trumbull Counties. Approval of the "Final Supplemental Remedial Investigation for Sediment and Surface Water at RVAAP-01, RVAAP-04, RVAAP-16, and RVAAP-001-R-01" at the Former Ravenna Army Ammunition Plant, Ravenna, Ohio; Contract No. W912QR-12-D-0020; Dated November 29, 2017, Ohio EPA ID # 267-000859-067

Dear Mr. Leeper:

The Ohio Environmental Protection Agency (Ohio EPA), Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR) has received the "Final Supplemental Remedial Investigation for Sediment and Surface Water at RVAAP-01, RVAAP-04, RVAAP-16, and RVAAP-001-R-01" at the Ravenna Army Ammunition Plant (RVAAP), Ravenna, Ohio. This document was received at Ohio EPA's Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR) on November 29, 2017. The Report was prepared for the U.S. Army Corps of Engineers (USACE) Louisville District by Leidos, under Contract Number W912QR-12-D-0020.

This document was reviewed by personnel from Ohio EPA's DERR, based on the above notation and pursuant to the Director's Findings and Orders paragraph 39 (b), Ohio EPA considers the document final and approved.

If you have any questions or concerns, please do not hesitate to contact me at (330) 963-1292.

Sincerely,

Kevin Palombo, Site Coordinator
Division of Environmental Response and Revitalization

KP/nvp

cc: Rebecca Shreffler, Vista Sciences Corp.
ec: Craig Coombs, USACE
Thomas Schneider, Ohio EPA, SWDO, DERR
Robert Princic, Ohio EPA, NEDO, DERR
Nicholas Roope, Ohio EPA, NEDO, DERR

Gail Harris, Vista Sciences Corp.
Katie Tait, OARNG RTLS
Kevin Sedlak, ARNG
Rod Beals, Ohio EPA, NEDO, DERR
Carrie Rasik, Ohio EPA, CO, DERR