

**Ohio Environmental Protection Agency (Ohio EPA)**  
**And**  
**Ravenna Army Ammunition Plant (RVAAP)**  
**2015 Correspondences**



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

February 27, 2015

Mr. Mark Leeper, P.G., MBA  
Army National Guard Directorate  
Environmental Programs Division  
ARNGD-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  
267000859

**Subject:** Approval for the "Final Remedial Action Report for Soil and Dry Sediment at the RVAAP-01 Ramsdell Quarry Landfill, RVAAP-01 at the Ravenna Army Ammunition Plant, Ravenna, Ohio," Dated January 30, 2015, Ohio EPA ID # 267-000859-130

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 Remedial Action Report for Soil and Dry Sediment at the RVAAP-01 Ramsdell Quarry Landfill, RVAAP-01 at the Ravenna Army Ammunition Plant, Ravenna, Ohio," dated January 30, 2015. This document, received by Ohio EPA's NEDO on February 2, 2015, was prepared for the U.S. Army Corps of Engineers (USACE) Louisville District, by Leidos Engineering of Ohio, Inc.

Ohio EPA has reviewed this documentation and has found no additional deficiencies. As a result, the "Final Remedial Action Report for Soil and Dry Sediment at the RVAAP-01 Ramsdell Quarry Landfill, RVAAP-01 at the Ravenna Army Ammunition Plant, Ravenna, Ohio," has been approved.

If you have any questions or concerns, please do not hesitate to contact me at (330) 963-1249.

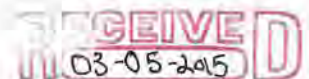
Sincerely,

Andrew C. Kocher, Site Coordinator  
Division of Environmental Response and Revitalization

ACK/nvr

cc: Travis R. McCoun, USACE, Baltimore District  
Katie Tait/Kevin Sedlak, Camp Ravenna  
Haney/Harris, Vista Sciences, Newton Falls

ec: Rod Beals, NEDO, DERR  
Justin Burke, CO, DERR





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

January 16, 2015

Mark Leeper, P.G., MBA  
Army National Guard Directorate  
Environmental Programs Division  
ARNG-ILE-CR  
703.607.7955  
111 South George Mason Drive  
Arlington, VA 22204

Re: US Army Ravenna Ammunition Plt RVAAP  
Remediation Response  
Project Records  
Remedial Response  
Portage County  
267000859

Subject: Approval of the "Draft Remedial Action Report at RVAAP-01 Ramsdell Quarry Landfill, Former Ravenna Army Ammunition Plant, Ravenna, Ohio," Dated November 12, 2014 (Work Activity No. 267-000859-130)

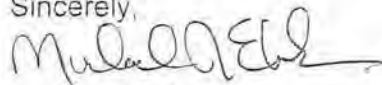
Dear Mr. Leeper:

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 Remedial Action Report at RVAAP-01 Ramsdell Quarry Landfill, Former Ravenna Army Ammunition Plant, Ravenna, Ohio,*" dated November 12, 2014. This document, received by Ohio EPA's NEDO on November 14, 2014, was prepared by Leidos Engineering of Ohio, Inc.

Ohio has reviewed this documentation and has found no significant deficiencies. Please provide a revised document or replacement pages within 30 days, in accordance with the Findings and Orders for RVAAP.

If you have any questions or concerns, please do not hesitate to contact me at (330) 963-1249.

Sincerely,

 - PCR -

Andrew C. Kocher  
Site Coordinator  
Division of Environmental Response and Revitalization

ACK/nvr

cc: Gregory F. Moore, USACE, Louisville District  
Katie Tait/Kevin Sedlak, Camp Ravenna Environmental Office, Newton Falls  
Haney/Harris, Camp Ravenna Environmental Office, Vista Sciences, Newton Falls

ec: Rod Beals, Ohio EPA, NEDO, DERR  
Justin Burke, Ohio EPA, CO, DERR

Northeast District Office • 2110 East Aurora Road • Twinsburg, OH 44087-1924  
www.epa.ohio.gov • (330) 963-1200 • (330) 487-0769 (fax)

Scanned

By: RMH  
Date: 01-21-2015

RECEIVED  
01-21-2015

E-MAILED  
01-20-2015 RMH



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

06 January 2015

Environmental Office

Nancy Zikmanis, Environmental Supervisor  
Ohio Environmental Protection Agency  
Division of Emergency and Remedial Response  
2110 East Aurora Road  
Twinsburg, Ohio 44087-1924

Reference: Closed Ramsdell Quarry Landfill Status Report

Dear Ms. Zikmanis,

On December 29, 2014, the subject Landfill was inspected by Portage County General Health District (see attached inspection report).

The Camp Ravenna Joint Military Training Center Support Services Contractor, Vista Sciences Corporation, conducts weekly inspections of the conditions of the landfill cap. No deficiencies have been detected since January 1, 2006. These inspection reports are available for your viewing at the Vista office located at Camp Ravenna Environmental Office.

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](mailto:timothy.m.morgan.nfg@mail.mil) at any time. The OHARNG is committed to environmental excellence and compliance and will work with the Ohio EPA should any issues ensue. Thank you for your time and consideration in this matter.

Sincerely,



Timothy M. Morgan  
Fort Ohio Environmental Supervisor

cc: Mark Leeper  
Katie Tait  
Kevin Sedlak  
Timothy Morgan



# PORTAGE COUNTY COMBINED GENERAL HEALTH DISTRICT

705 Oakwood Street  
Suite 208  
Ravenna, Ohio 44266

Phone: 330-296-9919  
Fax: 330-297-3597  
E-mail: [pchd@portageco.com](mailto:pchd@portageco.com)



**DuWayne O. Porter, M.P.H., R.S.**  
Health Commissioner

Web: [www.co.portage.oh.us/dept/healthdepartment](http://www.co.portage.oh.us/dept/healthdepartment)

December 30, 2014

Al Brillinger  
Vista Sciences Corp.  
Camp Ravenna  
1438 St. Rt. 534 SW  
Newton Falls, OH 44444

RE: Ramsdell Quarry

Dear Sir:

On December 29, 2014, I conducted a comprehensive inspection at Ramsdell Quarry. I was accompanied by Brad Kline, environmental technician. The weather was cloudy and 35°F.

No violations of Post Closure Rules were noted. Thank you for your cooperation.

If you have any questions, you can contact me at this office weekday mornings between 8:00 a.m. and 10:00 a.m. at (330) 296-9919 Ext. 116 or email at [jmadved@portageco.com](mailto:jmadved@portageco.com).

Sincerely,

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

Jack Madved, R.S.

JM:df

Enclosure



## Closed MSW Landfill Inspection Checklist

Facility Name <u>Ramsdell Quarry</u>	
Address	
Date <u>12-29-14</u>	Time
Inspection Representatives	
Facility <u>Brad Kline</u>	
Health District <u>Jack Madved</u>	
Ohio EPA	
Other	

Inspection Type	Reason for Inspection	
<input checked="" type="checkbox"/> Comprehensive	<input type="checkbox"/> Required	<input type="checkbox"/> Other
<input type="checkbox"/> Focused	<input type="checkbox"/> Re-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	
			<b>3745-27-14 Post closure care of MSW Landfills</b>				
			(A) Post-closure care activities	<input checked="" type="checkbox"/>			(5) Monitoring and reporting requirements of OAC 3745-27-10, 3745-27-12, 3745-76
		<input checked="" type="checkbox"/>	(1) Leachate management, surface water management, explosive gas extraction and monitoring, ground water monitoring system			<input checked="" type="checkbox"/>	(6) Annual report
<input checked="" type="checkbox"/>			(2) Integrity of cap system	<input checked="" type="checkbox"/>			(7) Record keeping
<input checked="" type="checkbox"/>			(3) Repair leachate outbreaks	<input checked="" type="checkbox"/>			(D) Facility access
		<input checked="" type="checkbox"/>	(4) Quarterly inspections-report to Ohio EPA within 15 days				Provide access to facility for Ohio EPA and local health department inspections

Comments: Weather - 35° F, Cloudy, no snow

A 8' erosion rill at the NW corner of the pond needs attention. Some small holes on the cap need to be filled - no loss of cap integrity. New fence installed around the landfill.

<u>J. Madved</u> Print Name of Inspector Completing Form	<u>J. Madved</u> Signature	<u>12-29-14</u> Date
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John R. Kasich, Governor  
Mary Taylor, Lt. Governor  
Craig W. Butler, Director

February 19, 2015

Mr. Mark Leeper, P.G., MBA  
Army National Guard Directorate  
Environmental Programs Division  
ARNGD-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  
267000859**

**Subject: Approval for the "Responses to Ohio EPA Comments for the Memorandum for the Record, Recommended Path Forward, Open Demolition Area # 2, RVAAP-04 at the Ravenna Army Ammunition Plant, Ravenna, Ohio," Dated January 21, 2015, Ohio EPA ID # 267-000859-089**

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, "Responses to Ohio EPA Comments for the Memorandum For The Record, Recommended Path Forward, Open Demolition Area # 2, RVAAP-04 at the Ravenna Army Ammunition Plant, Ravenna, Ohio," dated January 21, 2015.

Ohio EPA has reviewed this documentation and concurs with the responses. As a result, the "Responses to Ohio EPA Comments for the Memorandum for the Record, Recommended Path Forward, Open Demolition Area # 2, RVAAP-04 at the Ravenna Army Ammunition Plant, Ravenna, Ohio," has been approved. Please provide a revised document within 30 days, in accordance with the Findings and Orders for RVAAP.



MR. MARK LEEPER, P.G., MBA  
ARMY NATIONAL GUARD DIRECTORATE  
FEBRUARY 19, 2015  
PAGE 2

If you have any questions or concerns, please do not hesitate to contact me at (330) 963-1249.

Sincerely,



Andrew C. Kocher  
Site Coordinator  
Division of Environmental Response and Revitalization

ACK/nvr

cc: Gregory F. Moore, USACE, Louisville District  
Katie Tait/Kevin Sedlak, Camp Ravenna  
Haney/Harris, Vista Sciences, Newton Falls

ec: Rod Beals, NEDO, DERR  
Justin Burke, CO, DERR



**NATIONAL GUARD BUREAU**

111 SOUTH GEORGE MASON DRIVE  
ARLINGTON VA 22204-1373

January 21, 2014

Ohio Environmental Protection Agency  
DERR-NEDO  
Attn: Mr. Andrew Kocher, Project Manager  
2110 East Aurora Road  
Twinsburg, OH 44087-1924

Subject: Ravenna Army Ammunition Plant (RVAAP) Restoration Program  
Portage/Trumbull Counties, Response to Ohio EPA Comments on the  
"Memorandum For Record, Recommended Path Forward, Open Demolition Area  
#2, RVAAP-04 at the Ravenna Army Ammunition Plant, Ravenna, Ohio" (Work  
Activity No. 267-000859-089).

Dear Mr. Kocher:

Enclosed for your review are responses to Ohio EPA's comments dated December 31, 2014 regarding the *Memorandum For Record, Recommended Path Forward, Open Demolition Area #2, RVAAP-04 at the Ravenna Army Ammunition Plant, Ravenna, Ohio.*"

Please contact the undersigned at (703) 607-7995 or [mark.s.leeper.civ@mail.mil](mailto:mark.s.leeper.civ@mail.mil) if there are issues or concerns with this submission.

Sincerely,

A handwritten signature in black ink, appearing to read "Mark S. Leeper", is positioned below the word "Sincerely,".

Mark S. Leeper, P.G., MBA  
RVAAP Restoration Program Manager  
Army National Guard Directorate

cc: Rod Beals, Ohio EPA, DERR-NEDO  
Justin Burke, Ohio EPA, CO  
Kevin Sedlak, ARNG, Camp Ravenna  
Katie Tait, OHARNG, Camp Ravenna  
Greg Moore, USACE Louisville  
Pat Ryan, Leidos-REIMS  
Gail Harris, Vista Sciences Corporation

Subject: Ravenna Army Ammunition Plant (RVAAP) Restoration Program Portage/Trumbull Counties, Response to Ohio EPA Comments on the “*Memorandum For Record, Recommended Path Forward, Open Demolition Area #2, RVAAP-04 at the Ravenna Army Ammunition Plant, Ravenna, Ohio*” (Work Activity No. 267-000859-089).

**Comment O-1 (Paragraph 2):** The text states that this memorandum’s purpose is for identification and mitigation of MEC and MPPEH. Ohio EPA recommends that Munitions Debris (MD), which may contain residual Munition Constituents (MC), be included for areas along the banks of Sand Creek in order to prevent said debris from being released into the creek bed.

**Response:** MPPEH by definition includes munitions debris. Munitions Debris is not in and of itself a separate category of debris, rather it is a subcategory of MPPEH that requires inspection prior to certification as MDAS. To clarify, the memorandum will be modified to include the full definition of MPPEH as follows: "MPPEH. Material that, prior to determination of its explosives safety status, potentially contains explosives or munitions (e.g., munitions containers and packaging material; munitions debris remaining after munitions use, demilitarization, or disposal; and range-related debris)."

**Comment O-2 (Paragraph 4-b):** The text states that ODA-2 is located on an operational range. It appears that just the far northeast corner of ODA-2 is an operational range. Please clarify where this operational range is located and how it impacts this Memorandum.

**Response:** Concur. The text and figures in the memorandum will be clarified to specify which portions of ODA2 are located on Operational Range.

**Comment O-3 (Paragraph 5-a-i):** Ohio EPA is concerned with omitting areas delineated as moderate to high probability, which are inaccessible to human receptors due to heavy vegetation. These areas may be accessible in the future as vegetation changes. In addition, these areas may be along the banks of Sand Creek, which could erode and expose MD/MEC/MPPEH to accessible areas in the future. Please revise this paragraph to identify areas that would be determined inaccessible and explain the rationale for selecting these areas. Also, please note that these areas would be very limited and would not include areas along Sand Creek.

**Response:** As stated in paragraph 5a, an updated probability assessment is required to identify those areas with Moderate to High probability for encountering MEC. No areas are going to be omitted, the inaccessible areas will be surveyed and then a determination as to best deal with these areas will be determined in the FS. Once this assessment has been completed as noted in paragraph 5bi, Task 1, any inaccessible areas deemed Moderate to High probability will be delineated. Task 2 states that moderate to high accessible areas will be delineated as well. Rationale for the inaccessible/accessible determination will be provided in the AAR for this effort. This information cannot be added to the memorandum at this time.

**Comment O-4 (Paragraph 5-b):** Please add an additional task that addresses Comment O-1 above.

**Response:** See response to response to comment 0-1.



Subject: Ravenna Army Ammunition Plant (RVAAP) Restoration Program Portage/Trumbull Counties, Response to Ohio EPA Comments on the “*Memorandum For Record, Recommended Path Forward, Open Demolition Area #2, RVAAP-04 at the Ravenna Army Ammunition Plant, Ravenna, Ohio*” (Work Activity No. 267-000859-089).

**Comment O-5 (Paragraph 5-b):** Please add and additional task that addresses stabilization/repair of the stream diversion at Rocket Ridge, which was found to be ineffective during heavy rains, as described in the attachment.

**Response:** Concur. Task 6 will be modified to include stabilization of Rocket Ridge and repair of the stream diversion system. Text will include: “The slope of rocket ridge will be stabilized with additional plantings of trees in the unstable area. Additional boulders will be added to the entrance of the original stream channel, the upstream area, to slow the water during flood events from eroding the slope further”.



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

December 11, 2015

Mr. Mark Leeper, P.G., MBA  
Army National Guard Directorate  
Environmental Programs Division  
ARNGD-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: Approval of the "Final FY 2015 Third Quarter Land Use Control Report at RVAPP-05 Winklepeck Burning Grounds at the Ravenna Army Ammunition Plant, Ravenna, Ohio," Dated October 30, 2015, Ohio EPA ID # 267-000859-029**

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 2015 Third Quarter Land Use Control Report at RVAAP-05 Winklepeck Burning Grounds at the Ravenna Army Ammunition Plant, Ravenna, Ohio,*" dated October 30, 2015. This document, received by Ohio EPA's NEDO on November 3, 2015, was prepared for the U.S. Army Corps of Engineers (USACE) Louisville District, by Vista Sciences Corporation.

Ohio EPA has reviewed this documentation and has found no significant deficiencies. As a result, the "*Final FY 2015 Third Quarter Land Use Control Report at RVAAP-05 Winklepeck Burning Grounds*" is approved.

If you have any questions or concerns, please do not hesitate to contact me at (330) 963-1249.

Sincerely,

A handwritten signature in black ink, appearing to read "Andrew C. Kocher".

Andrew C. Kocher, Site Coordinator  
Division of Environmental Response and Revitalization

ACK/nvr

cc: Gregory F. Moore, USACE, Louisville District  
Haney/Harris, Vista Sciences, Newton Falls  
Katie Tait/Kevin Sedlak, Camp Ravenna

ec: Bob Princic, NEDO, DERR  
Rod Beals, NEDO, DERR  
Justin Burke, CO, DERR



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

December 11, 2015

Mr. Mark Leeper, P.G., MBA  
Army National Guard Directorate  
Environmental Programs Division  
ARNGD-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: Approval of the "Draft FY 2015 Fourth Quarter Land Use Control Report at RVAPP-05 Winklepeck Burning Grounds at the Ravenna Army Ammunition Plant, Ravenna, Ohio," Dated September 30, 2015, Ohio EPA ID # 267-000859-029**

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 FY 2015 Fourth Quarter Land Use Control Report at RVAAP-05 Winklepeck Burning Grounds at the Ravenna Army Ammunition Plant, Ravenna, Ohio*," dated September 30, 2015. This document, received by Ohio EPA's NEDO on October 2, 2015, was prepared for the U.S. Army Corps of Engineers (USACE) Louisville District, by Vista Sciences Corporation.

Ohio EPA has reviewed this documentation and has found no significant deficiencies. As a result, the "*Draft FY 2015 Fourth Quarter Land Use Control Report at RVAAP-05 Winklepeck Burning Grounds*" is approved. Ohio EPA will be expecting the final document for review and approval.

If you have any questions or concerns, please do not hesitate to contact me at (330) 963-1249.

Sincerely,

Andrew C. Kocher, Site Coordinator  
Division of Environmental Response and Revitalization

ACK/nvr

cc: Gregory F. Moore, USACE, Louisville District  
Haney/Harris, Vista Sciences, Newton Falls  
Katie Tait/Kevin Sedlak, Camp Ravenna

ec: Bob Princic, NEDO, DERR  
Rod Beals, NEDO, DERR  
Justin Burke, CO, DERR





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

September 29, 2015

Mr. Mark Leeper, P.G., MBA  
Army National Guard Directorate  
Environmental Programs Division  
ARNGD-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: Approval of the "Final FY 2015 Second Quarter Land Use Control Report at RVAPP-05 Winklepeck Burning Grounds at the Ravenna Army Ammunition Plant, Ravenna, Ohio," Dated July 23, 2015, Ohio EPA ID # 267-000859-029**

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 2015 Second Quarter Land Use Control Report at RVAAP-05 Winklepeck Burning Grounds at the Ravenna Army Ammunition Plant, Ravenna, Ohio*," dated July 23, 2015. This document, received by Ohio EPA's NEDO on July 24, 2015, was prepared for the U.S. Army Corps of Engineers (USACE) Louisville District, by Vista Sciences Corporation.

Ohio EPA has reviewed this documentation and has found no significant deficiencies. As a result, the "*Final FY 2015 Second Quarter Land Use Control Report at RVAAP-05 Winklepeck Burning Grounds*" is approved.

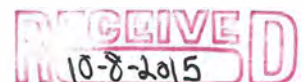
If you have any questions or concerns, please do not hesitate to contact me at (330) 963-1249.

Sincerely,

Andrew C. Kocher, Site Coordinator  
Division of Environmental Response and Revitalization

ACK/nvr

cc: Gregory F. Moore, USACE, Louisville District  
Haney/Harris, Vista Sciences, Newton Falls  
Katie Tait/Kevin Sedlak, Camp Ravenna  
ec: Bob Princic, NEDO, DERR  
Rod Beals, NEDO, DERR  
Justin Burke, CO, DERR





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

September 29, 2015

Mr. Mark Leeper, P.G., MBA  
Army National Guard Directorate  
Environmental Programs Division  
ARNGD-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: Approval of the "Draft FY 2015 Third Quarter Land Use Control Report at RVAPP-05 Winklepeck Burning Grounds at the Ravenna Army Ammunition Plant, Ravenna, Ohio," Dated July 20, 2015, Ohio EPA ID # 267-000859-029**

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 FY 2015 Third Quarter Land Use Control Report at RVAAP-05 Winklepeck Burning Grounds at the Ravenna Army Ammunition Plant, Ravenna, Ohio,*" dated July 20, 2015. This document, received by Ohio EPA's NEDO on July 22, 2015, was prepared for the U.S. Army Corps of Engineers (USACE) Louisville District, by Vista Sciences Corporation.

Ohio EPA has reviewed this documentation and has found no significant deficiencies. As a result, the "*Draft FY 2015 Third Quarter Land Use Control Report at RVAAP-05 Winklepeck Burning Grounds*" is approved. Ohio EPA will be expecting the final document for review and approval.

If you have any questions or concerns, please do not hesitate to contact me at (330) 963-1249.

Sincerely,

Andrew C. Kocher, Site Coordinator  
Division of Environmental Response and Revitalization

ACK/nvr

cc: Gregory F. Moore, USACE, Louisville District  
Haney/Harris, Vista Sciences, Newton Falls  
Katie Tait/Kevin Sedlak, Camp Ravenna  
ec: Bob Princic, NEDO, DERR  
Rod Beals, NEDO, DERR  
Justin Burke, CO, DERR







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

September 25, 2015

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

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

**Subject: Ohio EPA Approval of the Final Remedial Design for the Post-ROD Changes to the Remedy at RVAAP-05 (267-000-859-138) Winklepeck Burning Grounds Former Ravenna Army Ammunition Plant/Camp, Dated August 27, 2015.**

Dear Mr. Leeper:

The Ohio Environmental Protection Agency (Ohio EPA) approves the August 27, 2015 Final Remedial Design for the Post-ROD Changes to the Remedy at RVAAP-05 Winklepeck Burning Grounds. Since the July 2015 conditional approval letter was issued to you, Ohio EPA worked with U.S. Army Corp of Engineers Louisville District on final edits to the document. Comments and edits were provided to the US Army Corp, Louisville District via e-mail.

The e-mails that discuss and show these comments and edits are attached to this letter.

**Background:**

Ohio EPA, Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR) received and reviewed the draft Remedial Design for the Post-ROD Changes to the Remedy at RVAAP-05 Winklepeck Burning Grounds Former Ravenna Army Ammunition Plant/Camp, dated November 2014. This document was received by Ohio EPA, NEDO on November 19, 2014. The document was prepared by the U.S. Army Corps of Engineers (USACE) Louisville District.

Our review of this document was delayed, because Ohio EPA had to first review and approve the March 2015 Final Explanation of Significant Differences (ESD) for the Post ROD Changes to the Remedy at RVAAP-05 Winklepeck Burning Grounds before proceeding forward with completing the review on this Remedial Design document for



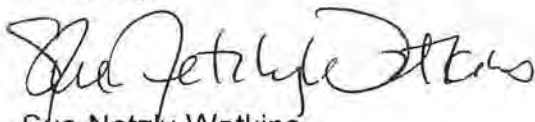


MR. MARK LEEPER  
ARMY NATION GUARD DIRECTORATE  
SEPTEMBER 25, 2015  
PAGE 2

the Winklepeck Burning Grounds. We had some comments on the Remedial Design document that we provided you in our July 2015 letter. We worked through these comments in e-mail correspondences provided to the U.S. Army Corp of Engineers, Louisville District.

Ohio EPA has no further comments regarding the Final Remedial Design for the Post-ROD Changes to the Remedy at Winklepeck Burning Grounds document. 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](mailto:susan.netzly-watkins@epa.ohio.gov).

Sincerely,



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

SN-W/nvr

Enclosure

cc: Kevin Sedlak, ARNG-ILE, Camp Ravenna  
Katie Tate, OHARNG, Camp Ravenna  
Gregory F. Moore, USACE, Louisville District

Nat Peters, USACE Louisville  
Gail Harris, Vista Sciences Corp

ec: Rod Beals, NEDO, DERR  
Brian Tucker, CO-DERR  
Frank Zingales, NEDO-DMWM

Justin Burke, CO-DERR  
Bob Princic, NEDO, DERR

As indicated in the preceding sections of this RD, excavated soils from the excavation areas will be processed for removal of MEC, stockpiled, and then sampled for subsequent off-site disposal. Approximately 1400 cubic yards is to be excavated from areas around Pads 38, 66, and 67. The COCs are TNT (in all three areas) and RDX (Pads 66/67). The soil from these pads will be stockpiled separately from the soil from Pads 61 and 61A, which had PAHs as the COC. The processed and stockpiled soil from Pads 38, 66, and 67 will be tested for hazardous waste characteristics at a rate of approximately one sample per each 70 cubic yards of stockpiled material. Each sample collected to represent a 70 cubic yard portion will be an ISM sample composed of at least 30 soil aliquots. *(\*Consider confirming with the lab that you have adequate material for the analysis.)*

The soil will be stockpiled, sampled, and analyzed in such a way that parent material represented by each ISM characterization sample can be identified for proper disposal after analysis. This approach will allow for distinguishing between 70-yd lots that are hazardous and non-hazardous, so that each can be properly disposed of. If a 70-yd lot is characterized as hazardous waste, the Army may direct the contractor to divide the pile and collect additional characterization samples in order to potentially reduce the amount of soil that would be disposed of as hazardous waste. The Army may also direct the contractor to increase the sampling frequency, if the analyses consistently approach or exceed screening levels for toxicity. *(For clarification: when you say screening levels – do you mean the “regulatory” level or were you considering screening to be the 20x’s rule?)*

Approximately 3900 cubic yards of soil is to be excavated from around Pads 61 and 61A, where the COCs are PAHs. The processed and stockpiled soil from Pads 61 and 61A will be tested for hazardous waste characteristics at a rate of approximately one sample per each 150 cubic yards of stockpiled material. Each sample collected to represent a 150 cubic yard portion will be an ISM sample composed of at least 60 soil aliquots. *(\*Consider confirming with the lab that you have adequate material for the analysis.)*

The soil will be stockpiled, sampled, and analyzed in such a way that parent material represented by each ISM characterization sample can be identified for proper disposal after analysis. This approach will allow for distinguishing between 150-yd lots that are hazardous and non-hazardous, so that each can be properly disposed of. If a 150-yd lot is characterized as hazardous waste, the Army may direct the contractor to divide the pile and collect additional characterization samples in order to potentially reduce the amount of soil that would be disposed of as hazardous waste. The Army may also direct the contractor to increase the sampling frequency, if the analyses consistently approach or exceed screening levels for toxicity. *(For clarification: when you say screening levels – do you mean the “regulatory” level or were you considering screening to be the 20x’s rule?)*

The soil to be disposed of is not a listed hazardous waste on the F, K, P, or U lists of specific waste streams from industrial or manufacturing processes or discarded commercial chemical products. Therefore it will be disposed of as non-hazardous solid waste if it does not exhibit any of the following four characteristics: ignitability, corrosivity, reactivity, or toxicity.

The soil to be disposed of will be tested for toxicity using methods consistent with the Toxicity Characteristic Leaching Procedure (TCLP) (Method 1311). Typically after the leaching procedure is performed the resulting extract is analyzed for specific metals, specific volatile organic compounds (VOCs), specific semi-volatile organic compounds (SVOCs), and specific herbicides and pesticides. Since neither VOCs nor pesticides/herbicides were identified as Chemicals of Concern at Winklepeck Burning Grounds, the TCLP extract will be analyzed only for the TCLP metals and SVOCs, based on generator

knowledge of the waste. If the land disposal facility requires additional testing of the TCLP extract, that required testing will be performed.

The soil to be disposed of is not a liquid, a compressed gas, or an oxidizer. The in situ soil to be disposed of contains a maximum of 0.5% by weight of TNT and 0.2% by weight of RDX, based on data collected during the site characterization. The soil also contains no free liquid, such as petroleum-based fuel, that is ignitable. Therefore, there is no evidence that it is capable, under standard temperature and pressure, of causing fire through friction, absorption of moisture or spontaneous chemical changes or, when ignited, it would burn so vigorously and persistently that it would create a hazard. Therefore, the soil to be disposed of will not be tested for ignitability, unless the land disposal facility requires that test. The soil is neither aqueous nor liquid; therefore, by definition it cannot be corrosive. The soil to be disposed of will not be tested for corrosivity, unless the land disposal facility requires that test. The soil to be disposed of does not exhibit any of the eight characteristics of reactivity listed in 40 CFR 261.23. While the soil may contain low levels of explosive compounds, the in situ soil to be disposed of contains a maximum of 0.5% by weight of TNT and 0.2% by weight of RDX, based on data collected during the site characterization. Typically a mixture of explosive compounds and soil is not considered to be an explosive mixture unless the concentration of explosive compounds is 10% or greater by weight. The in situ soil has a concentration of explosives much less than 10%; therefore, the soil to be disposed of will not be tested for reactivity, unless the land disposal facility requires that test.

The waste characterization samples will be taken directly from the accumulated stockpile. In addition to analyses listed above, the samples will be analyzed for any other analyses required by the disposal facility for proper disposal. After processing and sample collection, the soil stockpiles will be identified, labeled, and segregated until analytical laboratory results determine the stockpile disposition.

Analytical results and associated QA/QC information should support an Ohio EPA Tier I data validation. More information concerning this is available in Ohio EPA's Tier I Data Validation Manual available at <http://epa.ohio.gov/portals/32/pdf/TierIDVManual.pdf> In particular, see Section 1.1, pages 8 and 9 (pages attached for reference purposes).

The hazardous waste characterization data will be submitted to Ohio EPA for our review and comment prior to disposal. Ohio EPA will review this information quickly to allow for timely determination on waste characterization and disposal options. The materials that are not deemed to be hazardous wastes or UXO will be disposed at a licensed and permitted solid waste landfill.

Following the removal of the stockpiled materials, confirmation soil samples will be collected from the area where the soils were stockpiled to ensure the area meets the site wide cleanup goals.





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

July 27, 2015

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

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

**Subject:** Ohio EPA Conditional Approval and Clarification Comments on the Draft Remedial Design for the Post-ROD Changes to the Remedy at RVAAP-05 (267-000-859-138) Winklepeck Burning Grounds Former Ravenna Army Ammunition Plant/Camp, Dated November 2014.

Dear Mr. Leeper:

The Ohio Environmental Protection Agency (Ohio EPA) conditionally approves your responses to the Draft Remedial design for the Post ROD changes – RVAAP-05 Winklepeck Burning Grounds. We received your response to our June 2015 comments on July 8, 2015. We do have a clarification comment regarding characterization of materials in stockpiles, Comment # 2.

**Background:**

Ohio EPA, Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR) has received and reviewed the draft Remedial Design for the Post-ROD Changes to the Remedy at RVAAP-05 Winklepeck Burning Grounds Former Ravenna Army Ammunition Plant/Camp, dated November 2014. We had a few comments on that document.

This document was received by Ohio EPA, NEDO on November 19, 2014. The document was prepared by the U.S. Army Corps of Engineers (USACE) Louisville District. Our review of this document was delayed, because Ohio EPA had to first review and approve the March 2015 Final Explanation of Significant Differences (ESD) for the Post ROD Changes to the Remedy at RVAAP-05 Winklepeck Burning Grounds before proceeding forward with completing the review on this Remedial Design document for the Winklepeck Burning Grounds.

If you have any questions or concerns, please do not hesitate to contact me at (330) 963-1201. Your prompt responses and edits to these questions is appreciated.

### JUNE 2015 COMMENTS

- 1) Section 2.5.2 – Changes to the Land Use Controls (LUCs). Please use the same language regarding the changes to the LUCs. Use the language that was agreed on in the March 2015 Final ESD document.

**July 2015 response is adequate.**

- 2) Section 4.12.2 Excavated Soil Stockpile Sampling – Clarify parameters you will test for waste characterization.

**July 2015 response clarification requested.** Ohio EPA noted you are proposing one ISM sample for every 3,000 cubic yds. of stockpiled soil for waste characterization. Please make sure to confirm with the lab that you have collected enough sample material for the lab to conduct the testing outlined in your response.

I am not familiar with using ISM sampling to characterize a waste pile. Ohio EPA Materials and Waste Management staff recommend a twofold evaluation if you plan to use ISM. The in situ total soil constituent analysis results from the areas where soil removal activities will be conducted can be screened against the "20 time rule" to see if these materials could be hazardous.

#### US EPA's website guidance

##### *Total Constituent Analysis Instead of TCLP Analysis*

It is acceptable to perform a total constituent analysis instead of a TCLP analysis and then divide the total concentration by 20 to determine if a waste is non-hazardous, as is implied in Section 1.2 of Method 1311, TCLP.

Section 1.2 of the TCLP method does allow for a total constituent analysis in lieu of the TCLP extraction. If a waste is 100% solid, as defined by the TCLP method, then the results of the total constituent analysis may be divided by twenty to convert the total results into the maximum leachable concentration. This factor is derived from the 20:1 liquid-to-solid ratio employed in the TCLP. If a waste has filterable liquid, then the concentration of the analyte in each phase (liquid and solid) must be determined. The following equation may be used to calculate this value:



$$\frac{[A \times B] + [C \times D]}{20} = E$$

$$B + [20 (L/kg) \times D]$$

Where:

A = Concentration of the analyte in liquid portion of the sample (mg/L)

B = Volume of the liquid portion of the sample (L).

C = Concentration of the analyte in solid portion of the sample (mg/kg)

D = Weight of the solid portion of the sample (kg)

E = Maximum theoretical concentration in leachate (mg/L)

The value obtained (E) can be used to show that the maximum theoretical concentration in a leachate from the waste could not exceed the concentration specified in the toxicity characteristic (TC) (40 CFR 261.24).

In addition, if the total constituent analysis results themselves are below the TC limits without dividing by 20, then the same argument holds true, i.e., the maximum theoretical concentration in the leachate could not exceed the TC limits.

If the total result for an individual contaminant is less than 20 times the TCLP regulatory concentration for the corresponding hazardous waste toxic characteristic, the waste will not exceed the regulatory TCLP limit if the waste contains 100% solids. For a waste that contains 100% solids, as defined by the TCLP method, the results of the total constituent analysis may be divided by 20, to convert the total results into the maximum leachable concentration. This factor comes from the 20:1 liquid-to-solid ratio employed in the TCLP leaching procedure. For example, if the lead total analysis of a waste was 80 ppm, it would not fail the TCLP value of 5 mg/l for lead since it is less than 20 times the regulatory TCLP level (5.0 mg/l X 20 = 100). However, if the total lead sample yields a result of 180 ppm, the result would exceed the screening value (180 ppm > 100). Therefore, the waste could be a characteristic hazardous waste for lead.

In summary, more ISM samples may be warranted from stockpiles created from the removal areas where the in situ material did not pass the 20x's screening test. This may help you to better segregate what materials may need to be managed as a hazardous waste vs. a solid waste.

An alternative to the screening in situ data + ISM sample proposal is for you to follow the guidance found on U.S. EPA's website regarding the assessment of waste piles: [http://www.epa.gov/osw/hazard/testmethods/sw846/samp\\_guid.htm](http://www.epa.gov/osw/hazard/testmethods/sw846/samp_guid.htm).

- 3) Section 4.13.1.1 Stockpiling at the Site – Please clarify where the stockpiled soils will be located. This section notes that a conveyor separator system will be used. Is there a figure or illustration of the conveyor separator system and where it will be located? Is the conveyor and central processing area within the Winklepeck AOC?

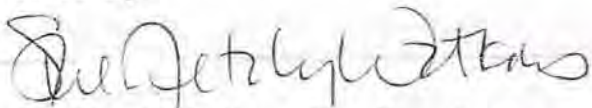
**July 2015 response is adequate.** Ohio EPA reminds you to keep all of the stockpiling activities within the confines of the Winklepeck AOC. We do not want you to inadvertently create a waste pile should sample results indicate the materials in the stockpile are hazardous.

- 4) Section 4.16 Weekly/Monthly Progress Reports and Attachment 1 Spill/Release Response Actions – Would spills/releases as well as rain events that cause stockpiles soils to erode outside the confinement area would these issues be identified in weekly/monthly progress reports?

**July 2015 response is adequate.** With regard to your additional proposed changes that were proposed by your MMRP Design Center at USACE Baltimore District; we defer to your experts on recommending the necessary safety steps required to manage the potential hazards posed by MEC.

We request that the reports include the details on the final disposition of these materials currently located at WBG. Please let us know if a temporary magazine will be used on WBG. If another earth-covered magazine is designated, please include the location of the magazine used in the reports.

Sincerely,



Sue Netzly-Watkins, Site Coordinator  
Division of Environmental Response and Revitalization

SN-W/nvr

cc: Kevin Sedlak, ARNG-ILE, Camp Ravenna  
Katie Tate, OHARNG, Camp Ravenna  
Gregory F. Moore, USACE, Louisville District  
ec: Rod Beals, NEDO, DERR  
Brian Tucker, CO-DERR  
Frank Zingales, NEDO-DMWM

Nat Peters, USACE Louisville  
Gail Harris, Vista Sciences Corp

Justin Burke, CO-DERR  
Bob Princic, NEDO, DERR





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

July 16, 2015

Mr. Mark Leeper, P.G., MBA  
Army National Guard Directorate  
Environmental Programs Division  
ARNGD-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: Approval of the "Draft FY 2015 Second Quarter Land Use Control Report at RVAPP-05 Winklepeck Burning Grounds at the Ravenna Army Ammunition Plant, Ravenna, Ohio," Dated May 27, 2015, Ohio EPA ID # 267-000859-029**

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 FY 2015 Second Quarter Land Use Control Report at RVAAP-05 Winklepeck Burning Grounds at the Ravenna Army Ammunition Plant, Ravenna, Ohio,*" dated May 27, 2015. This document, received by Ohio EPA's NEDO on May 28, 2015, was prepared for the U.S. Army Corps of Engineers (USACE) Louisville District, by Vista Sciences Corporation.

Ohio EPA has reviewed this documentation and has found no significant deficiencies. As a result, the "*Draft FY 2015 Second Quarter Land Use Control Report at RVAAP-05 Winklepeck Burning Grounds*" is approved. Ohio EPA will be expecting the final document for review and approval.

If you have any questions or concerns, please do not hesitate to contact me at (330) 963-1249.

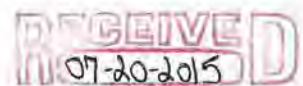
Sincerely,

Andrew C. Kocher, Site Coordinator  
Division of Environmental Response and Revitalization

ACK/nvr

cc: Gregory F. Moore, USACE, Louisville District  
Haney/Harris, Vista Sciences, Newton Falls  
Katie Tait/Kevin Sedlak, Camp Ravenna

ec: Bob Princic, NEDO, DERR  
Rod Beals, NEDO, DERR  
Justin Burke, CO, DERR





June 26, 2015

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

Subject: Response to Ohio EPA Comments, dated June 4, 2015 on  
the Draft Remedial Design for the Post-ROD Changes to the Remedy at RVAAP-05,  
Winklepeck Burning Grounds, Former Ravenna Army Ammunition  
Plant/Camp Ravenna, Portage and Trumbull Counties, Ohio  
(Ohio EPA Work Activity No. 267-000859-138)

Dear Ms. Netzly-Watkins,

The Army has received and evaluated your comments on the Draft Remedial Design for Winklepeck Burning Grounds (RVAAP-05). We appreciate your comments as we work together to complete this important project. In the following paragraphs, we have restated your comments and provided responses and proposed revised text.

Ohio EPA Comment #1: Section 2.5 .2 - Changes to the LUCs. Please use the same language regarding the changes to the LUCs. Use the language that was agreed on in the March 2015 Final ESD document.

Army Response: Concur. Section 2.5.2 will be revised to state:

"The ESD (USACE, 2014a) and the current facility Property Management Plan (PMP) (USACE, 2012b) documents the previous LUCs. The remedy described in the ESD replaces the previous LUCs with the following two, which are more applicable considering the planned soil removal to achieve commercial/industrial use.

- the AOC cannot be used for Unrestricted (Residential) Land Use unless or until additional evaluation shows that risk levels resulting from residual contamination have been reduced to levels acceptable for Residential Land Use and any residual MEC hazards have been removed and
- Groundwater use or extraction of groundwater located at or underlying the WBG AOC or any portion thereof is prohibited, except for the following:
  - The installation, development, purging, and sampling of new or existing monitoring wells in accordance with the most recent Facility-Wide Sampling and Analysis Plan (FWSAP) as part of the AOC-specific IRP, the Facility-Wide Ground Water Monitoring Program Plan (FGWMPP), or the Facility-Wide Groundwater Remedial Investigation.
  - The modification of existing monitoring wells, if necessary, to allow for construction on the range.
  - The abandonment and replacement of monitoring wells damaged by activities or removed for construction, and abandonment of wells no longer utilized as part of IRP or FGWMPP activities, in accordance with Ohio EPA guidance, the most recent FWSAP, and applicable Ohio Administrative Code requirements."

Subject: Response to Ohio EPA Comments, dated June 4, 2015 on the Draft Remedial Design for the Post-ROD Changes to the Remedy at RVAAP-05, Winklepeck Burning Grounds, Former Ravenna Army Ammunition Plant/Camp Ravenna, Portage and Trumbull Counties, Ohio (Ohio EPA Work Activity No. 267-000859-138)

Ohio EPA Comment #2: Section 4.12.2 - Excavated Soil Stockpile Sampling - Clarify parameters you will test for waste characterization.

Army Response: Concur. Section 4.12.2 will be revised to state:

"As indicated in the preceding sections of this RD, excavated soils from the excavation areas will be processed for removal of MEC, stockpiled, and then sampled for subsequent off-site disposal. One ISM soil sample will be collected for every 3,000 cubic yards of stockpiled soil for waste characterization purposes. Each stockpile soil sample will be composed of approximately 30 sample locations throughout the stockpile after the soil has been processed through the conveyor sifting operation and MEC has been removed. The samples will be taken directly from the accumulated stockpile. The samples will be collected and analyzed for Toxicity Characteristic Leaching Procedure (TCLP) explosives, TCLP SVOCs, corrosivity (pH), flashpoint and any other analyses required by the disposal facility for proper disposal. After processing and sample collection, the soil stockpiles will be identified, labeled, and segregated until analytical laboratory results determine the stockpile disposition."

Ohio EPA Comment #3: Section 4.13.1.1 - Stockpiling at the Site - Please clarify where the stockpiled soils will be located. This section notes that a conveyor separator system will be used. Is there a figure or illustration of the conveyor separator system and where it will be located? Is the conveyor and central processing area within the Winklepeck AOC?

Army Response: The conveyor/separator for screening MEC from the excavated soil will be located within the boundaries of what has been designated as the Winklepeck Burning Grounds Area of Concern (WBG AOC). The soil processed through this system will also be stockpiled within the WBG AOC while awaiting disposal. The Army anticipates that the soil processing and stockpiling will occur near the west end of the AOC and just south of the Mark 19 firing line, in order to minimize impact on the operation of the Mark 19 Range. The Army requests that the precise location remain open until the removal contract is awarded. This will allow the selected contractor to coordinate with the Ohio ARNG in order to locate their equipment in a way that will maximize efficiency while minimizing impact on the range operations. In any event, the final location will be within the WBG AOC.

The following revision to the first paragraph of Section 4.13.1.1 is proposed:

"Excavated soils to be stockpiled will be stored within the WBG AOC temporarily before being transported to an approved disposal facility. It is anticipated that excavated soils to be stockpiled will be dry and will not require management of discharge water following placement in stockpiles. The stockpile(s) will be located at the end of the conveyor separator system in the same area as the approved central processing area, also within the WBG AOC. At the end of each day, the stockpile(s) will be covered with a minimum 6-mil polyethylene liner and secured to prevent wind damage to the cover and stockpile."

Ohio EPA Comment #4: Section 4.16 - Weekly/Monthly Progress Reports and Attachment 1 Spill/Release Response Actions - Would spills/releases, as well as rain events that cause stockpile soils to erode outside the confinement area, be issues identified in weekly/monthly progress reports?

Army Response: The weekly/monthly reports should include all activities that the contractor performs.



Subject: Response to Ohio EPA Comments, dated June 4, 2015 on the Draft Remedial Design for the Post-ROD Changes to the Remedy at RVAAP-05, Winklepeck Burning Grounds, Former Ravenna Army Ammunition Plant/Camp Ravenna, Portage and Trumbull Counties, Ohio (Ohio EPA Work Activity No. 267-000859-138)

The Army proposes the following revision to Section 4.16 to ensure that the contractor understands that the progress reports will include these important activities: "The Contractor will prepare and submit electronic copies of the weekly and monthly reports to OHARNG (Camp Ravenna), ARNG, USACE, and Ohio EPA. These progress reports will document the project activities conducted by the Contractor in its performance of the project tasks. These reports shall include all inspection activities, including those required for storm water in Section 6.5 of this RD, and spill/release reports and response actions. The monthly reports will be submitted for receipt by the addressee by the fifth of each month."

In addition to the changes proposed above, the Army proposes some minor revisions in response to review comments received from our MMRP Design Center at the USACE Baltimore District. We appreciate your consideration of these proposed revisions, anticipating that they do not have a substantive impact on your original review, as they are confined to MEC-handling issues.

USACE has determined that the selected remediation contractor will not prepare the Explosives Safety Submittal (ESS) for the work at WBG. The ESS will be prepared by our MMRP Design Center, at the USACE Baltimore District. After the contractor is selected, they will be allowed to work with Baltimore District to implement any revisions to the ESS that may be appropriate for their specific processing equipment. The RD will be revised to consistently reflect, throughout the document, that Baltimore District will prepare the ESS.

Section 3.10 will be revised to state "The UXO/MEC Site Manager will serve as the UXOSO."

The second paragraph of Section 4.2.9 will be revised as follows:

"All recovered MEC and suspect items, which are deemed safe to move, will be documented and stored for subsequent demolition and disposal. Storage will occur either in a temporary magazine on WBG or in an earth-covered magazine designated by the OHARNG, if allowed by the approved ESS. The subsequent demolition will be part of this RA and will occur on site at WBG or at Open Demolition Area #2 (ODA2). Onsite storage and demolition must be in accordance with an approved ESS prepared by the USACE Baltimore District. The contractor shall provide a schedule for disposal activities once MEC items are recovered. UXO items cannot be moved from the AOC without approval of the applicable Explosive Ordnance Disposal (EOD) agency or the Baltimore District MMRP Design Center. Procedures for using ODA2 are described in the DFFO and the Camp Ravenna Integrated Contingency Plan (ICP) (OHARNG, 2014). See Section 4.6 of this RD for details."

Section 4.8 will be revised as follows:

"The title is changed to "4.8 Inspection/Certification of Materials Presenting a Potential Explosive Hazard (MPPEH)"

The first sentence of Section 4.8 is revised to "This section provides the general procedures to be followed for the Army to certify and dispose of MPPEH, Munitions Debris (MD), and scrap metal."

Subject: Response to Ohio EPA Comments, dated June 4, 2015 on the Draft Remedial Design for the Post-ROD Changes to the Remedy at RVAAP-05, Winklepeck Burning Grounds, Former Ravenna Army Ammunition Plant/Camp Ravenna, Portage and Trumbull Counties, Ohio  
(Ohio EPA Work Activity No. 267-000859-138)

The paragraph titled Step 4 is revised as follows: "Step 4. The UXOSO will ensure that MPPEH items are inspected/certified in accordance with the provisions outlined in DoDM 6055.9M and DoDI 4140.62, and that all procedures are being performed safely."

Section 4.9 will be revised as follows: "MD and scrap metal will be disposed of by recycling. The Contractor will document the transport and transfer of the MD and scrap metal using proper chain-of-custody procedures."

Section 4.10 will be revised as follows: "The contractor shall prepare a work plan for explosives management. The work plan will be reviewed and approved by the Baltimore District MMRP Design Center."

Section 4.11 will be revised as follows: "The procedures for explosives sifting will be contained in the contractor's work plan."

Thank you for your consideration of our responses and proposed revisions. If these responses are acceptable, the Army will prepare the Final Remedial Design document and submit the appropriate electronic and hard copies.

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

Sincerely,



Mark S. Leeper  
RVAAP Restoration Program Manager  
Army National Guard Directorate

cc: Bob Princic, Ohio EPA, DERR-NEDO  
Rod Beals, Ohio EPA, DERR-NEDO  
Kevin Sedlak, ARNG-ILE, Camp Ravenna  
Katie Tait, OHARNG, Camp Ravenna  
Greg Moore, USACE Louisville  
Nat Peters, USACE Louisville  
Gail Harris, Vista Sciences Corporation  
REIMS - attn. Pat Ryan, Leidos



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

June 4, 2015

Re: US Army Ravenna Ammunition Plt RVAAP  
DFFO

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

Correspondence

Remedial Response

Portage County

267000859138

Re: Ohio EPA Comments on the Draft Remedial Design for the Post-ROD Changes to the Remedy at RVAAP-05 (267-000-859-138) Winklepeck Burning Grounds Former Ravenna Army Ammunition Plant/Camp, Dated November 2014.

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 draft Remedial Design for the Post-ROD Changes to the Remedy at RVAAP-05 Winklepeck Burning Grounds Former Ravenna Army Ammunition Plant/Camp, dated November 2014. We have a few comments on the document.

#### COMMENTS

- 1) Section 2.5.2 - Changes to the LUCs. Please use the same language regarding the changes to the LUCs. Use the language that was agreed on in the March 2015 Final ESD document.
- 2) Section 4.12.2 - Excavated Soil Stockpile Sampling – Clarify parameters you will test for waste characterization.
- 3) Section 4.13.1.1 - Stockpiling at the Site – Please clarify where the stockpiled soils will be located. This section notes that a conveyor separator system will be used. Is there a figure or illustration of the conveyor separator system and where it will be located? Is the conveyor and central processing area within the Winklepeck AOC?

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06-10-2015

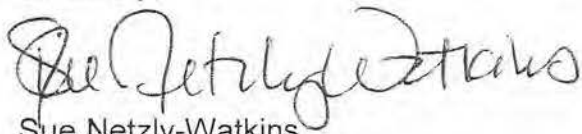
MR. MARK LEEPER  
Ohio EPA Comments on RVAAP RD CHANGES WINKLEPECK  
June 1, 2015  
PAGE 2

- 4) Section 4.16 - Weekly/Monthly Progress Reports and Attachment 1 Spill/Release Response Actions – Would spills/releases as well as rain events that cause stockpiles soils to erode outside the confinement area issues identified in weekly/monthly progress reports?

The draft Remedial Design for the Post-ROD Changes to the Remedy at RVAAP-05 Winklepeck Burning Grounds Former Ravenna Army Ammunition Plant/Camp was received by Ohio EPA's NEDO on November 19, 2014, was prepared by the U.S. Army Corps of Engineers (USACE) Louisville District. Our review of this document was delayed because Ohio EPA had to first review and approve the March 2015 Final Explanation of Significant Differences (ESD) for the Post ROD Changes to the Remedy at RVAAP-05 Winklepeck Burning Grounds before proceeding forward with completing the review and comments on the Remedial Design document. The ESD approval was granted on May 20, 2015.

If you have any questions or concerns, please do not hesitate to contact me at (330) 963-1201. Your prompt responses and edits to these questions is appreciated.

Sincerely,



Sue Netzly-Watkins  
Site Coordinator  
Division of Environmental Response and Revitalization

SN-W/nvr

cc: Kevin Sedlak, ARNG-ILE, Camp Ravenna  
Katie Tait, OHARNG, Camp Ravenna  
Nat Peters, USACE Louisville  
Gail Harris, Vista Sciences Corp  
Gregory F. Moore, USACE, Louisville District

ec: Rod Beals, Ohio EPA, NEDO, DERR  
Justin Burke, Ohio EPA, CO-DERR  
Brian Tucker, Ohio EPA, CO-DERR





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

June 3, 2015

Mr. Mark Leeper, P.G., MBA  
Army National Guard Directorate  
Environmental Programs Division  
ARNGD-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:** Approval of the "Final FY 2015 First Quarter Report for the Quarterly Land Use Control Inspections at RVAPP-05 Winklepeck Burning Grounds at the Ravenna Army Ammunition Plant, Ravenna, Ohio," Dated April 3, 2015, Ohio EPA ID # 267-000859-029

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 2015 First Quarter Report for the Quarterly Land Use Control Inspections at RVAAP-05 Winklepeck Burning Grounds at the Ravenna Army Ammunition Plant, Ravenna, Ohio,*" dated April 3, 2015. This document, received by Ohio EPA's NEDO on April 6, 2015, was prepared for the U.S. Army Corps of Engineers (USACE) Louisville District, by Vista Sciences Corporation.

Ohio EPA has reviewed this documentation and has found no significant deficiencies. As a result, the "*Final FY 2015 First Quarter Report for the Quarterly Land Use Control Inspections at RVAAP-05 Winklepeck Burning Grounds*" is approved.

If you have any questions or concerns, please do not hesitate to contact me at (330) 963-1249.

Sincerely,

Andrew C. Kocher, Site Coordinator  
Division of Environmental Response and Revitalization

ACK/nvr

cc: Gregory F. Moore, USACE, Louisville District  
Haney/Harris, Vista Sciences, Newton Falls  
Katie Tait/Kevin Sedlak, Camp Ravenna  
ec: Rod Beals, NEDO, DERR  
Bob Princic, NEDO, DERR  
Justin Burke, CO, DERR

RECEIVED  
06-08-2015



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

**MAY 20 2015**

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

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

**Subject: Approval for the "Final Explanation of Significant Differences for Post – ROD Changes to the Remedy at RVAAP-05, Winklepeck Burning Grounds (267-000859-138), Former Ravenna Army Ammunition Plant/Camp Ravenna, Dated March 26, 2015.**

Dear Mr. Leeper:

The Ohio Environmental Protection Agency (Ohio EPA), Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR) has received, reviewed, and approved "Final Explanation of Significant Differences for Post – ROD Changes to the Remedy at RVAAP-05, Winklepeck Burning Grounds, Former Ravenna Army Ammunition Plant/Camp Ravenna", dated March 26, 2015.

This document received by Ohio EPA's NEDO on March 30, 2015, was prepared by the U.S. Army Corps of Engineers (USACE) Louisville District. If you have any questions or concerns, please do not hesitate to contact me at (330) 963-1201.

Sincerely,

Pete Whitehouse  
Chief  
Division of Environmental Response and Revitalization

cc: Kevin Sedlack, ARNG-ILE, Camp Ravenna  
Nat Peters, USACE Louisville  
Gregory F. Moore, USACE, Louisville District

Katie Tate, OHARNG, Camp Ravenna  
Gail Harris, Vista Sciences Corp

ec: Rod Beals, Ohio EPA, NEDO, DERR  
Brian Tucker, Ohio EPA, CO-DERR

Justin Burke, Ohio EPA, CO-DERR







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

March 17, 2015

Mr. Mark Leeper, P.G., MBA  
Army National Guard Directorate  
Environmental Programs Division  
ARNGD-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  
267000859

**Subject: Approval of the "Draft FY 2015 First Quarter Land Use Control Report at RVAPP-05 Winklepeck Burning Grounds at the Ravenna Army Ammunition Plant, Ravenna, Ohio," Dated February 6, 2015, Ohio EPA ID # 267-000859-029**

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 FY 2015 First Quarter Land Use Control Report at RVAAP-05 Winklepeck Burning Grounds at the Ravenna Army Ammunition Plant, Ravenna, Ohio,*" dated February 6, 2015. This document, received by Ohio EPA's NEDO on February 7, 2015, was prepared for the U.S. Army Corps of Engineers (USACE) Louisville District, by Vista Sciences Corporation.

Ohio EPA has reviewed this documentation and has found no significant deficiencies. As a result, the "*Draft FY 2015 First Quarter Land Use Control Report at RVAAP-05 Winklepeck Burning Grounds*" is approved. Ohio EPA will be expecting the final document for review and approval.

If you have any questions or concerns, please do not hesitate to contact me at (330) 963-1249.

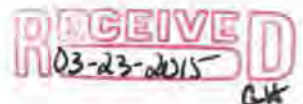
Sincerely,

Andrew C. Kocher, Site Coordinator  
Division of Environmental Response and Revitalization

ACK/nvr

cc: Gregory F. Moore, USACE, Louisville District  
Haney/Harris, Vista Sciences, Newton Falls  
Katie Tait/Kevin Sedlak, Camp Ravenna

ec: Rod Beals, NEDO, DERR  
Justin Burke, CO, DERR





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

March 17, 2015

Mr. Mark Leeper, P.G., MBA  
Army National Guard Directorate  
Environmental Programs Division  
ARNGD-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  
267000859

**Subject:** Approval of the "Final FY 2014 Annual Report for the Quarterly Land Use Control Inspections at RVAPP-05 Winklepeck Burning Grounds at the Ravenna Army Ammunition Plant, Ravenna, Ohio," Dated January 8, 2015, Ohio EPA ID # 267-000859-029

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 2014 Annual Report for the Quarterly Land Use Control Inspections at RVAAP-05 Winklepeck Burning Grounds at the Ravenna Army Ammunition Plant, Ravenna, Ohio*," dated January 8, 2015. This document, received by Ohio EPA's NEDO on January 13, 2015, was prepared for the U.S. Army Corps of Engineers (USACE) Louisville District, by Vista Sciences Corporation.

Ohio EPA has reviewed this documentation and has found no significant deficiencies. As a result, the "*Final FY 2014 Annual Report for the Quarterly Land Use Control Inspections at RVAAP-05 Winklepeck Burning Grounds*" is approved.

If you have any questions or concerns, please do not hesitate to contact me at (330) 963-1249.

Sincerely,

Andrew C. Kocher, Site Coordinator  
Division of Environmental Response and Revitalization

ACK/nvr

cc: Gregory F. Moore, USACE, Louisville District  
Haney/Harris, Vista Sciences, Newton Falls  
Katie Tait/Kevin Sedlak, Camp Ravenna

ec: Rod Beals, NEDO, DERR  
Justin Burke, CO, DERR





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

January 27, 2015

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

Subject: Revised Response to Ohio EPA Comments for  
Draft Explanation of Significant Differences (ESD) for  
Post-ROD Changes to the Remedy at RVAAP-05,  
Winklepeck Burning Grounds, Former Ravenna Army Ammunition  
Plant/Camp Ravenna, Portage and Trumbull Counties, Ohio (Ohio EPA  
Work Activity No. 267-000859-138)

Dear Ms. Netzly-Watkins,

The Army received your comment letter on the Draft ESD for Winklepeck Burning Grounds on October 28, 2014. We reviewed your comments and offered a response on November 25, 2014. Based on subsequent correspondence with your agency, the following revised responses are provided.

1) **Ohio EPA:** Add a key to Figure 1-3 to clarify what the blue image is on the map and if the red line represents the Winklepeck boundary.

**Army Response:** Figure 1-3 is a copy of a survey prepared by a licensed land surveyor. The Army would prefer not to do anything that might appear to be an addition to the surveyor's map. The Army suggests that a note be added after the figure title. The revised figure caption would read as follows:

FIGURE 1-3. Map of Winklepeck Burning Grounds, Camp Ravenna. (Note: The red line represents the boundary of Winklepeck Burning Grounds and the blue lines represent the range fan of the existing Mark-19 Firing Range.)

2) **Ohio EPA:** Page 14 Section 4.6 indicates the soil will be remedied to industrial standards and the AOC will continue to be used and controlled as an Operational Range. The noted cleanup standard is referenced as being commercial/industrial land use in Sections 3 and 4.1 Clarify the land use cleanup standard for Winklepeck.

**Response:** The approved Technical Memorandum for Land Use and Risk Assessment added a third Land Use for Camp Ravenna called Commercial/Industrial Land Use. To achieve this Land Use, the land must meet the U.S. EPA's Industrial Regional Screening Levels (RSLs) at the remediation level (cancer risk  $1 \times 10^{-5}$  and/or Hazard Quotient (HQ) of 1). The RI/FS Supplement for Winklepeck Burning Grounds used the May 2013 Industrial RSLs to determine the area that should be remediated to achieve the Commercial/Industrial Land Use. The risk assessment calculations supporting the RI/FS Supplement verified that meeting the Industrial RSL for each contaminant of concern also ensured that the site-wide risk meets the  $1 \times 10^{-5}$  cumulative excess lifetime cancer risk and the non-cancer hazards meet an HI of 1.

Subject: Revised Response to Ohio EPA Comments for Draft Explanation of Significant Differences (ESD) for Post-ROD Changes to the Remedy at RVAAP-05, Winklepeck Burning Grounds, Former Ravenna Army Ammunition Plant/Camp Ravenna, Portage and Trumbull Counties, Ohio

The Army proposes the following changes to the ESD document to clarify the cleanup standard.

In the proposed revision, the passage in the third paragraph of Section 3, which begins "Details of the nature and extent," would be rewritten as follows:

"Details of the nature and extent of the residual contamination were used to assess potential risks to the full-time occupational exposure receptor by using the U.S. Environmental Protection Agency's (USEPA's) Industrial Regional Screening Levels (RSLs) (May 2013) at the remediation level (cancer risk  $1 \times 10^{-5}$  or Hazard Quotient (HQ) of 1, whichever is lower). In the RI/FS Supplement, risks were evaluated to the maximum depth that the chemical contamination occurred, optimizing the depth of soils that receptors can access. The risk assessment calculations described in the RI/FS Supplement verified that meeting the Industrial RSL for each contaminant of concern would also ensure that the site-wide risk meets the  $1 \times 10^{-5}$  cumulative excess lifetime cancer risk and the non-cancer hazards meet an HI of 1."

In the proposed revision, the last sentence of section 4.1 would be rewritten as follows:

The RI/FS Supplement (USACE, 2014) demonstrates that, with some limited additional soil removal, the site-wide risk can meet the  $1 \times 10^{-5}$  cumulative excess lifetime cancer risk and the non-cancer hazards can meet an HI of 1; thereby meeting the requirements of Commercial/Industrial Land Use and allowing for safe use by full-time military workers.

In the proposed revision to the ESD, the last sentence of the first paragraph of 4.6 would be revised to say:

The Army considers this to be a reasonable approach given that, the chemical contamination in the soil will be remedied to meet the  $1 \times 10^{-5}$  cumulative excess lifetime cancer risk and the non-cancer HI of 1, and the AOC will continue to be used and controlled as an Operational Range.

In addition to the responses included in this letter, the Army is also providing an electronic version of the revised document for your review. Thank you for your review of our responses. If these proposed revisions are acceptable, the document will be finalized and appropriate copies provided.

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

Sincerely,

A handwritten signature in black ink, appearing to read 'M. Leeper', with a stylized flourish at the end.

Mark S. Leeper  
RVAAP Restoration Program Manager  
Army National Guard Directorate

Subject: Revised Response to Ohio EPA Comments for Draft Explanation of Significant Differences (ESD) for Post-ROD Changes to the Remedy at RVAAP-05, Winklepeck Burning Grounds, Former Ravenna Army Ammunition Plant/Camp Ravenna, Portage and Trumbull Counties, Ohio

No enclosures (revised document to be submitted via email)

cc: Rod Beals, Ohio EPA, DERR-NEDO  
Kevin Sedlak, ARNG-ILE, Camp Ravenna  
Katie Tait, OHARNG, Camp Ravenna  
Greg Moore, USACE Louisville  
Nat Peters, USACE Louisville  
Gail Harris, Vista Sciences Corporation  
REIMS - attn. Pat Ryan, Leidos



**NATIONAL GUARD BUREAU**

111 SOUTH GEORGE MASON DRIVE  
ARLINGTON VA 22204-1373

January 12, 2015

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

Subject: Ravenna Army Ammunition Plant Restoration Program  
FINAL FY 2013 Annual Report for the Land Use Control Inspections at the  
RVAAP-05 Winklepeck Burning Grounds  
Camp Ravenna, Portage/Trumbull Counties, Ohio

Dear Mr. Kocher:

Enclosed for your review is one (1) hard copy and three (3) electronic copies of the Final *FY 2014 Annual Report for the Land Use Control Inspections at the RVAAP-05 Winklepeck Burning Grounds*. This report was prepared in support of the Environmental Support Services project at the Winklepeck Burning Grounds of 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 Vista Sciences Corporation under Contract No. W912QR-13C-0031.

Please contact the undersigned at (703) 607-7955 or [Mark.S.Leeper.civ@mail.mil](mailto:Mark.S.Leeper.civ@mail.mil) if there are issues or concerns with this submission.

Sincerely,

A handwritten signature in black ink, appearing to read "Mark S. Leeper", is located below the "Sincerely," text.

Mark S Leeper  
RVAAP Restoration Program Manager  
Army National Guard Directorate

cc: Justin Burke, Ohio EPA, DERR (one [1] electronic copy)  
Quyet C. La, USACE – Louisville (one [1] electronic copy)  
Gail Harris, Vista Science Corp. (two [2] electronic copies, two [2] hard copies)





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

January 5, 2015

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

Re: US Army Ravenna Ammunition Plt RVAAP  
DFFO  
Correspondence  
Remedial Response  
Portage County  
267000859

**Subject: Winklepeck Burning Ground Final RI/FS Study Supplement for the  
RVAAP-05; Ohio EPA ID # 267-000859059-138**

Dear Mr. Leeper:

The Ohio Environmental Protection Agency (Ohio EPA) received a letter from the Army Team dated December 23, 2014, that provided a response to comments to our December 1, 2014, letter, regarding the Final RI/FS Study Supplement for RVAAP-05 Winklepeck Burning Grounds.

Ohio EPA's comments were addressed in your December 23<sup>rd</sup> letter. Ohio EPA has no further comments regarding the Final RI/FS Supplemental work plan.

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](mailto:susan.netzly-watkins@epa.ohio.gov).

Sincerely,

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

SN-W

cc: Katie Tait, OHARNG RTLS  
Kevin Sedlak, ARNG  
Mark Nichter, USACE

Rebecca Haney/Gail Harris, Vista Sciences  
Gregory F. Moore, USACE

ec: Ohio EPA, VAP File, CO, DERR at:  
Nancy Zikmanis, DERR, NEDO  
Rod Beals, DERR, NEDO

[records@epa.ohio.gov](mailto:records@epa.ohio.gov)  
Justin Burke, DERR, CO  
Kevin Palombo, DERR, NEDO

**E-MAILED**  
01-09-2015 PM 4:11

**Scanned**

By: *AMH*  
Date: 01-09-2015

Northeast District Office • 2110 East Aurora Road • Twinsburg, OH 44087-1924  
[www.epa.ohio.gov](http://www.epa.ohio.gov) • (330) 963-1200 • (330) 487-0769 (fax)

**RECEIVED**  
01-09-2015



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

June 16, 2015

Mr. Mark Leeper, P.G., MBA  
Army National Guard Directorate  
Environmental Programs Division  
ARNGD-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  
267000859188

**Subject: Approval of the "Final Remedial Action Report for Soil, Sediment, and Surface Water at RVAPP-013 Building 1200 at the Ravenna Army Ammunition Plant, Ravenna, Ohio," Dated May 14, 2015, Ohio EPA ID # 267-000859-188**

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 Remedial Action Report for Soil, Sediment, and Surface Water at RVAPP-013 Building 1200 at the Ravenna Army Ammunition Plant, Ravenna, Ohio,"* dated May 14, 2015. This document, received by Ohio EPA's NEDO on May 15, 2015, was prepared for the U.S. Army Corps of Engineers (USACE) Louisville District, by Leidos Engineering of Ohio, Inc.

Ohio EPA has reviewed this documentation and has found no significant deficiencies. As a result, the *"Final Remedial Action Report for Soil, Sediment, and Surface Water at RVAPP-013 Building 1200"* is approved.

If you have any questions or concerns, please do not hesitate to contact me at (330) 963-1249.

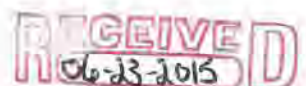
Sincerely,

Andrew C. Kocher  
Site Coordinator  
Division of Environmental Response and Revitalization

ACK/nvr

cc: Gregory F. Moore, USACE, Louisville District  
Haney/Harris, Vista Sciences, Newton Falls  
Katie Tait/Kevin Sedlak, Camp Ravenna

ec: Rod Beals, NEDO, DERR  
Bob Princic, NEDO, DERR  
Justin Burke, CO, DERR







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

March 4, 2015

Mr. Mark Leeper, P.G., MBA  
Army National Guard Directorate  
Environmental Programs Division  
ARNGD-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  
267000859188

**Subject: Approval of the "Draft Remedial Action Report for Soil, Sediment, and Surface Water at RVAPP-013 Building 1200 at the Ravenna Army Ammunition Plant, Ravenna, Ohio," Dated March 17, 2015, Ohio EPA ID # 267-000859-188**

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 Remedial Action Report for Soil, Sediment, and Surface Water at RVAPP-013 Building 1200 at the Ravenna Army Ammunition Plant, Ravenna, Ohio,"* dated March 17, 2015. This document, received by Ohio EPA's NEDO on March 18, 2015, was prepared for the U.S. Army Corps of Engineers (USACE) Louisville District, by Leidos Engineering of Ohio, Inc.

Ohio EPA has reviewed this documentation and has found no significant deficiencies. As a result, the *"Draft Remedial Action Report for Soil, Sediment, and Surface Water at RVAPP-013 Building 1200"* is approved. Ohio EPA will be expecting the final document for review and approval.

If you have any questions or concerns, please do not hesitate to contact me at (330) 963-1249.

Sincerely,

Andrew C. Kocher, Site Coordinator  
Division of Environmental Response and Revitalization

ACK/nvr

cc: Gregory F. Moore, USACE, Louisville District  
Haney/Harris, Vista Sciences, Newton Falls  
Katie Tait/Kevin Sedlak, Camp Ravenna

ec: Rod Beals, NEDO, DERR  
Justin Burke CO DERR



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

July 16, 2015

Mr. Mark Leeper, P.G., MBA  
Army National Guard Directorate  
Environmental Programs Division  
ARNGD-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  
267000859025

**Subject:** Approval for the "Final Site Inspection Report for RVAPP-28 Suspected Agent Burial Site at the Ravenna Army Ammunition Plant, Ravenna, Ohio," Dated April 27, 2015, Ohio EPA ID # 267-000859-025

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 Site Inspection Report for RVAPP-28 Suspected Agent Burial Site at the Ravenna Army Ammunition Plant, Ravenna, Ohio," dated April 27, 2015. This document, received on May 7, 2015, was prepared for the Ohio Army National Guard/Camp Ravenna, by the U.S. Army Corps of Engineers – Huntsville District.

Ohio EPA has reviewed this documentation and has found no significant deficiencies. As a result, the "Final Site Inspection Report for RVAPP-28 Suspected Agent Burial Site" has been approved.

If you have any questions or concerns, please do not hesitate to contact me at (330) 963-1249.

Sincerely,

Andrew C. Kocher, Site Coordinator  
Division of Environmental Response and Revitalization

ACK/nvr

cc: Gregory F. Moore, USACE, Louisville District  
Katie Tait/Kevin Sedlak, Camp Ravenna  
Haney/Harris, Vista Sciences, Newton Falls

ec: Rod Beals, NEDO, DERR  
Justin Burke, CO, DERR





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

April 20, 2015

Mr. Mark Leeper, P.G., MBA  
Army National Guard Directorate  
Environmental Programs Division  
ARNGD-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  
267000859025

**Subject:** Approval for the "Revised Draft Site Inspection Report for RVAPP-28 Suspected Agent Burial Site at the Ravenna Army Ammunition Plant, Ravenna, Ohio," Dated February 18, 2015, Ohio EPA ID # 267-000859-025

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, "Revised Draft Site Inspection Report for RVAPP-28 Suspected Agent Burial Site at the Ravenna Army Ammunition Plant, Ravenna, Ohio," dated February 18, 2015. This document, received on March 9, 2015, was prepared for the Ohio Army National Guard/Camp Ravenna by the U.S. Army Corps of Engineers – Huntsville District.

Ohio EPA has reviewed this documentation and has found no significant deficiencies. As a result, the "Revised Draft Site Inspection Report for RVAPP-28 Suspected Agent Burial Site" has been approved. Please provide a final document or replacement pages.

If you have any questions or concerns, please do not hesitate to contact me at (330) 963-1249.

Sincerely,

Andrew C. Kocher, Site Coordinator  
Division of Environmental Response and Revitalization

ACK/nvr

cc: Gregory F. Moore, USACE, Louisville District  
Katie Tait/Kevin Sedlak, Camp Ravenna  
Haney/Harris, Vista Sciences, Newton Falls

ec: Rod Beals, NEDO, DERR  
Justin Burke, CO, DERR



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

August 6, 2015

Re: US Army Ravenna Ammunition PLT RVAAP  
Remediation Response  
Project Records  
Remedial Response  
Trumbull County  
267000859102

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

**SUBJECT: OHIO EPA APPROVAL LETTER FOR RAVENNA ARMY AMMUNITION  
PLANT PORTAGE/TRUMBULL COUNTIES "FINAL, REMEDIAL  
INVESTIGATION REPORT FOR SOIL, SEDIMENT, AND SURFACE WATER  
AT RVAAP-43 LOAD LINE 10," DATED JUNE 26, 2015**

Dear Mr. Leeper:

The Ohio Environmental Protection Agency (Ohio EPA) has received and reviewed the "Final, Remedial Investigation Report For Soil, Sediment, and Surface Water at RVAAP-43 Load Line 10," dated June 26, 2015 for the Ravenna Army Ammunition Plant, Portage/Trumbull Counties. This report was received at the Northeast District Office (NEDO) on July 2, 2015, and was prepared by Leidos Engineering of Ohio, Inc.

Ohio EPA acknowledges that there have been many revisions and submittals of the LL-10 Remedial Investigation (RI) over a span of several years and current contractual limitations resulting from the long period of revisions and reviews. It had been the goal to have LL-10 as the "template" model for all future PAA08 forthcoming RI report submittals. For various reasons, previously stated global concerns were not adequately addressed within this "template" and will require resolution in the future, outside of the approval process for this RI Report.

Ohio EPA is providing approval of the LL-10 Final RI report. As stated above, there are global issues that were not adequately addressed within this report; however, we do not believe that resolution of these comments will affect or change the conclusion for the LL-10 Final RI. We are providing comments to address global concerns that still require resolution and could affect decisions in future submittals for other AOCs at RVAAP. Recognizing the limitations of the Army's contractual obligations of this current phase for this AOC, Ohio EPA is not asking for formal responses or a re-submittal of the report; however, failure to address comments that are applicable to future submittals for other AOCs could result in non-approval by our Agency. Please recognize that while we are willing to work with the Army through contractual limitations, it is generally a low-priority consideration when reviewing a submittal that will ultimately guide all remedial decisions at an AOC.



The following are the general comments:

- (1) The application of CERCLA exemption applied to contaminants at RVAAP, not related to historical operations, including PAHs;

This RI report and others continue to use a very broad approach to exempting certain constituents stating "CERCLA exemption". Ohio EPA does not agree that this broad approach of eliminating specific contaminants detected or above the FWCUGs, including PAHs, is appropriate.

While it is appropriate to provide "weight-of-evidence" evaluations in an RI concerning AOC-specific information, acceptance of such arguments (e.g., ubiquitous PAHs not associated with a release from Army activities at RVAAP) will only be accepted after considering AOC history and data, not as a general site-wide condition. Until such time that the sources can be linked to something other than a site-related release, it will be assumed that PAHs and other contaminants above the appropriate FWCUGs will need to be evaluated in a Feasibility Study (FS) for further decision making.

- (2) The sampling design, how the data are used to make decisions, application of FWCUGs, and how the sample design relates to remedial decision making, continue to be concerns for our Agency. Further discussions with the Army may be warranted/are needed to resolve similar concerns for other AOCs where field investigation data has been completed and reports have been or will be submitted. In addition, because many of the Army's and Ohio EPA's project managers have changed since data quality decisions were made and Work Plans were approved, Ohio EPA suggests a general meeting with the Army prior to future sampling efforts in support of future investigations at RVAAP, in order to get a clear understanding and mutual agreement of acceptable sample design, application of FWCUGs, and decision-making based on the collected data. Thus far, most discussions between our agencies have focused on site-specific concerns, but perhaps a broader discussion will help resolve potential future concerns from our Agency.
- (3) Elimination of data or removal of a hot spot as an "outlier" such as L10sb-71, is not appropriate. Page 7-25, second paragraph states "....this boring and does not represent a CERCLA release, nor does it represent the EPC across the EU. With this outlier removed, the EPC for the remaining subsurface soil samples at the FPA is 0.19 mg/kg." Also, noted was an inappropriate use for a "CERCLA release."
- (4) Lead FWCUG. Beginning on page 7-11 there is much information provided regarding lead cleanup criteria and U.S. EPA's approach of evaluating lead exposure. Much of this information should not be included in any future RI/FS documents. Future reports are to be clarified that the unrestricted (residential) FWCUG soil value for lead is 400 mg/kg. This value will be applied to all soils considered for unrestricted use. Areas or decision units with concentrations greater than the unrestricted FWCUG are considered not meeting residential standards and will most often require evaluation in a feasibility study.
- (5) The RVAAP stakeholders have spent a considerable amount of time and resources on developing specific cleanup values (FWCUGs) to be used exclusively on RVAAP projects. Citing other "standards" is not appropriate. Reference to other program's numeric values should not be included in other reports or documents. Page 7-17 in the

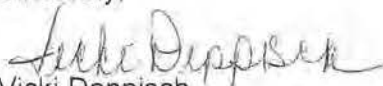
MR. MARK LEEPER  
ARMY NATIONAL GUARD DIRECTORATE  
AUGUST 6, 2015  
PAGE 3

RI report and elsewhere, cites or discusses Ohio EPA's Voluntary Action Program (VAP) and the State of Ohio fire marshal's bureau of underground storage tank regulation (BUSTR) standards (which are often the same values). Without the proper context of the entire rules and approaches developed for use of these values and programs, they are misleading.

- (6) All features, including ditches, etc., must be labeled on all maps.
- (7) Regarding the DNT isomers discussion, page 2-1: Please review and summarize in all future reports the correspondence from the Army providing the rationale for not sampling for some of the isomers. The paragraph provided in LL-10 does not capture this rationale. It is the understanding of Ohio EPA that RVAAP was not a production plant and therefore, it is unlikely to have the DNT isomers. Please reword the entire paragraph for all future reports.

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

Sincerely,



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

VD/hvr

- cc: Katie Tait/Kevin Sedlak, ARNG, Camp Ravenna  
Gail Harris/Rebecca Haney, Vista Sciences  
Greg Moore, USACE Louisville
- ec: Justin Burke, 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





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

June 16, 2015

Mr. Mark Leeper, P.G., MBA  
Army National Guard Directorate  
Environmental Programs Division  
ARNGD-ILE-CR  
111 South George Mason Drive  
Arlington, VA 22204

Re: US Army Ravenna Ammunition Pit RVAAP  
Remediation Response  
Project Records  
Remedial Response  
Portage County  
267000859109

**Subject: Approval of the "Final Remedial Action Report for Soil, Sediment, and Surface Water at RVAPP-048 Anchor Test Area at the Ravenna Army Ammunition Plant, Ravenna, Ohio," Dated April 16, 2015, Ohio EPA ID # 267-000859-109**

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 Remedial Action Report for Soil, Sediment, and Surface Water at RVAPP-048 Anchor Test Area at the Ravenna Army Ammunition Plant, Ravenna, Ohio,"* dated April 16, 2015. This document, received by Ohio EPA's NEDO on April 17, 2015, was prepared for the U.S. Army Corps of Engineers (USACE) Louisville District, by Leidos Engineering of Ohio, Inc.

Ohio EPA has reviewed this documentation and has found no significant deficiencies. As a result, the *"Final Remedial Action Report for Soil, Sediment, and Surface Water at RVAPP-048 Anchor Test Area"* is approved.

If you have any questions or concerns, please do not hesitate to contact me at (330) 963-1249.

Sincerely,

Andrew C. Kocher  
Site Coordinator  
Division of Environmental Response and Revitalization

ACK/nvr

cc: Gregory F. Moore, USACE, Louisville District  
Haney/Harris, Vista Sciences, Newton Falls  
Katie Tait/Kevin Sedlak, Camp Ravenna

ec: Rod Beals, NEDO, DERR  
Bob Princic, NEDO, DERR  
Justin Burke, CO, DERR





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

June 16, 2015

Mr. Mark Leeper, P.G., MBA  
Army National Guard Directorate  
Environmental Programs Division  
ARNGD-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  
267000859109

**Subject: Approval of the "Final Remedial Action Report for Soil, Sediment, and Surface Water at RVAPP-048 Anchor Test Area at the Ravenna Army Ammunition Plant, Ravenna, Ohio," Dated April 16, 2015, Ohio EPA ID # 267-000859-109**

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Ohio EPA has reviewed this documentation and has found no significant deficiencies. As a result, the "*Final Remedial Action Report for Soil, Sediment, and Surface Water at RVAPP-048 Anchor Test Area*" is approved.

If you have any questions or concerns, please do not hesitate to contact me at (330) 963-1249.

Sincerely,

Andrew C. Kocher  
Site Coordinator  
Division of Environmental Response and Revitalization

ACK/nvr

cc: Gregory F. Moore, USACE, Louisville District  
Haney/Harris, Vista Sciences, Newton Falls  
Katie Tait/Kevin Sedlak, Camp Ravenna

ec: Rod Beals, NEDO, DERR  
Bob Princic, NEDO, DERR  
Justin Burke, CO, DERR







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

March 17, 2015

Mr. Mark Leeper, P.G., MBA  
Army National Guard Directorate  
Environmental Programs Division  
ARNGD-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  
267000859

**Subject:** Approval of the "Draft Remedial Action Report for Soil, Sediment, and Surface Water at RVAPP-048 Anchor Test Area at the Ravenna Army Ammunition Plant, Ravenna, Ohio," Dated January 27, 2015, Ohio EPA ID # 267-000859-109

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 Remedial Action Report for Soil, Sediment, and Surface Water at RVAPP-048 Anchor Test Area at the Ravenna Army Ammunition Plant, Ravenna, Ohio*," dated January 27, 2015. This document, received by Ohio EPA's NEDO on January 28, 2015, was prepared for the U.S. Army Corps of Engineers (USACE) Louisville District, by Leidos Engineering of Ohio, Inc.

Ohio EPA has reviewed this documentation and has found no significant deficiencies. As a result, the "*Draft Remedial Action Report for Soil, Sediment, and Surface Water at RVAPP-048 Anchor Test Area*" is approved. Ohio EPA will be expecting the final document for review and approval.

If you have any questions or concerns, please do not hesitate to contact me at (330) 963-1249.

Sincerely,

Andrew C. Kocher, Site Coordinator  
Division of Environmental Response and Revitalization

ACK/nvr

cc: Gregory F. Moore, USACE, Louisville District  
Haney/Harris, Vista Sciences, Newton Falls  
Katie Tait/Kevin Sedlak, Camp Ravenna

ec: Rod Beals, NEDO, DERR  
Justin Burke, CO, DERR



December 22, 2015

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

Subject: Final Response to Ohio EPA Comments on the Work Plan for a Pilot Study and Feasibility Study at RVAAP-50 Atlas Scrap Yard at the Ravenna Army Ammunition Plant, Ravenna, Ohio, Dated, October 14, 2015 Ohio EPA ID # 267-000859-106

Dear Ms. Deppisch:

The Army National Guard Directorate is in receipt of comments on the above referenced Work Plan from Ohio Environmental Protection Agency (Ohio EPA) dated October 30, 2015. It was requested that we respond to comment #3 prior to beginning the pilot-test in order to obtain Ohio EPA conditional approval to begin the pilot-test, which is scheduled to begin on November 16, 2015. A separate letter addressing Comment #3 was submitted on November 4, 2015. This letter is to address and finalize the responses to all other comments received in the October 30, 2015 letter. Please see the responses to your comments below:

1. General: The work plan states it was developed in accordance with many of the facility-wide documents, including the Facility-Wide Sampling and Analysis Plan/Quality Assurance Project Plan, and Safety and Health Plan. Where applicable, the bench- and pilot-tests must adhere to all relevant Facility-Wide documents, which would also include the Human Health Cleanup Goals, etc. Please review all Facility-Wide documents for applicability.

Response: Facility-wide documents will be reviewed and referenced to ensure that the bench- and pilot-scale tests adhere to the applicable requirements and guidance.

2. General: Facility-Wide Cleanup Goals (FWCUGs) have been developed for many constituents, specifically for the Ravenna Arsenal. The RSL cleanup level should not be used if a FWCUG exists.

Response: The FWCUGs will be used as cleanup levels for this project. RSL cleanup levels will be used only if a FWCUG does not exist. This will be specified in the document.

3. Ohio EPA noted that the PAH-excavated soil area will be in the approximate location of the former T-4703 Roads and Grounds Maintenance Building. According to multiple maps in the Final (RI) Report, dated June 26, 2015, there are many other source areas with much higher contaminant concentrations. Ohio EPA suggests the Army consider the area with the highest contamination for the tests.

Response: NOTE THIS COMMENT HAS BEEN PREVIOUSLY RESPONDED TO IN A LETTER DATED NOVEMBER 4, 2015.

4. The work plan did not specify, after the pilot test has been completed and the soils have been placed back in the excavation pit, if this area will be included in any future remediation using the



Subject: Response to Ohio EPA Comments on the Work Plan for a Pilot Study and Feasibility Study at RVAAP-50 Atlas Scrap Yard at the Ravenna Army Ammunition Plant, Ravenna, Ohio, Dated, October 14, 2015 Ohio EPA ID # 267-000859-106

VEG technology or if this area will be excluded due to previous treatment. The soils/area used in the pilot-test should not be excluded from the areas proposed in the FS for remediation. During the remediation process, sufficient confirmatory soil samples should be taken of the in-situ bottom soils, prior to backfilling the treated soils to demonstrate applicable standards have been met.

Response: The excavated area will be included in any future remediation at the site. This will be clarified in the Work Plan. It is noted that full remediation of the site will likely occur at a future date and sufficient confirmatory samples will be included at that time.

5. Lead: The work plan does not specify the composition of steel slag to be used with the lead, as various compositions exists. Please provide the composition and indicate if the same composition will be used throughout the pilot test. It is the understanding of Ohio EPA that the amount of lead-contaminated soil to be treated has not yet been determined. Steel slag in general, can have negative consequences to surrounding surface water and aquatic life by the generation of high pH waters, leaching of potentially problematic trace metals, and rapid rates of calcite precipitation. Although the purpose is to bind the lead, Ohio EPA wants to make sure another problem is not created. Please discuss.

Response: Treatment of lead-contaminated soils will only be conducted during bench-scale testing at the subcontractor's laboratory in California. We will be using Basic oxygen furnace (BOF) slag, electric arc furnace (EAF) slag, or stainless steel slag in the bench-scale test. The final choice will depend on the treatability study metrics. Our selection of the slag will also depend on the blending results during the bench-scale study (especially relative to the buffer capacity of the soil). Steel slag composition and the potential negative consequences of treatment of site soils with steel slag will be thoroughly discussed in the FS. Clarification of this path forward will be provided in the Work Plan. Additionally, technical articles regarding the addition of slag to immobilize lead will be included in an appendix of the Final Work Plan.

We will use the slag in a mode more consistent with soil blending and stabilization/solidification (S/S), where the slag is leveraged for its residual lime content and soluble silica to immobilize lead by pH control and precipitation of a variety of insoluble carbonates and silicates. In short, steel slag relies on a combination of chemical precipitation, metals complexation, and hydraulic conductivity reduction to bond metals in place. The approach will be to blend the slag with the impacted soil and compact in an above ground soil berm that will be covered with a natural soil (6 inches min) and seeded with grass. The slag will not impact the surface waters of Ohio in this application.

6. Health and Safety Plans: Ohio EPA reviews and comments, but does not approve, Health and Safety Plans. Ticks and poison ivy, as referenced in the "Site Safety and Health Plan" section, are numerous throughout the site. In addition, cell phone coverage is spotty. Ohio EPA suggests evaluating cell phone coverage specifically at the Atlas Scrap Yard area and perhaps plan on working in pairs.

Response: Comment noted. The information is appreciated. Upon arrival at the site, the field oversight representative will test cell phone coverage. Additionally, personnel from both Alliant and its subcontractor should be on site during the pilot study.

7. 3.1.1 Pre-Treatment Sampling and Worksheets: The text is not clear about how the composite samples will be collected from the 55 gal. drum (PAH) or the 10 gal. bucket (lead) or the number of samples that will go into each composite. The work plan states "...one 2-aliquot (or more) composite sample will be collected from soil contaminated in the 10-gallon container." Ohio EPA recommends 7 or 8 per container, to get a good distribution of the contents. The same should also apply to post-treatment samples collected in 3.1.2 and 3.1.3. A larger sample group makes for a more

Subject: Response to Ohio EPA Comments on the Work Plan for a Pilot Study and Feasibility Study at RVAAP-50 Atlas Scrap Yard at the Ravenna Army Ammunition Plant, Ravenna, Ohio, Dated, October 14, 2015 Ohio EPA ID # 267-000859-106

representative composite. As the bench-test is already in progress, please provide the number of aliquots that were collected and if less than 7-8, provide rationale and support for the pre-treatment number. As stated above, Ohio EPA recommends 7-8 aliquots (or points) be collected for post-treatment sampling.

Response: The information is appreciated. The pilot study sampling requirements will be revised to state that 7-point composites will be collected in the field instead of 3-point composites. Additionally, the pre- and post-test bench-scale sampling (for lead and PAHs) will be revised to include 7-point composites. The Work Plan will be revised to include these new requirements.

8. Pilot-Test: The work plan indicates the pre-treatment and post-treatment sampling will consist of 3 point composites. As stated above in comment #7, Ohio EPA recommends 7-8 point composite samples be collected for a more representative composite.

Response: The pilot study sampling requirements will be revised to state that 7-point composites will be collected in the field instead of 3-point composites. Additionally, the pre- and post-test bench-scale sampling (for lead and PAHs) will be revised to include 7-point composites. The Work Plan will be revised to include these new requirements. See also response to Ohio EPA Comment #7.

9. 3.1.3 Bench-Scale Testing for Treatment of lead in Soils: Ohio EPA recommends adding the Synthetic Precipitation Leaching Procedure (SPLP), method 1312, to the Method 1315 procedure, to assess leaching from the treated samples. The Method 1315 procedure uses deionized water, while the SPLP process uses a simulate acid rain solution. In that way, the effects of a more realistic or natural precipitation on leaching. As stated in the work plan, the standard method 1311 (TCLP) should still be included and used for disposal purposes. As it is the understanding of Ohio EPA that the bench-scale lead test is currently underway and a pilot test is not planned for lead, this issue will need to be resolved prior to moving forward with remediation.

Response: The decision to employ either Mass Transfer Rates using a Semi-dynamic Tank Leaching Procedure (TLP) Method 1315 or SPLP Method 1312 is generally made on the basis of the final disposition of the impacted soils. There are several alternatives for final disposition of the lead-impacted soils at the Atlas Scrap Yard. The most likely alternatives include excavating and landfilling the lead-impacted soils, treating the impacted soils and then disposing of them at a landfill, or treating the impacted soils and leaving them in place at the site. If the goal is to treat the soils, and then dispose of them in a landfill, then Semi-dynamic TLP Method 1315 should be used. Semi-dynamic TLP Method 1315 is a mass transfer rate of leaching test that would more accurately indicate the leaching potential of lead-impacted soils in a landfill since it employs deionized water as the leaching agent. If the goal is to treat the soils and leave them in place, then the soil should be characterized for leaching potential using SPLP Method 1312. SPLP Method 1312 would more accurately indicate the leaching potential of lead-impacted soils left on site since it uses a simulated acid rain solution which is more realistic of natural precipitation on leaching. The most probable alternative for disposition of the lead-impacted soils at the Atlas Scrap Yard is to treat the impacted soils and leave them in place on site. Therefore, SPLP Method 1312 will be used to determine the leaching potential of the treated soils during the bench scale testing.

10. QAPP Worksheet #17: Please insert the analytical methods next to the descriptions for clarification. For example, "semi-dynamic TLP samples" should state "semi-dynamic TLP samples (method 1315)."

Response: Text in Worksheet #17 will be revised as follows: "All of the samples will consist of stockpiled soils. There will be eight (8) PAH samples (8270D SIM), and (1) PAH sample for pre-treatment (8270), five (5) TCLP samples (1311/6010C) and two (2) semi-dynamic TLP samples (TLP

Subject: Response to Ohio EPA Comments on the Work Plan for a Pilot Study and Feasibility Study at RVAAP-50 Atlas Scrap Yard at the Ravenna Army Ammunition Plant, Ravenna, Ohio, Dated, October 14, 2015 Ohio EPA ID # 267-000859-106

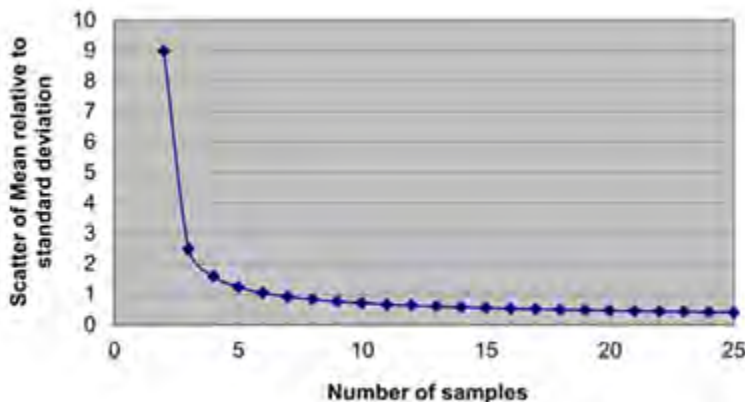
1315). The field activities will be conducted during the dry weather periods. Since these samples will help determine the efficiency of remedial alternatives, no background sampling will be necessary. Pretreatment profiles and sampling will establish baseline conditions.” Note that the one PAH sample that is identified as being analyzed by 8270 rather than 8270 SIM was the sample collected in advance of sending the 55-gallon drum for bench-testing prior to the pilot test. Therefore the specific analytical test was assigned at the time of sampling and cannot be changed.

11. Method 1315: Please clarify the length of time it will take to turn around method 1315. U.S. EPA method 1315 indicates it will take 63 days; the work plan QAPP worksheet #30 indicates “data package turnaround time” is 28 days.

Response: According to the TestAmerica the turnaround time for USEPA Method 1315 ranges from 28 days to 63 days. Worksheet #30 will be revised accordingly.

12. 3.2.1 Soil Excavation and 3.2.2 Onsite Treatment: As with pre-treatment sampling, Ohio EPA recommends more than 3 points in the composite samples. Seven (7) or 8 points would result in a more representative composite. Refer to comment #3 above.

The following graph shows how the mean of a composite test sample can vary depending on the number of specimens that make up the sample.



The vertical axis is the 95% range of the scatter of the mean (relative to the true standard deviation of the population) as a function of the number of individual specimens in the composite. As the plot shows, when the number of specimens exceeds 7 or 8 the likely scatter of the sample mean gets smaller. Thus, the larger sample size means that the indicated value of the mean will probably be closer to the true value.

Response: The information is appreciated. The pilot study sampling requirements will be revised to state that 7-point composites will be collected in the field instead of 3-point composites. Additionally, the pre- and post-test bench-scale sampling (for lead and PAHs) will be revised to include 7-point composites. The Work Plan will be revised to include these new requirements. See also responses to Ohio EPA Comments #7, and #8.

13. QAPP Worksheet #28: This worksheet states that QC samples are listed in Table 3-1. Ohio EPA cannot locate any reference to QC samples in that table.

Subject: Response to Ohio EPA Comments on the Work Plan for a Pilot Study and Feasibility Study at RVAAP-50 Atlas Scrap Yard at the Ravenna Army Ammunition Plant, Ravenna, Ohio, Dated, October 14, 2015 Ohio EPA ID # 267-000859-106

Response: Alliant's subcontractor will collect nine (9) polycyclic aromatic hydrocarbon (PAH) samples, and one (1) duplicate sample (field QC sample) as listed in Table 3-1. Other than the duplicate sample, no other field QC samples are planned. Laboratory QC samples will be analyzed in accordance with the USACE Quality Systems Manual (QSM) version 5. This will be clarified in a footnote for Table 3-1.

14. Please indicate the source of the water for the pilot test project.

Response: Water for the pilot test was obtained from Canton Water Works, and consisted of public water used by the city of Canton, Ohio.

15. Figure 4-4, April 2010 Source Area Sampling Locations: This is the only figure included in the work plan and although it does identify some of the source sampling areas it does not identify all sampling locations at the Atlas Scrap Yard. Other maps in the Final RI report identify additional sampling locations and contaminant concentrations. Please refer to comment #3.

Response: The pilot test will be conducted in one of the most contaminated areas at the site, in the vicinity of the stockpiled railroad ties. The Work Plan will be revised accordingly. Additionally, a new figure will be included in the Work Plan that more clearly depicts the excavation location. See also response to Ohio EPA Comment #3 which has been previously responded to in a letter dated November 4, 2015.

16. Air: The local air agency has reviewed the work plan and indicated to Ohio EPA that they have spoken with the contractor and the Army. The Agency stated the Permit-By-Rule (PBR) for the soil vapor remediation equipment was submitted for review and the contractor and the Army are aware of the requirements to use best practices for controlling visible emissions of fugitive dust from the roadways, storage piles, and material handling equipment. It appears the scope and scale of the pilot-test is small enough to not require permits for the fugitive sources at this time, provided the use of best practices is employed.

Response: A PBR has been granted for this work. The facility ID number is 1667000109 and the Permit Number is PBR14548. The contractor and the Army will employ best practices to control visible emissions as noted. A new section (Section 4.1) will be added to the Work Plan which discusses air permitting and fugitive dust.

17. Section 3.1.1 titled, "Pretreatment Sampling" is located on page 6. The Table of Contents does not mention this section. Please correct this discrepancy.

Response: This comment will be incorporated as requested. The Table of Contents will be revised to include this Section.

18. Sections 3.1.2 and 3.1.3 are located on page 8. These sections are not labeled correctly in the Table of Contents. Please correct this discrepancy.

Response: This comment will be incorporated as requested. The Table of Contents will be updated so that these sections are labeled correctly and it shows the correct page references.

19. Page 1, Section 1.1, paragraph 2, last sentence states that the 1280 acres are being remediated and managed by the Base Realignment and Closure Division (BRACD). This has changed, the site is not currently being addressed by BRACD, please modify this section.

Response: Text in this paragraph will be revised to state that, "The facility was formerly used as a load, assemble, and pack facility for munitions production. As of September 2013,



Subject: Response to Ohio EPA Comments on the Work Plan for a Pilot Study and Feasibility Study at RVAAP-50 Atlas Scrap Yard at the Ravenna Army Ammunition Plant, Ravenna, Ohio, Dated, October 14, 2015 Ohio EPA ID # 267-000859-106

administrative accountability for the entire 21,683-acre facility has been transferred to the United States Property and Fiscal Officer (USP&FO) for Ohio and the property was subsequently licensed to the Ohio Army National Guard (OHARNG) for use as a military training site, Camp Ravenna.”

20. Page 3, Section 1.2, paragraph 1. The historical use of the Atlas Scrap Yard area also included the presence of an incinerator, underground storage tanks and was a storage area for numerous “treated” railroad ties and other items. This information should be included in the site description of this area.

Response: Text will be added at the end of this paragraph stating, “The Atlas Scrap Yard also included an incinerator, underground storage tanks, and was a storage area for numerous treated railroad ties.”

21. Page 5, Section 3.0, paragraph 1 implies that the Feasibility Study (FS) will be completed as part of a Technical Memorandum, which presents the results and conclusions of the bench- and pilot-tests. Please clarify this sentence, which appears to conflict with other text areas that state a Draft FS Study for this AOC is under internal review by the Army, and this work plan will be inserted as part of the FS. Please note, that Ohio EPA anticipates that the FS will follow CERCLA’s RI/FS guidance documents.

Response: The FS will be prepared separately from the Technical Memorandum. A Preliminary Draft FS was previously prepared for the site. The FS will be updated based on the results of the Bench- and Pilot-scale studies. Section 3 will be revised to clarify that the Work Plan, updated FS and Technical Memorandum will each be prepared separately. The FS will be prepared in accordance with CERCLA guidelines.

22. This Work Plan does not include a Vapor Energy Generation (VEG) process diagram. A process diagram would be useful to improve Ohio EPA’s understanding of this treatment technology. Please provide a general process diagram as a Figure in Section 2 or 3.

Response: A simple process diagram along with a photograph of the system is presented in page 2 of the subcontractor’s Work Plan. The subcontractor’s Work Plan is provided in Appendix C. The process diagram and system photograph will be referenced in Section 2.

Please contact the undersigned at (703) 607-7955 or [mark.s.leeper.civ@mail.mil](mailto:mark.s.leeper.civ@mail.mil) if there are issues or concerns with the submittal.

Sincerely,



Mark Leeper  
RVAAP Restoration Program Manager  
Army National Guard Directorate



cc: Rod Beals, Ohio EPA, DERR  
Bob Princic, Ohio EPA, DERR  
Justin Burke, Ohio EPA, DERR-CO  
Katie Tait, OHARNG Camp Ravenna  
Kevin Sedlak, ARNG, Camp Ravenna  
Greg Moore, USACE Louisville  
Nathaniel Peters II, USACE Louisville  
Eric Cheng, USACE Louisville  
Gail Harris, Vista Sciences Corp.  
Pat Ryan, Leidos-REIMS  
Belinda Price, Alliant Corporation



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

December 10, 2015

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

Subject: Final Response to Ohio EPA Comments on the Work Plan for a Pilot Study and Feasibility Study at RVAAP-50 Atlas Scrap Yard at the Ravenna Army Ammunition Plant, Ravenna, Ohio, Dated, October 14, 2015 Ohio EPA ID # 267-000859-106

Dear Ms. Deppisch:

The Army National Guard Directorate is in receipt of comments on the above referenced Work Plan from Ohio Environmental Protection Agency (Ohio EPA) dated October 30, 2015. It was requested that we respond to comment #3 prior to beginning the pilot-test in order to obtain Ohio EPA conditional approval to begin the pilot-test, which is scheduled to begin on November 16, 2015. A separate letter addressing Comment #3 was submitted on November 4, 2015. This letter is to address and finalize the responses to all other comments received in the October 30, 2015 letter. Please see the responses to your comments below:

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Response: Facility-wide documents will be reviewed and referenced to ensure that the bench- and pilot-scale tests adhere to the applicable requirements and guidance.

2. General: Facility-Wide Cleanup Goals (FWCUGs) have been developed for many constituents, specifically for the Ravenna Arsenal. The RSL cleanup level should not be used if a FWCUG exists.

Response: The FWCUGs will be used as cleanup levels for this project. RSL cleanup levels will be used only if a FWCUG does not exist. This will be specified in the document.

3. Ohio EPA noted that the PAH-excavated soil area will be in the approximate location of the former T-4703 Roads and Grounds Maintenance Building. According to multiple maps in the Final (RI) Report, dated June 26, 2015, there are many other source areas with much higher contaminant concentrations. Ohio EPA suggests the Army consider the area with the highest contamination for the tests.

Response: NOTE THIS COMMENT HAS BEEN PREVIOUSLY RESPONDED TO IN A LETTER DATED NOVEMBER 4, 2015.

4. The work plan did not specify, after the pilot test has been completed and the soils have been placed back in the excavation pit, if this area will be included in any future remediation using the

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VEG technology or if this area will be excluded due to previous treatment. The soils/area used in the pilot-test should not be excluded from the areas proposed in the FS for remediation. During the remediation process, sufficient confirmatory soil samples should be taken of the in-situ bottom soils, prior to backfilling the treated soils to demonstrate applicable standards have been met.

Response: The excavated area will be included in any future remediation at the site. This will be clarified in the Work Plan. It is noted that full remediation of the site will likely occur at a future date and sufficient confirmatory samples will be included at that time.

5. Lead: The work plan does not specify the composition of steel slag to be used with the lead, as various compositions exists. Please provide the composition and indicate if the same composition will be used throughout the pilot test. It is the understanding of Ohio EPA that the amount of lead-contaminated soil to be treated has not yet been determined. Steel slag in general, can have negative consequences to surrounding surface water and aquatic life by the generation of high pH waters, leaching of potentially problematic trace metals, and rapid rates of calcite precipitation. Although the purpose is to bind the lead, Ohio EPA wants to make sure another problem is not created. Please discuss.

Response: Treatment of lead-contaminated soils will only be conducted during bench-scale testing at the subcontractor's laboratory in California. We will be using Basic oxygen furnace (BOF) slag, electric arc furnace (EAF) slag, or stainless steel slag in the bench-scale test. The final choice will depend on the treatability study metrics. Our selection of the slag will also depend on the blending results during the bench-scale study (especially relative to the buffer capacity of the soil). Steel slag composition and the potential negative consequences of treatment of site soils with steel slag will be thoroughly discussed in the FS. Clarification of this path forward will be provided in the Work Plan.

We will use the slag in a mode more consistent with soil blending and stabilization/solidification (S/S), where the slag is leveraged for its residual lime content and soluble silica to immobilize lead by pH control and precipitation of a variety of insoluble carbonates and silicates. In short, steel slag relies on a combination of chemical precipitation, metals complexation, and hydraulic conductivity reduction to bond metals in place. The approach will be to blend the slag with the impacted soil and compact in an above ground soil berm that will be covered with a natural soil (6 inches min) and seeded with grass. The slag will not impact the surface waters of Ohio in this application. As an aside, slag already enjoys an agricultural lime certification in OH from many producers, and USDA is actively researching the issue of raw steel slag in OH to immobilize phosphorous in stormwater and agricultural runoff (direct contact with surface waters). This is a leading technology to eliminate phosphorous-initiated algal blooms in the great lakes.

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Response: Comment noted. The information is appreciated. Upon arrival at the site, the field oversight representative will test cell phone coverage. Additionally, personnel from both Alliant and its subcontractor should be on site during the pilot study.

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Response: The information is appreciated. The pilot study sampling requirements will be revised to state that 7-point composites will be collected in the field instead of 3-point composites. Additionally, the pre- and post-test bench-scale sampling (for lead and PAHs) will be revised to include 7-point composites. The Work Plan will be revised to include these new requirements.

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Response: The pilot study sampling requirements will be revised to state that 7-point composites will be collected in the field instead of 3-point composites. Additionally, the pre- and post-test bench-scale sampling (for lead and PAHs) will be revised to include 7-point composites. The Work Plan will be revised to include these new requirements. See also response to Ohio EPA Comment #7.

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Response: The decision to employ either TCLP Method 1315 or SPLP Method 1312 is generally made on the basis of the final disposition of the impacted soils. There are several alternatives for final disposition of the lead-impacted soils at the Atlas Scrap Yard. The most likely alternatives include excavating and landfilling the lead-impacted soils, treating the impacted soils and then disposing of them at a landfill, or treating the impacted soils and leaving them in place at the site. If the goal is to treat the soils, and then dispose of them in a landfill, then TCLP Method 1315 should be used. TCLP Method 1315 would more accurately indicate the leaching potential of lead-impacted soils in a landfill since it employs deionized water as the leaching agent. If the goal is to treat the soils and leave them in place, then the soil should be characterized for leaching potential using SPLP Method 1312. SPLP Method 1312 would more accurately indicate the leaching potential of lead-impacted soils left on site since it uses an acid solution which simulates acid rain as the leaching agent. The most probable alternative for disposition of the lead-impacted soils at the Atlas Scrap Yard is to treat the impacted soils and leave them in place on site. Therefore, SPLP Method 1312 will be used to determine the leaching potential of the treated soils during the bench scale testing.

10. QAPP Worksheet #17: Please insert the analytical methods next to the descriptions for clarification. For example, "semi-dynamic TLP samples" should state "semi-dynamic TLP samples (method 1315)."

Response: Text in Worksheet #17 will be revised as follows: "All of the samples will consist of stockpiled soils. There will be eight (8) PAH samples (8270D SIM), and (1) PAH sample for pre-

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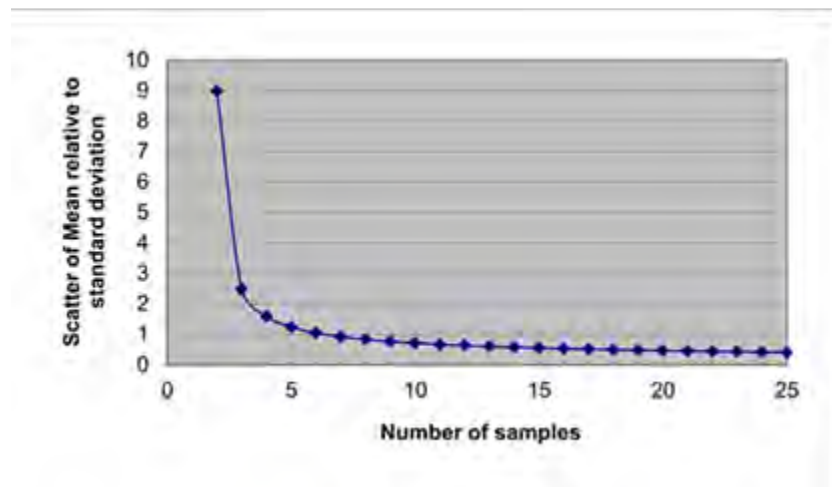
treatment (8270), five (5) TCLP samples (1311/6010C) and two (2) semi-dynamic TLP samples (TLP 1315). The field activities will be conducted during the dry weather periods. Since these samples will help determine the efficiency of remedial alternatives, no background sampling will be necessary. Pretreatment profiles and sampling will establish baseline conditions.” Note that the one PAH sample that is identified as being analyzed by 8270 rather than 8270 SIM was the sample collected in advance of sending the 55-gallon drum for bench-testing prior to the pilot test. Therefore the specific analytical test was assigned at the time of sampling and cannot be changed.

11. Method 1315: Please clarify the length of time it will take to turn around method 1315. U.S. EPA method 1315 indicates it will take 63 days; the work plan QAPP worksheet #30 indicates “data package turnaround time” is 28 days.

Response: According to the TestAmerica the turnaround time for USEPA Method 1315 ranges from 28 days to 63 days. Worksheet #30 will be revised accordingly.

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The following graph shows how the mean of a composite test sample can vary depending on the number of specimens that make up the sample.



The vertical axis is the 95% range of the scatter of the mean (relative to the true standard deviation of the population) as a function of the number of individual specimens in the composite. As the plot shows, when the number of specimens exceeds 7 or 8 the likely scatter of the sample mean gets smaller. Thus, the larger sample size means that the indicated value of the mean will probably be closer to the true value.

Response: The information is appreciated. The pilot study sampling requirements will be revised to state that 7-point composites will be collected in the field instead of 3-point composites. Additionally, the pre- and post-test bench-scale sampling (for lead and PAHs) will be revised to include 7-point composites. The Work Plan will be revised to include these new requirements. See also responses to Ohio EPA Comments #7, and #8.

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13. QAPP Worksheet #28: This worksheet states that QC samples are listed in Table 3-1. Ohio EPA cannot locate any reference to QC samples in that table.

Response: Alliant's subcontractor will collect nine (9) polycyclic aromatic hydrocarbon (PAH) samples, and one (1) duplicate sample (field QC sample) as listed in Table 3-1. Other than the duplicate sample, no other field QC samples are planned. Laboratory QC samples will be analyzed in accordance with the USACE Quality Systems Manual (QSM) version 5. This will be clarified in a footnote for Table 3-1.

14. Please indicate the source of the water for the pilot test project.

Response: Water for the pilot test was obtained from Canton Water Works, and consisted of public water used by the city of Canton, Ohio.

15. Figure 4-4, April 2010 Source Area Sampling Locations: This is the only figure included in the work plan and although it does identify some of the source sampling areas it does not identify all sampling locations at the Atlas Scrap Yard. Other maps in the Final RI report identify additional sampling locations and contaminant concentrations. Please refer to comment #3.

Response: The pilot test will be conducted in one of the most contaminated areas at the site, in the vicinity of the stockpiled railroad ties. The Work Plan will be revised accordingly. Additionally, a new figure will be included in the Work Plan that more clearly depicts the excavation location. See also response to Ohio EPA Comment #3 which has been previously responded to in a letter dated November 4, 2015.

16. Air: The local air agency has reviewed the work plan and indicated to Ohio EPA that they have spoken with the contractor and the Army. The Agency stated the Permit-By-Rule (PBR) for the soil vapor remediation equipment was submitted for review and the contractor and the Army are aware of the requirements to use best practices for controlling visible emissions of fugitive dust from the roadways, storage piles, and material handling equipment. It appears the scope and scale of the pilot-test is small enough to not require permits for the fugitive sources at this time, provided the use of best practices is employed.

Response: A PBR has been granted for this work. The facility ID number is 1667000109 and the Permit Number is PBR14548. The contractor and the Army will employ best practices to control visible emissions as noted. A new section (Section 4.1) will be added to the Work Plan which discusses air permitting and fugitive dust.

17. Section 3.1.1 titled, "Pretreatment Sampling" is located on page 6. The Table of Contents does not mention this section. Please correct this discrepancy.

Response: This comment will be incorporated as requested. The Table of Contents will be revised to include this Section.

18. Sections 3.1.2 and 3.1.3 are located on page 8. These sections are not labeled correctly in the Table of Contents. Please correct this discrepancy.

Response: This comment will be incorporated as requested. The Table of Contents will be updated so that these sections are labeled correctly and it shows the correct page references.

19. Page 1, Section 1.1, paragraph 2, last sentence states that the 1280 acres are being remediated and managed by the Base Realignment and Closure Division (BRACD). This has changed, the site is not currently being addressed by BRACD, please modify this section.

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Response: Text in this paragraph will be revised to state that, "The facility was formerly used as a load, assemble, and pack facility for munitions production. As of September 2013, administrative accountability for the entire 21,683-acre facility has been transferred to the United States Property and Fiscal Officer (USP&FO) for Ohio and the property was subsequently licensed to the Ohio Army National Guard (OHARNG) for use as a military training site, Camp Ravenna."

20. Page 3, Section 1.2, paragraph 1. The historical use of the Atlas Scrap Yard area also included the presence of an incinerator, underground storage tanks and was a storage area for numerous "treated" railroad ties and other items. This information should be included in the site description of this area.

Response: Text will be added at the end of this paragraph stating, "The Atlas Scrap Yard also included an incinerator, underground storage tanks, and was a storage area for numerous treated railroad ties."

21. Page 5, Section 3.0, paragraph 1 implies that the Feasibility Study (FS) will be completed as part of a Technical Memorandum, which presents the results and conclusions of the bench- and pilot-tests. Please clarify this sentence, which appears to conflict with other text areas that state a Draft FS Study for this AOC is under internal review by the Army, and this work plan will be inserted as part of the FS. Please note, that Ohio EPA anticipates that the FS will follow CERCLA's RI/FS guidance documents.

Response: The FS will be prepared separately from the Technical Memorandum. A Preliminary Draft FS was previously prepared for the site. The FS will be updated based on the results of the Bench- and Pilot-scale studies. Section 3 will be revised to clarify that the Work Plan, updated FS and Technical Memorandum will each be prepared separately. The FS will be prepared in accordance with CERCLA guidelines.

22. This Work Plan does not include a Vapor Energy Generation (VEG) process diagram. A process diagram would be useful to improve Ohio EPA's understanding of this treatment technology. Please provide a general process diagram as a Figure in Section 2 or 3.

Response: A simple process diagram along with a photograph of the system is presented in page 2 of the subcontractor's Work Plan. The subcontractor's Work Plan is provided in Appendix C. The process diagram and system photograph will be referenced in Section 2.

Please contact the undersigned at (703) 607-7955 or [mark.s.leeper.civ@mail.mil](mailto:mark.s.leeper.civ@mail.mil) if there are issues or concerns with the submittal.

Sincerely,



Mark Leeper  
RVAAP Restoration Program Manager  
Army National Guard Directorate





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

cc: Rod Beals, Ohio EPA, DERR  
Bob Princic, Ohio EPA, DERR  
Justin Burke, Ohio EPA, DERR-CO  
Katie Tait, OHARNG Camp Ravenna  
Kevin Sedlak, ARNG, Camp Ravenna  
Greg Moore, USACE Louisville  
Nathaniel Peters II, USACE Louisville  
Eric Cheng, USACE Louisville  
Gail Harris, Vista Sciences Corp.  
Pat Ryan, Leidos-REIMS  
Belinda Price, Alliant Corporation



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

November 24, 2015

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

Subject: Response to Ohio EPA Comments on the Work Plan for a Pilot Study and Feasibility Study at RVAAP-50 Atlas Scrap Yard at the Ravenna Army Ammunition Plant, Ravenna, Ohio, Dated, October 14, 2015 Ohio EPA ID # 267-000859-106

Dear Ms. Deppisch:

The Army National Guard Directorate is in receipt of comments on the above referenced Work Plan from Ohio Environmental Protection Agency (Ohio EPA) dated October 30, 2015. It was requested that we respond to comment #3 prior to beginning the pilot-test in order to obtain Ohio EPA conditional approval to begin the pilot-test, which is scheduled to begin on November 16, 2015. A separate letter addressing Comment #3 was submitted on November 4, 2015. This letter is to address all other comments received in the October 30, 2015 letter. Please see the responses to your comments below:

1. General: The work plan states it was developed in accordance with many of the facility-wide documents, including the Facility-Wide Sampling and Analysis Plan/Quality Assurance Project Plan, and Safety and Health Plan. Where applicable, the bench- and pilot-tests must adhere to all relevant Facility-Wide documents, which would also include the Human Health Cleanup Goals, etc. Please review all Facility-Wide documents for applicability.

Response: Facility-wide documents will be reviewed and referenced to ensure that the bench- and pilot-scale tests adhere to the applicable requirements and guidance.

2. General: Facility-Wide Cleanup Goals (FWCUGs) have been developed for many constituents, specifically for the Ravenna Arsenal. The RSL cleanup level should not be used if a FWCUG exists.

Response: The FWCUGs will be used as cleanup levels for this project. RSL cleanup levels will be used only if a FWCUG does not exist. This will be specified in the document.

3. Ohio EPA noted that the PAH-excavated soil area will be in the approximate location of the former T-4703 Roads and Grounds Maintenance Building. According to multiple maps in the Final (RI) Report, dated June 26, 2015, there are many other source areas with much higher contaminant concentrations. Ohio EPA suggests the Army consider the area with the highest contamination for the tests.

Response: NOTE THIS COMMENT HAS BEEN PREVIOUSLY RESPONDED TO IN A LETTER DATED NOVEMBER 4, 2015.

4. The work plan did not specify, after the pilot test has been completed and the soils have been placed back in the excavation pit, if this area will be included in any future remediation using the VEG technology or if this area will be excluded due to previous treatment. The soils/area used in the

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Response: Please note that SPLP tests (Method 1312) are about the acidity, not the acetic acid which has been shown with EPA 1313 tests; hence, we do not typically propose Method 1312 and instead rely on 1315 (DI water). That said, if the Ohio EPA disagrees with this logic, we will add the 1312 test to the pilot. We will, however, need the prevailing criteria for the ultimate design which the Ohio EPA will require; namely, will it be SPLP or TCLP. It is difficult to design for both due to the buffer capacity needed to offset TCLP No. 2 fluid. Preference would be for SPLP, since it will correspond to less slag added.

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Response: Text in Worksheet #17 will be revised as follows: "All of the samples will consist of stockpiled soils. There will be eight (8) PAH samples (8270D SIM), and (1) PAH sample for pre-treatment (8270), five (5) TCLP samples (1311/6010C) and two (2) semi-dynamic TLP samples (TLP 1315). The field activities will be conducted during the dry weather periods. Since these samples will help determine the efficiency of remedial alternatives, no background sampling will be necessary. Pretreatment profiles and sampling will establish baseline conditions." Note that the one PAH sample that is identified as being analyzed by 8270 rather than 8270 SIM was the sample collected in advance of sending the 55-gallon drum for bench-testing prior to the pilot test. Therefore the specific analytical test was assigned at the time of sampling and cannot be changed.



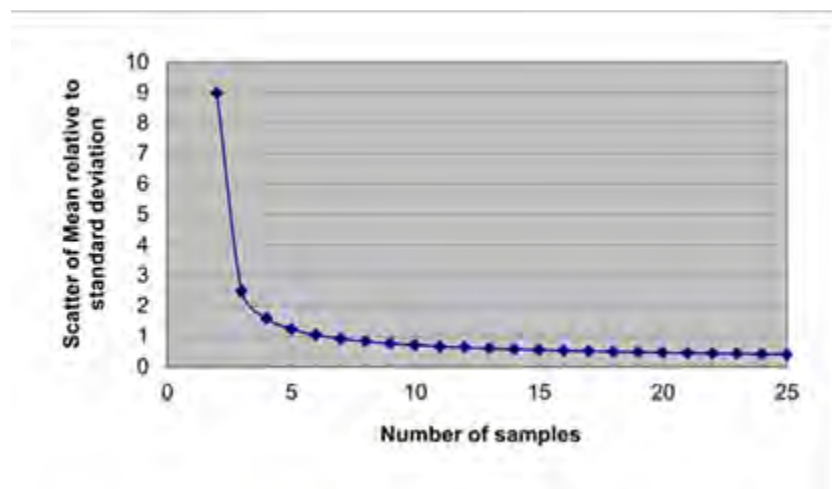
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14. Please indicate the source of the water for the pilot test project.

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Response: Water will be used for the generation of steam in the treatment system. The water will be brought onto the site from a commercial water hauler and stored on site in a water truck.

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Response: This comment will be incorporated as requested. The Table of Contents will be updated so that these sections are labeled correctly and it shows the correct page references.

19. Page 1, Section 1.1, paragraph 2, last sentence states that the 1280 acres are being remediated and managed by the Base Realignment and Closure Division (BRACD). This has changed, the site is not currently being addressed by BRACD, please modify this section.

Response: Text in this paragraph will be revised to state that, "The facility was formerly used as a load, assemble, and pack facility for munitions production. As of September 2013, administrative accountability for the entire 21,683-acre facility has been transferred to the United States Property and Fiscal Officer (USP&FO) for Ohio and the property was subsequently licensed to the Ohio Army National Guard (OHARNG) for use as a military training site, Camp Ravenna."

20. Page 3, Section 1.2, paragraph 1. The historical use of the Atlas Scrap Yard area also included the presence of an incinerator, underground storage tanks and was a storage area for numerous

Subject: Response to Ohio EPA Comments on the Work Plan for a Pilot Study and Feasibility Study at RVAAP-50 Atlas Scrap Yard at the Ravenna Army Ammunition Plant, Ravenna, Ohio, Dated, October 14, 2015 Ohio EPA ID # 267-000859-106

“treated” railroad ties and other items. This information should be included in the site description of this area.

Response: Text will be added at the end of this paragraph stating, “The Atlas Scrap Yard also included an incinerator, underground storage tanks, and was a storage area for numerous treated railroad ties.”

21. Page 5, Section 3.0, paragraph 1 implies that the Feasibility Study (FS) will be completed as part of a Technical Memorandum, which presents the results and conclusions of the bench- and pilot-tests. Please clarify this sentence, which appears to conflict with other text areas that state a Draft FS Study for this AOC is under internal review by the Army, and this work plan will be inserted as part of the FS. Please note, that Ohio EPA anticipates that the FS will follow CERCLA’s RI/FS guidance documents.

Response: The FS will be prepared separately from the Technical Memorandum. A Preliminary Draft FS was previously prepared for the site. The FS will be updated based on the results of the Bench- and Pilot-scale studies. Section 3 will be revised to clarify that the Work Plan, updated FS and Technical Memorandum will each be prepared separately. The FS will be prepared in accordance with CERCLA guidelines.

22. This Work Plan does not include a Vapor Energy Generation (VEG) process diagram. A process diagram would be useful to improve Ohio EPA’s understanding of this treatment technology. Please provide a general process diagram as a Figure in Section 2 or 3.

Response: A simple process diagram along with a photograph of the system is presented in page 2 of the subcontractor’s Work Plan. The subcontractor’s Work Plan is provided in Appendix C. The process diagram and system photograph will be referenced in Section 2.

Please contact the undersigned at (703) 607-7955 or [mark.s.leeper.civ@mail.mil](mailto:mark.s.leeper.civ@mail.mil) if there are issues or concerns with the submittal.

Sincerely,



Mark Leeper  
RVAAP Restoration Program Manager  
Army National Guard Directorate

cc: Rod Beals, Ohio EPA, DERR  
Bob Princic, Ohio EPA, DERR  
Justin Burke, Ohio EPA, DERR-CO  
Katie Tait, OHARNG Camp Ravenna  
Kevin Sedlak, ARNG, Camp Ravenna  
Greg Moore, USACE Louisville  
Nathaniel Peters II, USACE Louisville  
Eric Cheng, USACE Louisville

Gail Harris, Vista Sciences Corp.  
Pat Ryan, Leidos-REIMS  
Belinda Price, Alliant Corporation



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

November 13, 2015

**Re: US Army Ravenna Ammunition PLT RVAAP  
Remediation Response  
Project Records  
Remedial Response  
Trumbull County  
267000859106**

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

**SUBJECT: "FINAL, REMEDIAL INVESTIGATION REPORT FOR SOIL,  
SEDIMENT, AND SURFACE WATER AT RVAAP-50 ATLAS SCRAP  
YARD, FORMER RAVENNA ARMY AMMUNITION PLANT (RVAAP)  
PORTAGE/TRUMBULL COUNTIES" DATED JUNE 26, 2015**

Dear Mr. Leeper:

The Ohio Environmental Protection Agency (Ohio EPA) received and reviewed the "Final Remedial Investigation Report for Soil, Sediment and Surface Water at RVAAP-50 Atlas Scrap Yard" (Final RI Report), for the Ravenna Army Ammunition Plant, Portage/Trumbull Counties. The report is dated June 26, 2015 and was prepared by Leidos Engineering of Ohio, Inc. for the U.S. Army Corps of Engineers, Louisville District. The report was received at Ohio EPA, Northeast District Office (NEDO) on July 2, 2015.

Due to deficiencies identified on key issues, Ohio EPA is unable to approve the Final RI Report. Ohio EPA agrees that the recommended path forward is to proceed with a Feasibility Study (FS). However, Ohio EPA does not concur with the recommendation to only evaluate the contaminated areas summarized on Figure 8-2. In order to approve the Final RI Report, revisions need to be made to the conclusions and recommendations in the Final RI Report, including Figures ES-2 and 8-2 to present where Facility Wide Clean Up Goals (FWCUGs) are exceeded and require an evaluation of remedial alternatives in the FS.

The approval letter for the Final LL-10 RI report, dated August 6, 2015, noted some general issues that need to be addressed in all forthcoming Installation Restoration Program (IRP) RI submittals at RVAAP, including the Atlas Scrap RI. The following are excerpts from the LL-10 approval letter that are applicable to the Atlas Scrap Yard Final RI Report:



- A. The application of CERCLA exemption applied to contaminants at RVAAP, not related to historical operations, including PAHs: Although this issue appears to be addressed for the most part, Ohio EPA noted that this reference still exists in the text for Atlas Scrap. Please delete this reference in all forthcoming reports.
- B. While it is appropriate to provide "weight-of-evidence" evaluations in an RI concerning AOC-specific information, acceptance of such arguments (e.g., ubiquitous PAHs not associated with a release from Army activities at RVAAP) will only be accepted after considering area of concern (AOC) history and data, not as a general site-wide condition. Until such time that the sources can be linked to something other than a site-related release, it will be assumed that PAHs and other contaminants above the appropriate FWCUGs will need to be evaluated in a FS for further decision making.
- C. The sampling design, decision units, how the data are used to make decisions, application of FWCUGs, and how the sample design relates to remedial decision making, continue to be Ohio EPA concerns. Further discussions with the Army may be warranted to resolve similar concerns for other AOCs, where field investigation data has been completed and reports have been or will be submitted.
- D. The RVAAP stakeholders have spent a considerable amount of time and resources on developing specific cleanup values (FWCUGs) to be used exclusively on RVAAP projects. Citing other "standards" is not appropriate. Reference to other program's numeric values should not be included in other reports or documents. Ohio EPA's Voluntary Action Program (VAP) and the State of Ohio fire marshal's bureau of underground storage tank regulation (BUSTR) standards are not appropriate to be used as FWCUGs at RVAAP AOCs. Without the proper context of the entire rules and approaches developed for use of these values and programs, they are misleading.

**The following comments must be addressed to move the Final Atlas Scrap RI report toward approval:**

- 1) **Ohio EPA comment letter dated March 6, 2015:** Ohio EPA's comment letter on the Draft Atlas Scrap RI report is included as Appendix K in the Final RI Report; however, a response to these comments was not provided. As stated in the March 6, 2015 comment letter, the Atlas Scrap RI content should contain enough detailed information to support the conclusions. Ohio EPA could not locate a discussion in the text regarding Ohio EPA's comment letter and if all comments/changes were incorporated in the Final RI report. Please identify where these comments were addressed in the revised Final RI report.

- 2) Application of cleanup standards from other programs:** VAP standards or other program-specific numeric criteria (e.g., BUSTR) are not appropriate to be used as FWCUGs at RVAAP AOCs. Without the proper context of the entire rules and approaches developed for use of these values and programs, they are misleading. The RVAAP stakeholders have spent a considerable amount of time and resources on developing the FWCUGs to be used on RVAAP projects. The residential FWCUGs need to be used in the RI Report to determine the chemicals of concern (COCs) that require further evaluation in an FS. The FWCUGs should not be replaced by Ohio EPA's VAP residential direct contact soil standards to eliminate COCs from evaluation in the FS. These standards are not applicable as either screening values or for qualitative comparisons at sites that are not within that specific program. All references and comparisons to Ohio EPA's VAP and others, such as BUSTR, are inappropriate and need to be removed (including text, conclusions, comparisons, Figure 7-3, etc.).

For example, the "Figure 2., April 2011 Sampling Locations and Exceedances," which was given out during the May 28, 2015, Atlas Scrap Yard meeting, depicted exceedances above the residential FWCUG of 0.221 mg/kg for benzo(a)pyrene. However, in the Final RI Report, "Figure ES-2 and Figure 8-2, Contaminated Areas Requiring Remediation at Atlas Scrap Yard," the Residential FWCUG of 0.221 mg/kg was eliminated and replaced with the VAP residential generic direct contact value of 1.1 mg/kg. Consequently, exceeded residential FWCUG areas were eliminated for further evaluation in the FS. Revisions need to be made to the Final RI Report to evaluate areas that exceed residential and industrial/commercial FWCUGs.

- 3) Sample Design and Use of Data:** As presented in the Final RI report, the data collected included discreet, various targeted ISM locations, the 18 large ISM grids (entire site), and the ISM Inactive Storage Area (ISA) and Active Storage Area (ASA) grids of various sizes. In some cases, COCs varied and grid sizes ranged from approximately 0.01 to 4 acres in size. In many cases, the same area was sampled multiple times using different sampling methods. The various grid sampling data purpose and applicability to decision units is not presented to provide a clear understanding of the investigation or conclusions. Ohio EPA evaluated all the data, how it was used within the RI, and its application for inclusion in the FS. Overall, all sampling data exceeding the FWCUGs (e.g., Tables 7-7 through 7-9: All discreet and ISM sampling data exceedances for inorganics and organics, including small and large grids) must be carried through to the FS for further evaluation.

For example, large ISM grids that have higher concentrations of COCs than the smaller ISM grids or discrete samples indicate that the sources and

sources areas have not been fully characterized. Ohio EPA noted in Figure 7-3 that large grids ASYss-088M, ASYss-089M, and ASYss093M exceeded the industrial/commercial regional screening level (RSL), large grids ASYss-088M and ASYss093M also exceeded the National Guard Trainee FWCUGs, and large grid ASYss-101M exceeded the residential VAP soil standards or PAHs. In some areas, large grid ISM sampling data clearly documented higher concentrations of PAHs than in the discrete and smaller ISM sampling data. Grid ASYss-101M detected the PAH contamination at an order of magnitude greater than the light green colored grids on Figure 7-3 that are also above the FWCUG. Data suggest potential sources and source areas have not been fully defined within these grids and may require further evaluation and sampling prior to remedy selection and implementation. In contrast, the large light green colored grids that exceed the residential FWCUGs (Figure 7-3) and other low level exceedances for inorganics and organics for all other sampling data may be evaluated using a strong weight-of-evidence approach in the FS.

- 4) **Weight of Evidence Evaluation:** In general, when an area sampled within an AOC exceeds FWCUGs and/or RSLs for a COC, the AOC needs to be evaluated for remedial alternatives in the FS. Ohio EPA recognizes that there will be circumstances where documentation of a strong weight of evidence based on the RI data and AOC specific sources may be appropriate and could lead to a conclusion that no additional actions are needed. Weight of evidence evaluations, especially for PAHs, can be conducted within the FS evaluation of remedial alternatives. Ohio EPA recognizes that risk management decisions may be made based on a strong weight of evidence demonstration, and these actual decisions for the Atlas Scrap Yard AOC need to be fully evaluated within the FS, not the RI, due to the many sources and source areas, extent of the contamination, and need for confirmation sampling to determine the nature and extent of contamination. A strong weight of evidence should consider all of the AOC historical sources and uses, as well as all of the RI data. Weight of evidence evaluations for PAHs and other contaminants above the appropriate FWCUGs need to be conducted in an FS for further decision making. This weight-of-evidence approach will be part of the remedial alternative analysis that will likely also include an evaluation of alternative land uses, land use restrictions, and remediation.

#### **Summary of Final RI Recommendations:**

Ohio EPA does not concur with the Final RI recommendation to only evaluate the contaminated areas summarized on Figures ES-2 and Figure 8-2. In order to approve a Final RI Report, Figures ES-2 and 8-2 need to be revised to reflect the nature and

extent of contamination, including all areas that exceed the FWCUGs. This includes discreet and small/large ISM sampling areas. For example, although the entire grid ASYss-089M is above FWCUGs, it appears that only a portion of this grid is recommended for remediation in Figure 8-2. It is also unclear why large grids ASYss-101M and ASYss-093M and the other smaller areas of exceedances in Figure 7-3 are not carried forward for further evaluation in the FS. As stated above, regarding Tables 7-7 through 7-9, all discreet and ISM sampling data above the FWCUGs for inorganics and organics need to be carried through to the FS. Within the FS, Ohio EPA recognizes that there will be circumstances where documentation of a strong weight of evidence based on the RI data and specific sources may support a no action alternative in defined areas. This weight of evidence approach will be part of the FS remedial alternative analysis that will likely also include an evaluation of alternative land uses, land use restrictions, and remediation. These risk management recommendations and decisions will need to be clearly documented within the remedial alternatives analysis within the FS. Because of the extensive exceedances of the FWCUGs, these evaluations should not result in the general removal of COCs from further evaluation prior to the FS.

The above issues need to be addressed and resolved before a Final RI report can be approved. Ohio EPA is open to a conference call or meeting to discuss these issues. Please contact me at (330) 963-1207, if you have any questions.

Sincerely,



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

VD/nvr

ec: Mark Leeper, ARNG  
Nat Peters, USACE Louisville  
Katie Tait/Kevin Sedlak, OHARNG, Camp Ravenna  
Gail Harris/Rebecca Haney, Vista Sciences  
Greg Moore, USACE Louisville  
Justin Burke, Ohio EPA, CO, DERR  
Brian Tucker/Carrie Rasik, Ohio EPA, CO, DERR  
Bob Princic, Ohio EPA, NEDO, DERR  
Rod Beals, Ohio EPA, NEDO, DERR  
Vanessa Steigerwald-Dick, Ohio EPA, NEDO, DERR





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

November 5, 2015

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  
267000859106

**Subject:** E-mailed Letter, Dated November 4, 2015, regarding Ohio EPA Comment #3 on the Draft Work Plan for a Pilot Study and Feasibility Study at RVAAP-50 Atlas Scrap Yard at the Ravenna Army Ammunition Plant, Ravenna, Ohio, Dated, October 14, 2015

Dear Mr. Leeper:

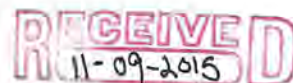
The Ohio Environmental Protection Agency (Ohio EPA) has received and reviewed the e-mailed letter, dated November 4, 2015, regarding Ohio EPA's Comment #3 on the Work Plan for a Pilot Study and Feasibility Study at RVAAP-50 Atlas Scrap Yard at the Ravenna Army Ammunition Plant, Ravenna, Ohio.

The Ohio EPA comment and ONG response are detailed below:

*Comment #3: Ohio EPA noted that the PAH-excavated soil area will be in the approximate location of the former T-4703 Roads and Grounds Maintenance Building. According to multiple maps in the Final (RI) Report, dated June 26, 2015, there are many other source areas with much higher contaminant concentrations. Ohio EPA suggests the Army consider the area with the highest contamination for the tests.*

*Response: For the pilot test, the soils will not be excavated around building T-4703. The most highly contaminated area is located near the stock piled rail road ties. Please see attached Figure ES-2. The drum of soil that was collected for the VEG pre-calibration was collected from the yellow shaded area depicted on Figure ES-2 and the pilot test will be conducted in this area. The Work Plan will be revised accordingly.*

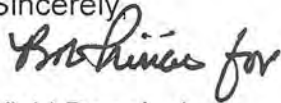
Ohio EPA finds the response to Comment #3 to be acceptable. The pilot test project is approved by Ohio EPA. It is the understanding of Ohio EPA that the responses to the other comments will be forthcoming.



MR. MARK LEEPER  
ARMY NATIONAL GUARD DIRECTORATE  
PAGE 2  
NOVEMBER 5, 2015

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

Sincerely,

A handwritten signature in black ink that reads "Bob Princic for". The signature is written in a cursive, flowing style.

Vicki Deppisch  
Environmental Specialist  
Division of Environmental Response and Revitalization

VD/nvr

cc: Katie Tait, OHARNG RTLS  
Kevin Sedlak, ARNG  
Gregory F. Moore, USACE  
Rebecca Haney/Gail Harris, VISTA Sciences Corp.

ec: Mark Leeper, ARNG  
Bob Princic, Ohio EPA, NEDO DERR  
Rodney Beals, Ohio EPA NEDO DERR  
Justin Burke, Ohio EPA, CO DERR  
Tim Christman, Ohio EPA, NEDO DDAGW  
Kevin Palombo, Ohio EPA, NEDO DERR  
Eric Cheng, USACE Louisville



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

November 4, 2015

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

Subject: Response to OEPA Comment #3 on the Work Plan for a Pilot Study and Feasibility Study at RVAAP-50 Atlas Scrap Yard at the Ravenna Army Ammunition Plant, Ravenna, Ohio, Dated, October 14, 2015. Ohio EPA ID # 267-000859-106.

Dear Mr. Princic:

The Army National Guard Directorate is in receipt of comments on the above referenced Work Plan from Ohio Environmental Protection Agency (OEPA) dated October 30, 2015. You have requested that we respond to comment #3 prior to beginning the pilot-test in order to obtain Ohio EPA conditional approval to begin the pilot-test, which is scheduled to begin on November 16, 2015. Please see the response to comment #3 below:

Comment #3: Ohio EPA noted that the PAH-excavated soil area will be in the approximate location of the former T-4703 Roads and Grounds Maintenance Building. According to multiple maps in the Final (RI) Report, dated June 26, 2015, there are many other source areas with much higher contaminant concentrations. Ohio EPA suggests the Army consider the area with the highest contamination for the tests.

Response: For the pilot test, the soils will not be excavated around building T-4703. The most highly contaminated area is located near the stock piled rail road ties. Please see attached Figure ES-2. The drum of soil that was collected for the VEG pre-calibration was collected from the yellow shaded area depicted on Figure ES-2 and the pilot test will be conducted in this area. The Work Plan will be revised accordingly.

We respectfully request your concurrence with the response to Comment #3 and conditional approval to begin the pilot-test. Responses to the other comments will be forthcoming. Please contact the undersigned at (703) 607-7955 or [mark.s.leeper.civ@mail.mil](mailto:mark.s.leeper.civ@mail.mil) if there are issues or concerns with the submittal.

Sincerely,

Mark Leeper  
RVAAP Restoration Program Manager  
Army National Guard Directorate

cc: Rod Beals, Ohio EPA, DERR  
Justin Burke, Ohio EPA, DERR-CO

Katie Tait, OHARNG Camp Ravenna  
Kevin Sedlak, ARNG, Camp Ravenna

Response to OEPA Comment #3 on the Work Plan for a Pilot Study and Feasibility Study at RVAAP-50  
Atlas Scrap Yard at the Ravenna Army Ammunition Plant, Ravenna, Ohio, Dated, October 14, 2015.  
Ohio EPA ID # 267-000859-106

Greg Moore, USACE Louisville  
Nathaniel Peters II, USACE Louisville  
Eric Cheng, USACE Louisville  
Gail Harris, Vista Sciences Corp.  
Pat Ryan, Leidos-REIMS  
Belinda Price, Alliant Corporation



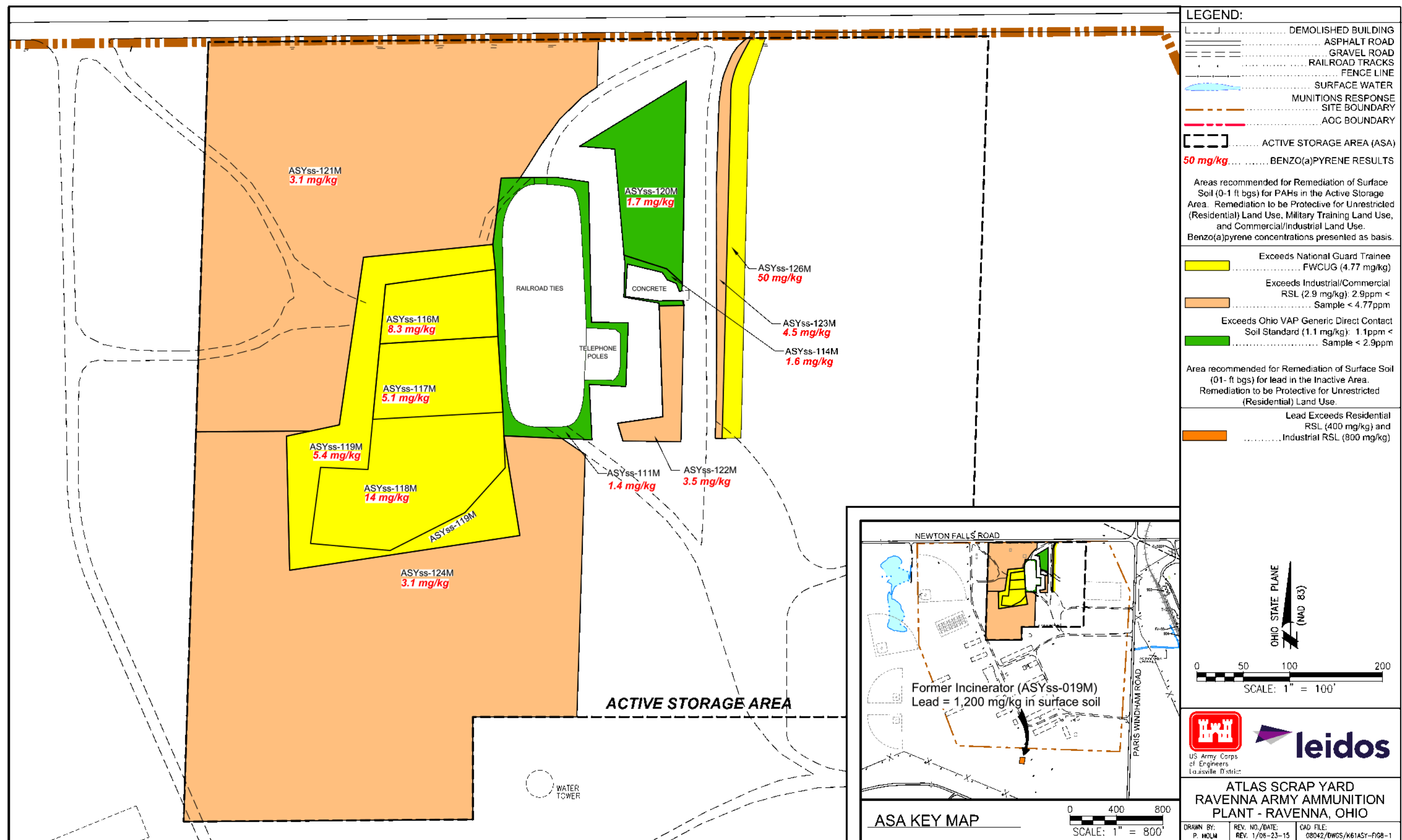


Figure ES-2. Contaminated Areas Requiring Remediation at Atlas Scrap Yard



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

October 30, 2015

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  
267000859106**

**Subject: Ravenna Army Ammunition Plant, Portage/Trumbull Counties. Draft,  
Work Plan for a Pilot Study and Feasibility Study at RVAAP-50 Atlas  
Scrap Yard at the Ravenna Army Ammunition Plant, Ravenna, Ohio,  
Dated, October 14, 2015**

Dear Mr. Leeper:

The Ohio Environmental Protection Agency (Ohio EPA) has received and reviewed the "Draft, Work Plan for a Pilot Study and Feasibility Study at RVAAP-50 Atlas Scrap Yard" at the Ravenna Army Ammunition Plant (RVAAP), Ravenna, Ohio, and is dated October 14, 2015. This document was received at Ohio EPA's Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR), on October 15, 2015. The work plan was prepared for the US Army Corps of Engineers (USACE) Louisville District by Alliant Corporation under Contract Number W912QR-14-D-0001. The work plan has been reviewed by various personnel at Ohio EPA.

It is the understanding of Ohio EPA that the bench-test is currently being conducted and the pilot-test is scheduled to begin November 16, 2015. Please note that Ohio EPA is finalizing comments on the Final Remedial Investigation (RI) report dated June 26, 2015, which may have an impact on the areas proposed for remediation on the amount of soil to be treated.

Comments on the work plan are provided below. **Please respond to comment #3, prior to beginning the pilot-test in order to obtain Ohio EPA conditional approval to begin the pilot-test.** Some comments refer to the bench-test as well as the pilot-test. Although the bench-test is currently underway, the comments require a response. All comments require adequate responses in order to approve the Final Work Plan.

### COMMENTS

1. General: The work plan states it was developed in accordance with many of the facility-wide documents, including the Facility-Wide Sampling and Analysis Plan/Quality Assurance Project Plan, and Safety and Health Plan. Where applicable, the bench- and pilot-tests must adhere to all relevant Facility-Wide documents, which would also include the Human Health Cleanup Goals, etc. Please review all Facility-Wide documents for applicability.
2. General: Facility-Wide Cleanup Goals (FWCUGs) have been developed for many constituents, specifically for the Ravenna Arsenal. The RSL cleanup level should not be used if a FWCUG exists.
3. Ohio EPA noted that the PAH-excavated soil area will be in the approximate location of the former T-4703 Roads and Grounds Maintenance Building. According to multiple maps in the Final (RI) Report, dated June 26, 2015, there are many other source areas with much higher contaminant concentrations. Ohio EPA suggests the Army consider the area with the highest contamination for the tests.
4. The work plan did not specify, after the pilot test has been completed and the soils have been placed back in the excavation pit, if this area will be included in any future remediation using the VEG technology or if this area will be excluded due to previous treatment. The soils/area used in the pilot-test should not be excluded from the areas proposed in the FS for remediation. During the remediation process, sufficient confirmatory soil samples should be taken of the in-situ bottom soils, prior to backfilling the treated soils to demonstrate applicable standards have been met.
5. Lead: The work plan does not specify the composition of steel slag to be used with the lead, as various compositions exists. Please provide the composition and indicate if the same composition will be used throughout the pilot test. It is the understanding of Ohio EPA that the amount of lead-contaminated soil to be

treated has not yet been determined. Steel slag in general, can have negative consequences to surrounding surface water and aquatic life by the generation of high pH waters, leaching of potentially problematic trace metals, and rapid rates of calcite precipitation. Although the purpose is to bind the lead, Ohio EPA wants to make sure another problem is not created. Please discuss.

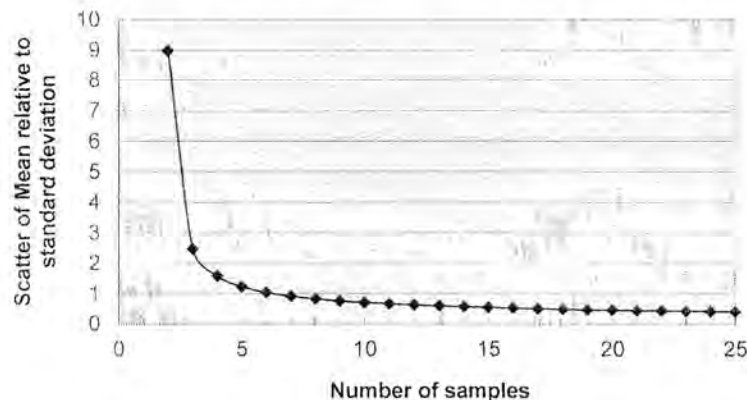
6. Health and Safety Plans: Ohio EPA reviews and comments, but does not approve, Health and Safety Plans. Ticks and poison ivy, as referenced in the "Site Safety and Health Plan" section, are numerous throughout the site. In addition, cell phone coverage is spotty. Ohio EPA suggests evaluating cell phone coverage specifically at the Atlas Scrap Yard area and perhaps plan on working in pairs.
7. 3.1.1 Pre-Treatment Sampling and Worksheets: The text is not clear about how the composite samples will be collected from the 55 gal. drum (PAH) or the 10 gal. bucket (lead) or the number of samples that will go into each composite. The work plan states "...one 2-aliquot (or more) composite sample will be collected from soil contaminated in the 10-gallon container." Ohio EPA recommends 7 or 8 per container, to get a good distribution of the contents. The same should also apply to post-treatment samples collected in 3.1.2 and 3.1.3. A larger sample group makes for a more representative composite. As the bench-test is already in progress, please provide the number of aliquots that were collected and if less than 7-8, provide rationale and support for the pre-treatment number. As stated above, Ohio EPA recommends 7-8 aliquots (or points) be collected for post-treatment sampling.
8. Pilot-Test: The work plan indicates the pre-treatment and post-treatment sampling will consist of 3 point composites. As stated above in comment #7, Ohio EPA recommends 7-8 point composite samples be collected for a more representative composite.
9. 3.1.3 Bench-Scale Testing for Treatment of lead in Soils: Ohio EPA recommends adding the Synthetic Precipitation Leaching Procedure (SPLP), method 1312, to the Method 1315 procedure, to assess leaching from the treated samples. The Method 1315 procedure uses deionized water, while the SPLP process uses a simulate acid rain solution. In that way the effects of a more realistic or natural precipitation on leaching. As stated in the work plan, the standard method 1311 (TCLP) should still be included and used for disposal purposes. As it is the understanding of Ohio EPA that the bench-scale lead test



is currently underway and a pilot test is not planned for lead, this issue will need to be resolved prior to moving forward with remediation.

10. QAPP Worksheet #17: Please insert the analytical methods next to the descriptions for clarification. For example, "semi-dynamic TLP samples" should state "semi-dynamic TLP samples (method 1315)."
11. Method 1315: Please clarify the length of time it will take to turn around method 1315. U.S. EPA method 1315 indicates it will take 63 days; the work plan QAPP worksheet #30 indicates "data package turnaround time" is 28 days.
12. 3.2.1 Soil Excavation and 3.2.2 Onsite Treatment: As with pre-treatment sampling, Ohio EPA recommends more than 3 points in the composite samples. Seven (7) or 8 points would result in a more representative composite. Refer to comment #3 above.

The following graph shows how the mean of a composite test sample can vary depending on the number of specimens that make up the sample.



The vertical axis is the 95% range of the scatter of the mean (relative to the true standard deviation of the population) as a function of the number of individual specimens in the composite. As the plot shows, when the number of specimens exceeds 7 or 8 the likely scatter of the sample mean gets smaller. Thus, the larger sample size means that the indicated value of the mean will probably be closer to the true value.

13. QAPP Worksheet #28: This worksheet states that QC samples are listed in Table 3-1. Ohio EPA cannot locate any reference to QC samples in that table.
14. Please indicate the source of the water for the pilot test project.
15. Figure 4-4, April 2010 Source Area Sampling Locations: This is the only figure included in the work plan and although it does identify some of the source sampling areas it does not identify all sampling locations at the Atlas Scrap Yard. Other maps in the Final RI report identify additional sampling locations and contaminant concentrations. Please refer to comment #3.
16. Air: The local air agency has reviewed the work plan and indicated to Ohio EPA that they have spoken with the contractor and the Army. The Agency stated the Permit-By-Rule (PBR) for the soil vapor remediation equipment was submitted for review and the contractor and the Army are aware of the requirements to use best practices for controlling visible emissions of fugitive dust from the roadways, storage piles, and material handling equipment. It appears the scope and scale of the pilot-test is small enough to not require permits for the fugitive sources at this time, provided the use of best practices is employed.
17. Section 3.1.1 titled, "Pretreatment Sampling" is located on page 6. The Table of Contents does not mention this section. Please correct this discrepancy.
18. Sections 3.1.2 and 3.1.3 are located on page 8. These sections are not labeled correctly in the Table of Contents. Please correct this discrepancy.
19. Page 1, Section 1.1, paragraph 2, last sentence states that the 1280 acres are being remediated and managed by the Base Realignment and Closure Division (BRACD). This has changed, the site is not currently being addressed by BRACD, please modify this section.
20. Page 3, Section 1.2, paragraph 1. The historical use of the Atlas Scrap Yard area also included the presence of an incinerator, underground storage tanks and was a storage area for numerous "treated" railroad ties and other items. This information should be included in the site description of this area.
21. Page 5, Section 3.0, paragraph 1 implies that the Feasibility Study (FS) will be completed as part of a Technical Memorandum, which presents the results and conclusions of the bench- and pilot-tests. Please clarify this sentence, which appears to conflict with other text areas that state a Draft FS Study for this AOC

is under internal review by the Army, and this work plan will be inserted as part of the FS. Please note, that Ohio EPA anticipates that the FS will follow CERCLA's RI/FS guidance documents.

22. This Work Plan does not include a Vapor Energy Generation (VEG) process diagram. A process diagram would be useful to improve Ohio EPA's understanding of this treatment technology. Please provide a general process diagram as a Figure in Section 2 or 3.

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

Sincerely,



Vicki Deppisch  
Environmental Specialist  
Division of Environmental Response and Revitalization

VD/nvr

cc: Katie Tait/Kevin Sedlak OHARNG RTLS  
Gregory F. Moore, USACE  
Rebecca Haney/Gail Harris, VISTA Sciences Corp.

ec: Mark Leeper, ARNG  
Bob Princic, Ohio EPA, NEDO DERR  
Rodney Beals, Ohio EPA NEDO DERR  
Justin Burke, Ohio EPA, CO DERR  
Tim Christman, Ohio EPA, NEDO DDAGW  
Kevin Palombo, Ohio EPA, NEDO DERR



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

October 30, 2015

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

Subject: Notification of Field Work, Former Ravenna Army Ammunition Plant (RVAAP) Restoration Program, Camp Ravenna, Portage/Trumbull Counties, RVAAP-50 Atlas Scrap Yard, Pilot Study and Feasibility Study.  
Ohio EPA ID # 267-000859-106

Dear Mr. Princic:

In accordance with the Director's Final Findings and Orders, Section XIII, #28, for Ravenna, the Army is providing notification of field pilot study activities at Camp Ravenna 15 days prior to the scheduled start date. These activities are currently scheduled to begin on November 16, 2015 and to conclude by November 23, 2015, and will be conducted at the Atlas Scrap Yard (CC-RVAAP-50). The primary contractor, Alliant Corporation and their subcontractor, Endpoint Consulting Inc. will be conducting the pilot study under contract W912QR-14-D-0001.

The pilot study activities at this site will fall under the *Final Work Plan for a Pilot Study and Feasibility Study at RVAAP-50 Atlas Scrap Yard* scheduled to be completed prior to the start of field activities.

Please contact the undersigned at (703) 607-7955 or [mark.s.leeper.civ@mail.mil](mailto:mark.s.leeper.civ@mail.mil) if there are issues or concerns with the submittal.

Sincerely,

Mark Leeper  
RVAAP Restoration Program Manager  
Army National Guard Directorate

cc: Rod Beals, Ohio EPA, DERR  
Justin Burke, Ohio EPA, DERR-CO  
Katie Tait, OHARNG Camp Ravenna  
Kevin Sedlak, ARNG, Camp Ravenna  
Greg Moore, USACE Louisville  
Nathaniel Peters II, USACE Louisville

Eric Cheng, USACE Louisville  
Gail Harris, Vista Sciences Corp.  
Pat Ryan, Leidos-REIMS  
Belinda Price, Alliant Corporation





**NATIONAL GUARD BUREAU**

111 SOUTH GEORGE MASON DRIVE  
ARLINGTON VA 22204-1373

October 6, 2015

Ohio Environmental Protection Agency  
DERR-NEDO

Attn: Ms. Vicki Deppisch  
2110 East Aurora Road  
Twinsburg, OH 44087-1924

Subject: Ravenna Army Ammunition Plant Restoration Program  
RVAAP-50 Atlas Scrap Yard Remedial Investigation Report Extension Request  
Ohio EPA ID #267-000859-106  
Camp Ravenna, Portage/Trumbull Counties, Ohio

Dear Ms. Deppisch:

On September 30, 2015 the Army received an additional Extension Request for review of the *Final Remedial Investigation Report of Soil, Sediment, and Surface Water at RVAAP-50 Atlas Scrap Yard* site at Camp Ravenna (Ohio EPA ID#267-000859-106) to a review deadline of October 31, 2015. The document was received at the Ohio EPA on July 2, 2015, and dated June 26, 2015. The Ohio EPA requested and was granted an extension of the 45-day review deadline of August 14, 2015 to September 30, 2015. The Army approves the additional extension request to October 31, 2015.

Please contact the undersigned at (703) 607-7955 or [Mark.S.Leeper.civ@mail.mil](mailto:Mark.S.Leeper.civ@mail.mil) if there are issues or concerns.

Sincerely,

A handwritten signature in black ink, appearing to read "Mark S. Leeper", is located below the "Sincerely," text.

Mark S. Leeper  
RVAAP Restoration Program Manager  
Army National Guard Directorate

cc: Justin Burke, Ohio EPA, DERR  
Rod Beals, Ohio EPA DERR  
Bob Princic, Ohio EPA DERR  
Nat Peters, USACE – Louisville  
Greg Moore, USACE – Louisville  
Katie Tait/Kevin Sedlak, Camp Ravenna  
Gail Harris/Rebecca Haney, Vista Science Corp.



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

September 29, 2015

Mr. Mark Leeper, P.G., MBA  
Army National Guard Directorate  
Environmental Programs Division  
ARNGD-ILE-CR  
111 South George Mason Drive  
Arlington, VA 22204

Re: US Army Ravenna Ammunition Plt RVAAP  
Remediation Response  
Project Records  
Remedial Response  
Trumbull County  
267000859106

**SUBJECT: OHIO EPA ADDITIONAL EXTENSION REQUEST FOR FINAL ATLAS SCRAP  
YARD REMEDIAL INVESTIGATION REPORT FOR THE RAVENNA ARMY  
AMMUNITION PLANT DATED JUNE 26, 2015**

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, Remedial Investigation (RI) Report for Soil, Sediment, and Surface Water at RVAAP-50 Atlas Scrap" document, for the Ravenna Army Ammunition Plant (RVAAP). The document was received at NEDO on July 2, 2015, and is dated June 26, 2015. Ohio EPA's 45-day review deadline is August 14, 2015. On July 15, 2015, Ohio EPA requested an extension deadline of September 30, 2015. Due to the complexity of the various issues associated with the Atlas Scrap AOC, Ohio EPA is requesting an additional extension until October 31, 2015. Please respond to Ohio EPA formally, if this deadline is acceptable or not.

If you have any questions on the above, 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  
Division of Environmental Response and Revitalization

VD/nvr

cc: Gail Harris/Rebecca Haney, Vista Sciences  
Greg Moore, USACE Louisville  
ec: Justin Burke, Ohio EPA, CO, DERR  
Brian Tucker/Carrie Rasik, Ohio EPA, CO, DERR  
Rod Beals, Ohio EPA, NEDO, DERR  
Bob Princic, Ohio EPA, NEDO, DERR  
Vanessa Steigerwald, Ohio EPA, NEDO, DERR  
Katie Tait, OHARNG, Camp Ravenna  
Kevin Sedlak, ARNG, Camp Ravenna  
Nat Peters, USACE Louisville



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

July 15, 2015

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

Re: US Army Ravenna Ammunition PLT RVAAP  
Remediation Response  
Project Records  
Remedial Response  
Trumbull County  
267000859106

**SUBJECT: OHIO EPA EXTENSION REQUEST FOR FINAL ATLAS SCRAP YARD  
REMEDIAL INVESTIGATION REPORT FOR THE RAVENNA ARMY  
AMMUNITION PLANT, DATED JUNE 26, 2015**

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 Remedial Investigation (RI) Report for Soil, Sediment, and Surface Water at RVAAP-50 Atlas Scrap" document for the Ravenna Army Ammunition Plant (RVAAP). The document was received at NEDO on July 2, 2015, and is dated June 26, 2015. Ohio EPA's 45-day review deadline is August 14, 2015. It is the understanding of Ohio EPA that the document has been completely revised in order to address the numerous comments in Ohio EPA's previous comment letter of March 6, 2015, and others. Due to the time allocation required to conduct the review coupled with other project deadlines, Ohio EPA is requesting an extension deadline until September 30, 2015. Although the Army has verbally agreed to this new deadline, please advise Ohio EPA formally, if this deadline is acceptable.

If you have any questions on the above, please call me at 330-963-1207.

Sincerely,

Vicki Deppisch  
Division of Environmental Response and Revitalization

VD/nvr

cc: Gail Harris/Rebecca Haney, Vista Sciences  
ec: Justin Burke, Ohio EPA, CO, DERR  
Vanessa Steigerwald, Ohio EPA, NEDO, DERR  
Rod Beals, Ohio EPA, NEDO, DERR  
Bob Princic, Ohio EPA, NEDO, DERR  
Nat Peters, USACE Louisville

Greg Moore, USACE Louisville  
Brian Tucker, Ohio EPA, CO, DERR  
Katie Tait, Camp Ravenna  
Kevin Sedlak, ARNG, Camp Ravenna  
Carrie Rasik, Ohio EPA, CO, DERR





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

March 6, 2015

**Re: US Army Ravenna Ammunition PLT RVAAP  
Remediation Response  
Project Records  
Remedial Response  
Trumbull County  
267000859**

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

**SUBJECT: OHIO EPA REVISED COMMENT LETTER OF SEPTEMBER 29, 2014,  
"RAVENNA ARMY AMMUNITION PLANT PORTAGE/TRUMBULL  
COUNTIES DRAFT, ATLAS SCRAP YARD RI REPORT DATED JUNE  
18, 2014," Project ID # 267-000859-106**

Dear Mr. Leeper:

The Ohio Environmental Protection Agency (Ohio EPA) received and reviewed the "Draft, Remedial Investigation (RI) Report for Soil, Sediment and Surface Water at RVAAP-50 Atlas Scrap Yard" for the Ravenna Army Ammunition Plant, Portage/Trumbull Counties. The report is dated June 18, 2014. Ohio EPA sent the Army comments in a letter dated September 29, 2014. The comment letter addressed global and specific issues, but due to the nature of the global comments that could affect the human health and ecological risk assessments, a detailed risk review was not conducted by Ohio EPA. During the December 2014 meeting regarding the Load Line 10 (LL-10) RI report, the Army requested detailed risk comments from Ohio EPA for Atlas Scrap. Since many of the comments in the September 29, 2014 Ohio EPA comments overlap the risk issues, Ohio EPA is providing a comprehensive revised comment letter for the Atlas Scrap RI report. Please disregard Ohio EPA's comment letter dated September 29, 2014, for the Atlas Scrap RI report.

The Atlas Scrap RI report was received at Ohio EPA prior to resolving the comments for the LL-10 RI report, which was proposed as the template for the remaining PBA08 reports. Many of the global issues and concerns regarding the LL-10 RI report are cited in this comment letter. The Atlas Scrap RI content should contain enough detailed information to be a stand-alone document and support the conclusions.



There are specific concerns with the Atlas Scrap RI, including the sampling design used to define contamination at the AOC and how the data was used to make remedial decisions, CERCLA exemption, and others. Therefore, Ohio EPA would like to request a meeting to work through those concerns identified in our review, which affect both approval of the document and final remedy selection for the site. Based upon the data presented in the RI, a No Further Action (NFA) for Atlas Scrap does not appear appropriate.

Ohio EPA suggests that the following over-arching issues be discussed to identify a path forward for Atlas Scrap:

1. The application of CERCLA exemption for PAHs and Section 7.2.6 - Ohio EPA does not agree that this exemption applies, as there are potential sources where releases related to these activities could have occurred. Semi-volatile organic compounds (SVOCs) may have been generated from many potential sources at Atlas Scrap, given the multiple uses of the AOC over time (e.g., UST/Service stations, incinerator, truck grease rack, tool crib, blacksmith shop, garage, workman sheds, materials testing lab, various operations, vehicle areas, and railroad ties).

If there are areas the Army would like to propose that would qualify for this Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) exemption, where no potential source or release is located, Ohio EPA would require evidence which supports the exemption to concur with the Army's determination. Until such time that the sources can be linked to something other than a site-related release, it will be assumed that Polycyclic Aromatic Hydrocarbons (PAHs) and other contaminants above the appropriate Facility-Wide Cleanup Goals (FWCUGs) will need to be evaluated in a Feasibility Study (FS) for further decision making.

2. ISM grid sampling decision units (including specific historical locations) – There are many different grid unit designations presented in the RI report and the rationale for the various (both historical and those collected for the RI) grids is not clearly presented. A more detailed description and rationale of the grid sampling would help, including the decision approach for each ISM sample. The following is a summary of the ISM sampling as understood by Ohio EPA and stumbling blocks encountered:

The report states (1) 35 ISM samples were collected in 2004 for "The 14 AOCs Report," (2) 35 ISM samples and 5 discrete samples were collected in 2010 for the PBA08 RI, and (3) 16 ISM samples were collected in 2011 for the PBA08 RI report. The 35 ISM samples collected in 2010 included 17 samples (ASYss-069m through ASYss-085m), to further define the extent of contamination detected in the 2004 ISM samples, and 18 samples (ASYss-086m through

ASYss-103m), which evaluated the entire site into approximately 4 acres each. The 16 ISM samples were from the "active" area after the site was further evaluated and divided into two areas: "active" and "inactive." The grid sizes for the 16 ISM samples ranged from 0.2 to 3.3 acres. The rationale for the different grids and decision criteria were not discussed in the text to provide a clear understanding of the investigation.

Necessary historical information was not included in the report to provide an understanding of the previous sampling locations. Ohio EPA reviewed "The Construction Camp Utilities Map" by Wilbur Watson & Associates, dated February 2, 1942, that Ohio EPA was provided by the Army during the "14 areas of concern (AOCs) report." The map identifies areas of potential contamination that were designated for sampling for the "14 AOCs report" including ditches, etc. Figures ES-2 and 4-3 in the RI report identify historical ISM sampling locations, but many are not labeled (such as ditches). The legend does refer the historical sampling specifically to the "14 AOCs report." Supporting information regarding the 35 ISM samples and maps/tables from the "14 AOCs report" that is used to understand and support the conclusions should be included in the RI report. Figures ASY-7 through 10B from the "14 AOCs report" should be evaluated for inclusion in the RI report.

There appears to be a conflict with three figures from three different reports for Atlas Scrap regarding sampling locations: (1) Figure ASY-7 from the "14 AOCs Report" (identifying ISM sampling locations), (2) Figure Q-3, Historical Exceedances and Proposed Sampling Locations from the work plan for the RIs (identifying proposed ISM sampling locations to further define the horizontal extent of contamination), and (3) Figures ES-2 and 4-3 from the RI report (which combine # 1 and # 2 figures and identifies the confirmatory sampling locations) appear to conflict with each other. It appears from Figures ES-2 and 4-3 that the locations of the proposed additional sampling from Figure Q-3 were altered. The rationale for the change should be discussed in the text as it appears to deviate from the approved work plan. A discussion in the RI report text that discusses these discrepancies could not be located. The discrepancies need to be resolved.

Specific information from the work plan and sampling and analysis plan (SAP) that is necessary to understand and support the conclusion of the RI should also be provided. Other figures, data, and text from the work plan should be evaluated for inclusion in the RI report, such as Figure Q-2, Q-1, exceedance maps, etc.

The SAP, Table Q-3, pg. Q-5, comment response states, "Eighteen MI samples areas are planned in an approximately 4-acre grid to characterize those portions of the known operational area of Atlas Scrap Yard where samples have not been

previously collected." Section 4.1.1 (RI report), Surface Soil Sampling Rationale and Methods, stated, "A total of 18 grid ISM samples were collected to complete characterization of the AOC." There is no mention that the samples excluded areas that were previously sampled or the opposite. A recent email from USACE indicated all 18 ISM samples included all previously sampled areas located within the entire grid. The text does not discuss when and where the change from the SAP was made or the rationale.

The site is grouped into two final areas: active and inactive for estimating exposure point concentrations (EPCs). Two areas for a 73 acre site are too large for estimating exposure. Ohio EPA is concerned with the approach and potential implications for remediation, as several of the larger and smaller units indicate exceedances of standards. In addition, several comments have been made in the past regarding the appropriate sizes for exposure areas and how small but related ISM samples could be combined.

3. Plans for materials on-site that are likely sources (railroad ties, scrap etc.) - This is another area that has solid waste and materials that could be a source of contamination, however, the document does not discuss how these materials will be handled or remedied.
4. Not enough information is provided for a clear understanding of the investigation and sampling results - Enough information should be provided in the report to be a stand-alone document that adequately supports the conclusion. This was also discussed in more detail during the LL-10 meeting. All figures and tables should be referenced and tied back to the text in appropriate places to provide a clear understanding of the data.

The following are Ohio EPA specific comments:

1. A discussion was held for MMRP projects regarding how the Army will address solid and construction/demolition wastes at AOCs. The Atlas Scrap Yard disposal areas fall under the solid waste discussion and the conclusion was that solid waste or construction/demolition wastes would be addressed appropriately under the IRP action. As Atlas Scrap Yard contains solid waste and construction/demolition wastes, these materials must be appropriately handled, evaluated, and disposed of, in accordance with Director's Final Findings and Orders (DFFOs) and applicable or relevant and appropriate requirements (ARARs). Please advise how the Army plans to address this issue.
2. Two areas from historical references that were not included in ISM or discreet sampling were the truck grease rack and the materials testing lab. Please discuss.

3. Historical potable wells that have not been properly abandoned may provide contaminant pathways to ground water and should be investigated and included in the RI report. The Former Water Well Abandonment Report indicated well # 1 in the Atlas Scrap Yard was shown in the 1941 surveyors' field book, but could not be located due to "Too much local attraction (junk) to pinpoint with locator." The report states, "They (un-located wells) are worth another look when the vegetation is down." The RI report does not discuss any historical potable well. The Wilbur Watson construction map identifies two wells and their locations, which are assumed to be for potable water use. The location and status of these wells should be investigated and discussed in the RI report to ensure the protectiveness of the ground water at RVAAP.
4. Page ES-11 and other areas: The word "necessary" is used in association with No Further Action (NFA) such as "NFA is necessary." Ohio EPA is concerned with the meaning of this statement as it appears to imply the Army must make this determination and not rely on the Army's interpretation of the data. Ohio EPA suggests substituting "recommends" or "suggests" or another appropriate word. The use of the acronym 'NFA' in this section, and in others, is difficult for the reader to understand in the context of this report.
5. Page 1-3, lines 8 and 9: Report states, "All buildings and structures at Atlas Scrap Yard have been demolished; therefore, they are not evaluated as continuing sources of contamination in this report." Although Structures may have been removed, the text does not indicate if historical operations or demolition practices may have contributed to contamination at the property. The text should define the historic activities at, near, or underlying these buildings, which may present a source or migration route for site contamination. All historical usage and associated contaminants need to be evaluated. Please revise this sentence and discuss all historical areas, based on activities, their investigation, and sampling that occurred.
6. General: Ohio EPA could not locate a map that identifies all ISM sampling locations with all historical site features (Figure 2-1). Please provide.
7. Sewers: Please provide a more detailed discussion on the sample locations and findings related to the sewers at Atlas Scrap and whether areas on Atlas Scrap have been identified as sources to the sewers. It appears from the 14 AOCs report that sewers at Atlas Scrap were impacted. If so, discuss how the source area will be addressed for the sewers located within the Atlas Scrap property boundaries. Note: the sewers are identified on the Wilbur Watson construction map. Please discuss how the sewer related data at Atlas Scrap will be or has been disseminated to the Site-Wide Sewer RI report.
8. Figure 2-1, Site Features: Please add a legend to identify buildings.



9. Page 2-3, list of historical buildings (including multiple uses over time): This section should address each building's use/activities over time, potential associated contaminants, rationale to include/exclude for sampling, if appropriate, sampling results and conclusions of the area. The discussion should also include asbestos and PCBs/transformers.
10. Page 2-3, lines 18 & 19: The text does not provide an origin of the slag, which could be an indication of its leaching potential. The report should denote if the slag could be a potential source of contamination to ground water or surface water in the area. This discussion should also denote the type of chemicals of concern (COCs) the Army would expect if the slag would leach and the sampling completed to address this concern.
11. Page 2-3, line 39: Report states north-central former parking area was used as a supply dump by the highway department. Based upon this use, there is potential for releases of materials in this area, such as petroleum compounds or other materials. Please discuss what was stored, if this use noted any releases and what investigation was performed.
12. Page 2-4, Operational History - It was noted that MEC was previously identified around building T-18. Ohio EPA is concerned with safety, so the text should note whether the MEC was removed or if safety concerns were observed during the activities. Please clarify.
13. Section 4.1.1 Surface Soil Sampling Rationale and Methods do not contain enough information to support the conclusions of the RI report. Supporting maps and tables that are referenced in the text should also be included to provide a clear understanding.
14. Table 4-2, PBA08 RI Surface Soil Samples and Rationale, and Table 5-2, Data Summary, Table 5-12, Analytes Detected in PBA08 RI Discrete Surface Soil Samples and others: Ohio EPA could not locate corresponding maps. Maps identifying all sampling locations, data presentations, etc. would be helpful.
15. Section 2.2.2.1 - Relative Risk Site Evaluation (RRSE) Report for Newly Added Sites: Summary information needs to be provided for this report including a table and map of detected contaminants. Were any data from this report used in the RI report? Please discuss. If so, provide a discussion of the sampling rationale, locations, and conclusions.
16. Section 2.2.2.1 - Relative Risk Site Evaluation (RRSE) Report for Newly Added Sites: It appears that VOCs were noted in this report, including benzene in ground water, and two historical service stations were identified at the AOC. This

information identifies COCs and potential sources at Atlas Scrap, which need to be discussed in the RI report with the supporting data. Please discuss.

17. Section 2.2.2.2 - Characterization of 14 AOCs Report: This report appears to be relied upon for conclusions in the Atlas Scrap RI, however, it is unclear what data was used, where the samples were located within the AOC, the chemicals of potential concern (COPCs), and the rationale for conclusions based upon this report. The document should clearly state the 35 samples and analysis that was used for the RI report with maps and tables; a description of the source areas and migration routes impacted with regards to the 14 AOCs; and any conclusions used from this report for the RI Report.
18. Ground water: Page 3-5: The report presents results of slug tests performed at the 10 ground water monitoring wells during the "Characterization of 14 AOCs" investigation. Please indicate how this information will be disseminated to the facility-wide ground water monitoring program (FWGWMP).
19. Ground water: Page 3-9, section 3.7.1.1: The report states contaminated surface soil may represent a potential secondary source of contamination to ground water. Page 6-26, lines 16-18: Report states, "Observed ground water concentrations from AOC monitoring wells ... however, it should be noted that these wells may not exist near the sample location with the maximum concentration and should not be consider in direct correlation." The RI report then compares monitoring well data from EQM with the summary statement, "These data indicate soil and sediment sources are not currently impacting ground water quality." However, this is not supported by the above statements, which point to "sources" and improper sampling support to document impacts or no impacts to ground water. If the locations (horizontal and vertical) of the monitoring wells were not evaluated, this statement may be inaccurate.
20. Ground water: The report relies on 123D modeling results and interpretation that indicate some contaminants "exceed screening criteria in ground water beneath their source and were retained for lateral transport modeling to downgradient receptors [i.e., unnamed tributary to Cobbs Pond (flowing northeast)]. The ground water should be considered the primary receptor of the migration prior to impacting surface water." Additionally, the model results indicated concentrations in ground water beneath source areas would exceed maximum contaminant levels (MCLs) or regional screening levels (RSLs) in about 30 years or less, will peak at 50 years or less. Report concludes, based upon modeling results, that there are no potential future impacts. Ohio EPA does not have a high comfort level with these conclusions or accuracy of the model based upon statements within the document eluding to no support for the modeling parameters. The report has stated the monitoring wells may not be installed in the correct location and the same model used for LL-10 had conflicts. In

addition, ground water in these RI locations may be used for a potable water source in the future. These issues need further clarification and discussion.

21. Ground water: Flow lines indicate flow from LL-12 to Atlas Scrap which are adjacent to one another. Nitrate, above the MCL, and elevated levels of metals were detected in ground water at LL-12. Was nitrate sampled in any of the soil or ground water at Atlas Scrap due to the potential of contaminant migration?
22. Ground water: Section 6 discusses chemical factors affecting fate and transport, the soil screening process, modeling, etc. Please reference the document(s), such as SAP, work plan, etc., where the fate and transport discussions were agreed upon, the soil screening process approved, etc. This will support the conclusion of the RI report that states (pg. 6-32), "Based on review of the screening and modeling results, along with weight of evidence (WOE) factors, none of the identified CMCOs for soil or sediment are impacting ground water at Atlas Scrap Yard and do not warrant further evaluation of source removal in a FS."

The report recommends no soil removal based on modeling assumptions that were presented with conflicting or lacking information, such as reliance on ground water wells that may not be appropriately placed. It is still unclear to Ohio EPA how information in all the RI reports, regarding ground water issues, will be evaluated and disseminated to the FWGWMP.

23. Page 3-9, Section 3.7.1: Report states, "No primary contaminant sources from building structures remain at Atlas Scrap yard in the IA." However, there did not appear to be any discussion regarding the potential for asbestos at the site or transformers. Please discuss if these issues were addressed in demolition and if any releases may have occurred.
24. Page 4-2, Section 4.1.1: Report states, "The sample locations in the PBA08 SAP were derived from the sample polygons provided during the development of the SAP." Please provide the polygons with additional discussion on their development and if any basis of the decision has changed.
25. Section 5.2.2.3, line 34, regarding: ISM sampling location ASY/ss-126M. Ohio EPA could not locate on Figure 4-3. Please verify.
26. Figure 5-8 and 5-9 (ISM sampling grids): As specified above, please discuss these figures in more detail in the text and how these sampling grids were developed and the decision criteria to be used following obtaining the results.
27. ISM sample numbers ASYss-113m through ASYss-117m are not included in Table 5-11. Please verify.

28. Page 6-11, lines 24-26: Refers to Table E-4 identifying site-related contaminant (SRCs) that are eliminated and SRCs that are carried forward. A hardcopy of Table E-4 (Appendix E) should be included in the text section of the report as it represents a decision. Appendices A-I is presented only on disk.
29. Page 6-15 regarding SRCs eliminated and retained: This refers to Table E-7 (Appendix E), which is only presented on disk. As this represents another decision, a hardcopy should be included in the RI report.
30. Ohio EPA compared the 18 grid ISM sampling results for inorganics (Figure 5-9) (Figure 5-8) to the smaller ISM sampling results (Figure 5-2, 5-3, 5-4). Figure 5-8 does not include boundary lines for Figures 5-2 through 5-4, so it was approximated. Some large grid results, indicating no FWCUG exceedances, had smaller ISM exceedances within the larger grid. These include ASYss-093m, ASYss-091m, ASYss-102m for manganese, ASYss-096m for arsenic, and ASYss-092m for lead (close to the incinerator). Ohio EPA also compared the 18 grid sampling results for organics to Figures 5-5 through 5-7. Exceedances were noted in the smaller grids within the large grids ASYss-094m, ASYss-91m, and ASYss-96m. These large grids indicated no exceedances. This relates to the earlier comments regarding the grid sampling structure and path forward that needs to be resolved.
31. Section 7.2, human health risk assessment (HHRA), references various guidance documents used in the HHRA. Ohio EPA noted that the Final, Technical Memorandum Land Uses and Revised Risk Assessment Process document, dated September 6, 2013, was not included in this list. It is unclear to Ohio EPA if this document played a role in the HHRA or any other portion of the RI report. Please discuss and clarify.
32. Table 4-2, pg. 4-4, (which provides rationale for sampling), ISM 0-1, states, "Delineated lateral extent of previously identified contamination in the IA and further investigate the location of former tar cleaning operations." Ohio EPA could not locate a discussion regarding a "tar cleaning operations" within the report. All historical operations should be discussed and included in the RI report.
33. Various sections of the report state there is no background for PAHs but it conflicts with discussion of PAH background in the risk assessment page 7-21. It is the understanding of Ohio EPA that although SVOCs were collected at background locations they were not going to be used in the reports. Please clarify.



The following are specific HHRA comments as requested:

34. Section 5.1.4 states that only data from ISM locations were used in the SRC screen. This is not appropriate. Given this is an initial screening step, all data should be included in the SRC screening process.
35. Table 5-6 appears to be a summary for surface soil concentrations as part of the SRC process. Table 5-6 indicates the maximum value of lead is 1200 mg/kg. This is not consistent with Figure 5-4 that lists a value of lead as 3,570 mg/kg. Similarly, manganese on table 5-6 has a listed maximum value of 3,600 mg/kg and Figure 5-4 has a value for the same metal listed as 5,480 mg/kg. Table 6-4 SEOIL modeling result, cites AYSss-080M-5754-SO as the source of the greatest BaP concentration of 200 mg/kg. However, Figure 5-5 has the same sample number with a BaP concentration of only 20 mg/kg. Clarify and ensure data are accurately used and displayed throughout the document.
36. Section 7.1.1 indicates that some discrete and ISM surface soil samples were used to characterize the nature and extent of contamination, but were not used for screening or risk assessment purposes. No rationale was provided on the decision criteria for using or not using data. All data should be used in the SRC screening unless data do not meet the data quality objects of the sampling plan(s). ISM results are to be treated as individual assessments and management units with the caveats listed below. Discrete data should be subject to the screening process and if found to be elevated, used in the risk assessment as appropriate.
37. Page 7-13: Discussions of hexavalent chromium indicated that the National Guard Trainee FWCUG was adjusted to estimate a CUG for Cr+6. It is recommended that the residential U.S. EPA RSL for hexavalent chromium of 3 mg/kg (based on 1E-5 risk goal) be used in future assessments. In addition the RSL for trivalent chromium should also be used for future assessments.
38. Section 7.2.4.2. Exposure Point Concentrations for Comparisons to FWCUGs: Per discussions on the previous LL-10 RI report, ISM areas and results should be treated as separate AOCs. Results from ISM events should generally not be combined with either discrete or other ISM data to calculate EPCs and should be considered independent evaluation/assessments. However, there may be some instances where adjacent and small ISM areas could be combined to make a larger exposure area. Care must be taken not to oversize the decision units or have the units based on something other than extent of contamination. Under certain circumstances adjacent or small ISM areas could be combined, but this would need to be agreed upon and rationale provided. Combining small ISM samples would be based on site-specific information, such as the extent of

contamination, the type or types of COCs, their concentrations and spatial considerations. In addition, aggregates of soil data should be based on the extent of contamination, not the boundaries of the AOCs. This change will result in some ISM areas, and possibly limited aggregates, being evaluated in a Feasibility Study (FS) to determine the type of remedy needed for those areas that exceed risk and hazard goals.

39. Section 7.2.4.2.: Only two exposure units were identified in section 7.2.4.2, the ASA and IA as being used for EPC calculations. Given the sizes of the two areas, these areas are too large and do not appear to match the overall sampling strategy for the AOC. Given the large number of ISM units, it is not clear how the units were initially intended to be used in the assessments or possible remedial decisions. The grid areas used as EUs need to be discussed and an approach on how to determine exposure areas, exposure point concentrations, and how areas with COPCs are evaluated in a feasibility study agreed to prior to revising the RI report. In addition, if other PBA08 AOCs have been evaluated similarly, then revisions to those reports will likely be necessary.
40. Section 7.2.4.3.: SOR calculations are still not consistent with U.S. EPA RAGS A. See section 8.2.2 (starting on page 8-11) in EPA/540/1-89/002. The current risk assessment attempts to only sum compounds with similar target organs or systems. The U.S. EPA approach sums all non-carcinogens and then segregates compounds based on target organs. The remaining COPCs or those compounds without specific adverse/critical effects remain in the first group of non-carcinogens.

The following are specific ecological risk comments:

41. Ecological risk assessment: The report indicates that the Atlas Scrap Yard has not been surveyed for threatened and endangered species. Two mobile state species of interest (one of concern and one threatened) have been identified near the AOC. Provide rationale for not completing a species survey for these organisms.
42. Section 7.3.3.3.: All soil data should be used for screening purposes and possibly EPC estimates or identification of COPECs. Provide additional detail on how ecological data were selected for screening and re-screen using all appropriate soil data.
43. Section 7.3.3.7.: Additional information is needed on how average (mean) concentrations were calculated. Also, given that many of the data points were ISM values it may not be appropriate to combine or average the values based on their locations and spatial relationship to the wetlands. Each wetland being assessed should be identified (e.g., Figure 7.1) and any ISM or discrete data

within the wetland should be evaluated, to determine if the values can be used as EPCs for further assessment (refinement of COPECs). It is not appropriate to average AOC-wide values to estimate mean concentrations of COPECs in wetlands of 1 or more acre. The quantitative portions of the ecological risk assessment should be revised based on these comments and future discussions. In addition, further sampling may be needed if the wetland areas are not evaluated well enough for a quantitative screening or assessment.

44. Section 7.3.3.7.: Background screening should be used on a point by point evaluation and site concentrations not be reduced to mean values. See Ohio EPA background guidance for further detail:

<http://www.epa.state.oh.us/portals/30/rules/Use%20of%20Background%20for%20ORR%20Sites.pdf>

Comparison of mean values may be appropriate to risk-based screening values for ecological risk assessments. Evaluations of background values using mean concentrations should be eliminated from the ecological risk assessment.

Please call me at (330) 963-1207, if you have any questions on the above.

Sincerely,



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

VD/nvr

cc: Katie Tait/Kevin Sedlak, ARNG, Camp Ravenna  
Gail Harris/Rebecca Haney, Vista Sciences  
Greg Moore, USACE Louisville

ec: Justin Burke, Ohio EPA, CO, DERR  
Brian Tucker/Carrie Rasik, Ohio EPA, CO, DERR  
Rod Beals, Ohio EPA, NEDO, DERR  
Vanessa Steigerwald, Ohio EPA, NEDO, DERR





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

March 19, 2015

Mr. Mark Leeper  
Army National Guard Directorate  
ARNGD-ILE Clean Up  
111 South George Mason Drive  
Arlington, VA 22204

Re: US Army Ravenna Ammunition Plt RVAAP  
Remediation Response  
Project Records  
Remedial Response  
Portage County  
267000859

**Subject: Ravenna Army Ammunition Plant Portage/Trumbull Counties, Approval, Re. Final Site Characterization/Focused Feasibility Study (SC/FFS), Dump along Paris-Windham Road, RVAAP-51, Dated February 6, 2015, Ohio EPA ID # 267-000859-040**

Dear Mr. Leeper:

The Ohio Environmental Protection Agency (Ohio EPA) has received and reviewed the draft changes to the Executive Summary of the "Final Site Characterization/Focused Feasibility Study (SC/FFS), Dump along Paris-Windham Road, RVAAP-51 at the Ravenna Army Ammunition Plant (RVAAP), Ravenna, Ohio." These changes were received via e-mail February 6, 2015, and are based on a comment letter sent by Ohio EPA, dated November 10, 2014. The document was prepared for the U.S. Army Corps of Engineers (USACE)-Louisville District, by Science Applications International Corporation (currently known as Leidos), under contract no. W912QR-08-D-0008.

Ohio EPA has reviewed the changes made to the Executive Summary for the SC/FFS based on Ohio EPA's comment letter, dated November 10, 2014, and a conference call that occurred December 4, 2014, and found them to be acceptable.

Ohio EPA provides the following comment on the submittal:

**Comment 1.**

The Focused Feasibility Study for Paris-Windham Dump did not provide an operation and maintenance (O&M) plan or a clear description of activities that will be conducted to ensure the cover (cap) over the waste will be maintained and on what schedule. Appendix D includes cost estimates for O&M activities for the selected Alternative. The FFS also included discussions of the 5 year review. Ohio EPA will anticipate that a clearly described O&M Plan will be included in the Preferred Plan and other future submittals.

During our review of the changes made to the document, there were issues that Ohio EPA believes should be included or considered in future Feasibility Study submittals:

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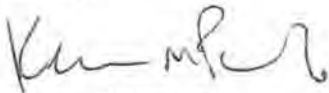
MR. MARK LEEPER  
ARMY NATIONAL GUARD DIRECTORATE  
MARCH 19, 2015  
PAGE 2

- All Land Use Control agreements need to be made part of the facility-wide Property Management Plan.
- The Feasibility Study should include discussions of O&M of any Engineering Control included in the remedy.
- We understand for this particular site, a Focused Feasibility Study was presented where only two alternatives were discussed and evaluated. In future submittals for other areas of concern, Ohio EPA will anticipate that a wider array of technologies and alternatives will be evaluated.

Pursuant to the CERCLA process, the property owner usually can provide the expected land uses to assist in ensuring that the investigation addresses all receptors for both current and future land uses. Be advised that due to land use uncertainty, Ohio EPA may require additional work in the future, to address data gaps. It is incumbent upon the Army to finalize land use at Camp Ravenna as soon as possible, otherwise additional work and schedule slippage may result.

We look forward to the Army's submittal of the Proposed Plan. 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: Katie Tait, OHARNG RTLS  
Kevin Sedlak, ARNG  
Gregory F. Moore, USACE  
Nat Peters, USACE  
Rebecca Haney/Gail Harris, Vista Sciences Corp.

ec: Justin Burke, Ohio EPA, CO DERR  
Rod Beals, Ohio EPA NEDO DERR  
Brian Tucker, Ohio EPA, CO DERR



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

February 4, 2015

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

Subject: Response to Ohio EPA Comments for Final Site Characterization/Focused Feasibility Study (SC/FFS), Dump Along Paris-Windham Road, RVAAP-51, Former Ravenna Army Ammunition Plant / Camp Ravenna, Portage and Trumbull Counties, Ohio, (Ohio EPA Work Activity No. 267-000859-040)

Dear Mr. Palombo,

The Army received your comment letter on the SC/FFS for the Dump Along Paris Windham Road on November 14, 2014. The Army team and the Ohio EPA held a comment clarification meeting by telephone on December 4, 2014.

Since that time the Army has evaluated the Residential Contaminants of Concern (COCs) by comparing the exposure point concentrations to the USEPA regional screening levels for the industrial worker (which corresponds to the full-time worker receptor for Camp Ravenna). This evaluation, which has been added to the revised "Executive Summary and Update" of the document, demonstrated that the residual contamination meets the commercial/industrial standard to allow use by the full-time worker. The revised "Executive Summary and Update" also points out that the inhalation risk from residual asbestos has been alleviated by the cover applied during the interim removal action and that digging restrictions will be part of the final remedy.

The Army believes that these revisions address your concerns contained in the November 2014 comment letter. We have included an electronic copy of the revised document so that you can review the redline revisions in the "Executive Summary and Update." If these revisions are acceptable, the Army will finalize the report and provide the appropriate number of copies.

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

Sincerely,

A handwritten signature in black ink, appearing to read "Mark S. Leeper", is positioned above the printed name.

Mark S. Leeper  
RVAAP Restoration Program Manager  
Army National Guard Directorate

Subject: Response to Ohio EPA Comments for Final Site Characterization/Focused Feasibility Study (SC/FFS), Dump Along Paris-Windham Road, RVAAP-51, Former Ravenna Army Ammunition Plant / Camp Ravenna, Portage and Trumbull Counties, Ohio, (Ohio EPA Work Activity No. 267-000859-040)

No enclosures (revised document to be submitted via email)

cc: Rod Beals, Ohio EPA, DERR-NEDO  
Kevin Sedlak, ARNG-ILE, Camp Ravenna  
Katie Tait, OHARNG, Camp Ravenna  
Greg Moore, USACE Louisville  
Nat Peters, USACE Louisville  
Gail Harris, Vista Sciences Corporation  
REIMS - attn. Pat Ryan, Leidos



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

December 17, 2015

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  
267000859036**

**Subject: Ravenna Army Ammunition Plant, Portage/Trumbull Counties.  
Approval of the Response to Comments on the RVAAP-66 Draft  
Facility-Wide Groundwater Report on the July 2015 Sampling Event,  
Dated December 3, 2015. Ohio EPA ID # 267-000859-036**

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 Report on the July 2015 Sampling Event" 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 December 4, 2015. The report was prepared for the US Army Corps of Engineers (USACE) Louisville District by Environmental Quality Management, Inc. under Contract Number W912QR-11-F-0266.

The response to Ohio EPA comments provided an agreement to modify the Executive Summary based on a minor omission and to evaluate the need for redevelopment of selected monitoring wells prior to the installation of dedicated sampling pumps.

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 may be finalized.



MR. MARK LEEPER  
ARMY NATIONAL GUARD DIRECTORATE  
December 17, 2015  
PAGE 2

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: Katie Tait, OHARNG RTLS  
Kevin Sedlak, ARNG  
Gregory F. Moore, USACE  
Rebecca Haney/Gail Harris, VISTA Sciences Corp.

ec: Bob Princic, Ohio EPA, NEDO, DERR  
Rodney Beals, Ohio EPA, NEDO, DERR  
Justin Burke, Ohio EPA, CO, DERR  
Al Muller, Ohio EPA, NEDO, DDAGW



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

November 17, 2015

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 with Modifications on the "Draft Facility-Wide Groundwater Monitoring Program Report on the July 2015 Sampling Event" for the Ravenna Army Ammunition Plant, Ravenna, Ohio, Dated October 22, 2015, Ohio EPA ID # 267-000859-036**

Dear Mr. Leeper:

The Ohio Environmental Protection Agency (Ohio EPA) has received the "Draft Facility-Wide Groundwater Monitoring Program Report on the July 2015 Sampling Event" for 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 October 23, 2015. The report was prepared for the US Army Corps of Engineers (USACE) Louisville District by Environmental Quality Management, Inc. under Contract Number W912QR-11-F-0266.

The Draft Facility-Wide Ground Water Report summarizes the ground water monitoring activities conducted during the July 2015 sampling event. A total of 42 wells were sampled. FWGWMP semiannual sampling of 37 wells was conducted concurrently with semiannual RCRA ground water sampling of three wells (RQLmw-007, RQLmw-008, and RQLmw-009) in Ramsdell Quarry and two wells (DETmw-003 and DETmw-004) in Demolition Area #2. The 42 wells were sampled between July 20 and 24, 2015.

Eight wells, FBQmw-174, FWGmw-002, LL1mw-083, LL1mw-084, LL1mw-086, RQLmw-011, RQLmw-012, and RQLmw-013 having historical pH levels outside the typical range for natural ground water (i.e., <5 or >9) were specifically monitored for pH during the 2015 July sampling event. Four of these wells were also sampled for analytical testing.



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. Most laboratory analyses were performed by Test America Laboratories. Hexavalent chromium analyses were performed by ALS Environmental. Ground water results were compared to Ohio EPA Drinking Water MCLs and U.S. EPA June 2015 Regional Screening Levels (RSLs) for tap water.

Explosive/Propellant compounds, including: 2,4,6-trinitrotoluene, 2,4-dinitrotoluene, 2,6-dinitrotoluene, nitrate-nitrite, and RDX were detected above their respective RSLs and/or MCLs in 11 monitoring wells: FBQmw-174, LL1mw-083, LL1mw-084, LL3mw-238, LL3mw-241, LL12mw-185, LL12mw-187, DETmw-004, LL2mw-267, WBGmw-006, and WBGmw-009.

Concentrations of inorganic compounds including: aluminum, arsenic, cobalt, cyanide, iron, manganese, and hexavalent chromium exceeded their respective RSLs and/or MCLs in 31 monitoring wells: DA2mw-115, DETmw-003, FWGmw-011, FWGmw-012, FWGmw-015, FWGmw-016, LL1mw-064, LL1mw-065, LL1-083, LL1-084, LL1mw-086, LL1mw-087, LL1mw-088, LL2mw-059, LL2mw-267, LL2mw-271, LL3mw-244, LL7mw-001, LL12mw-18, LL12mw-242, LL12mw-247, NTAmw-119, NTAmw-119, RQLmw-007, RQLmw-008, RQLmw-009, SCFmw-002, SCFmw-004, WBGmw-006, WBGmw-020, and WBGmw-021.

Concentrations of one VOC carbon tetrachloride exceeded its RSLs (0.45 µg/L) in one well: LL10mw-003. The concentration of carbon tetrachloride did not exceed its MCL (5.0 µg/L) in LL10mw-003.

Pursuant to the Directors Findings and Orders Paragraph 39 (b), Ohio EPA approves the submittal upon satisfactory written response to specified conditions as presented below:

#### **Draft Facility-Wide Groundwater Monitoring Program Report on the July 2015 Sampling Event**

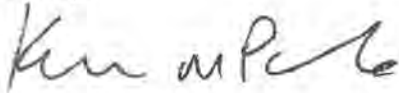
1. The *Inorganic Elements* section of the *Executive Summary* of the report contains an error of omission, as it does not mention that the concentrations of cobalt exceed the RSL in a number of the wells ((LL1mw-083, LL1mw-084, LL2mw-059, LL2mw-271, and LL2mw-187) sampled during the July 2015 sampling event. This portion of the *Executive Summary* should be modified to fully and accurately summarize results.
2. The report indicates that seven (FWGmw-011, LL3mw-238, LL7mw-001, LL12mw-242, LL12mw-247, NTAmw-119, and RQLmw-008) of the 42 sampled wells (about 17 percent) had elevated turbidity levels (>10 NTUs) at the time of

MR. MARK LEEPER  
ARMY NATIONAL GUARD DIRECTORATE  
NOVEMBER 17, 2015  
PAGE 3

sampling. The turbidity in these wells ranged from about 22.9 NTUs (NTAmw-119) to 407 NTUs (LL12mw-242). Six of these wells also had elevated concentrations of iron, manganese, and arsenic. The Agency understands that the facility plans to install dedicated pumps in most of the frequently sampled wells by the next sampling event, scheduled for January 2016. Hopefully, the use of dedicated pumps will reduce the incidences of elevated turbidity during sampling and provide for more representative samples. Ohio EPA also recommends that the facility evaluate the need of redeveloping some of the seven wells that had elevated turbidity prior to installing the dedicated pumps.

If you have any questions, or wish to request 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/nvr

cc: Katie Tait, OHARNG RTLS  
Kevin Sedlak, ARNG  
Gregory F. Moore, USACE  
Rebecca Haney/Gail Harris, VISTA Sciences Corp.

ec: Bob Prinic, Ohio EPA, NEDO DERR  
Rodney Beals, Ohio EPA NEDO DERR  
Justin Burke, Ohio EPA, CO DERR  
Albert Muller, Ohio EPA, NEDO DDAGW





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

November 9, 2015

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

Mr. Mark Leeper  
Army National Guard Bureau  
Environmental Programs Division  
ARNG-ILE-CR  
111 South George Mason Drive  
Arlington, VA 22204

**Subject: FFY'15 Milestone Extension for the RVAAP-66 Facility-Wide  
Groundwater Draft RI/FS Work Plan and Annual Submittal Date  
Revision for the Draft Facility-Wide Groundwater Report, Project ID #  
267-000859-036.**

Dear Mr. Leeper:

The purpose of this correspondence is to respond to your September 29, 2015 request, to extend the Facility-Wide Groundwater AOC, RVAAP-66 *Draft Remedial Investigation/ Feasibility Study (RI/FS) Work Plan* milestone date and your October 6, 2015 request, to change the *Draft Annual Facility-Wide Groundwater (FWGW) Report* milestone submittal date. These topics were further discussed during the October 14, 2015 meeting at Ohio EPA's Northeast District Office.

The September 30, 2015, FFY'15 RVAAP-66 Draft RI/FS Work Plan milestone date was missed due to a change in contractors and related contracting procedures. The National Guard Bureau (NGB) raised the potential of project delays in our January 29, 2015 Installation Action Plan (IAP) meeting and Ohio EPA has been provided project updates since. Ohio EPA is pleased that a new contractor has been selected and that work is proceeding expeditiously on this project. The September 29, 2015 request proposed a revised milestone date of March 28, 2016. This date was changed to February 1, 2016, during our October 14, 2015 meeting. Pursuant to Section X, paragraph 22 of the June 10, 2004 Director's Final Findings and Orders (DFFOs), Ohio EPA concurs that there is good cause for the requested extension and approves your request. The new milestone date for the Draft RI/FS Work Plan is February 1, 2016.

The annual submittal date for the Draft FWGW report is December 15<sup>th</sup>. This milestone date was first documented in the December 2003 *Final Conceptual Plan for a Facility-Wide Groundwater Monitoring Program Plan (FWGMP), Section 4.2*, which was

MR. MARK LEEPER  
ARMY NATIONAL GUARD BUREAU  
NOVEMBER 9, 2015  
PAGE 2

attached as Appendix F of the 2004 DFFOs and has been used since as an annual milestone. The NGB has pointed out that the December 15<sup>th</sup> submittal date raises scheduling and logistical issues related to the semi-annual sample collection and analysis, and has proposed that the Draft FWGW Report be submitted in the first quarter of the following year, in order to assure appropriate data and report QA/QC. This topic was discussed at the October 14, 2015 meeting and an alternative submittal date of February 15<sup>th</sup> was agreed upon by both Agencies. Thus, Ohio EPA concurs with the request to change the milestone date for the annual submittal of the Draft FWGW Report to February 15<sup>th</sup>.

Section 4.3 of the FWGMP also requires the submittal of an annual review, as part of the annual reporting process. This review evaluates the applicability and effectiveness of the FWGMP and describes any proposed modifications to the plan. Since the ground water sampling that will be conducted during the next year will be detailed within the FWGW RI/FS Work Plan, Ohio EPA and NGB agreed during the October 14, 2015 meeting that the annual review is not needed for the next year. Annual review submittals will resume in calendar year 2017, as an attachment to the Draft FWGW report.

Please update the FFY'16 Milestones to reflect the approved extension for the RVAAP-66 Draft RI/FS Work Plan and the revised milestone submittal date for the Annual FWGW Reports. Please do not hesitate to contact me at (330)963-1218 or [rodney.beals@epa.ohio.state](mailto:rodney.beals@epa.ohio.state), if you have any questions.

Sincerely,



Rod Beals  
Manager  
Division of Environmental Response and Revitalization

RB/nvr

cc: Bob Princic, DERR, NEDO  
Kevin Palombo, DERR, NEDO  
Justin Burke, CO, NEDO  
Katie Tait, OHARNG RTLS  
Kevin Sedlak, OHARNG RTLS  
Gregory F. Moore, USACE  
Rebecca Haney/Gail Harris, VISTA Sciences Corp.



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

October 1, 2015

Mr. Mark Leeper  
Army National Guard Directorate  
ARNGD-ILE Clean Up  
111 South George Mason Drive  
Arlington, VA 22204

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

**Subject: Ravenna Army Ammunition Plant, Portage/Trumbull Counties. Approval of the RVAAP-66 Draft Facility-Wide Groundwater Report on the March 2015 Sampling Event, Dated September 21, 2015. Ohio EPA ID # 267-000859-036**

Dear Mr. Leeper:

The Ohio Environmental Protection Agency (Ohio EPA) has received the "Final Facility-Wide Groundwater Monitoring Program RVAAP-66 Facility-Wide Groundwater Report on the March 2015 Sampling Event" 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 September 22, 2015. The report was prepared for the US Army Corps of Engineers (USACE) Louisville District by Environmental Quality Management, Inc. under Contract Number W912QR-11-F-0266.

This document was reviewed by personnel from Ohio EPA's DERR, 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.

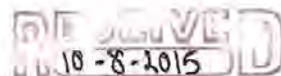
Sincerely,

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: Katie Tait, OHARNG RTLS  
Kevin Sedlak, ARNG  
Gregory F. Moore, USACE  
Rebecca Haney/Gail Harris, VISTA Sciences Corp.  
ec: Rodney Beals, Ohio EPA NEDO DERR  
Bob Princic, Ohio EPA NEDO DERR  
Justin Burke, Ohio EPA, CO DERR  
Al Muller, Ohio EPA, NEDO DDAGW





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

September 29, 2015

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

Subject: Ravenna Army Ammunition Plant (RVAAP) Restoration Program  
Portage/Trumbull Counties, Ohio  
Request for FY15 DFFO Milestone Extension for RVAAP-66 Remedial  
Investigation/Feasibility Study Work Plan

Dear Mr. Beals:

The following designated Area of Concern (AOC), Facility-Wide Groundwater AOC, RVAAP-66, located at the former Ravenna Army Ammunition Plant (RVAAP), has a mutually agreed upon Fiscal Year (FY) 2015 Director's Final Findings and Orders (DFFO) milestone that will not be achieved.

The "*Draft Remedial Investigation/Feasibility Study (RI/FS) Work Plan*" will not meet its DFFO Milestone due to a change in contractors (and the related contractor solicitation/award). The new contractor, the TEC-Weston Joint Venture Team, received a Notice to Proceed on 18 August 2015. The Contract Kick-Off Meeting was held on 22 September 2015. The FY15 DFFO Milestone for issuance of a "*Draft RI/FS Work Plan*" on 30 September 2015 will not be achieved. The Army proposes to transition the Milestone deliverable into FY16, with a proposed DFFO Milestone Date of **28 March 2016**.

The Army requests Ohio EPA's review and concurrence with this request for a FY15 DFFO Milestone extension for the RVAAP-66 RI/FS Work Plan. Please contact the undersigned at [\(703\) 607-7955](tel:7036077955) or [mark.s.leeper.civ@mail.mil](mailto:mark.s.leeper.civ@mail.mil) if there are issues or concerns with this submission.

Sincerely,

A handwritten signature in black ink, appearing to read "Mark Leeper", is positioned above the printed name.

Mark Leeper, P.G., MBA  
RVAAP Restoration Program Manager  
Army National Guard Directorate

cc: Rod Beals, Ohio EPA, DERR-NEDO  
Justin Burke, Ohio EPA  
Kevin Palombo, Ohio EPA  
Katie Tait, Ohio National Guard  
Kevin Sedlak, ARNG, Camp Ravenna  
Gail Harris, Vista Sciences





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

September 2, 2015

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  
267000859036**

**Subject: Ravenna Army Ammunition Plant, Portage/Trumbull Counties.  
Approval of the Response to Comments on the RVAAP-66 Draft  
Facility-Wide Groundwater Report on the March 2015 Sampling  
Event, Dated July, 2015. Ohio EPA ID # 267-000859-036**

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 Report on the March 2015 Sampling Event" 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), via email on August 27, 2015. The report was prepared for the US Army Corps of Engineers (USACE) Louisville District by Environmental Quality Management, Inc. under Contract Number W912QR-11-F-0266.

The response to Ohio EPA comments provided clarification on the Draft Report and notification of the award of the new ground water contract. It also provided assurance that tasks that have been delayed, such as additional well installation near the southeast property lines will be completed.

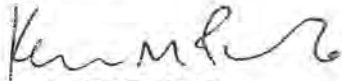


MR. MARK LEEPER  
ARMY NATIONAL GUARD DIRECTORATE  
SEPTEMBER 2, 2015  
PAGE 2

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 may be finalized.

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: Katie Tait, OHARNG RTLS  
Kevin Sedlak, ARNG  
Gregory F. Moore, USACE  
Rebecca Haney/Gail Harris, VISTA Sciences Corp.

ec: Bob Princic, Ohio EPA, NEDO DERR  
Rodney Beals, Ohio EPA, NEDO DERR  
Justin Burke, Ohio EPA, CO DERR  
Al Muller, Ohio EPA, NEDO DDAGW



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

August 27, 2015

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

Subject: Ravenna Army Ammunition Plant (RVAAP) Restoration Program  
Portage/Trumbull Counties  
RVAAP-66 Facility-Wide Groundwater  
Report on the March 2015 Sampling Event  
Response to Comments  
Ohio EPA ID 267-000859-036

Dear Mr. Palombo:

On August 20, 2015, the Army received a letter of correspondence from the Ohio Environmental Protection Agency (Ohio EPA), dated August 18, 2015. The letter presented the Ohio EPA comments on the Draft *Facility-Wide Groundwater Monitoring Program RVAAP-66 Facility-Wide Groundwater Report on the March 2015 Sampling Event* for the former Ravenna Army Ammunition Plant in Portage/Trumbull Counties Ohio. Below, please find our responses to the Ohio EPA comments. This document was prepared for the U.S. Army Corps of Engineers (USACE) - Louisville District by Environmental Quality Management, Inc. under Contract No. W912QR-11-F-0266.

**COMMENTS**

**Comment #1.** Ohio EPA believes that the following statement in the Executive Summary section (page vi) of the submitted report is a typographical error:

*To date, 281 Facility-wide Ground Water Monitoring Program (FWGWMP) wells of the 284 wells at the facility have been sampled and analyzed a minimum of four quarters.*

It is our understanding, that as of the October 2014 sampling event that all 284 FWGWMP wells have been sampled and analyzed a minimum of four quarters. If this is accurate, please let us know in an email, then we will provide notice to finalize the document.

**Response:** This is a typographical error. All 284 wells have been sampled a minimum of four quarters. The text will be revised to reflect this change.



Subject: Facility-Wide Groundwater Monitoring Program RVAAP-66 Facility-Wide  
Groundwater Response to Comments for the Draft Report on the March 2015 Sampling Event  
Portage/Trumbull Counties

## GENERAL COMMENTS

**Comment #1.** Ohio EPA is aware that the contract for the continuation of ground water monitoring activities, the preparation of the Remedial Investigation and Feasibility Study for the Facility Wide Groundwater at RVAAP has not yet been awarded. This task is a milestone in Ohio EPA's Directors Final Findings and Orders that was not met in 2014 and is behind schedule in 2015. We anticipate that this contract will be awarded soon and that the requirements for ground water activities will be satisfied within the FFY 16 milestone deadlines.

**Response:** The groundwater contract has been awarded to Weston Solutions. The award was made on August 18, 2015. The Army and the Contractor are currently arranging the kickoff meeting. The Army will inform the Ohio EPA of the location and time of the meeting so they may also attend if they so choose.

**Comment #2.** The results of the sampling of three ground water monitoring wells that were installed December 2013 (LL1MW-088, LL2MW-271, and LL3MW-246) near the East and Southeast property lines showed some evidence of impact from site activities. After the initial sampling in January 2014, additional wells were proposed to be installed further off site and downgradient to evaluate whether or not impact was affecting groundwater quality further off property. Without the installation of these additional wells, Ohio EPA cannot be assured adjacent properties to RVAAP have not been affected by site activities.

**Response:** The additional wells will be installed as necessary by the newly selected contractor for the groundwater contract. The schedule for the installation of the wells will be discussed at the kickoff meeting and in subsequent documents.

Finalization of the Report on the March 2015 Sampling Event will occur in accordance with the Director's Final Findings and Orders upon receipt of the Ohio EPA notice to finalize the document.

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

Sincerely,



Mark S. Leeper  
RVAAP Restoration Program Manager  
Army National Guard Directorate

cc: Bob Princic, Ohio EPA, NEDO-DERR  
Rod Beals, Ohio EPA, NEDO-DERR



Subject: Facility-Wide Groundwater Monitoring Program RVAAP-66 Facility-Wide  
Groundwater Response to Comments for the Draft Report on the March 2015 Sampling Event  
Portage/Trumbull Counties

Justin Burke, Ohio EPA, CO-DERR  
Kevin Sedlak, ARNG, Camp Ravenna  
Katie Tait, OHARNG Camp Ravenna  
Greg Moore, USACE Louisville  
Nat Peters, USACE Louisville  
Gail Harris, Vista Sciences



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

August 18, 2015

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.  
Comments on the RVAAP-66 Draft Facility-Wide Groundwater  
Monitoring Program RVAAP-66, Facility-Wide Groundwater Report on  
the March 2015 Sampling Event at the Ravenna Army Ammunition Plant,  
Ravenna, Ohio, Dated, July 1, 2015, Ohio EPA ID # 267-000859-036**

Dear Mr. Leeper:

The Ohio Environmental Protection Agency (Ohio EPA) has received and reviewed the "Draft Report on the Facility-Wide Groundwater Monitoring Program RVAAP-66 Facility-Wide Groundwater Report on the March 2015 Sampling Event" 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 July 2, 2015. The report was prepared for the US Army Corps of Engineers (USACE) Louisville District by Environmental Quality Management, Inc. under Contract Number W912QR-11-F-0266.

Ohio EPA has one comment regarding the July 2, 2015 submittal. In addition, Ohio EPA has provided general comments regarding the completion of planned Facility Wide Groundwater tasks. Please provide response to the enclosed comments in accordance with the Director's Findings and Orders.

The *Draft RVAAP-66 Facility-Wide Ground Water Report* summarizes most of the ground water monitoring activities conducted during the March 2015 sampling event, including:

- A total of 42 wells were sampled. The FWGWMP semiannual sampling of 37 wells was conducted concurrently with semiannual RCRA ground water sampling

of three wells (RQLmw-007, RQLmw-008, and RQLmw-009) in Ramsdell Quarry and two wells (DETmw-003 and DETmw-004) in Demolition Area #2. The 42 wells were sampled between March 9 and March 25, 2015.

- Four wells, FWGmw-002, LL1mw-086, FBQmw-174, and LL1mw-083 were monitored for pH in the field as requested by Ohio EPA.
- Water levels and total depth were gaged in 46 monitoring wells scheduled for ground water sampling and/or pH monitoring at the facility.
- Laboratory analyses and data evaluation was completed for collected samples.
- An Investigation-Derived Waste (IDW) characterization and disposal report was prepared and submitted.
- A draft monitoring report for the sampling event was prepared and submitted.

## COMMENTS

1. Ohio EPA believes that the following statement in the Executive Summary section (page vi) of the submitted report is a typographical error:

*To date, 281 Facility-wide Ground Water Monitoring Program (FWGWMP) wells of the 284 wells at the facility have been sampled and analyzed a minimum of four quarters.*

It is our understanding, that as of the October 2014 sampling event that all 284 FWGWMP wells have been sampled and analyzed a minimum of four quarters. If this is accurate, please let us know in an email, then we will provide notice to finalize the document.

## GENERAL COMMENTS

1. Ohio EPA is aware that the contract for the continuation of ground water monitoring activities, the preparation of the Remedial Investigation and Feasibility Study for the Facility Wide Groundwater at RVAAP has not yet been awarded. This task is a milestone in Ohio EPA's Directors Final Findings and Orders that was not met in 2014 and is behind schedule in 2015. We anticipate that this contract will be awarded soon and that the requirements for ground water activities will be satisfied within the FFY 16 milestone deadlines.
2. The results of the sampling of three ground water monitoring wells that were installed December 2013 (LL1MW-088, LL2MW-271, and LL3MW-246) near the

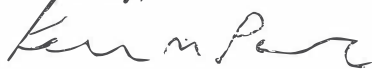
MR. MARK LEEPER  
ARMY NATIONAL GUARD DIRECTORATE  
AUGUST 18, 2015  
PAGE 3

East and Southeast property lines showed some evidence of impact from site activities. After the initial sampling in January 2014, additional wells were proposed to be installed further off site and downgradient to evaluate whether or not impact was affecting ground water quality further off property. Without the installation of these additional wells, Ohio EPA cannot be assured adjacent properties to RVAAP have not been affected by site activities.

Ohio EPA does expect and will anticipate receipt of the next scheduled reporting activities, including the finalization of the Report on the March 2015 Sampling Event, the Report on the July 2015 Sampling event, and the Annual Report for 2015.

This document was reviewed by personnel from Ohio EPA, DERR. Ohio EPA has determined that additional information is necessary to approve the document. 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: Katie Tait, OHARNG RTLS  
Kevin Sedlak, ARNG  
Gregory F. Moore, USACE  
Rebecca Haney/Gail Harris, VISTA Sciences Corp.

ec: Bob Princic, Ohio EPA, NEDO DERR  
Rodney Beals, Ohio EPA NEDO DERR  
Justin Burke, Ohio EPA, CO DERR  
Albert Muller, Ohio EPA, NEDO DDAGW





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

April 7, 2015

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 RVAAP-66 Final Facility-Wide Groundwater Annual  
Report for 2014, Dated March 30, 2015, Ohio EPA ID # 267-000859-036**

Dear Mr. Leeper:

The Ohio Environmental Protection Agency (Ohio EPA) has received the "Final Facility-Wide Groundwater Monitoring Program RVAAP-66 Facility-Wide Groundwater Annual Report for 2014" 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 March 31, 2015. The report was prepared for the US Army Corps of Engineers (USACE) Louisville District by Environmental Quality Management, Inc., under Contract Number W912QR-11-F-0266.

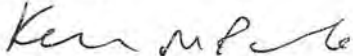
This document was reviewed by personnel from Ohio EPA's DERR, pursuant to the Director's Findings and Orders paragraph 39 (b). Ohio EPA considers the document final and approved.

Pursuant to the CERCLA process, the property owner usually can anticipate the expected land uses to assist in ensuring that the investigation addresses all receptors for both current and future land uses. Be advised that due to land use uncertainty, Ohio EPA may require additional work in the future to address data gaps. It is incumbent upon the Army to finalize land use at Camp Ravenna as soon as possible, otherwise additional work and schedule slippage may result.

MR. MARK LEEPER  
ARMY NATIONAL GUARD DIRECTORATE  
APRIL 7, 2015  
PAGE 2

Please include Ohio EPA's unique project number (267-000859-036) that can be found in the subject line of this letter with all return communications regarding this activity. 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: Katie Tait, OHARNG RTLS  
Kevin Sedlak, ARNG  
Gregory F. Moore, USACE  
Rebecca Haney/Gail Harris, VISTA Sciences Corp.

ec: Rodney Beals, Ohio EPA NEDO DERR  
Justin Burke, Ohio EPA, CO DERR



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

April 2, 2015

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 RVAAP-66 Final Facility-Wide Groundwater Report  
on the October 2014 Sampling Event, Dated March 20, 2015, Ohio  
EPA ID # 267-000859-036**

Dear Mr. Leeper:

The Ohio Environmental Protection Agency (Ohio EPA) has received the "Final Facility-Wide Groundwater Monitoring Program RVAAP-66 Facility-Wide Groundwater Report on the October 2014 Sampling Event" 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 March 23, 2015. The report was prepared for the US Army Corps of Engineers (USACE) Louisville District, by Environmental Quality Management, Inc., under Contract Number W912QR-11-F-0266.

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

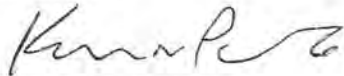
Pursuant to the CERCLA process, the property owner usually can anticipate the expected land uses to assist in ensuring that the investigation addresses all receptors for both current and future land uses. Be advised that due to land use uncertainty, Ohio EPA may require additional work in the future to address data gaps. It is incumbent

MR. MARK LEEPER  
ARMY NATIONAL GUARD DIRECTORATE  
APRIL 2, 2015  
PAGE 2

upon the Army to finalize land use at camp Ravenna as soon as possible, otherwise additional work and schedule slippage may result.

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/nrp

cc: Katie Tait, OHARNG RTLS  
Kevin Sedlak, ARNG  
Gregory F. Moore, USACE  
Rebecca Haney/Gail Harris, VISTA Sciences Corp.

ec: Rodney Beals, Ohio EPA NEDO DERR  
Justin Burke, Ohio EPA, CO DERR





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

March 19, 2015

Mr. Mark Leeper  
Army National Guard Directorate  
ARNGD-ILE Clean Up  
111 South George Mason Drive  
Arlington, VA 22204

Re: US Army Ravenna Ammunition Plant RVAAP  
Remediation Response  
Project Records  
Remedial Response  
Portage County  
267000859

**Subject: Ravenna Army Ammunition Plant, Portage/Trumbull Counties. Approval of the RVAAP-66 Final Facility-Wide Groundwater Report on the July 2014 Sampling Event, Dated March 13, 2015, Ohio EPA ID # 267-000859-036**

Dear Mr. Leeper:

The Ohio Environmental Protection Agency (Ohio EPA) has received the "Final Facility-Wide Groundwater Monitoring Program RVAAP-66 Facility-Wide Groundwater Report on the July 2014 Sampling Event" 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 March 16, 2015. The report was prepared for the US Army Corps of Engineers (USACE) Louisville District by Environmental Quality Management, Inc. under Contract Number W912QR-11-F-0266.

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

Pursuant to the CERCLA process, the property owner usually can anticipate the expected land uses to assist in ensuring that the investigation addresses all receptors for both current and future land uses. Be advised that due to land use uncertainty, Ohio EPA may require additional work in the future to address data gaps. It is incumbent upon the Army to finalize land use at camp Ravenna as soon as possible, otherwise additional work and schedule slippage may result.

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 Haney/Gail Harris, VISTA Sciences Corp.  
Katie Tait/Kevin Sedlak, OHARNG RTLS  
ec: Rodney Beals, NEDO, DERR

Gregory F. Moore, USACE

Justin Burke, CO, DERR



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

March 9, 2015

Mr. Mark Leeper  
Army National Guard Directorate  
ARNGD-ILE Clean Up  
111 South George Mason Drive  
Arlington, VA 22204

Re: US Army Ammunition Plant RVAAP  
Remediation Response  
Project Records  
Remedial Response  
Portage County  
267000859

**Subject: Ravenna Army Ammunition Plant, Portage/Trumbull Counties. Approval of the Response to Comments on the RVAAP-66 Draft Facility-Wide Groundwater Annual Report for 2014, Dated February 23, 2015, Ohio EPA ID # 267-000859-036**

Dear Mr. Leeper:

The Ohio Environmental Protection Agency (Ohio EPA) has received the Response to Ohio EPA comments on the "Draft Facility-Wide Groundwater Monitoring Program RVAAP-66 -Annual Report for 2014" 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 February 24, 2015. The report was prepared for the US Army Corps of Engineers (USACE) Louisville District by Environmental Quality Management, Inc., under Contract Number W912QR-11-F-0266.

The Response to Ohio EPA Comments was based on five comments included in a letter to the National Guard Bureau, dated January 27, 2015. Based on our review, we found the responses to be satisfactory. The 2014 Annual Report should be finalized.

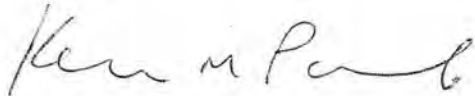
Pursuant to the CERCLA process, the property owner usually can provide the expected land uses to assist in ensuring that the investigation addresses all receptors for both current and future land uses. Be advised that due to land use uncertainty, Ohio EPA may require additional work in the future to address data gaps. It is incumbent upon the

MR. MARK LEEPER  
ARMY NATIONAL GUARD DIRECTORATE  
MARCH 9, 2015  
PAGE 2

Army to finalize land use at camp Ravenna as soon as possible, otherwise additional work and schedule slippage may result.

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". The signature is fluid and cursive, with the first name "Kevin" being the most prominent.

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

KP/nvr

cc: Katie Tait, OHARNG RTLS  
Kevin Sedlak, ARNG  
Gregory F. Moore, USACE  
Rebecca Haney/Gail Harris, VISTA Sciences Corp.

ec: Rodney Beals, Ohio EPA NEDO DERR  
Justin Burke, Ohio EPA, CO DERR  
Al Muller, Ohio EPA, NEDO DDAGW





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

March 9, 2015

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  
267000859**

**Subject: Ravenna Army Ammunition Plant, Portage/Trumbull Counties.  
Approval of the RVAAP-66 Final Facility-Wide Groundwater  
Semiannual Groundwater Monitoring Addendum for 2015, Dated  
February 20, 2015, Ohio EPA ID # 267-000859-036**

Dear Mr. Leeper:

The Ohio Environmental Protection Agency (Ohio EPA) has received the "Final Facility Wide Groundwater Monitoring Program RVAAP-66 Facility-Wide Groundwater Monitoring Addendum for 2015" 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 February 23, 2015. This submittal provided satisfactory responses to Ohio EPA's comments provided in our letter dated February 4, 2015. The report was prepared for the US Army Corps of Engineers (USACE) Louisville District by Environmental Quality Management, Inc., under Contract Number W912QR-11-F-0266.

These documents were reviewed by personnel from Ohio EPA's Division of Environmental Response and Revitalization (DERR). Ohio EPA has determined that all required changes have been made to the document and considers it to be final and approved.

Pursuant to the CERCLA process, the property owner usually can provide the expected land uses to assist in ensuring that the investigation addresses all receptors for both



MR. MARK LEEPER  
ARMY NATIONAL GUARD DIRECTORATE  
MARCH 9, 2015  
PAGE 2

current and future land uses. Be advised that due to land use uncertainty, Ohio EPA may require additional work in the future, to address data gaps. It is incumbent upon the Army to finalize land use at Camp Ravenna as soon as possible, otherwise additional work and schedule slippage may result.

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: Katie Tait, OHARNG RTLS  
Kevin Sedlak, ARNG  
Gregory F. Moore, USACE  
Rebecca Haney/Gail Harris, VISTA Sciences Corp.

ec: Rodney Beals, Ohio EPA NEDO DERR  
Justin Burke, Ohio EPA, CO DERR  
Albert Muller, Ohio EPA, NEDO DDAGW



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

March 5, 2015

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  
Assessment  
Remedial Response  
Portage  
267000859**

**Subject: Ravenna Army Ammunition Plant, Portage/Trumbull Counties.  
Approval of the RVAAP-66 Draft Facility-Wide Groundwater Report  
on the October 2014 Sampling Event, Dated January, 2015. Ohio  
EPA ID # 267-000859-036**

Dear Mr. Leeper:

The Ohio Environmental Protection Agency (Ohio EPA) has received the "Draft Facility-Wide Groundwater Monitoring Program RVAAP-66 Facility-Wide Groundwater Report on the October 2014 Sampling Event" 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 January 30, 2015. The report was prepared for the US Army Corps of Engineers (USACE) Louisville District by Environmental Quality Management, Inc. under Contract Number W912QR-11-F-0266.

The Draft Report provided the results of the sampling of the three newest monitoring wells; one unconsolidated glacial aquifer well LL1mw-088 and two Sharon Sandstone wells, LL2mw-271 and LL3mw-246. All three wells are located near the eastern boundary of the facility, just beyond the perimeter fence. This sampling event is the fourth quarterly sampling event for these three wells. The sampling occurred October 21 through October 22, 2014.

Ground water samples were analyzed for: volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), PCBs, organochlorinated pesticides,

explosives/propellants, cyanide, nitrate/nitrite, and metals (field filtered). Samples were analyzed by Test America. Ground water results were compared to Ohio EPA Drinking Water MCLs and U.S. EPA November 2014 Regional Screening Levels (RSLs) for tap water. Note: the practical quantification limit (PQL) exceeded RSLs for a number of compounds (refer to Appendix D of the report). Ground Water Results are summarized in Table 3-3 of the report.

Concentrations of the explosive/propellant compounds 2-amino-4,6-dinitrotoluene, 4-amino-2,6-dinitrotoluene and Research Department Formula (RDX) were detected in one of the three sampled wells LL3mw-246 at concentrations below their respective RSLs. There are no MCLs for the three aforementioned explosive/propellant compounds.

Concentrations of arsenic (LL1mw-088 and LL2mw-271), iron (LL1mw-088 and LL2-271), and manganese (LL1mw-088, LL2mw-271, and LL3mw-246) were detected at concentrations exceeding their respective MSLs and/or RSLs in the sampled wells.

No VOCs, SVOCs, or PCBs were detected at levels exceeding the PQL in the three sampled wells.

Analytical results indicate an estimated concentration of one pesticide 3-5, alpha-BHC in one of the three sampled wells (LL1MW-88) above its respective RSL (0.0071 µg/L). However, the method blank associated with the aforementioned sample was found to contain alpha-BHC contamination; therefore, the alpha-BHC detected in the sample from LL1MW-88 is attributed to low-level lab contamination and is so designated with a "B" qualifier.

This document was reviewed by personnel from Ohio EPA's DERR, pursuant to the Director's Findings and Orders paragraph 39 (b), Ohio EPA has no comments on this document and it may be finalized.

Pursuant to the CERCLA process, the property owner usually can provide the expected land uses to assist in ensuring that the investigation addresses all receptors for both current and future land uses. Be advised that due to land use uncertainty, Ohio EPA may require additional work in the future to address data gaps. It is incumbent upon the Army to finalize land use at camp Ravenna as soon as possible, otherwise additional work and schedule slippage may result.

MR. MARK LEEPER  
ARMY NATIONAL GUARD DIRECTORATE  
MARCH 5, 2015  
PAGE 3

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: Katie Tait/Kevin Sedlak, OHARNG RTLS  
Gregory F. Moore, USACE  
Rebecca Haney/Gail Harris, VISTA Sciences Corp.

ec: Rodney Beals, Ohio EPA NEDO DERR  
Justin Burke, Ohio EPA, CO DERR  
Al Muller, Ohio EPA, NEDO DDAGW





**NATIONAL GUARD BUREAU**

111 SOUTH GEORGE MASON DRIVE  
ARLINGTON VA 22204-1373

February 13, 2015

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

Subject: Former Ravenna Army Ammunition Plant (RVAAP) Restoration Program  
Portage/Trumbull Counties  
2015 Groundwater Sampling Event  
Ohio EPA ID # 267-000859-036

Dear Mr. Palombo:

On February 9, 2015 the Army received a letter from the Ohio EPA dated February 4, 2015 granting approval with specified conditions for the *Facility-Wide Groundwater Monitoring Program Plan RVAAP-66 Facility-Wide Groundwater Semiannual Groundwater Monitoring Addendum* response to comments dated December 19, 2014. This letter provides notification that the sampling of the wells identified in the addendum is currently scheduled for the time period of March 2 through the 6, 2015. This letter was prepared by the U.S. Army Corps of Engineers, Louisville District in support of the former Ravenna Army Ammunition Plant/Camp Ravenna restoration program.

The purpose of this event is to conduct sampling and analysis of the wells identified in the *Facility-Wide Groundwater Monitoring Program Plan RVAAP-66 Facility-Wide Groundwater Semiannual Groundwater Monitoring Addendum*. This includes 42 wells for chemical analysis as identified in Table 2 of the addendum, and four additional wells to be monitored for pH and other field stabilization criteria.

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

Sincerely,

Mark S. Leeper  
RVAAP Restoration Program Manager  
Army National Guard Directorate

cc: Rod Beals, Ohio EPA, NEDO-DERR  
Justin Burke, Ohio EPA, CO-DERR  
Kevin Sedlak, ARNG, Camp Ravenna  
Katie Tait, OHARNG Camp Ravenna  
Greg Moore, USACE Louisville  
Nat Peters, USACE Louisville  
Gail Harris, Vista Sciences



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

February 4, 2015

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  
267000859

**Subject: Ravenna Army Ammunition Plant, Portage/Trumbull Counties. Approval with Modifications on the RVAAP-66 Draft Facility-Wide Groundwater Monitoring Program RVAAP-66, Semiannual Groundwater Addendum for 2015 for the Ravenna Army Ammunition Plant, Ravenna, Ohio, Dated December 19, 2014, Ohio EPA ID # 267-000859-036**

Dear Mr. Leeper:

The Ohio Environmental Protection Agency (Ohio EPA) has received the "Draft Facility-Wide Groundwater Monitoring Program RVAAP-66, Semiannual Groundwater Addendum for 2015" 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 December 22, 2014. The report was prepared for the US Army Corps of Engineers (USACE) Louisville District by Environmental Quality Management, Inc., under Contract Number W912QR-11-F-0266.

Pursuant to The Directors Findings and Orders Paragraph 39 (b), Ohio EPA approves the submittal upon specified conditions as presented below:

Ohio EPA's November 25, 2014, comments and the National Guard's December 19, 2014, responses to those comments are presented below, along with Ohio EPA's current response.

**Ohio EPA Comment 1: Inconsistency in the Naming of Ground Water Zones**

Table 1 inconsistently identifies wells screened in unconsolidated glacial material either as "overburden" wells or as "unconsolidated" wells. This is unnecessarily confusing. The identifying name of the hydrostratigraphic unit needs to be

consistent and accurately identify the unit. Ohio EPA discourages the use of the term "overburden" because it is ambiguous and not appropriate. "Overburden" is a mining term that refers to material of any nature, consolidated or unconsolidated, that overlies a deposit of useful material (e.g., gravel, ore, and coal) that are mined from the surface by open cuts.

**Army National Guard Response:** This is the first correspondence that we have received in which the Ohio EPA has mentioned that they discourage the use of the term "overburden." We will change the term "overburden" to "unconsolidated" in Table 1.

**Ohio EPA's Response to The National Guard's Response to Comment 1**

The National Guard's response adequately addresses Ohio EPA's Comment 1.

**Ohio EPA Comment 2: Shallow and Deep Unconsolidated Ground Water Zones.** Table 1 indicates that 17 of the wells to be monitored are screened in the "first" or "uppermost water-bearing zone" in the unconsolidated glacial material and two of the wells to be monitored are screened in the "second water bearing zone" or "deep" portion of the unconsolidated glacial material. It is unclear if there are one or two hydrostratigraphic zones within the unconsolidated glacial material beneath the RVAAP. In order to assure that the facility is adequately monitored, it needs to be clarified if the two ground water zones have the same potentiometric surface, and to what extent the two zones are interconnected.

**Army National Guard Response:** During installation of the preliminary RI wells in 2012, 19 wells were completed in the unconsolidated aquifer, which was the first water-bearing zone encountered. However, three of these wells (FWGmw-002, LL1mw-086, and NTAmw-119) were completed in an apparent second water-bearing zone within deeper unconsolidated strata. It was originally intended that these three wells would be completed in bedrock to monitor vertical migration in these areas of the site. However, due to the thickness of the unconsolidated material (greater than 70-ft-thick), the presence of clay till between the first and second water-bearing zones in the unconsolidated material, and the predicted communication between these deeper unconsolidated strata and the upper portion of the bedrock aquifer, it was concluded that the second water-bearing zone at these locations should be evaluated. Wells FWGmw-002 and NTAmw-119 appear to be associated with a suspected buried tributary valley to the Mahoning River, which has been mentioned in prior RVAAP documents (USATHAMA, 1978 and Barnes, 1950).



(Note that the unconsolidated deposits at LL11mw-012 were also more than 70-ft-thick; this well, which was ultimately completed in shale, would also be within the tributary valley mentioned above.) These locations were the only ones identified with thick (i.e., >70 feet) unconsolidated deposits at the former RVAAP. Table 1 summarizes the well completion information for the 284 wells at RVAAP, including the depth to bedrock where encountered. Table 2 shows the well comparisons and vertical hydraulic gradients between the upper consolidated water-bearing strata and the deeper unconsolidated water-bearing strata for these three locations during six sampling and well gauging events between July 2012 and July 2014. (Note that well LL1mw-088 was not installed until December 2013). In general, the potentiometric surface elevations show that the shallow and deep unconsolidated water-bearing strata are disparate aquifers. In addition, the vertical hydraulic gradients indicate a downward vertical gradient from the upper to lower water-bearing zones.

**Ohio EPA's Response to The National Guard's Response to Comment 2**

The National Guard's response adequately addresses Ohio EPA's Comment 2.

**Ohio EPA Comment 3: Horizontal Extent Evaluated with Well Pair LL1mw-086 and LL1mw-088.** The SAGWMA indicates (page 2) that a subset of the well network was selected in association with or paired with several of the new RI wells to assess horizontal and vertical contaminant distribution. Table 1 indicates that Well LL1mw-086, screened in the second (deep) ground water zone in the unconsolidated glacial till, is paired with "sentinel" well LL1mw-088, screened in the first ground water zone in the unconsolidated glacial till. LL1mw-088 is a "new" well that was installed in December 2013. LL1mw-086 is located downgradient of Load Line 1, and LL1mw-088 is located downgradient of LL1mw-086 and outside the perimeter fence. Considering these wells' relationship to each other, it is unclear how this well pair is being used to determine horizontal and vertical extent. This needs to be explained.

**Army National Guard Response:** Due to the thickness of the unconsolidated strata in this area of the former RVAAP (approx. 75 feet), these two wells are being used as exit pathway wells to monitor dissolved constituents in the upper and lower portions of the unconsolidated material. As mentioned previously, the groundwater elevations for the two wells are nearly equal (difference of 0.02 feet), indicating that the two water-bearing zones within the unconsolidated strata are in hydraulic communication in this area of the Site.



**Ohio EPA's Response to The National Guard's Response to Comment 3**

Ohio EPA believes that although the potentiometric surface is similar between the two locations (LL1mw-086, approximate depth 75 feet and LL1-088, approximate depth 24 feet), we are not confident that deeper contaminants identified in LL1-mw-086 could be picked up in the shallow LL1 mw-088. Ohio EPA understands that LL1mw-088 still serves the purpose of identifying potential migration of contaminants in the shallow ground water. We will anticipate, however, that the RI Work Plan will include additional wells in this area (deeper unconsolidated zone), to ensure potential contaminants are not migrating off site from LL1.

**Ohio EPA Comment 4: Wells Used for Upgradient Data.** The 2015 SAGWMA (page 2) indicates that some of the 42 selected wells for monitoring are to provide upgradient data for the various site-wide models. Information in Table 1 indicates that all 42 of the wells selected for monitoring are located downgradient of an area of concern (AOC), impacted by constituents of concern (COCs), and would not be appropriate for representing background water quality at the facility. It needs to be clarified which of the 42 wells are to be used to provide upgradient data for the various site models, as well as the rationale that was used to select these wells.

**Army National Guard Response:** The second paragraph on page 2 of the 2015 SAGWMA discusses the rationale for the initial 2012-2013 Semiannual Addendum under the RI, not the proposed 42 wells for 2015. Specifically, the statement "provide up-gradient data for the various site-wide models" was one of several listed justifications for the monitoring well network presented in the 2012-2013 Semiannual Groundwater Monitoring Addendum (EQM, January 2012). During a meeting with the Ohio EPA in September 2013, the Ohio EPA indicated that the current network of background (BKG) wells was insufficient for determining background conditions at the former RVAAP. The Army subsequently proposed a subset of wells for inclusion in the background network, which the Ohio EPA appears willing to entertain; however, the Ohio EPA indicated in their comment letter dated January 16, 2014, that the number of proposed background wells may not be sufficient. The ARNG is in the process of preparing and submitting a Request for Proposal to eligible contractors to continue the RI/FS work at the former RVAAP, including installation of additional wells for establishing background conditions. Consequently, the Semiannual Groundwater Addendum for 2015 is designed to monitor potential offsite migration and potential fluctuations in contaminant concentrations at selected source area wells. No specific upgradient wells were selected for monitoring at this time since the existing background data is not considered relevant. The data

generated from the proposed semiannual monitoring wells for 2015 are still useful for any fate-and-transport modeling that may be prepared as part of the future RI work.

**Ohio EPA's Response to The National Guard's Response to Comment 4**

The National Guard's response adequately addresses Ohio EPA's Comment 4.

**Ohio EPA Comment 5: Wells with Consistently Anomalous pH Values Need to be Monitored.** Wells with consistently anomalous pH values outside the typical range of natural ground water (i.e., 5 to 9) need to be added to the list of wells to be sampled semiannually. Wells that appear to have consistently had anomalous pH values include FWGmw-002, RQLmw-011, RQLmw-012, and RQLmw-013. These wells need to have pH and other field parameters outlined in the *FWGWMP Ground Water Monitoring Program Plan* measured as part of semiannual sampling.

**Army National Guard Response:** Wells FWGmw-002, RQLmw-011, RQLmw-012, and RQLmw-013 will be monitored for pH and the other stabilization criteria during the 2015 semiannual sampling events. Time-series graphs for pH will be prepared for each well and included in future annual and semiannual groundwater reports.

**Ohio EPA's Response to The National Guard's Response to Comment 5**

The National Guard's response adequately addresses Ohio EPA's Comment 5.

**Ohio EPA Comment 6: How Installation and Sampling of Three Proposed Wells Will Be Incorporated into the 2015 Sampling Schedule.** Considering the concentrations of arsenic (LL1mw-088 and LL2mw-271), thallium (LL2mw-271), cobalt (LL2mw-271), and manganese (LL3mw-246) exceeding their respective (primary or secondary) MCLs and/or RSLs and the low concentrations of perchlorates and explosives/propellants present in one of the "new" monitoring wells (LL3mw-246), Ohio EPA agrees in principle with the National Guard's proposal at the May 21, 2014, RAB Meeting, to install three additional monitoring wells near the southeast corner of the facility near Load Lines # 1 through # 3. The details of such a proposal, including the location and construction of planned wells, would have to be reviewed and approved by Ohio EPA. Ohio EPA had made a similar comment based on its review of the January 2014 ground water

sampling data from the facility, and in an October 6, 2014 letter, to the National Guard Directorate. To date, no such proposal to install additional monitoring wells has been submitted to the Agency. It is not clear how the installation of these new wells will fit into the 2015 sampling schedule. This needs to be explained.

**Army National Guard Response:** As mentioned in our response to Comment 4, the ARNG is in the process of preparing and submitting a Request for Proposal to eligible contractors to continue the RI/FS work at the former RVAAP. Following selection of a Contractor to complete the RI efforts, a RI/FS Work Plan will be prepared with details regarding the location and construction of any additional RI wells at the former RVAAP. Any new wells will be sampled quarterly for the complete list of parameters under the FWGWMP. A schedule for completing this work will be provided as part of the RI/FS Work Plan.

**Ohio EPA's Response to The National Guard's Response to Comment 6**

The National Guard's response adequately addresses Ohio EPA's Comment 6.

**Ohio EPA Comment 7: "New" Wells Not Tested for Perchlorates.** It is not clear why the three "new" wells installed in December 2013 are not scheduled to be tested for perchlorates (refer to Table 2). Low levels of this compound were detected in samples from two of the "new" wells (LL2mw-271 and LL3mw-246) collected during the January 2014 sampling event. Ohio EPA made a similar comment in an October 6, 2014 letter, to the National Guard Directorate. This issue needs to be explained.

**Army National Guard Response:** Historically, each well at RVAAP has only been sampled once for perchlorates. There have been 195 wells that have had perchlorate detections above the reporting limit, ranging from 0.0089 ug/L to 0.19 ug/L (note that the RSL is 14 ug/L and the Interim Drinking Water Health Advisory is 15 ug/L). Given the locations of the detections in LL2mw-271 and LL3MW-246 (i.e., outside the perimeter fence), the Army will include perchlorates in the semiannual sampling for these two wells in 2015.

**Ohio EPA's Response to The National Guard's Response to Comment 7**

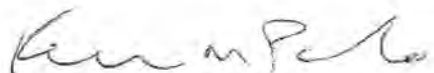
The National Guard's response adequately addresses Ohio EPA's Comment 7.

MR. MARK LEEPER  
ARMY NATIONAL GUARD DIRECTORATE  
February 4, 2015  
PAGE 7

Pursuant to the CERCLA process, the property owner usually can provide the expected land uses to assist in ensuring that the investigation addresses all receptors for both current and future land uses. Be advised that due to land use uncertainty, Ohio EPA may require additional work in the future to address data gaps. It is incumbent upon the Army to finalize land use at camp Ravenna as soon as possible, otherwise additional work and schedule slippage may result.

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: Katie Tait, OHARNG RTLS  
Kevin Sedlak, ARNG  
Gregory F. Moore, USACE  
Mark Nichter, USACE  
Rebecca Haney/Gail Harris, VISTA Sciences Corp.

ec: Susan Netzley-Watkins, Ohio EPA, NEDO DERR  
Rodney Beals, Ohio EPA NEDO DERR  
Justin Burke, Ohio EPA, CO DERR  
Albert Muller, Ohio EPA, NEDO DDAGW





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

January 27, 2015

Mr. Mark Leeper  
Army National Guard Directorate  
ARNGD-ILE Clean Up  
111 South George Mason Drive  
Arlington, VA 22204

Re: US Army Ammunition Plant RVAAP  
Remediation Response  
Project Records  
Remedial Response  
Portage County  
267000859

**Subject:** Ravenna Army Ammunition Plant, Portage/Trumbull Counties. Comments on the RVAAP-66 Draft Facility-Wide Groundwater Monitoring Program RVAAP-66, Facility-Wide Groundwater Annual Report for 2014 at the Ravenna Army Ammunition Plant, Ravenna, Ohio, Dated December 11, 2014, Ohio EPA ID # 267-000859-036

Dear Mr. Leeper:

The Ohio Environmental Protection Agency (Ohio EPA) has received the response to Ohio EPA comments on the "Draft Report on the Facility-Wide Groundwater Monitoring Program RVAAP-66 Facility-Wide Groundwater Annual Report for 2014" 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 December 12, 2014. The report was prepared for the US Army Corps of Engineers (USACE) Louisville District by Environmental Quality Management, Inc. under Contract Number W912QR-11-F-0266.

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.

#### COMMENTS

1. **SVOC and Pesticide Concentrations above RSLs.** The statement below, found on page viii of the *FWGWMP Annual Report for 2014*, is incorrect:

*During the 2014 reporting period, no semi-volatile organic compounds (SVOCs) or pesticides/herbicides were identified at concentrations exceeding their respective RSLs or MCLs.*

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By: *RNH*  
Date: 02-03-2015

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02-03-2015  
RNH

Table 4-3 (pages 48 – 51) of the report indicates that concentrations of SVOCs or a pesticide were detected above their RSLs in the following wells during the 2014 reporting period:

- LL1mw-083 bis(2-ethylhexyl)phthalate (SVOC) July 2014
- NTAmw-119 naphthalene (SVOC) January 2014
- RQLmw-008 beta-BHC (pesticide) July 2014

The statement on page viii needs to be changed to accurately summarize ground water sampling results for 2014.

2. **No Results from the October 2014 Sampling Event.** The *FWGWMP Annual Report for 2014* does not contain results from the October 2014 sampling event. The fourth quarterly sampling of the three new wells (LL1mw-088, LL2mw-271, and LL3mw-246) was the only ground water sampling conducted during the October sampling event. It is not clear why data from the October 2014 sampling event was not included in the submitted report. Data from the October 2014 sampling event needs to be included in the *FWGWMP Annual Report for 2014*.
3. **Time-Series Graphs for pH.** Figure 3-1 of the submitted report includes pH time-series graph for wells FWGmw-002 and LL1mw-086. The Facility's December 30, 2014, *Response to Ohio EPA's December 2, 2014, Comments* indicated that Annual and Semi-annual FWGWMP Ground Water Sampling Reports would include pH time-series graphs for wells FBQmw-174 and LL1mw-083, in addition to the two wells shown on Figure 3-1. Figure 3-1 needs to be modified to include historical pH data for wells FBQmw-174 and LL1mw-083. In general, Annual and Semi-Annual FWGWMP Ground Water Sampling Reports need to include pH time-series graphs for wells with pH measurements outside the typical pH range for natural ground water (i.e., 5 to 9). Any known historical processes near these pH anomalies need to be reviewed, as part of determining possible causes of the anomalies.
4. **Contaminant Distribution Maps.** While the Contaminant Distribution Maps (Figures 1 through 21) are acceptable as part of the *2014 Annual FWGWMP Ground Water Sampling Report* for general discussion purposes only, they do not necessarily represent a complete, accurate, and/or current determination of the rate, extent and concentration of contaminants of concern (COCs) in ground water. The maps are based on a mixture of current and historic data from a monitoring system that is likely not adequate [see Comment 5]. For approval of the submitted report, Ohio EPA does not require that the Contaminant Distribution Maps be further modified at this time.
5. **Ground Water Monitoring System.** Although beyond the scope of the submitted report, the adequacy of the ground water monitoring system needs to be evaluated

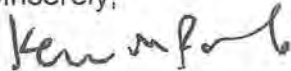
as part of the preparation of the RI Work Plan. It is not clear that the current ground water monitoring system is adequate to determine the complete rate, extent, and concentration of COCs. Considering the extensive regulatory history of the RVAAP, multiple contractors, multiple consultants, changes in personnel, and the demolition of historical structures, the specific rationale for placement of each monitoring well is not always clear. Further, it is not clear that the existing ground water monitoring system includes wells located in areas having the greatest concentration of COCs. Ohio EPA recommends that the RI work plan include a thorough review of the ground water monitoring system, including the following factors:

- Historical processes conducted at the areas of concern (AOCs)
- COCs associated with each AOC
- Any known release history
- Current soil/ground water data
- The different hydrostratigraphic units beneath the RVAAP
- Is the current ground water monitoring system adequate to evaluate the rate, extent, and concentration of potential contaminants from each AOC?

Pursuant to the CERCLA process, the property owner usually can provide the expected land uses to assist in ensuring that the investigation addresses all receptors for both current and future land uses. Be advised that due to land use uncertainty, Ohio EPA may require additional work in the future to address data gaps. It is incumbent upon the Army to finalize land use at Camp Ravenna as soon as possible, otherwise additional work and schedule slippage may result.

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: Katie Tait, OHARNG RTLS  
Kevin Sedlak, ARNG  
Mark Nichter, USACE

Rebecca Haney/Gail Harris, VISTA Sciences Corp.  
Gregory F. Moore, USACE

ec: Rodney Beals, NEDO, DERR  
Justin Burke, CO, DERR

Susan Netzley-Watkins, NEDO, DERR  
Albert Muller, NEDO, DDAGW





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

January 23, 2015

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  
267000859

**Subject: Ravenna Army Ammunition Plant, Portage/Trumbull Counties, Approval with Modifications of the RVAAP-66 Final Facility-Wide Groundwater Report on the July 2014 Sampling Event, Response to Ohio EPA Comments, Dated December 30, 2014, Ohio EPA ID # 267-000859-036**

Dear Mr. Leeper:

The Ohio Environmental Protection Agency (Ohio EPA) has received the Response to Ohio EPA Comments on the "Draft Report on the Facility-Wide Groundwater Monitoring Program RVAAP-66 Facility-Wide Groundwater Report on the July 2014 Sampling Event" 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 December 31, 2014. The report was prepared for the US Army Corps of Engineers (USACE) Louisville District by Environmental Quality Management, Inc., under Contract Number W912QR-11-F-0266.

Pursuant to The Directors Findings and Orders Paragraph 39 (b), Ohio EPA approves the submittal upon specified conditions as presented below:

**NATIONAL GUARD'S DECEMBER 30, 2014, RESPONSES TO OHIO EPA'S  
DECEMBER 2, 2014, COMMENTS**

Ohio EPA's three December 2, 2014, comments (*italics*) and the National Guard's December 30, 2014, responses to those comments (*italics*) are presented below along with Ohio EPA's response to the response submitted by the National Guard.

**Scanned**

By: *RMH*  
Date: 01-27-2015

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www.epa.ohio.gov • (330) 963-1200 • (330) 487-0769 (fax)

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01-27-2015

**E-MAILED**  
01-27-2015 *RMH*



## Ohio EPA's Comment 1

**Potentiometric Surface Map for Unconsolidated Hydrostratigraphic Zone.** It is unclear if the May 2014 Potentiometric Surface Map of the Unconsolidated Aquifer is representative of a single hydrostratigraphic zone or is a composite of two zones. The unconsolidated aquifer appears to consist of a "first" or "uppermost water bearing zone" and a "deep" or "second water bearing zone". In order to assure that the facility is adequately monitored, it needs to be clarified if the two zones have the same potentiometric surface, and to what extent the two zones are interconnected. DDAGW made a similar comment in its November 20, 2014, IOM to DERR regarding its review of the 2015 Addendum to the Facility-Wide Ground Water Monitoring Program Plan. This Issue needs to be explained.

## National Guard's Response to Ohio EPA's Comment 1

During installation of the preliminary RI wells in 2012, 19 wells were completed in the unconsolidated aquifer, which was the first water bearing zone encountered. However, three of these wells (FWGmw-002, LL1mw-086, and NTAmw-119) were completed in an apparent second water-bearing zone within deeper unconsolidated strata. It was originally intended that these three wells would be completed in bedrock to monitor vertical migration in these areas of the site. However, due to the thickness of the unconsolidated material (greater than 70 feet thick), the presence of clay till between the first and second water-bearing zones in the unconsolidated material, the predicted communication between these deeper unconsolidated strata and the upper portion of the bedrock aquifer, it was concluded that the second water-bearing zone at these locations should be evaluated. Well FWGmw-002 and NTAmw-119 appear to be associated with a suspected buried tributary valley to the Mahoning River, which has been mentioned in prior RVAAP documents (USATHAMA, 1978 and Barnes, 1950). (Note that the unconsolidated deposits at LL11mw-012 were also more than 70 feet thick; this well, which was ultimately completed in shale, would also be within the tributary valley mentioned above.) These four locations have been the only ones identified with thick (i.e., >70 feet) unconsolidated deposits at the former RVAAP. Table 1 summarizes the well completion information for 284 wells at the RVAAP, including the depth to bedrock where encountered.

Table 2 shows the well comparisons and vertical hydraulic gradients between the upper consolidated water-bearing strata and the deeper unconsolidated water-bearing strata for these three locations during six sampling and well gauging events between July 2012 and July 2014. (Note that Well LL1mw-088 was not installed until December 2013). In general, the potentiometric surface elevations show that the shallow and deep unconsolidated water-bearing strata are disparate aquifers.

*In addition, the vertical hydraulic gradients indicate a downward vertical gradient from the upper to the lower water-bearing zones.*

*The potentiometric surface map for the unconsolidated strata (Plate 2) shows the locations and ground water elevations for the three wells completed in the deeper unconsolidated material; however, these wells were not used for determining ground water flow in the unconsolidated deposits.*

#### **Ohio EPA's Response to the National Guard's Response to Comment 1**

The National Guard's response clarifies that the *May 2014 Potentiometric Surface Map of the Unconsolidated Aquifer* only represents the uppermost hydrostratigraphic unconsolidated unit beneath the Ravenna Arsenal. However, the response indicates that there is a data gap regarding ground water hydrogeology of the deeper unconsolidated hydrostratigraphic unit, which the National Guard's response suggests consists of buried valley deposits. This data gap includes inadequate information regarding the nature and extent, ground water flow interpretation, and ground water quality of the deeper unconsolidated hydrostratigraphic zone. While the clarification in the response is adequate for DDAGW to recommend finalization of *Report on the July 2014 Ground Water Sampling Event*, the identified data gap will need to be addressed in the *RI/FS Work Plan*.

The references mentioned in the response, Plate 5, entitled *Map Showing Principal Sources of Ground Water and Approximate Contours on the Bedrock Surface in Portage County* and Plate 3, entitled *Bedrock Geologic Map and Sections of Portage County Ohio* (specifically, refer to Section C-C') in *Geology and Ground Water Resources of Portage County Ohio USGS Professional Paper 511* (Winslow and White, 1966), show a buried valley system associated with Hinkley Creek and Sand Creek in the west-central portion of the Ravenna Arsenal.

The response indicates that FWGmw-002, LL1mw-086, and NTAmw-119, are the only three monitoring wells in the RVAAP monitoring system screened in the deeper unconsolidated buried valley hydrostratigraphic unit. Based on information presented on Plates 3 and 5 in USGS Professional Paper 511, NTAmw-119 is located within a buried valley; however, FWGmw-002 and LL1mw-086 do not appear to be located in a buried valley, and this inconsistency needs to be explained. The facility has not mapped or described the nature and extent of the deeper unconsolidated buried valley hydrostratigraphic unit beneath the facility. It does not appear that the facility has a sufficient number of wells screened within the deeper unconsolidated



buried valley hydrostratigraphic unit in order to adequately monitor the concentration, rate, and extent of contamination and/or determine ground water flow within that unit. These issues will need to be addressed in the forthcoming *RI/FS Work Plan*.

## **Ohio EPA's Comment 2**

***Wells with Anomalously High or Low pH Values.*** *The report does not discuss several wells that had anomalous pH values outside the typical range of natural ground water (i.e., five to seven). A review of Monitoring Well Purge Forms (Appendix B), indicates that four wells (FBQmw-174, LL1mw-083, LL1mw-086, and LL1mw-087) had anomalously high or low pH values. It is not clear if pH values in these wells are fairly stable or tending over time. Ohio EPA recommends that the facility present historic pH data for these four wells on time-series graphs. Such representation of the data will aid in the interpretation of anomalous pH values.*

## **National Guard's Response to Ohio EPA's Comment 2**

*Time-series graphs for pH for the four wells are included as Attachment 1. Additionally, this graph will be updated and included in future annual and semiannual ground water reports. Note that Well LL1mw-087 has a pH ranging from 6.36 to 7.31 S.U., which is within the typical variance for natural ground water.*

## **Ohio EPA's Response to The National Guard's Response to Comment 2**

The National Guard's response adequately addresses Ohio EPA's Comment 2. Further, Ohio EPA agrees with the facility that pH data for FBQmw-174, LL1mw-083, and LL1mw-086 need to be presented on time-series graphs as part of semiannual and annual ground water reports. However, FWGMW-02 has also historically had pH measurements above or near nine on more than one occasion in the recent past, and should also be represented on time-series graphs in future reports. Also, Ohio EPA agrees that pH data from LL1mw-087 appears to be within the typical range for natural ground water, and data from that well does not need to be represented on the aforementioned time-series graphs. According to Ohio EPA (2003, 2012) and Brownlow (1979), uncontaminated ground water typically exhibits a pH range from five to nine. In general, Annual and Semi-annual FWGWMP Ground Water Sampling Reports need to include pH time-series graphs for wells with pH measurements outside the five to nine range.

### **Ohio EPA's Comment 3**

***"New" Wells Not Tested for Perchlorates.** It is not clear why the three "new" wells installed in December 2013 were not tested for perchlorates during the July 2014 sampling event. Low levels of this compound were detected in samples from two the "new" wells (LL2mw-271 and LL3mw-246) collected during the January 2014 sampling event. Ohio EPA made a similar comment in an October 6, 2014, letter to the National Guard Directorate, and in DDAGW's November 20, 2014, IOM to DERR regarding its review of the 2015 Addendum to the Facility-Wide Ground Water Monitoring Program Plan. This issue needs to be explained.*

### **National Guard's Response to Ohio EPA's Comment 3**

*As stated in our previous correspondence regarding this issue, each well at the RVAAP has historically only been sampled once for perchlorates. There have been 195 wells that have had perchlorate detections above the reporting limit, ranging from 0.089  $\mu\text{g/L}$  to 0.19  $\mu\text{g/L}$  (note that the RSL is 14  $\mu\text{g/L}$  and the Interim Drinking Water Health Advisory is 15  $\mu\text{g/L}$ ). Given the locations of the detections in LL2mw-271 and LL3MW-246 (i.e., outside the perimeter fence), the Army will include perchlorates in the semiannual sampling for these two wells in 2015.*

### **Ohio EPA's Response to the Facility's Response to Comment 3**

The National Guard's response adequately addresses Ohio EPA's Comment 3. However, Ohio EPA recommends that new wells continue to be sampled for perchlorates for at least the initial ground water sampling round.

### **REFERENCES**

Brownlow, A.H., 1979, Geochemistry, Prentice-Hall, 498 pages.

Ohio EPA, 2003, 2002 305(b) Report, Ohio's Ground Water Quality, Ohio EPA, Division of Drinking and Ground Water, Columbus, Ohio, 78 pages.

Ohio EPA, 2012, Chapter 10, Ground Water Sampling in Technical Guidance Manual for Ground Water Investigations, Ohio EPA, Columbus, Ohio, 67 pages

Winslow, John D., and White, George W., 1966, Geology and Ground Water Resources of Portage County, Ohio, Geological Survey professional paper 511, United States Geological Survey, Reston Virginia, 80 pages

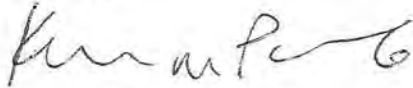


MR. MARK LEEPER  
ARMY NATIONAL GUARD DIRECTORATE  
JANUARY 23, 2015  
PAGE 6

Pursuant to the CERCLA process, the property owner usually can provide the expected land uses to assist in ensuring that the investigation addresses all receptors for both current and future land uses. Be advised that due to land use uncertainty, Ohio EPA may require additional work in the future to address data gaps. It is incumbent upon the Army to finalize land use at camp Ravenna as soon as possible, otherwise additional work and schedule slippage may result.

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: Katie Tait, OHARNG RTLS  
Kevin Sedlak, ARNG  
Gregory F. Moore, USACE  
Mark Nichter, USACE  
Rebecca Haney/Gail Harris, VISTA Sciences Corp.

ec: Susan Netzley-Watkins, Ohio EPA, NEDO DERR  
Rodney Beals, Ohio EPA NEDO DERR  
Justin Burke, Ohio EPA, CO DERR  
Albert Muller, Ohio EPA, NEDO DDAGW



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

August 18, 2015

Re: US Army Ravenna Ammunition Plt RVAAP  
Assessment  
Remedial Response  
Portage County  
267000859221

Mr. Mark Leeper, P.G., MBA  
Restoration/Cleanup Program Manager  
ARNG Directorate  
111 S. George Mason Dr.  
Arlington, VA 22204

Subject: Ohio EPA's Review of Final Remedial Investigation Report, CC-RVAAP-68,  
Electrical Substations (East, West, No. 3), Project No. 267-000859-221

Dear Mr. Leeper:

The Ohio Environmental Protection Agency (Ohio EPA) has reviewed the Final Remedial Inspection Report for CC-RVAAP-68, submitted as a response to Ohio EPA's comment letter dated July 13, 2015. The report was received by this office on July 31, 2015.

Ohio EPA's comments have been adequately addressed and incorporated into the document. The document is approved.

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 D'Amato  
Project Coordinator  
Ohio EPA - Division of Environmental Response and Revitalization

ED/nvr

ec: Bob Princic, Supervisor, DERRNEDO  
Rod Beals, Manager, DERR, NEDO  
Al Muller, DDAGW, NEDO  
Justin Burke, DERR-CO  
Katie Tait, OHARNG RTLS  
Kevin Sedlak, ARNG  
Gregory F. Moore, USACE  
Mark Nichter, USACE  
Rebecca Haney/Gail Harris, Vista Sciences Corp.



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

August 7, 2015

**Re: US Army Ravenna Ammunition Plt RVAAP  
Assessment  
Remedial Response  
Portage County  
267000859221**

Mr. Mark Leeper, P.G., MBA  
Restoration/Cleanup Program Manager  
ARNG Directorate  
111 S. George Mason Dr.  
Arlington, VA 22204

**Subject: Ohio EPA's Review of Draft Remedial Investigation Report, CC-RVAAP-68,  
Electrical Substations (East, West, No. 3), Project No. 267-000859-221**

Dear Mr. Leeper:

The Ohio Environmental Protection Agency (Ohio EPA), Northeast District Office (NEDO) has reviewed the Army's response to Ohio EPA comments on the Draft Site Inspection Report for CC-RVAAP-68, Electrical Substations (East, West, No. 3), dated July 31, 2015.

Ohio EPA's comments have been adequately addressed and incorporated into the document. The document is approved.

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 D'Amato  
Project Coordinator  
Ohio EPA - Division of Environmental Response and Revitalization

ED/nvr

ec: Bob Prinic, Supervisor, DERRNEDO  
Rod Beals, Manager, DERR, NEDO  
Al Muller, DDAGW, NEDO  
Justin Burke, DERR-OO  
Katie Tait, OHARNG RTLS  
Kevin Sedlak, ARNG  
Gregory F. Moore, USACE  
Mark Nichter, USACE  
Rebecca Haney/Gail Harris, Vista Sciences Corp.



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

July 13, 2015

Re: US Army Ravenna Ammunition Plt RVAAP  
Assessment  
Remedial Response  
Portage County  
267000859221

Mr. Mark Leeper, P.G., MBA  
Restoration/Cleanup Program Manager  
ARNG Directorate  
111 S. George Mason Dr.  
Arlington, VA 22204

**Subject: Ohio EPA's Review of Draft Remedial Investigation Report, CC-RVAAP-68,  
Electrical Substations (East, West, No. 3), Project No. 267000859221**

Dear Mr. Leeper:

The Ohio Environmental Protection Agency (Ohio EPA), Northeast District Office has reviewed the Army's response to Ohio EPA comments on the Draft Site Inspection Report for CC-RVAAP-68, Electrical Substations (East, West, No. 3), dated April 2, 2013. The response was received on July 7, 2015.

Ohio EPA's comments have been adequately addressed. Please submit the document for final approval.

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 D'Amato  
Project Coordinator  
Ohio EPA - Division of Emergency and Remedial Response

ED/nvr

ec: Bob Princic, Supervisor, DERRNEDO  
Rod Beals, Manager, DERR, NEDO  
Al Muller, DDAGW, NEDO  
Justin Burke, DERR-CO  
Katie Tait, OHARNG RTLS  
Kevin Sedlak, ARNG  
Gregory F. Moore, USACE  
Mark Nichter, USACE  
Rebecca Haney/Gail Harris, Vista Sciences Corp.





**NATIONAL GUARD BUREAU**

111 SOUTH GEORGE MASON DRIVE  
ARLINGTON VA 22204-1373

July 6, 2015

Ohio Environmental Protection Agency  
DERR-NEDO  
Attn: Ed D'Amato  
2110 East Aurora Road  
Twinsburg, OH 44087-1924

Subject: Former Ravenna Army Ammunition Plant (RVAAP) Restoration Program  
Portage/Trumbull Counties, CC RVAAP-68 Electric Substations (East, West, No. 3)  
Draft Remedial Investigation Report, Response to Comments, Ohio EPA ID # 267-000-859-221

Dear Mr. D'Amato:

Enclosed, for your review are the responses to the Ohio EPA comments on the *Draft Remedial Investigation Report* in support of the Environmental Remediation Services (ERS) project at Electric Substations (East, West, No 3) of the former Ravenna Army Ammunition Plant (RVAAP) in Portage and Trumbull counties, Ohio. This document was prepared for the US Army Corps of Engineers (USACE) - Louisville District, by ECC under Contract No. W912QR-04-D-0039.

The Army requests Ohio EPA review these comment responses. Upon approval of these responses, the Army will proceed with the formulation of the Final Remedial Investigation Report for CC RVAAP-68.

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

Sincerely,

A handwritten signature in black ink, appearing to read "Mark Leeper", is positioned above the typed name.

Mark Leeper  
RVAAP Restoration Program Manager  
Army National Guard Directorate

Attachment

cc: Justin Burke, Ohio EPA, DERR-CO  
Rod Beals, Ohio EPA, DERR-NEDO  
Bob Princic, Ohio EPA, DERR-NEDO  
Katie Tait, OHARNG Camp Ravenna  
Kevin Sedlak, ARNG, Camp Ravenna  
Greg Moore, USACE Louisville  
Eric Cheng, USACE Louisville  
Gail Harris, Vista Sciences

**DRAFT REMEDIAL INVESTIGATION REPORT, REVISION 0**  
**CC RVAAP-68 ELECTRIC SUBSTATIONS (EAST, WEST, NO. 3)**  
**FORMER RAVENNA ARMY AMMUNITION PLANT, PORTAGE AND TRUMBULL COUNTIES, OHIO**  
**COMMENT RESPONSE TABLE**

Remedial Investigation Report Issued – 02 April 2015

Ohio EPA Comments Received – 16 June 2015

Response to Comments Issued – 02 July 2015

Page 1 of 1

Comment Number	Page No. / Line No.	New Page or Sheet	Comment	Recommendation	Response
<i>Ohio EPA (Ed D'Amato)</i>					
1	Chapter 6.0 Table 6-4 and 6-5 (line 4338)		It is not clear why the Dilution Attenuation factors, listed in Table 6-4, are not consistent with those listed in the untitled table on line 4338 of the report. In order for the Agency to evaluate the screening process utilized, this needs to be explained.		The Dilution Attenuation Factors (DAFs) in Table 6-4 were incorrect and have been replaced, see attached Table 6-4. Table 6-4 now matches the bottom of Table 6-5 where the AOC-specific DAFs are calculated.
2	General		Ohio EPA agrees that naphthalene impact in the vicinity of Substation No. 3 be further investigated as part of RVAAP-66 Facility Wide Ground Water.		Naphthalene will be investigated as part of RVAAP-66 Facility-Wide Ground Water.
<i>End of Comments</i>					

**Table 6-4: Initial Contaminant Migration Chemicals of Potential Concern Based on Comparison of Maximum Concentrations of Site-Related Chemicals to Site Soil Screening Levels**

SRCs	Maximum Concentration (mg/kg)	Generic SSL (mg/kg)	DAF	Site SSL (DAF*Generic SSL) (mg/kg)	Contaminant Migration COPC? (Max Conc.>Site SSL)	Contaminant Migration COPC Justification
<b>Semivolatile Organic Compounds (SVOCs)</b>						
<b>Benzo(a)anthracene</b>	0.12	0.01	1.3	0.01	Yes	Exceeds Site SSL
<b>Benzo(a)pyrene</b>	0.09	0.024	1.3	0.03	Yes	Exceeds Site SSL
<b>Benzo(b)fluoranthene</b>	0.20	0.035	1.3	0.05	Yes	Exceeds Site SSL
<b>Naphthalene</b>	0.017	0.00047	1.3	0.0006	Yes	Exceeds Site SSL

**BOLD** - Initial Contaminant Migration COPC that exceeds Site SSL

SSL - Soil Screening Level

RSL - Regional Screening Level

mg/kg - milligrams per kilogram

SRC - Site-Related Chemical

DAF - Dilution Attenuation Factor (Calculated on Table 6-5)

COPC - Chemical of potential concern

> = greater than



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

June 16, 2015

Re: US Army Ravenna Ammunition Plt RVAAP  
Assessment  
Remedial Response  
Portage County  
267000859221

Mr. Mark Leeper, P.G., MBA  
Restoration/Cleanup Program  
Manager  
ARNG Directorate  
111 S. George Mason Dr.  
Arlington, VA 22204

**Subject: Ohio EPA's Review of Draft Remedial Investigation Report, CC-RVAAP-68, Electrical Substations (East, West, No. 3), Project No. 267-000859-221; Notice of Deficiency**

Dear Mr. Leeper:

The Ohio Environmental Protection Agency (Ohio EPA), Northeast District Office has reviewed the Draft Site Inspection Report for CC-RVAAP-68, Electrical Substations (East, West, No. 3), dated April 2, 1013. The document was prepared by ECC, under contract no. W912QR-04-D-0039.

Ohio EPA has the following comments. Ohio EPA will review either a response to comments letter or Response to Comments (RTC) table. However, a revised report will need to be completed, prior to final approval of the document:

Comments:

1. It is not clear why the Dilution Attenuation factors, listed in Table 6-4, are not consistent with those listed in the untitled table on line 4338 of the report. In order for the Agency to evaluate the screening process utilized, this needs to be explained.
2. Ohio EPA agrees that naphthalene impact in the vicinity of Substation No. 3 be further investigated as part of RVAAP-66 Facility Wide Ground Water.

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 D'Amato".

Edward D'Amato, Project Coordinator  
Ohio EPA - Division of Emergency and Remedial Response

ED/nvr

ec: Bob Princic, Supervisor, DERR-NEDO  
Justin Burke, DERR-CO  
Kevin Sedlak, ARNG  
Mark Nichter, USACE  
Al Muller, DDAGW, NEDO

Rod Beals, Manager, DERR-NEDO  
Katie Tait, OHARNG RTLS  
Gregory F. Moore, USACE  
Rebecca Haney/Gail Harris, Vista Sciences





**NATIONAL GUARD BUREAU**

111 SOUTH GEORGE MASON DRIVE  
ARLINGTON VA 22204-1373

March 23, 2015

Ohio Environmental Protection Agency  
DERR-NEDO  
Attn: Mr. Edward 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, RVAAP-69 Building 1048 Fire Station  
Ohio EPA ID # 267-000-859-022

Dear Mr. D'Amato:

In accordance with the Director's Final Findings and Orders, Section XIII, #28, for Ravenna, the Army is providing notification of field sampling activities at Camp Ravenna 15 days prior to the scheduled start date. These activities are currently scheduled to begin on April 7, 2015 and to conclude on April 15, 2015, and will be conducted at the former Building 1048 Fire Station (site CC-RVAAP-69). The primary contractor, Environmental Chemical Corporation (ECC), will be conducting the sampling under Contract No. W912QR-04-D-0039.

For additional information on the field sampling activities, please refer to the Field Change Notice submitted by the Army to the Ohio EPA on March 4, 2015.

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

Sincerely,

Mark Leeper  
RVAAP Restoration Program Manager  
Army National Guard Directorate

cc: Rod Beals, Ohio EPA, DERR-NEDO  
Kevin Sedlak, ARNG, Camp Ravenna  
Katie Tait, OHARNG Camp Ravenna  
Greg Moore, USACE Louisville  
Nat Peters, USACE Louisville  
Eric Cheng, USACE Louisville  
Gail Harris, Vista Sciences

March 18, 2015

**Re: US Ravenna Army Ammunition Plt RVAAP  
Assessment  
Remedial Response  
Portage County  
267000859**

Mr. Mark Leeper, P.G., MBA  
Restoration/Cleanup Program Manager  
ARNG Directorate  
111 S. George Mason Dr  
Arlington, VA 22204

**Subject: Ohio EPA's Review of Field Change Notice, CC-RVAAP-69 Building  
1048 Fire Station, Project No. 267-000859-155**

Dear Mr. Leeper:

The Ohio Environmental Protection Agency (Ohio EPA), Northeast District Office has reviewed the Field Change Request for CC RVAAP-69, Building 1048 Fire Station. The document was prepared by ECC under contract no. W912QR-04-D-0039.

Ohio EPA has the following comment. Ohio EPA will review either a response to comments letter or Response to Comments (RTC) table, however, a revised notice must be submitted:

**Comment:**

1. Given that the goal is to delineate the extent of carbon tetrachloride contamination (vertical and horizontal) in the vicinity of SB2, It is not clear why the 4-5 foot and 9-10 foot intervals are not to be sampled under the proposed sampling plan (in particular the 4-5 foot interval). Please clarify the sampling rationale.

This comment was e-mailed to Al Easterday/ECC on March 16, 2015. Mr. Easterday responded via e-mail: *Rather than go back and forth on this, ECC will collect samples from 4-5 ft and 9-10 from each of the 5 boring locations in addition to the ones presented in the FCN. We will put that in our response to your letter.* This is an acceptable response.

MR. MARK LEEPER,  
ARNG DIRECTORATE  
MARCH 18, 2015  
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.

Sincerely,

Edward J. D'Amato  
Project Coordinator  
Ohio EPA - Division of Emergency Response and Revitalization

ED/nvr

ec: Rod Beals, DERR-NEDO  
Justin Burke, DERR-CO  
Katie Tait, OHARNG RTLS  
Kevin Sedlak, ARNG  
Gregory F. Moore, USACE  
Mark Nichter, USACE  
Rebecca Haney/Gail Harris, Vista Sciences Corp.



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

February 19, 2015

Mr. Mark Leeper, P.G., MBA  
Restoration/Cleanup Program  
Manager  
ARNG Directorate  
111 S. George Mason Dr  
Arlington, VA 22204

**Re: US Army Ravenna Ammunition Plt RVAAP  
Assessment  
Remedial Response  
Portage County  
267000859**

**Subject: Ohio EPA's Review of the Final Site Inspection Report, CC-RVAAP-71  
Barn No. 5 Petroleum Release, February 12, 2015, Project No. 267-  
000859-155**

Dear Mr. Leeper:

On February 13, 2015, the Ohio Environmental Protection Agency (Ohio EPA), Northeast District Office (NEDO), received a copy of the Final Site Inspection Report for CC-RVAAP-71, Building 1037, Barn No. 5 Petroleum Release. The document was prepared by ECC under contract no. W912QR-04-D-0039.

Ohio EPA has reviewed the document. It is hereby approved.

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 D'Amato  
Project Coordinator  
Ohio EPA - Division of Environmental Response and Revitalization

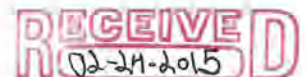
ED/nvr

ec: Rodney Beals, DERR, NEDO

Justin Burke, DERR-CO

cc: Katie Tait, OHARNG RTLS  
Gregory F. Moore, USACE  
Gail Harris, Vista Sciences Corp

Kevin Sedlak, ARNG  
Mark Nichter, USACE  
Rebecca Haney, Vista Sciences Corp.







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

January 21, 2015

Re: US Army Ravenna Ammunition Plt  
Assessment  
Remedial Response  
Portage County  
267000859

Mr. Mark Leeper, P.G., MBA  
Restoration/Cleanup Program  
Manager  
ARNG Directorate  
111 S. George Mason Dr  
Arlington, VA 22204

Subject: November 21, 2014 Draft Site Inspection Report, CC-RVAAP-71 Barn  
No. 5 Petroleum Release, Project No. 267-000859-155

Dear Mr. Leeper:

The Ohio Environmental Protection Agency (Ohio EPA), Northeast District Office (NEDO) has received your response to Ohio EPA's October 31, 2014 comments, on the Draft Site Inspection Report, CC-RVAAP-71, Barn No. 5 Petroleum Release. The response was received by this office via e-mail on December 5, 2014.

Ohio EPA has reviewed the submittals 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,

Edward D'Amato, Project Coordinator  
Ohio EPA - Division of Emergency and Remedial Response

ED/nvr

ec: Rodney Beals, Manager, DERR, NEDO

Justin Burke, DERR-CO

cc: Rebecca Haney/Gail Harris, Vista Sciences Corp  
Kevin Sedlak, ARNG  
Gregory F. Moore, USACE

Katie Tait, OHARNG RTLS  
Mark Nichter, USACE

**E-MAILED**  
01-26-2015  
RMT

**Scanned**

By: RMT  
Date: 01-26-2015

Northeast District Office • 2110 East Aurora Road • Twinsburg, OH 44087-1924  
www.epa.ohio.gov • (330) 963-1200 • (330) 487-0769 (fax)

**INDEXED**  
01-26-2015



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

July 14, 2015

Mr. Mark Leeper, P.G., MBA  
Restoration/Cleanup Program Manager  
ARNG Directorate  
111 S. George Mason Dr.  
Arlington, VA 22204

Re: **US Army Ravenna Ammunition Plt RVAAP  
Remediation Response  
Project records  
Remedial Response  
Portage County  
267000859219**

**Subject: Ohio EPA's Review of Site Inspection Report, CC-RVAAP-72 Facility-  
Wide USTs, Project No. 267-000859-219**

Dear Mr. Leeper:

The Ohio Environmental Protection Agency (Ohio EPA), Northeast District Office, has reviewed the Site Inspection Report for CC-RVAAP-72, Facility-wide USTs, dated July 9, 2015. The document was prepared by ECC under contract no. W912QR-04-D-0039.

Ohio EPA approves the 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.

Sincerely,

Edward D'Amato  
Project Coordinator  
Ohio EPA - Division of Emergency and Remedial Response

ED/nvr

cc: Rod Beals, DERR-NEDO  
Justin Burke, DERR-CO  
Katie Tait, OHARNG RTLS  
Kevin Sedlak, ARNG  
Gregory F. Moore, USACE  
Mark Nichter, USACE  
Rebecca Haney/Gail Harris, Vista Sciences Corp.  
Ohio EPA, VAP File, CO, DERR at: [records@epa.ohio.gov](mailto:records@epa.ohio.gov)



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

July 9, 2015

Re: **US Army Ravenna Ammunition Plt RVAAP  
Assessment  
Remedial Response  
Portage County  
267000859219**

Mr. Mark Leeper, P.G., MBA  
Restoration/Cleanup Program Manager  
ARNG Directorate  
111 S. George Mason Dr.  
Arlington, VA 22204

**Subject: Ohio EPA's Review of Draft Site Inspection Report, CC-RVAAP-72  
Facility-Wide USTs, Project No. 267-000859-219; Notice of Deficiency**

Dear Mr. Leeper:

The Ohio Environmental Protection Agency (Ohio EPA), Northeast District Office, has reviewed the Draft Site Inspection Report for CC-RVAAP-72, Facility-wide USTs, dated July 9, 2015. The document was prepared by ECC under contract no. W912QR-04-D-0039.

Ohio EPA approves the 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.

Sincerely,

Edward D'Amato  
Project Coordinator  
Ohio EPA - Division of Emergency and Remedial Response

cc: Rod Beals, DERR-NEDO  
Justin Burke, DERR-CO  
Katie Tait, OHARNG RTLS  
Kevin Sedlak, ARNG  
Gregory F. Moore, USACE  
Mark Nichter, USACE  
Rebecca Haney/Gail Harris, Vista Sciences Corp.  
Ohio EPA, VAP File, CO, DERR at: [records@epa.ohio.gov](mailto:records@epa.ohio.gov)



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

June 23, 2015

**Re: US Army Ravenna Ammunition Plt RVAAP  
Assessment  
Remedial Response  
Portage County  
267000859219**

Mr. Mark Leeper, P.G., MBA  
Program Manager  
Restoration/Cleanup  
ARNG Directorate  
111 S. George Mason Dr.  
Arlington, VA 22204

**Subject: Ohio EPA's Review of the Response to Comments for Site Inspection  
Report, CC-RVAAP-72 Facility-wide USTs, Project No. 267-000859-219**

Dear Mr. Leeper:

The Ohio Environmental Protection Agency (Ohio EPA), Northeast District Office (NEDO) has reviewed the Army's response to Ohio EPA's April 16, 2015 comment letter, on the Draft Site Inspection Report for CC-RVAAP-72, Facility-wide USTs. The response was received on May 21, 2015. The document was prepared by ECC, under contract no. W912QR-04-D-0039.

Ohio EPA finds the response to be acceptable and has no further comments. Please revise the document accordingly and re-submit it for final approval.

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 D'Amato  
Project Coordinator  
Ohio EPA - Division of Emergency and Remedial Response

ED/nvr

ec: Bob Princic, Supervisor, DERR, NEDO  
Katie Tait, OHARNG RTLS  
Gregory F. Moore, USACE  
Rebecca Haney, Vista Sciences Corp

Justin Burke, DERR-CO  
Kevin Sedlak, ARNG  
Mark Nichter, USACE  
Gail Harris, Vista Sciences Corp.





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

June 22, 2015

Ohio Environmental Protection Agency  
DERR-NEDO  
Attn: Ed D'Amato  
2110 East Aurora Road  
Twinsburg, OH 44087-1924

Subject: Former Ravenna Army Ammunition Plant (RVAAP) Restoration Program  
Portage/Trumbull Counties, CC RVAAP-72 Facility-Wide Underground Storage Tanks (USTs), Draft Site Inspection Report, Ohio EPA ID # 267-000859-219

Dear Mr. D'Amato:

Enclosed, for your review, are responses to the Ohio EPA's comments from May 13, 2015 on the *Draft Site Inspection (SI) Report* for CC-RVAAP-72 Facility-Wide Underground Storage Tanks (USTs), dated April 9, 2015. The attached comment response table was prepared for the US Army Corps of Engineers (USACE) – Louisville District, by ECC under Contract No. W912QR-04-0039.

Originally, a Draft SI was submitted to your office in June 2013. The Draft SI was revised and resubmitted as the April 9, 2015 *Draft SI* that you reviewed. To address your Comment #4, we have included Ohio EPA's comments on the June 2013 (original) submittal. This attachment to the response to comments table includes responses to your comments developed in 2015 as well as current responses that explain where/or how the 2013 comments were incorporated in the May 13, 2015 *Draft SI*.

The Army respectfully requests Ohio EPA review and approval of these responses to comments in order to finalize the *Draft SI*. Please contact the undersigned at (703) 607-7955 or [mark.s.leeper.civ@mail.mil](mailto:mark.s.leeper.civ@mail.mil) if there are issues or concerns with this submission.

Sincerely,

A handwritten signature in black ink, appearing to read "Mark Leeper", is positioned above the typed name.

Mark Leeper  
RVAAP Restoration Program Manager  
Army National Guard Directorate

Attachment

cc: Justin Burke, Ohio EPA, DERR-CO  
Rod Beals, Ohio EPA, DERR-NEDO  
Katie Tait, OHARNG Camp Ravenna  
Kevin Sedlak, ARNG, Camp Ravenna

Former Ravenna Army Ammunition Plant (RVAAP) Portage/Trumbull Counties  
CC RVAAP-72 Facility-Wide Underground Storage Tanks (USTs), Draft Site Inspection Report, Ohio  
EPA ID # 267-000859-219

Greg Moore, USACE Louisville  
Eric Cheng, USACE Louisville  
Gail Harris, Vista Sciences

**DRAFT SITE INSPECTION REPORT, REVISION 0**  
**CC RVAAP-72 FACILITY-WIDE UNDERGROUND STORAGE TANKS**  
**FORMER RAVENNA ARMY AMMUNITION PLANT, PORTAGE AND TRUMBULL COUNTIES, OHIO**  
**COMMENT RESPONSE TABLE**

Draft Site Inspection Report Submitted – 9 April 2015

Ohio EPA Comments Received – 15 May 2015

Response to Comments Issued – 18 June 2015

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Comment Number	Page No. / Line No.	New Page or Sheet	Comment	Recommendation	Response
<i>Ohio EPA (Ed D'Amato)</i>					
1	General		Ohio EPA has identified the following deficiencies in the report. Ohio EPA will review either a response to comments letter or Response to Comments (RTC) table. However, a revised report will need to be completed prior to final approval of the document.		Agree. A Final Report will be submitted that includes the revisions as stated herein this RTC.
2	Table 2-1		It is unclear what the approximate years were that each UST was in service. Please include this information, if available.		Agree. In order to clarify the time of use for each UST (where known), Table 2-1, has been revised as follows: The "Date Removed" column header has been revised to read "Date Installed/Removed" and the UST installation dates, if known, have been added to this column for each UST. <i>Please see attached for revised Table 2-1.</i>
3	Table 2-1		It is unclear why MTBE is a potential COC for USTs that, according to Table 2-1, were used for fuel oil, diesel fuel, kerosene, or leaded gasoline. According to U.S. EPA, MTBE has been used since 1979 to replace lead as an octane		Agree. The history of this site does not indicate usage of products that would contain, or are suspected to contain MTBE. However, as stated and required in the Work Plan (in order to follow BUSTR rules) MTBE was included as an analyte where gasoline may have been used. As expected, the results of all subsurface soil

**DRAFT SITE INSPECTION REPORT, REVISION 0**  
**CC RVAAP-72 FACILITY-WIDE UNDERGROUND STORAGE TANKS**  
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Comment Number	Page No. / Line No.	New Page or Sheet	Comment	Recommendation	Response
			enhancer in gasoline only (see web page here: <a href="http://www.epa.gov/mtbe/fag.htm">http://www.epa.gov/mtbe/fag.htm</a> ). If the use history of these tanks included unleaded gasoline, please revise Table 2-1 and other relevant parts of the document to include this information.		<p>samples collected as part of this SI were non-detect for MTBE.</p> <p>The Ohio Department of Commerce Bureau of Underground Storage Tank Regulations (BUSTR) requires testing for chemicals based upon the contents of the UST system. Under the BUSTR program, regulated substances are divided into five different analytical groups. The types of fuels included in BUSTR Analytical Group 1 included: light distillates, including unleaded gasoline, leaded gasoline, naphthalene, and aviation gasoline. BUSTR requires that Analytical Group 1 be tested for benzene, toluene, ethylbenzene, xylenes, and MTBE.</p> <p>CC RVAAP-72 soil samples collected were analyzed for MBTE, as part of this SI, as a BUSTR requirement. MTBE was included in the Final Work Plan as a substance to be sampled and analyzed for at CC RVAAP-72. Therefore, no text changes are recommended.</p>
4	General		It is difficult to find where information resulting from some of the comments in Ohio EPA's July		Agree. This version of the SI was significantly modified since the version submitted in 2013. Please see <b>Attachment 1</b> that identifies the



**DRAFT SITE INSPECTION REPORT, REVISION 0**  
**CC RVAAP-72 FACILITY-WIDE UNDERGROUND STORAGE TANKS**  
**FORMER RAVENNA ARMY AMMUNITION PLANT, PORTAGE AND TRUMBULL COUNTIES, OHIO**  
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Draft Site Inspection Report Submitted – 9 April 2015

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<b>Comment Number</b>	<b>Page No. / Line No.</b>	<b>New Page or Sheet</b>	<b>Comment</b>	<b>Recommendation</b>	<b>Response</b>
			<p>22, 2013 comment letter, was incorporated into the revised document.</p> <p>For example, Table 4-3 in the current report contains completely different information from Table 4-3 in the 2013 draft report. There are similar issues with some of the other comments. Please review the Army's August 22, 2013 comment response letter, and explain where the changes and/or explanations have been incorporated in the latest report, so Ohio EPA can verify them.</p>		<p>specific sections of the draft SI Report where comments from Ohio EPA letter dated July 18, 2013 were addressed in the text.</p>
<i>End of Comments</i>					

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Table 2-1: Summary of Known Information for 15 Former Underground Storage Tanks and 9 Hexavalent Chromium No Further Action Former Underground Storage Tanks

Former UST	Regulated under BUSTR	Date Installed/Removed	Summary of Removal Documentation Available from Field Notes and Reports	Available Soil Analytical Data	Location	Building	Size (gallons)	Stored Fuel Type	Further Action Recommended in HRR (SAIC 2011a)	Site Inspection Field Activities
Fifteen Former Underground Storage Tanks without Records of Soil Sampling										
RV-4	No	1941/1987	Not regulated under BUSTR (<110-gallon capacity). Documentation stating tank removed.	Unknown	Administration Area	Building 1026 Telephone Exchange	100	Gasoline	Yes	Subsurface soil sampling for PAHs, BTEX with MTBE, TPH GRO, TPH DRO, and TAL Metals. Geophysical survey <sup>(2)</sup>
RV-5	No	Unknown/ Prior to 1990	Not regulated under BUSTR (<110-gallon capacity). Documentation stating tank was removed and scrapped.	Unknown	Administration Area	Building 1048A	100	Gasoline	Yes	Subsurface soil sampling for PAHs, BTEX with MTBE, TPH GRO and TPH DRO, and TAL Metals.
RV-41	No	1981/June 1993	Tenant Tank (Physics International Company) Tank removal inspection report indicates no visible signs of soil contamination or visible holes upon tank removal.	Not available, may not exist	Load Line 6	Building 2F-11	6,000	No. 2 fuel oil/used for building and process heat	Yes	Subsurface soil sampling for PAHs, BTEX with MTBE, TPH GRO, TPH DRO, and TAL Metals. Geophysical survey <sup>(2)</sup>
RV-46	No	Pre-1941/1968	Nozzle News report from December 1991 indicates a 20- x 20-ft grid search in potential area of UST. No tank was found. Interviewees recall removal of tank from Bolton Mansion.	Not available, may not exist	Depot Area	Building EE-102 Bolton Mansion	1,500	No. 2 fuel oil for steam boiler	Yes	Subsurface soil sampling PAHs, BTEX with MTBE, TPH GRO, TPH DRO, and TAL Metals <sup>(3)</sup> . Geophysical survey <sup>(2)</sup>
RV-86	Unknown	1941/Unknown	Nozzle News report from December 1991 indicates a 20- x 20-ft grid search in potential area of each UST site. No tanks were found. No visual evidence of above grade tank components observed during 2010 property visit.	Not available	Administration Area	Building 1026 Telephone Building	Unknown	Unknown	Yes	Subsurface soil sampling for PAHs, BTEX with MTBE, TPH GRO, TPH DRO, and TAL Metals. Geophysical survey <sup>(2)</sup>
RV-87	Unknown	1941/Unknown	Nozzle News report from December 1991 indicates a 20- x 20-ft grid search in potential area of each UST site. No tanks were found. No visual evidence of above grade tank components observed during 2010 property visit.	Not available	Administration Area	Building 1026 Telephone Building	Unknown	Unknown	Yes	Subsurface soil sampling for PAHs, BTEX with MTBE, TPH GRO, TPH DRO, and TAL Metals. Geophysical survey <sup>(2)</sup>
RV-88	Unknown	1941/Unknown	Nozzle News report from December 1991 indicates a 20- x 20-ft grid search in potential area of each UST site. No tanks were found. No visual evidence of above grade tank components observed during 2010 property visit.	Not available	Building 1103	McClintocksburg Gate/Fire Station No. 2	Unknown	Diesel for boiler 19	Yes	Subsurface soil sampling for PAHs, BTEX with MTBE, TPH GRO, TPH DRO, and TAL Metals. Geophysical survey <sup>(2)</sup>
RV-89	Unknown	Pre-1992/ Unknown	Nozzle News report from December 1991 indicates a 20- x 20-ft grid search in potential area of each UST site. No tanks were found. No visual evidence of above grade tank components observed during 2010 property visit.	Unknown	South Service Road	George Road Sewage Treatment Plant – 100 yards south of South Service Road	Unknown	Fuel oil for generator	Yes	Subsurface soil sampling for PAHs, BTEX with MTBE, TPH GRO, TPH DRO, and TAL Metals. Geophysical survey <sup>(2)</sup>

Table 2-1: Summary of Known Information for 15 Former Underground Storage Tanks and 9 Hexavalent Chromium No Further Action Former Underground Storage Tanks (continued)

Former UST	Regulated Under BUSTR	Date Installed/Removed	Summary of Removal Documentation Available from Field Notes and Reports	Available Soil Analytical Data	Location	Building	Size (gallons)	Stored Fuel Type	Further Action Recommended in HRR (SAIC 2011a)	Site Inspection Field Activities
CC-RVAAP-72-01	Yes	1941/Unknown	Drawing 6698-RU A-10 indicates the presence of a kerosene tank at U-3. Some above grade piping was noticed at the U-3 during the property visit.	Not available	Depot	U-3	Unknown	Kerosene	Yes	Subsurface soil sampling for PAHs, BTEX with MTBE, TPH GRO, TPH DRO, and TAL Metals <sup>(3)</sup> .
CC -RVAAP-72-02	Yes	Unknown/Unknown	No tank was located during a geophysical survey performed by MKM in 2004. No visual evidence of above grade tank components observed during 2010 property visit.	Not available	Atlas Scrap Yard	Northern Service Station; Building T-15	1,000	Leaded gasoline; fueling station	Yes	Subsurface soil sampling for PAHs, BTEX with MTBE, TPH GROTPH DRO, and TAL Metals
CC-RVAAP-72-03	Yes	Unknown/Unknown	No tank was located during a geophysical survey performed by MKM in 2004. No sampling was performed. No visual evidence of above grade tank components observed during 2010 property visit.	Not available	Atlas Scrap Yard	Northern Service Station; Building T-15	1,000	Leaded gasoline; fueling station	Yes	Subsurface soil sampling for PAHs, BTEX with MTBE, TPH GRO, TPH DRO, and TAL Metals
CC-RVAAP-72-04	Yes	Unknown/Unknown	No tank was located during a geophysical survey performed by MKM in 2004. No visual evidence of above grade tank components observed during 2010 property visit.	Not available	Atlas Scrap Yard	Northern Service Station; Building T-15	1,000	Fuel oil	Yes	Subsurface soil sampling for PAHs, BTEX with MTBE, TPH GRO, TPH DRO, and TAL Metals
CC-RVAAP-72-05	Yes	Unknown/Unknown	No tank was located during a geophysical survey performed by MKM in 2004. No visual evidence of above grade tank components observed during 2010 property visit.	Not available	Atlas Scrap Yard	Northern Service Station; Building T-15	2,000	Kerosene	Yes	Subsurface soil sampling for PAHs, BTEX with MTBE, TPH GRO, TPH DRO, and TAL Metals
CC-RVAAP-72-06	Unknown	Unknown/Unknown	Map for Water Works 3 indicated the presence of a UST at the area of concern. It is unknown whether this UST has been removed.	Not available	Water Works 3	Water Works 3	280	Fuel oil	Yes	Subsurface soil sampling for PAHs, BTEX with MTBE, TPH GRO, TPH DRO, and TAL Metals
CC-RVAAP-72-08	No	October 1971/December 1971	Tank was installed in October 1971. UST was replaced with an aboveground storage tank in December 1971 due to a November malfunction causing a release of 400 gallons of fuel oil.	Not available	Inert Storage Area 8	Building 848	550	Fuel oil	Yes	Subsurface soil sampling for PAHs, BTEX with MTBE, TPH GRO, TPH DRO, and TAL Metals

Table 2-1: Summary of Known Information for 15 Former Underground Storage Tanks and 9 Hexavalent Chromium No Further Action Former Underground Storage Tanks (continued)



Former UST	Regulated Under BUSTR	Date Installed/Removed	Summary of Removal Documentation Available from Field Notes and Reports	Available Soil Analytical Data	Location	Building	Size (gallons)	Stored Fuel Type	Further Action Recommended in HRR (SAIC 2011a)	Site Inspection Field Activities
Nine Former Underground Storage Tanks Sampled for Hexavalent Chromium at the Request of Ohio EPA										
RV-13	Yes	1941/February 1990	1990 Closure Report by Cardamone Construction details tank removal and soil sampling.	Data tabulated in closure report	Depot Area	Building U-6, North Tank	12,000	Diesel	No <sup>(1)</sup>	Subsurface soil samples analyzed only for hexavalent chromium – USEPA Method 7196A
RV-14	Yes	1941/February 1990	1990 Closure Report by Cardamone Construction details tank removal and soil sampling.	Data tabulated in closure report	Depot Area	Building U-6, South Tank	12,000	Diesel	No <sup>(1)</sup>	Subsurface soil samples analyzed only for hexavalent chromium – USEPA Method 7196A
RV-15	Yes	1941/February 1990	1990 Closure Report by Cardamone Construction details tank removal and soil sampling.	Data tabulated in closure report	Depot Area	Building U-3, South Tank	12,000	Gasoline	No <sup>(1)</sup>	Subsurface soil samples analyzed only for hexavalent chromium – USEPA Method 7196A
RV-16	Yes	1941/February 1990	1990 Closure Report by Cardamone Construction details tank removal and soil sampling.	Data tabulated in closure report	Depot Area	Building U-3, North Tank	12,000	Gasoline	No <sup>(1)</sup>	Subsurface soil samples analyzed only for hexavalent chromium – USEPA Method 7196A
RV-17	Yes	1941/February 1990	1990 Closure Report by Cardamone Construction details tank removal and soil sampling.	Data tabulated in closure report	Depot Area	Building A-6, North Tank	3,900	Gasoline	No <sup>(1)</sup>	Subsurface soil samples analyzed only for hexavalent chromium – USEPA Method 7196A
RV-18	Yes	1941/February 1990	1990 Closure Report by Cardamone Construction details tank removal and soil sampling.	Data tabulated in closure report	Depot Area	Building A-6, Center Tank	3,900	Gasoline	No <sup>(1)</sup>	Subsurface soil samples analyzed only for hexavalent chromium – USEPA Method 7196A
RV-19	Yes	1941/February 1990	1990 Closure Report by Cardamone Construction details tank removal and soil sampling.	Data tabulated in closure report	Depot Area	Building A-6, South Tank	3,900	Gasoline	No <sup>(1)</sup>	Subsurface soil samples analyzed only for hexavalent chromium – USEPA Method 7196A
RV-37	No	1941/February 1990	1990 Closure Report by Cardamone Construction details tank removal and soil sampling.	Data tabulated in closure report	Depot Area	Building A-1	5,000	Heating oil	No <sup>(1)</sup>	Subsurface soil samples analyzed only for hexavalent chromium – USEPA Method 7196A
RV-97	No	1941/February 1990	1990 Closure Report by Cardamone Construction details tank removal and soil sampling.	Data tabulated in closure report	Depot Area	Building A-6	550	Heating oil	No <sup>(1)</sup>	Subsurface soil samples analyzed only for hexavalent chromium – USEPA Method 7196A

Notes:

1. Although the HRR (SAIC 2011a) recommended No Further Action, these former UST locations were added to this SI under CC RVAAP-72 FWUSTs in response to Ohio Environmental Protection Agency’s comment letter issued September 4, 2011 that requested additional subsurface soil sampling for hexavalent chromium only from these 9 former NFA USTs.

2. Two methods of surface geophysics were used; ground penetrating radar and electromagnetic at these noted UST locations.

3. TAL Metal analysis includes total chromium. Additional sample volume was collected at these locations and held at the laboratory. Metals sampled at all former UST locations per Final Work Plan (ECC 2012).

4. Table information was obtained from Table 5-1 of the *Final Historical Records Review Report for the 2010 Phase I Remedial Investigation Services at Compliance Restoration Sites (9 Areas of Concern), Ravenna Army Ammunition Plant, Ravenna, Ohio* (Science Applications International Corporation 2011a).

BTEX = Benzene, toluene, ethylbenzene, and total xylenes.

BUSTR = Bureau of Underground Storage Tank Regulations.

DRO = Diesel range organics.

ft = Feet.

GRO = Gasoline range organics.

HRR = Historical Records Review.

mg/kg = Milligrams per kilogram.

MTBE = Methyl tertiary-butyl ether.

PAH = Polycyclic aromatic hydrocarbon.

SAIC = Science Applications International Corporation.

TAL = Target Analyte List.

TPH = Total petroleum hydrocarbon.

USEPA = United States Environmental Protection Agency.

UST = Underground storage tank

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## ATTACHMENT 1

### DRAFT SITE INSPECTION REPORT CC RVAAP-72 FACILITY-WIDE UNDERGROUND STORAGE TANKS FORMER RAVENNA ARMY AMMUNITION PLANT, PORTAGE AND TRUMBULL COUNTIES, OHIO RESPONSE TO COMMENTS

Draft Site Inspection Report – Submitted 17 June 2013

Ohio EPA Comments – Received 22 July 2013

Responses to Ohio EPA Comments – Submitted 22 August 2013

*Comment Clarification Resubmitted in Response to Ohio EPA Comments dated 15 May 2015*

*The purpose of this Attachment is to address Comment Number 4 from the Ohio EPA received on 15 May 2015 and identifies the specific sections of the Draft SI Report (dated April 2015) where comments from Ohio EPA letter dated 18 July 2013 were previously addressed in the text. In some responses, clarifications were added (as shown in italics) to these Responses to Comments to address the 15 May 2015 comments from Ohio EPA. The original responses to the 18 July 2013 Ohio EPA comments were submitted on 22 August 2013 and are included below for completeness.*

**Comment 1.** Ohio EPA cannot evaluate parts of the report that cite or refer to risk assessment or Clean-Up Goal (CUG) criteria at this time, as these criteria are under review through the Technical Memorandum. Please note that when the new Technical Memorandum is finalized, Ohio EPA expects this report to be revised to reflect the changes and re-submit for review.

**Response 1 (June 2013):** Comment noted. Once the Final Technical Memorandum is issued and Ohio EPA accepts the Final Technical Memorandum, a revised Draft Site Inspection report will be issued 45 days from the receipt of Ohio EPA's acceptance letter for the Final Technical Memorandum.

**Response 2 (June 2015):** *The Final Technical Memorandum "FINAL TECHNICAL MEMORANDUM: Land Uses and Revised Risk Assessment Process for the Ravenna Army Ammunition Plant (RVAAP) Installation Restoration Program, Portage/Trumbull Counties, Ohio. February 2014" (Tech Memo) did not include an evaluation of the FWCUGs but an amendment to the RVAAP risk assessment process and the incorporation of a third Land Use Category of Commercial Industrial. The Tech Memo addresses only RIs and FSs and does not mention SIs. The FWCUGs and the process to use them in SIs follow the process described in the USACE Position Paper (2012). The revised SI still follows this process but uses the most current USEPA RSLs available at the time the comparison or screening was completed for this SI.*

**Comment 2.** **Lines 54-61:** Remove disclaimer statement.

**Response 2 (June 2013, June 2015):** *In accordance with the March 23, 2012 Submission Format Guidelines for the Ravenna Army Ammunition Plant, the disclaimer statement is required for Draft versions of documents. The Disclaimer Statement will be removed for Final version of this document.*

**Comment 3.** **Section 2.1 ¶ 4:** Please include the details of rationale for sampling the nine former USTs located within the Depot Area for hexavalent chromium as part of this document.

The rationale for sampling RV-46 and CC-RVAAP-72-01 for TAL Metals is not clear. Please explain.

RV-4 and RV-5 were gasoline tanks. CC-RVAAP-72-02 and CC-RVAAP-72-03 were former leaded gasoline tanks, yet, these areas were not sampled for lead. The period of time these tanks were in service indicates that they would have contained leaded gasoline at some point. Due to the low volatility of tetraethyl lead compared to other gasoline constituents, these areas should have been sampled for lead. Investigation for lead in these areas is necessary.

**Response 3 (June 2013):** a. The nine former USTs, located within the CC RVAAP-76 Depot Area, were sampled for hexavalent chromium and included in this report, which Ohio EPA requested this sampling

be completed at these underground storage tanks (USTs). Please refer to Appendix E (Comment Response Table and Regulatory Concurrence), Ohio EPA comment number 0-14 and the response to O-14 for additional information regarding this request from Ohio EPA for hexavalent chromium sampling at these 9 USTs. They were included in the CC RVAAP-72 report since these 9 USTs are included in the CC RVAAP-72 Facility-Wide USTs site. The following sentence will be inserted into the appropriate sections of the report to provide clarity of the hexavalent chromium sampling.

*“The hexavalent chromium sampling was requested by Ohio EPA due to the report use of potassium dichromate to prevent corrosion in the USTs when they were not in use.”*

The rationale for sampling RV-46 and CC-RVAAP-72-02 for Target Analyte List (TAL) Metals was evaluate the subsurface at these USTs for the full list TAL Metals.

- b. USTs RV-4, RV-5, CC-RVAAP-72-02 and CC-RVAAP-72-03 had samples collected and analyzed for TAL Metals. Note – In Table 2-1, TAL Metals will be added to the “Site Inspection Field Activities” column for RV-4, RV-5, and CC-RVAAP-72-02. Data for lead was collected for these UST’s and is presented in Table 5-5 of the report.

**Response 3 (June 2015):** *The rationale for sampling the nine former USTs for hexavalent chromium is presented in the fifth paragraph of Section 4.1 Sampling Rationale.*

*Soil samples from the UST locations listed below were analyzed for TAL Metals:*

- RV-89 (George Road Treatment Plant)
- CC-RVAAP-72-03 (Atlas Scrap Yard)
- CC-RVAAP-72-02 (Atlas Scrap Yard)
- CC-RVAAP-72-04 (Atlas Scrap Yard)
- CC-RVAAP-72-05 (Atlas Scrap Yard)
- RV-88 (Building 1103)
- RV-46 (Bolton Manor)
- CC-RVAAP-72-08 (Inert Storage Area 8, Building 848)
- CC-RVAAP-72-01 (Depot Area, Building U-3)
- RV-41 (Load Line 6, Building 2F-11)
- CC-RVAAP-72-06 (Water Works 3)
- RV-5
- RV-4
- RV-86
- RV-87

*Analysis of TAL metals was added to the Draft Work Plan based on comments received from Ohio EPA to evaluate the presence of chromium (total) in the subsurface soil in all UST locations with exception of the 9 Former NFA USTs sampled only for hexavalent chromium at Request of Ohio EPA. See Table 4-1: Summary of Samples Collected between November 2012 and August 2013 at CC RVAAP-72 Facility-Wide Underground Storage Tanks shows that USTs CC-RVAAP-72-02 and CC-RVAAP-72-03 were sampled for TAL Metals, which includes lead.*

**Comment 4.** **Table 4-3:** Table 4-3 indicates that 67 field samples were analyzed for TAL Metals. However, the laboratory data in Appendix D indicates that 71 TAL Metals samples were analyzed, 8 of which are field duplicates. Please explain this discrepancy and revise Table 4-3 accordingly. Also, please go through the rest of the lab data in Appendix D and revise Table 4-3 as necessary, to accurately reflect the number of samples that were actually taken and analyzed for all categories.

**Response 4 (June 2013):** Table 4-3 Sampling Summary Fifteen CC RVAAP-72 Facility-Wide USTs and Nine Additional USTs will be reviewed and revised to make sure that it matches the numbers of samples in Appendix D of the Site Inspection (SI) report.



**Response 4 (June 2015):** The original Table 4-3 was removed and was replaced with Table 4-1. Table 4-1 presents the list of all samples and their respective analyses which reflects laboratory data presented in Appendix D.

*A total of 84 subsurface soil samples were collected and analyzed for TAL metals, which includes 7 field duplicates. A total of 32 hexavalent chromium subsurface soil samples were collected, which includes 3 field duplicates.*

**Comment 5.** **Section 4.3.2 ¶ 2:** Paragraph 2 seems to imply that all subsurface soils in all former tank locations were analyzed for all of the constituents list in this paragraph. Table 4-1 indicates this is not the case. This is confusing. Please clarify this paragraph.

**Response 5 (June 2013):** Paragraph two in Section 4.3.2 will be revised in the revised Draft SI report version.

**Response 5 (June 2015):** Section 4.3 Field Sampling describes the samples collected and the analyses performed. Section 4.3 was completely revised based on several comments. The original text was modified to explicitly state that full-suite analysis were only collected at select locations and not project-wide. This same information is also presented in the revised Table 4-1, which shows sample analysis for each sample.

**Comment 6.** **Section 7.2:** With respect to UST RV-46, please be advised that BUSTR rules must be followed with respect to this tank. There is no indication in this report that the tank will be removed. BUSTR rules require the owner of out-of-service USTs to remove them.

**Response 6 (June 2013):** This comment was discussed and resolved during the 1 August 2013 clarification meeting.

**Response 6 (June 2015):** Recommendations for former UST RV-46 are presented in Section 7.2 Conclusions: further action is warranted at the location of the former UST RV-46 in the area of the EM and GPR anomalies to confirm or complete UST removal from the site in accordance with BUSTR UST closure requirements.

**Comment 7.** Exceedances for various compounds were identified in Section 5, but actions to be taken and justifications for those actions were not discussed anywhere in this report. Any actions to be taken as a result of exceedances (including no action) and the justifications for those actions should be discussed. This information should at least be summarized in the conclusions section of the report. Once this report is revised to incorporate the revised risk assessment and CUG criteria per the revised Technical Memorandum, please include this information.

**Response 7 (June 2013):** This comment was discussed and resolved during the 1 August 2013 clarification meeting.

**Response 7 (June 2015):** Justifications and actions to be taken are presented in Section 7.1 Summary of Results and Section 7.2 Conclusions, respectively, as well as in the last several paragraphs of the Executive Summary. The conclusions of the RI are as follows:

- *No potential contamination has been identified in the subsurface soil sampled at the 24 former UST locations that are the subject of this SI at CC RVAAP-72 FWUSTs.*
- *The results of this SI indicate that the subsurface soil is not contaminated; therefore, soil is not a source of groundwater contamination at CC RVAAP-72 FWUSTs.*

- *Twenty-three of the former 24 USTs (subject of this SI) have prior documentation, geophysical testing, or soil boring results showing that USTs no longer remain in-place.*

*Further action is warranted at the location of the former UST RV-46 in the area of the EM and GPR anomalies to confirm or complete UST removal from the site in accordance with BUSTR UST closure requirements.*

**Comment 8. Section 8.0:** Add the Director's Final Findings and Orders to Section 8.0 (references).

**Response 8 (June 2013, June 2015):** Section 8.0 lists the reference for the Director's Final Findings and Orders used for report preparation.

**Comment 9. Appendix A, pp. 24-43:** These field notes appear to contain notes from multiple RVAAP sites. Please explain. The field notes should be also labeled as to the author. Please provide this information.

**Response 9 (June 2013):** Yes, there are some other sites in the log book, since the field team was conducting sampling at several of the CR sites and in some cases starting in the morning at one site and then moving to a CC RVAAP-72 USTs in the afternoon. The field notes will be labeled with the author's name (Tomas Hernandez, Geologist). Sites included in the log book pages that are not part of the site being presented in the report will be crossed out.

**Response 9 (June 2015):** *Appendix A has been revised to only show field notes pertaining to sampling activities at UST site locations. The field notes are signed by the author at the end of each day's entries.*

**Comment 10. Appendix E: Laboratory Data, Case Narrative:** A review of the Case Narrative [pp. 9-13 of Appendix E file J18297-1 Std\_Tal\_L4\_Package\_Mini Final Report (1 Of 2)] indicates multiple problems with surrogate recoveries and other issues. Please submit the USACE data validation report to Ohio EPA for review and comment. This report cannot be approved without review and verification of this information.

**Response 10 (June 2013):** The USACE data validation report will be provided to the Ohio EPA for review and comment.

**Response 10 (June 2015):** *The USACE data validation report is provided in Appendix E.*

**Comment 11.** Any changes to the body of the report that affect the Executive Summary must also be made to the Executive Summary.

**Response 11 (June 2013, June 2015):** Changes to the report text will be carried into the Executive Summary.

**Comment 12.** The samples from this project were not shipped on ice. While it is understood that the samples were collected in December and the sample receipt form indicates the sample temperatures were within acceptable limits, please be advised that shipping samples without ice, even in the winter, is risky. The receiving temperature of one of the coolers was 5.7°C, which is very close to the acceptable limit of 6°C.

**Response 12 (June 2013, June 2015):** We agree that coolers should be shipped with ice regardless of the time of year. Please note that all samples were placed on ice in coolers immediately after sample collection by ECC and remained on ice until daily pick up by Test America at Building 1036 at Camp Ravenna.

The instance of shipping samples without ice occurred when Test America transferred samples for metals analysis from their Canton, OH laboratory to their Pittsburgh, PA laboratory. Test America Canton did not ship these samples with ice per their analytical method SOP which does not require soil samples for

metals analysis to be shipped with ice. These are the samples where the receiving check lists did indicate that the samples were not packed in ice.

ECC notified Test America that all future samples being shipped for the Ravenna project, regardless of analysis or matrix, will be placed on ice for shipment.

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

May 13, 2015

**Re: US Army Ravenna Ammunition Plt RVAAP  
Assessment  
Remedial Response  
Portage County  
267000859219**

Mr. Mark Leeper, P.G., MBA  
Army National Guard Directorate  
Environmental Programs Division  
ARNG-ILE-CR  
111 South George Mason Drive  
Arlington, VA 22204

**Subject: Ohio EPA's Review of Draft Site Inspection Report, CC-RVAAP-72  
Facility-Wide Underground Storage Tanks (USTs), Project No. 267-  
000859-219; Notice of Deficiency (NOD)**

Dear Mr. Leeper:

The Ohio Environmental Protection Agency (Ohio EPA), Northeast District Office (NEDO) has reviewed the Draft Site Inspection Report for CC-RVAAP-72, Facility-wide USTs, dated April 9, 2015. The document was prepared by ECC, under contract no. W912QR-04-D-0039.

Ohio EPA has identified the following deficiencies in the report. Ohio EPA will review either a response to comments letter or Response to Comments (RTC) table. However, a revised report will need to be completed prior to final approval of the document.

**Comments:**

1. It is unclear what the approximate years were that each UST was in service. Please include this information, if available.
2. It is unclear why MTBE is a potential COC for USTs that, according to Table 2-1, were used for fuel oil, diesel fuel, kerosene, or leaded gasoline. According to U.S. EPA, MTBE has been used since 1979 to replace lead as an octane enhancer in gasoline only (see web page here: <http://www.epa.gov/mtbe/faq.htm>). If the use history of these tanks included unleaded gasoline, please revise Table 2-1 and other relevant parts of the document to include this information.
3. It is difficult to find where information resulting from some of the comments in Ohio EPA's July 22, 2013 comment letter, was incorporated into the revised document.

MR. MARK LEEPER  
ARMY NATIONAL GUARD DIRECTORATE  
MAY 13, 2015  
PAGE 2

For example, Table 4-3 in the current report contains completely different information from Table 4-3 in the 2013 draft report. There are similar issues with some of the other comments. Please review the Army's August 22, 2013 comment response letter, and explain where the changes and/or explanations have been incorporated in the latest report, so Ohio EPA can verify them.

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 D'Amato

Project Coordinator

Ohio EPA - Division of Environmental Response and Revitalization

ED/nvr

ec: Rod Beals, DERR-NEDO, Manager  
Justin Burke, DERR-CO  
Katie Tait, OHARNG RTLS  
Kevin Sedlak, ARNG  
Gregory F. Moore, USACE  
Mark Nichter, USACE  
Rebecca Haney/Gail Harris, Vista Sciences Corp.  
Ohio EPA, VAP File, CO, DERR at: [records@epa.ohio.gov](mailto:records@epa.ohio.gov)



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

October 22, 2015

Ohio Environmental Protection Agency  
DERR-NEDO  
Attn: Ed D'Amato  
2110 East Aurora Road  
Twinsburg, OH 44087-1924

Subject: Former Ravenna Army Ammunition Plant (RVAAP) Restoration Program  
Portage/Trumbull Counties, CC RVAAP-74 Building 1034 Building Motor Pool  
Hydraulic Lift Draft Remedial Investigation Report, Response to Comments,  
Ohio EPA ID # 267-000-859-211

Dear Mr. D'Amato:

Enclosed for your review are the responses to the Ohio EPA comments made via letter on August 3, 2015 on the *Draft Remedial Investigation Report* in support of the Environmental Remediation Services (ERS) project at the Building 1034 Building Motor Pool Hydraulic Lift at Camp Ravenna.

The Army requests the Ohio EPA review these comment responses. In order to facilitate this review, the Army proposes a teleconference with the Ohio EPA to discuss the responses. Upon approval of these responses, the Army will proceed with the formulation of the Final Remedial Investigation Report for CC RVAAP-74.

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

Sincerely,

A handwritten signature in black ink, appearing to read "m Leeper", is positioned above the printed name.

Mark Leeper  
RVAAP Restoration Program Manager  
Army National Guard Directorate

Attachment

cc: Bob Princic, Ohio EPA, DERR-NEDO  
Justin Burke, Ohio EPA, DERR-CO  
Rod Beals, Ohio EPA, DERR-NEDO  
Katie Tait, OHARNG Camp Ravenna  
Kevin Sedlak, ARNG, Camp Ravenna  
Greg Moore, USACE Louisville  
Eric Cheng, USACE Louisville  
Gail Harris, Vista Sciences

October 16, 2015

**RESPONSE TO COMMENT:  
DRAFT REMEDIAL INVESTIGATION REPORT  
CC RVAAP-74 BUILDING 1034 – MOTOR POOL HYDRAULIC LIFT  
FORMER RAVENNA ARMY AMMUNITION PLANT, PORTAGE AND TRUMBULL  
COUNTIES OHIO**

**Draft Report Submittal Date: 01 March 2015  
Ohio EPA Comments Table Received: 22 June 2015  
Comment Response Table Issued: 01 July 2015  
Ohio EPA Letter with Comments Received: 5 August 2015  
\*Response to Ohio EPA Letter Comments Issued: 16 October 2015**

**\*Contract ended and Contractor was unable to prepare responses. These responses have been prepared by the Army in response to last comments from the Ohio EPA received on 5 August 2015.**

**I.) Background**

As noted above, there have been several exchanges between the Army and the Ohio EPA regarding the Remedial Investigation (RI) for CC RVAAP-74 Building 1034 – Motor Pool Hydraulic Lift Area of Concern (AOC). The AOC is comprised of Building 1034. The hydraulic lift is no longer used at the AOC and motor pool activities such as automotive repairs or maintenance for service vehicles are no longer conducted there in the building. The AOC has a two-door garage with a concrete floor. Only subsurface soil samples were taken. No chemicals of concern (COCs) were identified in the RI.

A human health risk assessment (HHRA) was completed as part of the RI. The risk assessment followed the process developed for Ravenna, but AOC-specific risk values were not calculated. Instead of using the site-specific Facility Wide Cleanup Goals (FWCUGs) or the USEPA Regional Screening Levels (RSLs), the risk assessment used the Ohio EPA's Bureau of Underground Storage Tank Regulations (BUSTR) Soil Action Levels Class 1 values for soil to make the determination of COCs. The maximum value detected in any of the soil borings for organic compounds, semi-volatile compounds (mostly those hydrocarbons found in petroleum products), and the Total Petroleum Hydrocarbons (TPH) for Diesel Range Organics (DRO – molecules with 10 to 20 carbons in their structure) were less than those of the BUSTR Action Levels.

Of the 35 samples results (at various depths from 1 to 13 feet) from 18 different borings, 10 samples had detectable concentrations of the Motor Oil Range Organics (MOR - molecules of oils with 20 to 34 carbons in their structure). Two of these ten samples had concentrations of MOR that were greater than the BUSTR Action Level of 5,000 mg/kg. A sample from SB-17 (collected from 6 to 6.5 feet deep) was 5,900 mg/kg MOR, and a sample from SB-18 taken at 7.5 to 8.5 depth interval had a MOR value of 26,000 mg/kg.

The exposure point concentration (EPC) was calculated in the HHRA using the average concentration for all the samples. The average-based EPC was 1,264 mg/kg for the MOR. The EPC was less than the BUSTR Action Level for MOR, it was concluded that there were no COCs and that a No Further Action (NFA) was appropriate for the AOC.

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## **II. Comments and Responses**

The first set of comments from the Ohio EPA requested that the Army use the USEPA's ProUCL software and recalculate the EPC 95% UCL average concentration of the MOR value. The Army responded that the 95% UCL was 11,700 mg/kg. In addition, the Army's response included a discussion of an outlier test and the recalculation of the 95% UCL without the value with the greatest concentration of MOR. The outlier-adjusted 95% UCL for the MOR was 1,797 mg/kg.

The Ohio EPA responded with the following comment in a letter received 5 August 2015.

### Comment:

*The response to comments states "The concentration of 26,000 mg/kg detected at SB18 is not representative of subsurface conditions. As noted in the boring log for SB18 "free product, possible hydraulic fluid" was observed in the 7.5ft to 8.5ft sample interval." It further states: "The text and tables will be revised to use the 95% upper confidence limit of the arithmetic mean (with the outlier excluded) as the EPC for the Resident Receptor." The conclusions section of the report proposes no further action at the site.*

*To conclude that the 7.5ft to 8.5ft interval of SB18 is not representative of subsurface conditions when there is free product present is inappropriate. In this instance, the sample is identifying a contamination hotspot, so it is a misapplication of the outlier test and the 95% UCL to exclude the sample. Rather, the outlier statistical analysis supports addressing the contamination. Depending on the site conditions, remedy options can range from enforceable institutional controls to prevent exposure or an active remedy such as targeted removal of the "hot spot".*

After receiving this comment from the Ohio EPA that the one elevated concentration of MOR value from SB-18 is a "hot spot", the Army decided to re-evaluate the data and potential risks to fully assess whether or not the NFA decision was appropriate or if additional remedial action was warranted.

## **III. Re-Evaluation of MOR Concentrations and Consideration of Other Factors**

The re-evaluation of the MOR concentrations as well as general characteristics of hydraulic oils was completed by considering the distribution of the MOR values at the AOC and using various lines of evidence to determine whether the single point concentration represents a hot spot and if additional remedial action was required. The following summarizes the various lines of evidence developed for the re-evaluation.

### **1.) General Information Regarding Hydraulic Fluid and Petroleum-based Oils and Analytical Tests**

The exact composition of the oily material found in the soil at SB-18 is unknown. Because the site had a hydraulic lift and was used for maintenance of vehicles, soil samples were analyzed for petroleum-based products (e.g., motor oil and hydraulic fluid) and other organic components such as semi-volatile organic compounds (SVOCs or polycyclic aromatic hydrocarbons (PAHs)) commonly found in such oils. Results from the analysis of the soil samples indicate that the lighter (molecular weight basis) organic components are not present. This is supported by the low Photoionization Detector (PID) readings for all the samples at all the soil borings and the limited concentrations of PAHs determined in the samples.

Generally, when petroleum-based oils are released in the environment, several processes occur as the oil ages. The lighter and volatile fractions undergo volatilization, biodegradation, and weathering until the remaining material is primarily heavy hydrocarbon chains (aliphatics) such



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as the oily material at SB-18, and possibly some aromatic compounds (hydrocarbons with at least one ring structure). The low concentration of PAHs and the low DRO measurements for the soil from this AOC further suggest that this oily material has undergone processes for many years. Additionally, in the first few days after an oil release, the redistribution of moisture and of the gravity drainage occurs, followed by vapor migration. After a few months to years, if the oil remains, it is considered in a residual saturation zone and essentially the mostly non-mobile portion is what remains (Geosphere, Inc., 2006).

Hydraulic fluid is a petroleum-based oil. There are mineral oil and water-in-oil emulsions types of fluids. The water-in-oil emulsions consist of about 45 to 40% water and 60% mineral oil. The carbon number range in mineral oil hydraulic fluids varies upon application but ranges from C<sub>15</sub> to C<sub>50</sub> (IARC 1984). Most mineral oil hydraulic fluids are made from dewaxed paraffin-based crude oil. Many formulations of early hydraulic fluids that were commercially available contained blended additives if they were for a particular use. Most additives were formulations to reduce corrosion or oxidation of the metals.

Hydraulic fluids that were manufactured during the time the lift was in use were complex mixtures of both aliphatic and aromatic hydrocarbons with the additives. The chemical composition depended upon the manufacturer, degree and type of refining, and the source of the crude oil. In 1984, Alekhina et. al., in "Hydrocarbon Composition of Hydraulic Oil Base Stock Produced by Two Stage Adsorptive Treatment" in *Manufacturing Processes* (Volume 20, Issue 2, pp 71-74) reported that the undesirable portion of the hydraulic oil base (that will be further refined) is less than 20% aromatic hydrocarbons. Based on this information, it is likely that the oily material at the AOC has much less aromatic hydrocarbons compared to the aliphatic hydrocarbons.

Besides not knowing the exact type of hydraulic fluid that was used on the site, other changes from weathering, biodegradation, and volatilization have further modified the oily material to what is still remaining in the soil. Samples of an oil-contaminated soil should be assessed for Total Petroleum Hydrocarbons (TPH) to help determine what type of oil it is. There are different measures of TPH (based on the number of carbons) that may be completed: TPH-gasoline range organics (G), TPH-diesel range organics (D), and/ or TPH-oil range organics (O). The measurement of TPH-oil range organics is done for samples where the source of petroleum hydrocarbons is from the heavy petroleum fractions such as hydraulic fluid, lube oil, and residual fuel oils. Hydraulic fluid is considered a highly refined mineral-oil based fluid. The soil from the site was analyzed for TPH-diesel range organics (Diesel Range Organics - DRO) and TPH-oil range organics (Motor Oil Range Organics - MOR). Since the hydraulic lift system at the site did not require fluid that could withstand high temperature, it is likely it did not have additives other than a corrosion inhibitor (e.g., ethylene glycol); therefore, specific additive analyses were not performed. PAH compounds were assessed in the soil samples.

## **2.) Exposure Considerations for a Potential Receptor**

- a.) Size of Building = ~680 ft<sup>2</sup> = Exposure Unit = Exposure Area = Decision Unit.
- b.) Thickness of concrete is such that there is no surface soil.
- c.) The Exposure Unit for this AOC is only 6% of the typical 1/4 acre plot used as the Residential Exposure Unit.

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d.) Currently, there are no risks to the current users because there is an incomplete exposure pathway. Future users would not be exposed to the material as long as the concrete floor and building are in place.

e.) The area where there is some oil is very small and is bounded.

### **3.) Land Use at the AOC**

a.) Currently, the building is only used for storage purposes.

b.) Current building conditions require renovations before it can be used for purposes other than storage.

c.) Regardless of the concentration of the oily material or other factors, there can be no risks to the current users because there is not a complete exposure pathway. Future users would not be exposed to the oily material in the soil either because of the depth where the oily material was found underneath the concrete floor. Current or future users would only have a complete exposure pathway if they dug down 7 feet under the concrete floor and then contacted the material. Additionally, the oily material is not volatile and would have to be ingested to elicit an effect.

### **4.) Total Petroleum Hydrocarbon Soil Saturation Concentrations (DERR – 00 DI-033)**

The permeability, pore size, and soil type affect the amount of oil that can be trapped within a soil.

a.) The Saturation Concentration for heavy oils in silty, clayey sand is 20,000 mg/kg. Heavy oils are those with 16 to 35 carbon atoms per molecule.

b.) In glacial till and silty clay, the soil saturation concentration for heavy oils is 40,000 mg/kg.

c.) In SB-18, the soil below 10 feet deep was silty clay, indicating that the saturation concentration for oil is expected to be around 40,000 mg/kg below 10 feet in this boring. The soil, between 6 and 10 feet of depth in SB-18, was described as silty sand with some gravel at the 7.5 to 8.5 foot sample. The sample with the MOR result of 26,000 mg/kg was taken from this zone, indicating that there may have been a small pocket of oil-saturated gravel in this boring. The surrounding borings indicated that this gravel pocket was not continuous, and analytical results from surrounding borings confirm that this oil pocket is not mobile.

### **5.) Sample Types and Numbers**

a.) 37 subsurface samples (discrete and composite) taken from 1 to 13 feet. (2 were QA (#4 and #14) and one was for QC purposes (#22). Sample #15 was from 7 to 13 feet and was a composite sample.

b.) 29 subsurface soil borings (28 investigative) + 1 field duplicate (SB-22) from 18 Soil Borings.

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- c.) The Army's contractor went back to the field and collected 5 additional samples from 3 soil borings.
- d.) Total was 38 subsurface soil samples (37 Investigative and one Field Duplicate).

#### **6.) Analysis – SW846 Method 8015B – DRO DoD – Non-halogenated Organics by Gas Chromatography**

- a.) DRO and MOR are based on a mixture of chemicals comprising the oil. These can be considered qualitative analyses for individual chemicals but provide a measure of the TPHs for specific ranges of carbons in the chains.
- b.) The DRO has specific alkane – diesel standards used, but the MOR uses lab-specific mixtures and standards. The main component of the standards is generally a basic mixture of diesel type fuels.
- c.) All 35 samples were assessed for MOR and DRO. The Work Plan only said to do DRO. MOR was used to determine Nature and Extent. The Army's contractor carried the MOR into the risk assessment for screening purposes and used a BUSTR value as if it was a cleanup goal or risk based number.
- d.) Based on the BUSTR limit of 5000 mg/kg, MOR was the only parameter identified as a COPC. MOR was detected in 10 of 35 samples, but only two of those detections exceeded 5000 mg/kg; 5,900 mg/kg (SB-17) and 26,000 mg/kg (SB-18).

#### **7.) Toxicity and Risks of MOR Organics and Hydraulic Fluid**

In human health risk assessments, risk is evaluated using an estimated dose of a chemical that a receptor may be exposed to on the site and then comparing this estimated dose for each chemical to concentrations (doses) that are assumed to be safe or non-toxic. The risk assessment involves equations that are used to estimate the doses. These equations account for specific parameters such as how long the receptor uses the site, how large an area the receptor is exposed over, what route of exposure is likely (exposure route (ingestion, inhalation, or dermal absorption), and many other factors. The non-toxic or safe dose is determined via toxicity tests and ultimately is used as a threshold for the determination of the risks. Since the oily material at the site is not volatile and receptors would not likely contact it on their skin, this response focuses on ingesting the material. The safe dose (the amount of a chemical that is safe to ingest) is reported as a Reference Dose (RfD) in terms of a daily dose that a receptor can ingest over their lifetime. The RfD<sub>oral</sub> is reported in units of the chemical in milligrams per kilogram of body weight per day (mg/kg-day).

For non-carcinogenic risks, the estimated dose from the concentrations of the chemicals on the site is compared to the RfD. The result of this comparison is called the Hazard Quotient (HQ). If there are multiple chemicals or a mixture, a Hazard Index (HI) may be calculated by summing the HQs of the other chemicals. When the HQ or HI exceed 1.0, there is some indication of a potential risk since the receptor is being exposed to an unsafe concentration. The non-carcinogenic effects are determined using the HQ/HI while carcinogenic effects and risks are estimated using slope factors of a dose-response curve for a test population. Based on the results for the oily material (heavy, with a large number of carbons and aliphatic, in contrast to oils that are aromatic and lightweight), the most likely adverse effect would be non-carcinogenic. Occupational exposure studies have shown that long term exposure to high doses of these oils can

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cause cancer, but these situations are not similar to the type of exposure or the concentrations of the oils at the site.

$$HQ = \text{Estimated Dose from Site} \div RfD$$

The HQ or HI can be calculated by dividing the Estimated Exposure (Concentration) Dose by the RfD. The USEPA provides RfDs and toxicity values (e.g., reference concentrations, carcinogenic slope factors, etc.) that are used to calculate the RSLs for many chemicals. The RSLs are not developed for mixtures or for hydraulic fluid. However, for comparison purposes, the RSL for mineral oils is provided below for different reference doses (RfD). Based on an RfD<sub>oral</sub> of 3 mg/kg/day (assuming occupational exposure), an HI of 1, and no carcinogenic effects, the USEPA calculated an RSL for mineral oil of **3.5 X 10<sup>6</sup> mg/kg**. This RSL is over 100 times greater than the maximum MOR result of 26,000 mg/kg.

The document "Guidance for Assessing Petroleum Hydrocarbons in Soil" Ohio EPA - DERR-00-DI-033 (2010 updated version) used a conservative surrogate RfD for the TPH fractions comprising hydrocarbon mixtures. The proportion of the fraction of aliphatic and aromatic hydrocarbons in the oily mixture in the soil at the site is unknown. However, hydraulic fluid is a highly refined oil and is mostly composed of aliphatic chains. Therefore, the RfD for the aliphatic portion is likely the more applicable of the two values reported in the DERR-00-DI-033 2010 Guidance.

- For TPH-oil - O (C20 – C35) (aliphatics), the RfD<sub>oral</sub> = 2 mg/kg-day.
- For TPH-oil - O (C20 - C35 (aromatics), the RfD<sub>oral</sub> = 0.03 mg/kg-day

The Army calculated a Residential FWCUG for aliphatic hydrocarbons (MOR organic compounds) using an RfD<sub>oral</sub> of 2 mg/kg-day. The equations used for the 2010 FWCUGs were used. Using an RfD of 2 mg/kg-day, the calculated FWCUG at HI = 1.0 is **1,000,000 mg/kg**. This FWCUG is over 30 times greater than the maximum MOR result of 26,000 mg/kg. The equation does not account for toxicity through inhalation since heavy hydrocarbons are not volatile and DERR guidance states that the oil has no inhalation toxicity.

The Army calculated a Residential FWCUG for aromatic hydrocarbons using an RfD<sub>oral</sub> of 0.03 mg/kg-day. The equations used for the 2010 FWCUGs were used and were not modified. Using a chronic RfD<sub>oral</sub> of 0.03 mg/kg-day, the calculated FWCUG at HI = 1.0 is **30,000 mg/kg**. This FWCUG is also greater than the maximum MOR result of 26,000 mg/kg. The equation does not account for toxicity through inhalation since heavy hydrocarbons are not volatile and DERR guidance states that the oil has no inhalation toxicity.

In summary, the concentration of the MOR at SB-18 is less than the FWCUG for both the aliphatic portion and the aromatic portion. Even if all the oily material is considered to be only aromatic hydrocarbons with 20 to 35 carbons in their structure, the material is at a concentration less than the FWCUG and does not need to be remediated. This further supports the NFA determination for the AOC.

## 8.) Pure Product Issue from Soil Boring Log Notes

- a.) The boring log for SB-18 noted free product, but did not describe what was meant by this term. No other notes regarding the visual observations were recorded.

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b) The soil boring log indicated a PID reading of 0.2 parts per million at this location, which is very low and not indicative of volatile compounds. The field notes for the SB-18 sample indicate that the photoionization detector (PID) was properly calibrated. This confirms that the material noted was not gasoline or a gasoline derivative. The DRO results from this interval confirm that the material noted was also not in the diesel range. The MOR results from this interval confirm that the material noted was a heavy hydrocarbon, or oil.

c.) According to the Ohio BUSTR Technical Guidance Manual 2012), free product means a separate liquid hydrocarbon phase is present that has a measureable thickness of greater than 0.01 ft. (0.12 inches). From what is written on the boring log for the sample with the elevated reading, it is not discernible what was actually observed. Based on the soil saturation values discussed above, the sample was likely taken from a pocket of sandy gravel that could have been saturated with oil. The use of the term "free product" should not be construed as pure product.

**9.) Not relative to any risk or concentration found on the site, hydraulic fluid is not a regulated CERCLA material.**

a.) The hydraulic lift and subsequent materials defined as the AOC (CC RVAAP-74 Motor Pool Hydraulic Lift) are not regulated under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and, therefore, no applicable regulatory requirement exists to remedy the petroleum condition at SB-18.

b.) CERCLA defines the term "hazardous substance" in Section 101(14) and excludes "petroleum, including crude oil or any fraction thereof" unless specifically listed or designated under CERCLA (42 U.S.C.A. §9601(14)).

c.) A United States Environmental Protection Agency (USEPA) memorandum (USEPA 1987) clarifies that this petroleum exclusion includes used oils. The petroleum products detected in SB-18 and SB-17 fall within the purview of the CERCLA petroleum exclusion.

#### **IV. Conclusions**

The Army agrees that, at first glance using the BUSTR Class Action values for MOR, the single reading at SB-18 and might be considered a hot spot or an area that needs additional investigation. However, based on the lines of evidence developed in the re-evaluation results, it appears that the concentration of the greatest value of the MOR detected at the site does not pose a current risk. The calculated FWCUG (1,000,000 mg/kg) for aliphatic MOR hydrocarbons, using the Ohio EPA's recommended RfDs (DERR\_00-D-033, 2010 Update) for oral ingestion (RfD<sub>oral</sub>) of 2 mg/kg-day, is much higher than the concentration of the MOR at SB-18 (26,000 mg/kg). Similarly, if the conservative assumption is made that the type of hydrocarbon in the oily material is entirely aromatic hydrocarbons, the calculated MOR FWCUG of 30,000 mg/kg is still greater than the maximum MOR concentration detected at SB-18. The small area where there appears to be oil is bounded vertically and horizontally by samples with nearly non-detect MOR values within a few feet. This shows that the area where there is oil residue is very limited. Given the predominant soil type at SB-18 and the surrounding borings, a concentration of 26,000 mg/kg MOR is less than the saturation concentration in silty clay, making it unlikely for the oil residue to be mobile. Overall, the area at SB-18 where the MOR was detected is isolated and very small and does not represent an exposure unit. The calculated FWCUG for MOR indicates that this



October 16, 2015

amount of residual oil and its concentration in the soil does not represent a current or future risk. Therefore, the Army believes that the lines of evidence provided herein present adequate rationale to support the NFA decision.



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

August 3, 2015

Mr. Mark Leeper, P.G., MBA  
Restoration/Cleanup Program  
Manager  
ARNG Directorate  
111 S. George Mason Dr.  
Arlington, VA 22204

Re: US Army Ravenna Ammunition Plt RVAAP  
Remediation Response  
Project records  
Remedial Response  
Portage County  
267000859211

**Subject: Ohio EPA's Review of Draft Remedial Investigation Report, CC-RVAAP-74 Motor Pool Hydraulic Lift; Notice of Deficiency**

Dear Mr. Leeper:

The Ohio Environmental Protection Agency (Ohio EPA), Northeast District Office has reviewed the Draft Remedial Investigation Report for CC-RVAAP-74, Motor Pool Hydraulic Lift, dated March 6, 2015. The document was prepared by ECC under contract no. W912QR-04-D-0039. Ohio EPA received the most recent response to comments on July 10, 2015.

Ohio EPA has identified the following deficiencies in the report. Ohio EPA will review either a response to comments letter or Response to Comments (RTC) table. However, a revised report will need to be completed prior to final approval of the document.

**Comment:**

1. The response to comments states, "The concentration of 26,000 mg/kg detected at SB18 is not representative of subsurface conditions. As noted in the boring log for SB18 'free product, possible hydraulic fluid' was observed in the 7.5ft to 8.5ft sample interval." It further states: "The text and tables will be revised to use the 95% upper confidence limit of the arithmetic mean (with the outlier excluded) as the EPC for the Resident Receptor." The conclusions section of the report proposes no further action at the site.

To conclude that the 7.5ft to 8.5ft interval of SB18 is not representative of subsurface conditions when there is free product present is inappropriate. In this instance, the sample is identifying a contamination hotspot, so it is a misapplication of the outlier test and the 95% UCL to exclude the sample.

MR. MARK LEEPER  
ARNG DIRECTORATE  
AUGUST 3, 2015  
PAGE 2

Rather, the outlier statistical analysis supports addressing the contamination. Depending on the site conditions, remedy options can range from enforceable institutional controls to prevent exposure or an active remedy such as targeted removal of the "hot spot".

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 Environmental Response and Revitalization

ED/hvr

ec: Rod Beals, Manager, DERR, NEDO  
Bob Princic, Supervisor, DERR, NEDO  
Vanessa Steigerwald, DERR, NEDO  
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Ohio EPA, VAP File, CO, DERR at: [records@epa.ohio.gov](mailto:records@epa.ohio.gov)



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

July 10, 2015

Ohio Environmental Protection Agency  
DERR-NEDO  
Attn: Ed D'Amato  
2110 East Aurora Road  
Twinsburg, OH 44087-1924

Subject: Former Ravenna Army Ammunition Plant (RVAAP) Restoration Program  
Portage/Trumbull Counties, CC RVAAP- 74 Building 1034 Building Motor Pool  
Hydraulic Lift Draft Remedial Investigation Report, Response to Comments,  
Ohio EPA ID # 267-000-859-211

Dear Mr. D'Amato:

Enclosed for your review are the responses to the Ohio EPA comments on the *Draft Remedial Investigation Report* in support of the Environmental Remediation Services (ERS) project at the Building 1034 Building Motor Pool Hydraulic Lift at the former Ravenna Army Ammunition Plant (RVAAP) in Portage and Trumbull counties, Ohio. This document was prepared for the US Army Corps of Engineers (USACE) - Louisville District, by ECC under Contract No. W912QR-04-D-0039.

The Army requests Ohio EPA review these comment responses. Upon approval of these responses, the Army will proceed with the formulation of the Final Remedial Investigation Report for CC RVAAP-74.

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

Sincerely,

A handwritten signature in black ink, appearing to read "Mark Leeper", is positioned below the "Sincerely," text.

Mark Leeper  
RVAAP Restoration Program Manager  
Army National Guard Directorate

Attachment

cc: Bob Princic, Ohio EPA, DERR-NEDO  
Justin Burke, Ohio EPA, DERR-CO  
Rod Beals, Ohio EPA, DERR-NEDO  
Katie Tait, OHARNG Camp Ravenna  
Kevin Sedlak, ARNG, Camp Ravenna  
Greg Moore, USACE Louisville  
Eric Cheng, USACE Louisville  
Gail Harris, Vista Sciences

**DRAFT REMEDIAL INVESTIGATION REPORT**  
**CC RVAAP-74 BUILDING 1034 – MOTOR POOL HYDRAULIC LIFT**  
**FORMER RAVENNA ARMY AMMUNITION PLANT, PORTAGE AND TRUMBULL COUNTIES OHIO**  
**COMMENT RESPONSE TABLE**  
**RI Report Submittal Date: 01 March 2015**  
**Ohio EPA Comments Received: 22 June 2015**  
**Response to Comments Issued: 01 July 2015**

Page 1 of 2

Comment Number	Page No./Line No.	Comment	Recommendation	Response
<i>Ohio EPA - Edward J. D'Amato, Project Coordinator</i>				
1	<b>Section 7.1.5, Exposure Point Concentration Development</b>	Section 7.1.5 states that “The average concentration of all the results was used as the EPC for the exposure area. The EPC for the Resident Receptor is based on 26 discrete subsurface samples collected from 6-13 ft bgs.” Table 7-2 summarizes the sampling results and screening values for the chemicals of potential concern in subsurface soil. Figure 5-3b summarizes the DRO/MOR SRCs in the subsurface soil. SB17 and SB18 contain motor oil range (MOR) organics at concentrations of 5,900 mg/kg and 26,000 mg/kg, respectively. The BUSTR Action Level used in the risk assessment is 5,000 mg/kg. Only SB17 and SB18 contain elevated concentrations of MOR, whereas the majority of all of the other sampling results are non-detect or orders of magnitude lower. Table I-1 contains the data aggregation for the subsurface soil. As stated in Section 7.1.5 and shown in Table I-1, the average concentration detected was	To calculate the ninety-five percent upper confidence of the arithmetic mean, refer to U.S. EPA’s ProUCL program and guidance which can be found at: <a href="http://www2.epa.gov/land-research/proucl-software">http://www2.epa.gov/land-research/proucl-software</a> .	<p>The 95% UCL for MOR using all subsurface soil (1 to 13 ft bgs) results is 11,700 mg/kg. An outlier test performed on the MOR subsurface soil dataset using ProUCL 5.0.00 identified the 26,000 mg/kg datum as an outlier at 5% significance level. Recalculating the 95% UCL without the outlier results in a value of 1,797 mg/kg which is below the BUSTR Action Level (5,000 mg/kg) and similar to the arithmetic mean used in the text.</p> <p>The boring logs provide further evidence that the concentration of 26,000 mg/kg detected at SB18 is not representative of subsurface conditions. As noted on the boring log for SB18 “free product, possible hydraulic fluid” was observed in the 7.5 to 8.5 ft sample interval. Free product was not observed in SB18 either above or below the 7.5 to 8.5 ft interval. An additional soil sample was collected from SB18 at a depth of 13 to 14 ft. The concentration of MOR in soil from SB18 (13-14 ft) is 38 mg/kg, indicating that nature and extent is defined vertically. SB18 is also bounded horizontally by additional borings. Free product was not observed in the remaining 21 soil borings. Some areas of staining were observed in the other 21 soil borings and the areas of staining</p>



**DRAFT REMEDIAL INVESTIGATION REPORT**  
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Page 2 of 2

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		calculated to be 1264 mg/kg and was used as the exposure point concentration (EPC) to demonstrate that applicable standards were met for the Resident Receptor. However, in accordance with U.S. EPA and Ohio EPA risk assessment procedures, the EPC should be determined by calculating the ninety-five percent upper confidence limit of the arithmetic mean or by using the maximum concentration within the exposure area. It is generally not acceptable to use the average concentration for the EPC in the risk assessment. Instead, the ninety-five percent upper confidence of the arithmetic mean should be used.		were sampled. MOR was detected in only 10 of 26 subsurface soil samples and 9 of the detections were below the BUSTR Action Level (5,000 mg/kg).  The text and tables will be revised to use the 95% upper confidence limit (UCL) of the arithmetic mean (with the outlier excluded) as the EPC for the Resident Receptor. This revision will not affect the HHRA conclusions.
2	<b>Section 7.1.6,</b>	Section 7.1.6 Resident Receptor states that “The EPC for C20-C34 MOR organics is 1,264 mg/kg.” This is the average concentration for the exposure area. Instead, the ninety-five percent upper confidence of the arithmetic mean should be used.	To calculate the ninety-five percent upper confidence of the arithmetic mean, refer to U.S. EPA’s ProUCL program and guidance which can be found at: <a href="http://www2.epa.gov/land-research/proucl-software">http://www2.epa.gov/land-research/proucl-software</a> .	As described in the Response to Comment #1, the EPC for MOR for the Resident Receptor subsurface soil will be revised to the 95% UCL (1,797 mg/kg). This value is below the BUSTR value for MOR of 5,000 mg/kg.
<b><i>End of comments.</i></b>				



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

June 22, 2015

Mark Leeper, P.G., MBA  
Restoration/Cleanup Program  
Manager  
ARNG Directorate  
111 S. George Mason Dr.  
Arlington, VA 22204

**Re: US Army Ravenna Ammunition Plt RVAAP  
Assessment  
Remedial Response  
Portage County  
267000859211**

**Subject: Ohio EPA's Review of Draft Remedial Investigation Report, CC-RVAAP-74 Motor Pool Hydraulic Lift; Notice of Deficiency**

Dear Mr. Leeper:

Ohio EPA- Northeast District Office has reviewed the Draft Remedial Investigation Report for CC-RVAAP-74, Motor Pool Hydraulic Lift dated March 6, 2015. The document was prepared by ECC under contract no. W912QR-04-D-0039.

Ohio EPA has identified the following deficiencies in the report. Ohio EPA will review either a response to comments letter or Response to Comments (RTC) table, however, a revised report will need to be completed prior to final approval of the document.

**Comments:**

1. **Section 7.1.5, Exposure Point Concentration Development** Section 7.1.5 states that "The average concentration of all the results was used as the EPC for the exposure area. The EPC for the Resident Receptor is based on 26 discrete subsurface samples collected from 6-13 ft bgs." Table 7-2 summarizes the sampling results and screening values for the chemicals of potential concern in subsurface soil. Figure 5-3b summarizes the DRO/MOR SRCs in the subsurface soil. SB17 and SB18 contain motor oil range (MOR) organics at concentrations of 5,900 mg/kg and 26,000 mg/kg, respectively. The BUSTR Action Level used in the risk assessment is 5,000 mg/kg. Only SB17 and SB18 contain elevated concentrations of MOR, whereas the majority of all of the other sampling results are non-detect or orders of magnitude lower. Table I-1 contains the data aggregation for the subsurface soil. As stated in Section 7.1.5 and shown in Table I-1, the average concentration detected was calculated to be 1264 mg/kg and was used as the exposure point concentration (EPC) to demonstrate that applicable standards were met for the Resident Receptor. However, in accordance with U.S. EPA and Ohio EPA risk assessment procedures, the EPC should be determined by calculating the ninety-five percent upper confidence limit of the arithmetic mean or by using the maximum concentration within the exposure area. It is generally not acceptable to use the average concentration for the EPC in the risk assessment. Instead, the ninety-five percent upper confidence of the arithmetic mean should be used.


MARK LEEPER, P.G., MBA  
JUNE 22, 2015  
PAGE 2

To calculate the ninety-five percent upper confidence of the arithmetic mean, refer to U.S. EPA's ProUCL program and guidance which can be found at: <http://www2.epa.gov/land-research/proucl-software>.

2. **Section 7.1.6, Identification of Chemicals of Potential Concern:** Resident Receptor Section 7.1.6 states that "The EPC for C20-C34 MOR organics is 1,264 mg/kg." This is the average concentration for the exposure area. Instead, the ninety-five percent upper confidence of the arithmetic mean should be used. To calculate the ninety-five percent upper confidence of the arithmetic mean, refer to U.S. EPA's ProUCL program and guidance which can be found at: <http://www2.epa.gov/land-research/proucl-software>.

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

EJD:bo

ec: Rod Beals, Manager, DERR, NEDO  
Bob Princic, Supervisor, DERR, NEDO  
Vanessa Steigerwald, DERR, NEDO  
Justin Burke, DERR-CO  
Katie Tait, OHARNG RTLS  
Kevin Sedlak, ARNG  
Gregory F. Moore, USACE  
Mark Nichter, USACE  
Rebecca Haney/Gail Harris, Vista Sciences Corp.  
DERR/DO VAP Files



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

November 16, 2015

Mr. Mark Leeper, P.G., MBA  
Restoration/Cleanup Program  
Manager  
ARNG Directorate  
111 S. George Mason Dr.  
Arlington, VA 22204

Re: US Army Ravenna Ammunition Plt RVAAP  
Assessment  
Correspondence  
Remedial Response  
Portage County  
267000859155

**Subject: Site Inspection Report, CC-RVAAP-75 George Road Sewage Treatment Plant Mercury Spill, Project No. 267-000859-155**

Dear Mr. Leeper:

On October 27, 2015, the Ohio Environmental Protection Agency (Ohio EPA), Northeast District Office, has reviewed your letter regarding the remedy for CC-RVAAP-75 George Road Sewage Treatment Plant Mercury Spill. You discussed the August 25, 2015 conference call between the Army and Ohio EPA, during which the Army proposed to add the following language to pages ES-6 and 7-3 to the site inspection report:

"Removal of the drainage pipe, concrete plug, and all contents within will be addressed separately under the RVAAP-67 Facility-Wide Sewers."

Ohio EPA agrees to this proposed language.

If you have any questions or concerns or would like to schedule a meeting or conference call, please free feel to contact me at (330) 963-1170.

Sincerely,

Edward D'Amato  
Project Coordinator  
Ohio EPA - Division of Environmental Response and Revitalization

ED/nvr

cc: Rod Beals, DERR/NEDO  
Bob Princic, DERR/NEDO  
Justin Burke, DERR/CO  
Katie Tait, OHARNG RTLS  
Kevin Sedlak, ARNG  
Gregory F. Moore, USACE  
Mark Nichter, USACE  
Rebecca Haney/Gail Harris, Vista Sciences Corp.



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

October 26, 2015

Ohio Environmental Protection Agency  
DERR-NEDO  
Attn: Ed D'Amato, Project Coordinator  
2110 East Aurora Road  
Twinsburg, OH 44087-1924

Subject: Former Ravenna Army Ammunition Plant (RVAAP) Restoration Program  
Portage/Trumbull Counties, CC-RVAAP-75 George Road Sewage Treatment Plant  
Mercury Spill, Draft Site Inspection Report, Ohio EPA ID # 267-000859-155

Dear Mr. D'Amato:

In a letter dated July 14, 2015, the Ohio Environmental Protection Agency (Ohio EPA), Northeast District Office submitted their acceptance of the Army's response to comments made on the Draft Site Inspection (SI) Report for the George Road Sewage Treatment Plant Mercury Spill (CC-RVAAP-75). In this letter, the Ohio EPA indicated, "steps must be taken to ensure the integrity of the concrete plug in the drain pipe and to ensure construction/excavation workers are not exposed should excavation activities occur." Per the conference call between the Army and the Ohio EPA on August 25, 2015, the Army proposes to add the following language to pages ES-6 and 7-3 to the SI report in order to address the issue:

"Removal of the drainage pipe, concrete plug, and all contents within will be addressed separately under the RVAAP-67 Facility-Wide Sewers."

Upon Ohio EPA acceptance of this response, the Army will begin the process of issuing the Final SI report for your review and acceptance. Please contact the undersigned at (703) 607-7955 or [mark.s.leeper.civ@mail.mil](mailto:mark.s.leeper.civ@mail.mil) if there are issues or concerns with the proposed response.

Sincerely,

Mark Leeper  
RVAAP Restoration Program Manager  
Army National Guard Directorate

cc: Rod Beals, Ohio EPA, DERR-NEDO  
Justin Burke, Ohio EPA, DERR-CO  
Katie Tait, OHARNG Camp Ravenna  
Kevin Sedlak, ARNG, Camp Ravenna  
Greg Moore, USACE Louisville  
Eric Cheng, USACE Louisville  
Gail Harris, Vista Sciences





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

July 14, 2015

Re: US Army Ravenna Ammunition Plt RVAAP  
Remediation Response  
Project records  
Remedial Response  
Portage County  
267000859155

Mr. Mark Leeper, P.G., MBA  
Restoration/Cleanup Program Manager  
ARNG Directorate  
111 S. George Mason Dr.  
Arlington, VA 22204

Subject: Ohio EPA's Review of Response to Comments for the Draft Site Inspection Report, CC-RVAAP-75 George Road Sewage Treatment Plant Mercury Spill Project No. 267-000859-155

Dear Mr. Leeper:

The Ohio Environmental Protection Agency (Ohio EPA), Northeast District Office has reviewed the Army's response to comments for the Draft Site Inspection Report, CC-RVAAP-75 George Road Sewage Treatment Plant Mercury Spill. The response was received via e-mail on June 9, 2015.

Ohio EPA finds the response to comments to be acceptable, but upon further review one additional issue has arisen. Because mercury in the drain pipe deposits is present above the residential facility-wide cleanup goal (FWCUG) of 7.2 mg/kg (for soil), steps must be taken to ensure the integrity of the concrete plug in the drain pipe and to ensure construction/excavation workers are not exposed should excavation activities ever occur. This can be accomplished by updating the Site Property Management Plan to include inspection of the concrete plug at regular intervals (such as every five years) and to require precautions during any excavation activities that may occur. Please propose such language to be inserted into the Site PMP.

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 D'Amato, Project Coordinator  
Ohio EPA - Division of Emergency and Remedial Response

ED/nvr

cc: Rod Beals, DERR-NEDO  
Katie Tait, OHARNG RTLS  
Gregory F. Moore, USACE  
Rebecca Haney, Vista Sciences Corp.  
Ohio EPA, VAP File, CO, DERR at:

Justin Burke, DERR-CO  
Kevin Sedlak, ARNG  
Mark Nichter, USACE  
Gail Harris, Vista Sciences Corp.  
[records@epa.ohio.gov](mailto:records@epa.ohio.gov)



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

June 8, 2015

Ohio Environmental Protection Agency  
DERR-NEDO  
Attn: Ed D'Amato, Project Coordinator  
2110 East Aurora Road  
Twinsburg, OH 44087-1924

Subject: Former Ravenna Army Ammunition Plant (RVAAP) Restoration Program  
Portage/Trumbull Counties, CC-RVAAP-75 George Road Sewage Treatment Plant  
Mercury Spill, Draft Site Inspection Report, Ohio EPA ID # 267-000859-155

Dear Mr. D'Amato:

Enclosed, for your review, are the responses to the Ohio EPA's comments from April 16, 2015 on the Draft Site Inspection Report for CC-RVAAP-75 George Road Sewage Treatment Plant Mercury Spill, dated March 13, 2015. The attached comment response table was prepared for the US Army Corps of Engineers (USACE) - Louisville District, by ECC under Contract No. W912QR-04-D-0039.

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

Sincerely,

A handwritten signature in black ink, appearing to read "Mark Leeper", is positioned below the "Sincerely," text.

Mark Leeper  
RVAAP Restoration Program Manager  
Army National Guard Directorate

Attachment

cc: Rod Beals, Ohio EPA, DERR-NEDO  
Justin Burke, Ohio EPA, DERR-CO  
Katie Tait, OHARNG Camp Ravenna  
Kevin Sedlak, ARNG, Camp Ravenna  
Greg Moore, USACE Louisville  
Eric Cheng, USACE Louisville  
Gail Harris, Vista Sciences

**DRAFT SITE INSPECTION, REVISION 0**  
**CC RVAAP-75 GEORGE ROAD SEWAGE TREATMENT PLANT MERCURY SPILL**  
**RAVENNA ARMY AMMUNITION PLANT, RAVENNA OHIO**  
**COMMENT RESPONSE TABLE**

Site Inspection Report Submitted – 12 March 2015

Ohio EPA Comments Received – 17 April 2015

Response to Comments Issued – 27 May 2015

Page 1 of 6

Comment Number	Page No. / Line No.	New Page or Sheet	Comment	Recommendation	Response
<i>Ohio EPA (Ed D'Amato)</i>					
1			Remove the disclaimer statement at the beginning of the document. This comment has been noted in Ohio EPA's review of previous ECC reports. Please refrain from including it in the future.		Agree. The Disclaimer Statement will be removed from the document when the final version is issued. The Disclaimer Statement in Draft reports is included per the Submission Format Guidelines Ravenna Army Ammunition Plant (dated July 22, 2014). The Disclaimer Statement is removed from Final report version. If ECC did not included the Disclaimer Statement in the Draft report version, the ACOE's Administrative Record Document Reviewer, would deem the report non-compliant with the current Ravenna Submission Format Guidelines.
2			It is not clear from the report if any sampling or inspection inside the P-Trap was done. It appears from the report that the exterior of the P-Trap was inspected, but not the inside. There is reference to the use of a Jerome meter in the floor drain, but the bottom of the P-Trap is 33 inches from the top of the concrete floor. Please clarify whether or not the interior of the P-Trap was inspected or		Agree. The SI Report in Section 4.3.1 Field Sampling Locations has been clarified as follows: <u>"The SI sampling at this AOC was conducted in November and December 2012 and in August and September 2013. During these site visits, the floor drain P-trap was inspected visually and using a hand-held sampling rod which was placed within the 4-inch cast iron pipe leading to the P-trap in an attempt to scrape any residual material from the bottom of the floor drain P-trap. However, no sediment or material was recovered. Therefore,</u>

**DRAFT SITE INSPECTION, REVISION 0**  
**CC RVAAP-75 GEORGE ROAD SEWAGE TREATMENT PLANT MERCURY SPILL**  
**RAVENNA ARMY AMMUNITION PLANT, RAVENNA OHIO**  
**COMMENT RESPONSE TABLE**

Site Inspection Report Submitted – 12 March 2015

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Response to Comments Issued – 27 May 2015

Page 2 of 6

Comment Number	Page No. / Line No.	New Page or Sheet	Comment	Recommendation	Response
			sampled.		<i>subsurface soil samples were collected from beneath the floor drain P-trap to determine if the P-trap leaked. The bottom-most depth of the P-trap is 2.75 feet bgs, and two subsurface soil samples were collected at 2.75 feet bgs, which is just below the P-trap and another was collected at 3.5 feet bgs for this SI”.</i>
3	Section 3.0		This section mentions that the mercury seals on the trickling filters leaked and describes sludge that was removed and spread along Greenleaf Rd. If so, sampling of the sludge application areas may have been appropriate. Please discuss whether or not mercury leakage from the seals could have contaminated the sludge.		Section 3.0 has been modified as followings. Line number 425 in Section 3.0 will be replace with the following text: <i>“The mercury leaking from the trickling filters was captured by drains, which flowed into a collection box. This collection box was periodically drained and the captured mercury was then stored in a pint size glass jar. There is no documentation of any mercury leaking into the sludge”.</i>
4	Section 7.0		The report states that there are no wetlands, streams, or surface water onsite. However, one of the decision units described in the Executive Summary and Section 4.2.2 is a section of stream just downstream from the George Road Sewage Treatment Plant outfall. Please revise Section 7.0 to accurately reflect that a		The SI Report has been revised to remove confusing text and to provide clarification.  There are no natural wetlands, streams, or surface water on the AOC. The reference to the stream section in Section 4.2.2 for DU02 is the outfall area which is the drainage pipe discharge point located adjacent to the outfall headwall.

**DRAFT SITE INSPECTION, REVISION 0**  
**CC RVAAP-75 GEORGE ROAD SEWAGE TREATMENT PLANT MERCURY SPILL**  
**RAVENNA ARMY AMMUNITION PLANT, RAVENNA OHIO**  
**COMMENT RESPONSE TABLE**

Site Inspection Report Submitted – 12 March 2015

Ohio EPA Comments Received – 17 April 2015

Response to Comments Issued – 27 May 2015

Page 3 of 6

Comment Number	Page No. / Line No.	New Page or Sheet	Comment	Recommendation	Response
			stream/surface water body is part of the site.		<p>This outfall area (corresponding to DU02) eventually drains to the tributary (West Branch Mahoning) to the east which is approximately 850 feet away from DU02 and therefore, is not located within the CC RVAAP-75 AOC.</p> <p>The word “<i>downstream</i>” has been removed from this SI Report in the following sections to address this comment, as follows:</p> <p><b>Executive Summary:</b> Line 562 has been revised as follows:</p> <p><i>“The second DU (DU02) is located <del>downstream</del> at the outfall area which is the drainage pipe discharge point located adjacent <del>of to</del> the outfall headwall.”</i></p> <p><b>Executive Summary: Line:</b> Line 497 has been revised as follows:</p> <p><i><u>There are no natural wetlands, streams, or surface water on the AOC. The building’s drainage system outfall area eventually drains to the tributary (i.e., West Branch Mahoning) to the east which is approximately 850 feet away from the</u></i></p>



**DRAFT SITE INSPECTION, REVISION 0**  
**CC RVAAP-75 GEORGE ROAD SEWAGE TREATMENT PLANT MERCURY SPILL**  
**RAVENNA ARMY AMMUNITION PLANT, RAVENNA OHIO**

**COMMENT RESPONSE TABLE**

Site Inspection Report Submitted – 12 March 2015

Ohio EPA Comments Received – 17 April 2015

Response to Comments Issued – 27 May 2015

Page 4 of 6

Comment Number	Page No. / Line No.	New Page or Sheet	Comment	Recommendation	Response
					<p><i>outfall area and therefore, is not located within the CC RVAAP-75 AOC. No surface water samples were collected as part of this SI, as no surface water is present at the AOC.</i></p> <p><b>Section 4.2.2 Soil and Wet Sediment Sampling Locations:</b> Lines 1497 to 1499 have been revised as follows:</p> <p><i><u>“CC RVAAP-75 contains two DU sampling areas, DU01 and DU02 (Figure 4-1); the latter of which DU02 is where the discrete wet sediment sample was collected downstream of the headwall of the at the outfall area. This outfall is where the drainage pipe daylights at the headwall.”</u></i></p> <p><b>Section 4.2.2 Soil and Wet Sediment Sampling Locations:</b> Line 1525 has been revised as follows:</p> <p><i><u>“DU02 consists of the area just downstream of at the headwall <del>at</del> of the outfall area.”</u></i></p> <p><b>Section 4.4.3 Wet Sediment Sampling:</b> Lines 1731 to 1732 have been revised as follows:</p> <p><i><u>“On 9 November 2012, the wet sediment samples were collected from DU02 at just downstream of</u></i></p>

**DRAFT SITE INSPECTION, REVISION 0**  
**CC RVAAP-75 GEORGE ROAD SEWAGE TREATMENT PLANT MERCURY SPILL**  
**RAVENNA ARMY AMMUNITION PLANT, RAVENNA OHIO**  
**COMMENT RESPONSE TABLE**

Site Inspection Report Submitted – 12 March 2015

Ohio EPA Comments Received – 17 April 2015

Response to Comments Issued – 27 May 2015

Page 5 of 6

Comment Number	Page No. / Line No.	New Page or Sheet	Comment	Recommendation	Response
					<p><del>the headwall at the outfall area. the outfall area at the drainage pipe discharge point located adjacent to the outfall headwall.</del></p> <p><b>Section 5.3 Summary of Wet Sediment Analytical Results:</b> Lines 2259 to 2262 have been revised as follows:</p> <p><i>“The wet sediment samples collected <u>at the outfall area at the drainage pipe discharge point located adjacent to the outfall headwall</u> <del>downstream of the outfall headwall</del> and were analyzed for mercury and RVAAP full suite analytes (TAL metals, explosives, propellants, SVOCs, VOCs, PCBs, and 2261 pesticides).”</i></p> <p><b>Section 6.2.1 Hydrological Setting:</b> Lines 2708 to 2710 have been revised as follows:</p> <p><i>“However, infiltrating surface water and groundwater flowing in the drain pipe <del>downstream</del> <u>leading from MH-P1</u> is directed south toward the outfall area and thereafter to a drainage ditch.”</i></p> <p><b>Section 7.0 Summary and Conclusions:</b> Line</p>

**DRAFT SITE INSPECTION, REVISION 0**  
**CC RVAAP-75 GEORGE ROAD SEWAGE TREATMENT PLANT MERCURY SPILL**  
**RAVENNA ARMY AMMUNITION PLANT, RAVENNA OHIO**  
**COMMENT RESPONSE TABLE**

Site Inspection Report Submitted – 12 March 2015

Ohio EPA Comments Received – 17 April 2015

Response to Comments Issued – 27 May 2015

Page 6 of 6

Comment Number	Page No. / Line No.	New Page or Sheet	Comment	Recommendation	Response
					<p>2823 has been revised as follows:</p> <p><i><u>“There are no wetlands, streams, or surface water features <del>onsite</del> located within the George Road Sewage Treatment Plant Mercury Spill AOC.”</u></i></p> <p>Lines 2829 to 2831 have been revised as follows:</p> <p><i><u>“Therefore, only subsurface soil <del>by</del> beneath and alongside of the drainage pipes, wet sediment <del>downstream of the</del> at the outfall area headwall, and the deposit within the 15-inch drainage pipe were sampled as part of this SI, as potential locations that may have been impacted by the mercury spill.”</u></i></p>
<i>End of Comments</i>					



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

April 16, 2015

Mr. Mark Leeper, P.G., MBA  
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  
Assessment  
Remedial Response  
Portage County  
267000859155**

**Subject: Ohio EPA's Review of Draft Site Inspection Report, CC-RVAAP-75  
George Road Sewage Treatment Plant Mercury Spill Project No. 267-  
000859-155; Notice of Deficiency (NOD)**

Dear Mr. Leeper:

The Ohio Environmental Protection Agency (Ohio EPA), Northeast District Office (NEDO) has reviewed the Draft Site Inspection Report, CC-RVAAP-75 George Road Sewage Treatment Plant Mercury Spill, dated March 13, 2015. The document was prepared by ECC, under contract no. W912QR-04-D-0039.

Ohio EPA has identified the following deficiencies in the report. Ohio EPA will review either a response to comments letter or Response to Comments (RTC) table. However, a revised report will need to be completed prior to final approval of the document.

**Comments:**

1. Remove the disclaimer statement at the beginning of the document. This comment has been noted in Ohio EPA's review of previous ECC reports. Please refrain from including it in the future.
2. It is not clear from the report if any sampling or inspection inside the P-Trap was done. It appears from the report that the exterior of the P-Trap was inspected, but not the inside. There is reference to the use of a Jerome meter in the floor drain, but the bottom of the P-Trap is 33 inches from the top of the concrete floor. Please clarify whether or not the interior of the P-Trap was inspected or sampled.
3. **Section 3.0:** This section mentions that the mercury seals on the trickling filters leaked and describes sludge that was removed and spread along Greenleaf Rd.

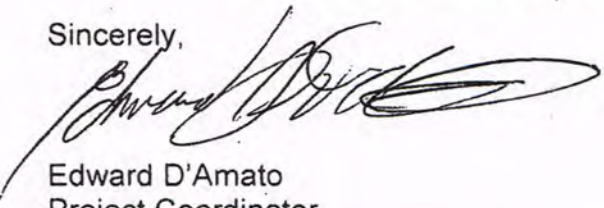
MR. MARK LEEPER, P.G., MBA  
ARMY NATIONAL GUARD DIRECTORATE  
APRIL 16, 2015  
PAGE 2

If so, sampling of the sludge application areas may have been appropriate. Please discuss whether or not mercury leakage from the seals could have contaminated the sludge.

4. **Section 7.0:** The report states that there are no wetlands, streams, or surface water onsite. However, one of the decision units described in the Executive Summary and Section 4.2.2 is a section of stream just downstream from the George Road Sewage Treatment Plant outfall. Please revise Section 7.0 to accurately reflect that a stream/surface water body is part of the site.

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 D'Amato  
Project Coordinator  
Ohio EPA - Division of Environmental Response and Revitalization

ec: Rod Beals, DERR-NEDO, Manager  
Justin Burke, DERR-CO  
Katie Tait, OHARNG RTLS  
Kevin Sedlak, ARNG  
Gregory F. Moore, USACE  
Mark Nichter, USACE  
Rebecca Haney/Gail Harris, Vista Sciences Corp.





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

February 19, 2015

**Re: US Army Ravenna Ammunition Plt RVAAP  
Assessment  
Remedial Response  
Portage County  
267000859**

Mr. Mark Leeper, P.G., MBA  
Restoration/Cleanup Program  
Manager  
ARNG Directorate  
111 S. George Mason Dr  
Arlington, VA 22204

**Subject: Ohio EPA's Review of the Final Site Inspection Report, CC-RVAAP-77  
Laundry Waste Water Sump, February 12, 2014, Project No. 267-  
000859-155**

Dear Mr. Leeper:

On February 12, 2015, the Ohio Environmental Protection Agency (Ohio EPA), Northeast District Office (NEDO), received a copy of the Final Site Inspection Report for CC-RVAAP-77, Building 1037, Laundry Wastewater Sump. The document was prepared by ECC under contract no. W912QR-04-D-0039.

Ohio EPA has reviewed the document. It is hereby approved.

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 D'Amato  
Project Coordinator  
Ohio EPA - Division of Environmental Response and Revitalization

ED/nvr

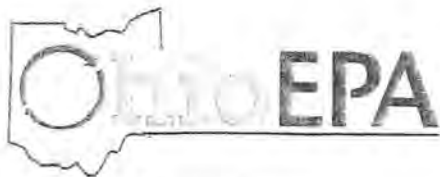
ec: Rodney Beals, DERR, NEDO

Justin Burke, DERR-CO

cc: Katie Tait, OHARNG RTLS  
Gregory F. Moore, USACE  
Gail Harris, Vista Sciences Corp.

Kevin Sedlak, ARNG  
Mark Nichter, USACE  
Rebecca Haney, Vista Sciences Corp.





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

January 21, 2015

Re: US Army Ravenna Ammunition Plt  
Assessment  
Remedial Response  
Portage County  
267000859

Mr. Mark Leeper, P.G., MBA  
Restoration/Cleanup Program  
Manager  
ARNG Directorate  
111 S. George Mason Dr  
Arlington, VA 22204

Subject: November 21, 2014 Draft Site Inspection Report, CC-RVAAP-77  
Laundry Waste Water Sump, Project No. 267-000859-155


Dear Mr. Leeper:

On November 24, 2014, the Ohio Environmental Protection Agency (Ohio EPA), Northeast District Office (NEDO), received a copy of the Draft Site Inspection Report for CC-RVAAP-77, Building 1037, Laundry Wastewater Sump. The document was prepared by ECC, under contract no. W912QR-04-D-0039.

Ohio EPA has reviewed the document 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,

  
Edward D'Amato, Project Coordinator  
Ohio EPA - Division of Emergency and Remedial Response

ED/nvr

ec: Rodney Beals, Manager, DERR, NEDO

Justin Burke, DERR-CO

cc: Rebecca Haney/Gail Harris, Vista Sciences Corp  
Kevin Sedlak, ARNG  
Gregory F. Moore, USACE

Katie Tait, OHARNG RTLS  
Mark Nichter, USACE

Scanned

By: RMH  
Date: 01-26-2015

Northeast District Office • 2110 East Aurora Road • Twinsburg, OH 44087-1924  
www.epa.ohio.gov • (330) 963-1200 • (330) 457-0769 (fax)

RECEIVED  
01-26-2015

E-MAILED  
01-26-2015 RMH



**NATIONAL GUARD BUREAU**

111 SOUTH GEORGE MASON DRIVE  
ARLINGTON VA 22204-1373

March 24, 2015

Ohio Environmental Protection Agency  
DERR-NEDO  
Attn: Mr. Edward 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, RVAAP-79 DLA Ore Storage Sites – Main Storage Yard and Remaining Ore Storage Sites  
Ohio EPA ID # 267-000-859-162

Dear Mr. D'Amato:

In accordance with the Director's Final Findings and Orders, Section XIII, #28, for Ravenna, the Army is providing notification of field sampling activities at Camp Ravenna 15 days prior to the scheduled start date. These activities are currently scheduled to begin on April 8, 2015 and to conclude on April 15, 2015, and will be conducted at the DLA Ore Storage Sites (CC-RVAAP-79) at the Main Storage Yard and the Remaining Ore Storage Sites. The primary contractor, Environmental Chemical Corporation (ECC), will be conducting the sampling under Contract No. W912QR-04-D-0039.

The field sampling activities at these sites will fall under the *Final Site Inspection and Remedial Investigation Work Plan at Compliance Restoration Sites*, dated October 3, 2012.

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

Sincerely,

Mark Leeper  
RVAAP Restoration Program Manager  
Army National Guard Directorate

cc: Rod Beals, Ohio EPA, DERR-NEDO  
Kevin Sedlak, ARNG, Camp Ravenna  
Katie Tait, OHARNG Camp Ravenna  
Greg Moore, USACE Louisville  
Nat Peters, USACE Louisville  
Eric Cheng, USACE Louisville  
Gail Harris, Vista Sciences





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

December 17, 2015

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  
267000859160**

**Subject: Ravenna Army Ammunition Plant, Portage/Trumbull Counties.  
Approval of the Response to Comments on the Revised Draft Project  
Work Plan for Site Inspection at Compliance Restoration Site CC-  
RVAAP-80 Group 2 Propellant Can Tops, Dated December 9, 2015.  
Ohio EPA ID # 267-000859-160**

Dear Mr. Leeper:

The Ohio Environmental Protection Agency (Ohio EPA) has received the Response to Comments on the "Revised Draft Project Work Plan for Site Inspection at Compliance Restoration Site CC- RVAAP-80 Group 2 Propellant Can Tops" 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 December 10, 2015. The report was prepared for the US Army Corps of Engineers (USACE) Louisville District by PIKA International, Inc., under Contract Number W912QR-12-F-0212.

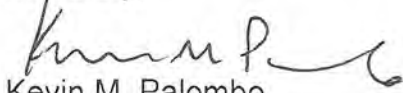
The response to Ohio EPA comments provided clarifications on site clearing using Unexploded Ordnance (UXO) Technicians, Incremental sampling methodologies (ISM) and the Quality Assurance Project Plan, specifically related to laboratory Reporting Limits.

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 may be finalized.

MR. MARK LEEPER  
ARMY NATIONAL GUARD DIRECTORATE  
December 17, 2015  
PAGE 2

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: Katie Tait, OHARNG RTLS  
Kevin Sedlak, ARNG  
Gregory F. Moore, USACE  
Rebecca Haney/Gail Harris, VISTA Sciences Corp.

ec: Bob Princic, Ohio EPA, NEDO, DERR  
Rodney Beals, Ohio EPA, NEDO, DERR  
Justin Burke, Ohio EPA, CO, DERR  
Al Muller, Ohio EPA, NEDO, DDAGW





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

December 9, 2015

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

Subject: Responses to Comments on Site Inspection Work Plan for CC-RVAAP-80,  
Group 2 Propellant Can Tops, Former Ravenna Army Ammunition  
Plant/Camp Ravenna, Portage and Trumbull Counties, Ohio  
Ohio EPA ID 267000859160

Dear Mr. Palombo:

Enclosed, for your review and approval, please find the responses to comments for the Group 2 Propellant Can Tops, Site Inspection (SI) revised draft Work Plan. The plan was conditionally approved with the successful responses to your comments, received in a letter dated October 23, 2015. Once responses to your comments are approved, the contractor will incorporate the corrections, and submit the SI Work Plan as final.

Thank you for working with the Army to help us finalize this work plan. Please contact the undersigned at (703) 607-7955 or [mark.s.leeper.civ@mail.mil](mailto:mark.s.leeper.civ@mail.mil) if there are issues or concerns with this submittal.

Sincerely,


Mark S. Leeper  
RVAAP Restoration Program Manager  
Army National Guard Directorate

cc: Bob Princic, Ohio EPA, DERR-NEDO (email transmittal letter only)  
Rod Beals, Ohio EPA, DERR-NEDO (email transmittal letter only)  
Justin Burke, Ohio EPA, CO-DERR (email letter and document w/o attachments)  
cc: Kevin Sedlak, ARNG-ILE, Camp Ravenna  
Katie Tait, OHARNG, Camp Ravenna  
Greg Moore, USACE Louisville  
Nat Peters, USACE Louisville  
Admin Records Manager, Camp Ravenna

**DOCUMENT: Revised Draft Work Plan for Site Inspection at Compliance Restoration Site CC RVAAP-80 Group 2  
Propellant Can Tops, Dated September 8, 2015**

**REVIEWER: Comments by Ohio EPA, Kevin Palombo**

**DATE: October 29, 2015**

CMT #	PAGE # LINE #	COMMENT	Recommendation /Requirement	RESPONSE
<b>Project Work Plan</b>				
1	Page 26, Section 2.13	An expression is used in this section, "PIKA will clear the locations of the previous anomalies of all propellant can tops ... "and," ... the UXO Technicians will clear the area within a one meter radius ... ". Does this expression mean that the propellant can lids will be removed? Ohio EPA understands from other locations in the documents that these materials will be removed and properly disposed.		<p>Yes. The text relates more to the land, than the metal. Clearing means that all of the propellant cans and can tops at each reacquired anomaly location will be picked up, then the metal detector will be used to make sure another can top isn't lying just below the ground surface at the same location. The ordnance professionals will stop when that location doesn't have any cans or tops left.</p> <p>The Text has been revised as follows:</p> <p>"Once reacquired, PIKA will mark each anomaly with a pin flag, inspecting the area within a 1 meter radius, removing all propellant cans and tops."</p>
2	Appendix B, Figure 5	Figure 5 provides the proposed samples locations for the collection of ISM samples. How was the size of each decision unit determined? It appears some are much larger than others, even though they have a similar number of anomalies. Wouldn't a larger decision unit around the same number of anomalies allow for the possibility of more diluted sample result? Why was the red circle in the northwest part of Figure 5 left partially completed? It is assumed the whole area of the circle is the decision unit. Please provide explanations for these questions.		<p>The goal of the sampling in the SI is to determine if a release occurred. As the can tops, and cans were found in five clusters, and scattered across the site, the soil at the location of the clusters represents the best place to find evidence of a release. The sample locations in themselves are not decision units, but an attempt to represent what impact if any, the work with the cans and tops had on the soil. As the samples relate to the top deposition, they should be representative. During the first part of this SI, the sample areas were;</p> 

				<p>MI sample area 1 equaled 198 square meters; MI sample area 2 equaled 553 square meters; and MI sample area 3 equaled 330 square meters.</p> <p>The primary objective of the Figure was to incorporate the anomalies identified and selected by the stakeholders to ensure that they were included in each of the incremental samples for that decision unit. Once mobilized, and the anomalies reacquired, each of the IS decision unit areas will be refined in the field to a shape that reflects the included anomalies and surveyed.</p> <p>As for the incomplete red circle in the northwest portion of the figure – the reviewer is correct. It should be displayed as a complete circle. This was the result of a production error and has been corrected.</p>
3	Page 27, Section 2.14, Sentences 4 and 5	Please explain that ISM surface soil samples will be collected within the designated ISM from 0-1 foot and from 1-4 feet below ground surface (bgs). It is understood that propellant can tops and lids were identified at most locations within the top nine inches of the ground surface. It is also understood that the shallow (0-1 foot) samples will be analyzed for TAL metals, and common propellants and perchlorate. Is there a chance soils collected so shallow may have oxidized or in other ways reacted so that the results might be biased low?		<p>To clarify this section, sentences 4, 5 and 6 have been revised to read as follows:</p> <p>“Five (5) surficial ISM samples (0-1’ bgs) and three (3) subsurface ISM samples (1-4’ bgs) (eight primary, plus quality assurance (QA) samples) will be collected from the designated decision units, depicted on Figure 5 in Appendix B.”</p> <p>The soil samples collected from the 0-1 foot interval are being collected where direct contact with the soil is possible. The sampling will show the current conditions, and identify a risk (if any) that proves that a RI (nature and extent) is necessary.</p> <p>We do not estimate that the past work with the cans/tops would have resulted in a release, but</p>

				in case it did, the 1-4 ft samples can show if anything is moving downward through the soil.
<b>Appendix D – Sampling and Analysis Plan</b>				
4	page 19, Section 5.6.1 sentence 3	<p>Section 5.6.1 sentence 3 states, "A total five ISM surface soil samples will be collected from 0 to one (1) foot bgs ..."</p> <p>Sentence 4 states, "No sediment samples are anticipated to be sampled." What does it mean that "no sediment samples are anticipated to be collected?" This Sampling and Analysis Plan does not agree with page 27, Section 2.14 of the Revised Draft Project Work Plan. Please make the correction. Ohio EPA anticipates samples will also be collected from 1-4 feet bgs at locations shown on Figure 5, and as provided in the Work Plan.</p>		<p>The WP discusses Surface and Subsurface IS in the same Section of the document - Page 27, Section 2.14, whereas the format of the SAP (based upon the RVAAP facility-wide document) separates the discussion of the two types of samples into separate sections.</p> <p>Subsurface Soil [samples] are presented in Section 5.5 (5.5.1 identifies the Rationale for the 3 subsurface IS) and separately discusses Surface Soil and Sediment [samples] in Section 5.6 (5.6.1 identifies the Rationale for the 5 surface IS).</p> <p>The title of Section 5.6 also includes the potential for the collection of sediment samples. Since Sediment Sampling is not part of the project scope - the statement "No sediment samples are anticipated to be collected." Was included to close out that potential sample matrix.</p> <p>This portion of the text was moved to the end of the paragraph to provide better continuity and revised to read:  "Sediment samples are not included in this investigation scope of work."</p>
<b>Appendix E – Quality Assurance Project Plan</b>				
5	Page 4, Section 2.4.2,	Section 2.4.2, paragraph 2, last sentence states, "Multiple smaller areas where anomalies are found may be combined into one designated ISM		Agree that the text as stated is confusing. This sentence has been deleted as it does not provide additional clarity to the discussion. As noted above in response to Comment 2, once

	paragraph 2	sample area." This is unclear, please provide additional clarification.		<p>mobilized, and the anomalies reacquired, each of the IS decision unit areas will be refined in the field to a shape that reflects the specified anomalies, the boundaries of which will then be surveyed.</p> <p>There are five clusters of can tops on the site. We currently have more than five total surficial samples scoped. Based upon the history, we do not believe the cans and tops could be the source of a release, but if they are, sampling in the same location as the can tops would yield the highest results. The exact location of the northwestern sample can be determined in the field. It is estimated that the individual aliquots will be placed near where can tops/cans were identified/currently exist in that portion of the site.</p>
6	Table 4-1	This table provides a soil Reporting Limit of 250 ug/Kg. Will this reporting limit for these compounds exceed the CUGs? Will you report data that is above the Method Detection Limit (MDL) but below the Reporting Limit (RL) as "J" value, or not at all? Why is the RL so much higher than the MDL?		<p>Upon review of Table 4-1, the Reporting limits were found to be incorrect and have been revised.</p> <p>Also, upon completing that review, it was determined that a revision to the DOD QSM was issued since this project was initiated in 2012, (Version 5.0, July 2013). So that revision has been made in the QAPP text. The project will be now performed in the TestAmerica – Sacramento Lab who is approved for Version 5.0. The SVOC extraction will now be performed using 3550 (Sonication) as per the QSM Version 5.0. In addition, since typical</p>



				<p>laboratories update their MDLs and RLs periodically, the Section 4 tables (Tables 4-1 through 4-5) were reviewed and revised by TestAmerica to reflect their current values for all analytes listed in the tables. Please see attached.</p> <p>Yes, these revised reporting limits will satisfy the CUGs.</p> <p>YES, results between the MDL and RL will be reported and flagged as a “j” value.</p>
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## **4.0 QUALITY ASSURANCE OBJECTIVES FOR MEASUREMENT DATA**

### **4.1 Data Quality Objectives (DQOs)**

DQOs summaries for this investigation will follow Tables 4-1 and 4-2 in the FWQAPP. All QC parameters stated in the specific U.S. Environmental Protection Agency (USEPA) SW-846 methods will be adhered to for each chemical listed. Laboratories are required to comply with all methods as written: recommendations are considered requirements. Concurrence with the *DoD Quality System Manual (QSM) for Environmental Laboratories* (Environmental Data Quality Workgroup, Version ~~5.04.2~~, 2013~~0~~), and the Louisville QSM Supplement (USACE, 2007) is expected. The contract laboratory will provide Level IV data packages.

The contract laboratory will deliver an electronic data deliverable (EDD) that is automated data review (ADR) compatible. The contract laboratory must identify variances to the established library prior to any analysis being performed. No variances to the DoD QSM Environmental Laboratories and the Louisville QSM Supplement are anticipated.

### **4.2 Level of Quality Control Effort**

QC efforts will follow Section 4.2 of the FWQAPP. Field Measurements will include field duplicates and equipment rinsate blanks. Laboratory QC measurements will include method blanks, laboratory control samples (LCSs), laboratory duplicates, and matrix spike/matrix spike duplicate (MS/MSD) samples. LCS measurements will include the standard mid-level analyte concentration, plus QC method reporting level (MRL) low-level concentration. It is recognized that the laboratory will routinely perform and monitor the QC/MRL; however, guidance check limits will be utilized, as advisory and corrective action will not be required for individual analyte variances. The QC/MRL will be successfully analyzed at the beginning of the analytical sequences as required by the DoD QSM. Additionally, the lab will analyze the QC/MRL sample at the close of the analytical sequence.

### **4.3 Accuracy, Precision, and Sensitivity of Analysis**

Accuracy, precision, and sensitivity goals will follow Section 4.3 of the FWQAPP. The accuracy and precision required for the specified analytical parameters listed in Section 2, Table 2-1, are incorporated in Tables 4-1 and 4-2 of the FWQAPP and are consistent with the analytical requirements found in the DoD QSM.

Laboratories will make all reasonable attempts to meet the reporting levels in Tables 4-3 through 4-9 of the FWQAPP for each individual sample analysis. When samples require dilution, both the minimum dilution and quantified dilution must be reported. All samples will be screened to determine optimum dilution ranges. Dilution runs will be performed to quantify high target analyte concentrations within the upper half of the calibration range, thus reducing the degree of dilution as much as possible. In addition, a five-times-less diluted run will be performed to report other target analyte reporting levels as low as possible without destroying analytical detectors and instrumentation. If there are matrix interferences, non-target analyte, or high-target analyte concentrations that preclude analysis of an undiluted sample, the laboratory project manager will contact PIKA, forward analytical and chromatographic information from diluted runs, and obtain direction on how to proceed. The PIKA PM will then contact the USACE CELRL, and Ohio EPA to discuss the data and the path forward.

The analyte lists and detection limits for the analyses listed in Section 2.5 are included in Tables 4-1 through 4-5.

**Table 4-1**

**Volatile Organic Compounds (VOC) Method 8260 DoD**

Analyte Description	CAS Number	SOIL		WATER	
		Method Detection Limit	Reporting Limit <sup>a</sup>	Method Detection Limit	Reporting Limit <sup>a</sup>
		ug/Kg		ug/L	
1,1,1-Trichloroethane	71-55-6	<u>.036</u>	<u>5.0</u>	<u>0.19</u>	<u>1</u>
1,1,2,2-Tetrachloroethane	79-34-5	<u>0.68</u>	<u>5.0</u>	<u>0.15</u>	<u>1</u>
1,1,2-Trichloroethane	79-00-5	<u>0.44</u>	<u>5.0</u>	<u>0.31</u>	<u>1</u>
1,1-Dichloroethane	75-34-3	<u>0.29</u>	<u>5.0</u>	<u>0.15</u>	<u>1</u>
1,1-Dichloroethene	75-35-4	<u>0.26</u>	<u>5.0</u>	<u>0.14</u>	<u>1</u>
1,2-Dibromoethane	106-93-4	<u>0.27</u>	<u>10.0</u>	<u>0.22</u>	<u>2</u>
1,2-Dichloroethane	107-06-2	<u>0.73</u>	<u>5.0</u>	<u>0.22</u>	<u>1</u>
1,2-Dichloroethene, Total	540-59-0	<u>0.89</u>	<u>5.0</u>	<u>0.11</u>	<u>1</u>
1,2-Dichloropropane	78-87-5	<u>0.60</u>	<u>5.0</u>	<u>0.15</u>	<u>1</u>
2-Butanone	78-93-3	<u>1.40</u>	<u>10.0</u>	<u>0.35</u>	<u>2</u>
2-Hexanone	591-78-6	<u>0.74</u>	<u>10.0</u>	<u>0.17</u>	<u>2</u>
4-Methyl-2-pentanone	108-10-1	<u>0.92</u>	<u>10.0</u>	<u>0.18</u>	<u>2</u>
Acetone	67-64-1	<u>1.40</u>	<u>20.0</u>	<u>2.1</u>	<u>10</u>
Benzene	71-43-2	<u>0.26</u>	<u>5.0</u>	<u>0.13</u>	<u>1</u>
Bromochloromethane	74-97-5	<u>0.94</u>	<u>5.0</u>	<u>0.14</u>	<u>1</u>
Bromodichloromethane	75-27-4	<u>0.53</u>	<u>5.0</u>	<u>0.14</u>	<u>1</u>
Bromoform	75-25-2	<u>0.40</u>	<u>5.0</u>	<u>0.1</u>	<u>1</u>
Bromomethane	74-83-9	<u>0.86</u>	<u>5.0</u>	<u>0.29</u>	<u>1</u>
Carbon disulfide	75-15-0	<u>0.49</u>	<u>10.0</u>	<u>0.16</u>	<u>2</u>
Carbon tetrachloride	56-23-5	<u>0.53</u>	<u>5.0</u>	<u>0.15</u>	<u>1</u>
Chlorobenzene	108-90-7	<u>0.29</u>	<u>5.0</u>	<u>0.12</u>	<u>1</u>
Chloroethane	75-00-3	<u>0.45</u>	<u>5.0</u>	<u>0.34</u>	<u>1</u>
Chloroform	67-66-3	<u>0.26</u>	<u>5.0</u>	<u>0.12</u>	<u>1</u>
Chloromethane	74-87-3	<u>0.50</u>	<u>5.0</u>	<u>0.25</u>	<u>1</u>
cis-1,2-Dichloroethene	156-59-2	<u>0.89</u>	<u>5.0</u>	<u>0.1</u>	<u>1</u>
cis-1,3-Dichloropropene	10061-01-5	<u>0.64</u>	<u>5.0</u>	<u>0.22</u>	<u>1</u>
Dibromochloromethane	124-48-1	<u>0.26</u>	<u>5.0</u>	<u>0.13</u>	<u>1</u>
Ethylbenzene	100-41-4	<u>0.34</u>	<u>5.0</u>	<u>0.15</u>	<u>1</u>
Methylene Chloride	75-09-2	<u>0.84</u>	<u>5.0</u>	<u>0.35</u>	<u>1</u>
m-Xylene & p-Xylene	179601-23-1	<u>0.81</u>	<u>5.0</u>	<u>0.18</u>	<u>1</u>
o-Xylene	95-47-6	<u>0.33</u>	<u>5.0</u>	<u>0.1</u>	<u>1</u>

Analyte Description	CAS Number	SOIL		WATER	
		Method Detection Limit	Reporting Limit <sup>a</sup>	Method Detection Limit	Reporting Limit <sup>a</sup>
		ug/Kg		ug/L	
Styrene	100-42-5	<u>0.31</u>	<u>5.0</u>	<u>0.15</u>	<u>1</u>
Tetrachloroethene	127-18-4	<u>0.61</u>	<u>5.0</u>	<u>0.15</u>	<u>1</u>
Toluene	108-88-3	<u>0.61</u>	<u>5.0</u>	<u>0.25</u>	<u>1</u>
trans-1,2-Dichloroethene	156-60-5	<u>0.38</u>	<u>5.0</u>	<u>0.11</u>	<u>1</u>
trans-1,3-Dichloropropene	10061-02-6	<u>0.75</u>	<u>5.0</u>	<u>0.15</u>	<u>1</u>
Trichloroethene	79-01-6	<u>0.60</u>	<u>5.0</u>	<u>0.13</u>	<u>1</u>
Vinyl chloride	75-01-4	<u>0.36</u>	<u>5.0</u>	<u>0.22</u>	<u>1</u>
Xylenes, Total	1330-20-7	<u>0.81</u>	<u>5.0</u>	<u>0.18</u>	<u>1.5</u>

<sup>a</sup> Specific quantitation limits are highly matrix-dependent; project reporting levels listed here are goals and may not always be achievable.

1  
2  
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**Table 4-2**

**Semivolatile Organic Compounds (SVOC) Method 8270 DoD**

Analyte Description	CAS Number	SOIL		WATER	
		Method Detection Limit	Reporting Limit <sup>a</sup>	Method Detection Limit	Reporting Limit <sup>a</sup>
		ug/Kg		ug/L	
1,2,4-Trichlorobenzene	120-82-1	<u>83.0</u>	<u>330</u>	<u>1.4</u>	<u>10</u>
1,2-Dichlorobenzene	95-50-1	<u>75.0</u>	<u>330</u>	<u>1.5</u>	<u>10</u>
1,3-Dichlorobenzene	541-73-1	<u>78.0</u>	<u>330</u>	<u>1.5</u>	<u>10</u>
1,4-Dichlorobenzene	106-46-7	<u>77.0</u>	<u>330</u>	<u>1.4</u>	<u>10</u>
2,4,5-Trichlorophenol	95-95-4	<u>83.0</u>	<u>330</u>	<u>2</u>	<u>10</u>
2,4,6-Trichlorophenol	88-06-2	<u>84.0</u>	<u>330</u>	<u>2</u>	<u>10</u>
2,4-Dichlorophenol	120-83-2	<u>89.0</u>	<u>330</u>	<u>2.6</u>	<u>10</u>
2,4-Dimethylphenol	105-67-9	<u>167</u>	<u>500</u>	<u>2.2</u>	<u>10</u>
2,4-Dinitrophenol	51-28-5	<u>214</u>	<u>2000</u>	<u>20</u>	<u>60</u>
2,4-Dinitrotoluene	121-14-2	<u>89.0</u>	<u>330</u>	<u>2</u>	<u>10</u>
2,6-Dinitrotoluene	606-20-2	<u>99.0</u>	<u>330</u>	<u>2</u>	<u>10</u>
2-Chloronaphthalene	91-58-7	<u>81.0</u>	<u>330</u>	<u>1.3</u>	<u>10</u>
2-Chlorophenol	95-57-8	<u>88.0</u>	<u>330</u>	<u>1.6</u>	<u>10</u>
2-Methylnaphthalene	91-57-6	<u>85.0</u>	<u>330</u>	<u>1.5</u>	<u>10</u>
2-Methylphenol	95-48-7	<u>58.0</u>	<u>330</u>	<u>0.93</u>	<u>10</u>
2-Nitroaniline	88-74-4	<u>84.0</u>	<u>1600</u>	<u>2</u>	<u>50</u>
2-Nitrophenol	88-75-5	<u>82.0</u>	<u>330</u>	<u>1.9</u>	<u>10</u>
3,3'-Dichlorobenzidine	91-94-1	<u>94.0</u>	<u>1600</u>	<u>0.96</u>	<u>50</u>
3-Methylphenol & 4-Methylphenol	15831-10-4	<u>330</u>	<u>1000</u>	<u>1.15</u>	<u>10</u>
3-Nitroaniline	99-09-2	<u>167</u>	<u>1600</u>	<u>1.4</u>	<u>50</u>
4,6-Dinitro-2-methylphenol	534-52-1	<u>81.0</u>	<u>2000</u>	<u>2.2</u>	<u>60</u>
4-Bromophenyl phenyl ether	101-55-3	<u>85.0</u>	<u>330</u>	<u>1.1</u>	<u>10</u>
4-Chloro-3-methylphenol	59-50-7	<u>92.0</u>	<u>330</u>	<u>2</u>	<u>10</u>
4-Chloroaniline	106-47-8	<u>58.0</u>	<u>330</u>	<u>2</u>	<u>10</u>
4-Chlorophenyl phenyl ether	7005-72-3	<u>93.0</u>	<u>330</u>	<u>1.1</u>	<u>10</u>
4-Nitroaniline	100-01-6	<u>88.0</u>	<u>1600</u>	<u>1.5</u>	<u>50</u>
4-Nitrophenol	100-02-7	<u>280</u>	<u>2000</u>	<u>6.1</u>	<u>60</u>
Acenaphthene	83-32-9	<u>83.0</u>	<u>330</u>	<u>1.1</u>	<u>10</u>
Acenaphthylene	208-96-8	<u>85.0</u>	<u>330</u>	<u>1.1</u>	<u>10</u>
Anthracene	120-12-7	<u>86.0</u>	<u>330</u>	<u>1</u>	<u>10</u>
Benzo[a]anthracene	56-55-3	<u>92.0</u>	<u>330</u>	<u>1</u>	<u>10</u>
Benzo[a]pyrene	50-32-8	<u>94.0</u>	<u>330</u>	<u>1</u>	<u>10</u>
Benzo[b]fluoranthene	205-99-2	<u>95.0</u>	<u>330</u>	<u>1.2</u>	<u>10</u>
Benzo[g,h,i]perylene	191-24-2	<u>110</u>	<u>330</u>	<u>1.4</u>	<u>10</u>
Benzo[k]fluoranthene	207-08-9	<u>113</u>	<u>330</u>	<u>0.96</u>	<u>10</u>
Benzoic acid	65-85-0	<u>289</u>	<u>1600</u>	<u>20</u>	<u>75</u>
Benzyl alcohol	100-51-6	<u>170</u>	<u>510</u>	<u>2.6</u>	<u>10</u>
bis (2-chloroisopropyl) ether	108-60-1	<u>79.0</u>	<u>330</u>	<u>1.3</u>	<u>10</u>



Compliance Restoration Site CC RVAAP-80

Analyte Description	CAS Number	SOIL		WATER	
		Method Detection Limit	Reporting Limit <sup>a</sup>	Method Detection Limit	Reporting Limit <sup>a</sup>
		ug/Kg		ug/L	
Bis(2-chloroethoxy)methane	111-91-1	<u>88.0</u>	<u>330</u>	<u>1</u>	<u>10</u>
Bis(2-chloroethyl)ether	111-44-4	<u>81.0</u>	<u>330</u>	<u>1.5</u>	<u>10</u>
Bis(2-ethylhexyl) phthalate	117-81-7	<u>98.0</u>	<u>330</u>	<u>1</u>	<u>10</u>
Butyl benzyl phthalate	85-68-7	<u>95.0</u>	<u>330</u>	<u>1.4</u>	<u>10</u>
Carbazole	86-74-8	<u>95</u>	<u>330</u>	<u>1.2</u>	<u>10</u>
Chrysene	218-01-9	<u>84</u>	<u>330</u>	<u>1</u>	<u>10</u>
Dibenzo(a,h)anthracene	53-70-3	<u>102</u>	<u>330</u>	<u>2</u>	<u>10</u>
Dibenzofuran	132-64-9	<u>86</u>	<u>330</u>	<u>1.1</u>	<u>10</u>
Diethyl phthalate	84-66-2	<u>90</u>	<u>330</u>	<u>0.93</u>	<u>10</u>
Dimethyl phthalate	131-11-3	<u>87</u>	<u>330</u>	<u>0.88</u>	<u>10</u>
Di-n-butyl phthalate	84-74-2	<u>97</u>	<u>330</u>	<u>1.1</u>	<u>10</u>
Di-n-octyl phthalate	117-84-0	<u>97</u>	<u>330</u>	<u>1.5</u>	<u>10</u>
Fluoranthene	206-44-0	<u>95</u>	<u>330</u>	<u>1</u>	<u>10</u>
Fluorene	86-73-7	<u>92</u>	<u>330</u>	<u>0.93</u>	<u>10</u>
Hexachlorobenzene	118-74-1	<u>89</u>	<u>330</u>	<u>1.4</u>	<u>10</u>
Hexachlorobutadiene	87-68-3	<u>82</u>	<u>330</u>	<u>1.3</u>	<u>10</u>
Hexachlorocyclopentadiene	77-47-4	<u>62</u>	<u>1600</u>	<u>5</u>	<u>50</u>
Hexachloroethane	67-72-1	<u>81</u>	<u>330</u>	<u>1.4</u>	<u>10</u>
Indeno[1,2,3-cd]pyrene	193-39-5	<u>96</u>	<u>330</u>	<u>3.4</u>	<u>10</u>
Isophorone	78-59-1	<u>93</u>	<u>330</u>	<u>1</u>	<u>10</u>
Naphthalene	91-20-3	<u>82</u>	<u>330</u>	<u>1.3</u>	<u>10</u>
Nitrobenzene	98-95-3	<u>76</u>	<u>330</u>	<u>1.6</u>	<u>10</u>
N-Nitrosodi-n-propylamine	621-64-7	<u>84</u>	<u>330</u>	<u>1.4</u>	<u>10</u>
N-Nitrosodiphenylamine	86-30-6	<u>86</u>	<u>330</u>	<u>1</u>	<u>10</u>
Pentachlorophenol	87-86-5	<u>51</u>	<u>1600</u>	<u>5</u>	<u>60</u>
Phenanthrene	85-01-8	<u>94</u>	<u>330</u>	<u>1</u>	<u>10</u>
Phenol	108-95-2	<u>83</u>	<u>330</u>	<u>1.1</u>	<u>10</u>
Pyrene	129-00-0	<u>94</u>	<u>330</u>	<u>1.4</u>	<u>10</u>

<sup>a</sup> Specific quantitation limits are highly matrix-dependent; project reporting levels listed here are goals and may not always be achievable.

**Table 4-3**

**Pesticides Method 8081 DoD and Polychlorinated Biphenyls (PCBs) Method 8082 DoD**

Analyte Description	CAS Number	SOIL		WATER	
		Method Detection Limit	Reporting Limit <sup>a</sup>	Method Detection Limit	Reporting Limit <sup>a</sup>
		ug/Kg		ug/L	
Method 8081					
4,4'-DDD	72-54-8	0.26	1.7	0.012	0.05
4,4'-DDE	72-55-9	0.22	1.7	0.012	0.05
4,4'-DDT	50-29-3	0.4	1.7	0.012	0.05
Aldrin	309-00-2	0.21	1.7	0.006	0.05
alpha-BHC	319-84-6	0.22	1.7	0.007	0.05
alpha-Chlordane	5103-71-9	0.2	1.7	0.006	0.05
beta-BHC	319-85-7	0.33	1.7	0.007	0.05
delta-BHC	319-86-8	0.16	1.7	0.011	0.05
Dieldrin	60-57-1	0.091	1.7	0.012	0.05
Endosulfan I	959-98-8	0.1	1.7	0.006	0.05
Endosulfan II	33213-65-9	0.1	1.7	0.012	0.05
Endosulfan sulfate	1031-07-8	0.092	1.7	0.012	0.05
Endrin	72-20-8	0.11	1.7	0.012	0.05
Endrin aldehyde	7421-93-4	0.11	1.7	0.025	0.1
Endrin ketone	53494-70-5	0.34	1.7	0.02	0.1
gamma-BHC (Lindane)	58-89-9	0.17	1.7	0.006	0.05
gamma-Chlordane	5103-74-2	0.1	1.7	0.012	0.05
Heptachlor	76-44-8	0.19	1.7	0.007	0.05
Heptachlor epoxide	1024-57-3	0.12	1.7	0.006	0.05
Methoxychlor	72-43-5	1.3	3.4	0.042	0.1
Toxaphene	8001-35-2	20	67	0.51	2
Method 8082					
Aroclor-1016	12674-11-2	3.4	33	0.15	1
Aroclor-1221	11104-28-2	5.2	33	0.53	1
Aroclor-1232	11141-16-5	6.4	33	0.16	1
Aroclor-1242	53469-21-9	7.4	33	0.25	1
Aroclor-1248	12672-29-6	5.7	33	0.24	1
Aroclor-1254	11097-69-1	2.7	33	0.19	1
Aroclor-1260	11096-82-5	2.9	33	0.22	1

<sup>a</sup> Specific quantitation limits are highly matrix-dependent; project reporting levels listed here are goals and may not always be achievable.

**Table 4-4**  
**Explosives - Method 8330B**  
**Propellants - Method 8330 Modified and 353.2**  
**Perchlorate - Method 6860**

Analyte Description	CAS Number	SOIL		WATER	
		Method Detection Limit	Reporting Limit <sup>a</sup>	Method Detection Limit	Reporting Limit <sup>a</sup>
		mg/Kg		ug/L	
1,3,5-Trinitrobenzene	99-35-4	<u>0.02</u>	<u>0.25</u>	<u>0.031</u>	<u>0.15</u>
1,3-Dinitrobenzene	99-65-0	<u>0.05</u>	<u>0.25</u>	<u>0.05</u>	<u>0.15</u>
2,4,6-Trinitrotoluene	118-96-7	<u>0.02</u>	<u>0.25</u>	<u>0.05</u>	<u>0.15</u>
2,4-Dinitrotoluene	121-14-2	<u>0.02</u>	<u>0.25</u>	<u>0.05</u>	<u>0.13</u>
2,6-Dinitrotoluene	606-20-2	<u>0.03</u>	<u>0.25</u>	<u>0.05</u>	<u>0.13</u>
2-Amino-4,6-dinitrotoluene	35572-78-2	<u>0.1</u>	<u>0.25</u>	<u>0.03</u>	<u>0.15</u>
2-Nitrotoluene	88-72-2	<u>0.08</u>	<u>0.25</u>	<u>0.088</u>	<u>0.5</u>
3-Nitrotoluene	99-08-1	<u>0.07</u>	<u>0.25</u>	<u>0.057</u>	<u>0.5</u>
4-Amino-2,6-dinitrotoluene	19406-51-0	<u>0.02</u>	<u>0.25</u>	<u>0.05</u>	<u>0.15</u>
4-Nitrotoluene	99-99-0	<u>0.08</u>	<u>0.25</u>	<u>0.088</u>	<u>0.5</u>
HMX	2691-41-0	<u>0.03</u>	<u>0.25</u>	<u>0.036</u>	<u>0.15</u>
Nitrobenzene	98-95-3	<u>0.05</u>	<u>0.25</u>	<u>0.05</u>	<u>0.15</u>
Nitroglycerin	55-63-0	<u>0.13</u>	<u>0.5</u>	<u>0.33</u>	<u>1.5</u>
PETN	78-11-5	<u>0.16</u>	<u>0.5</u>	<u>0.3</u>	<u>1.5</u>
RDX	121-82-4	<u>0.04</u>	<u>0.25</u>	<u>0.036</u>	<u>0.15</u>
Tetryl	479-45-8	<u>0.05</u>	<u>0.25</u>	<u>0.05</u>	<u>0.15</u>
Nitroguanidine (8330 modified)	556-88-7	<u>0.02</u>	<u>0.25</u>	<u>2.4</u>	<u>20</u>
Perchlorate (6860)	14797-73-0	<u>0.15</u>	<u>5</u>	<u>0.082</u>	<u>0.5</u>
Nitrocellulose (353.2)	9004-70-0	<u>0.78</u>	<u>5</u>	<u>0.475</u>	<u>2</u>

<sup>a</sup> Specific quantitation limits are highly matrix-dependent; project reporting levels listed here are goals and may not always be achievable.

**Table 4-5**

**Target Analyte List (TAL) ICP Metals - Methods 6010 DoD**

Analyte Description	CAS Number	SOIL		WATER	
		Method Detection Limit	Reporting Limit <sup>a</sup>	Method Detection Limit	Reporting Limit <sup>a</sup>
		mg/Kg		ug/L	
Aluminum	7429-90-5	<u>5.6</u>	<u>20</u>	<u>48</u>	<u>200.0</u>
Antimony	7440-36-0	<u>0.94</u>	<u>3</u>	<u>9.8</u>	<u>30.0</u>
Arsenic	7440-38-2	<u>1.3</u>	<u>4</u>	<u>12.0</u>	<u>40.0</u>
Barium	7440-39-3	<u>0.2</u>	<u>2</u>	<u>2.5</u>	<u>20.0</u>
Beryllium	7440-41-7	<u>0.03</u>	<u>0.3</u>	<u>0.3</u>	<u>3.0</u>
Cadmium	7440-43-9	<u>0.03</u>	<u>0.3</u>	<u>0.5</u>	<u>3.0</u>
Calcium	7440-70-2	<u>10</u>	<u>50</u>	<u>100.0</u>	<u>500.0</u>
Chromium	7440-47-3	<u>0.14</u>	<u>1</u>	<u>2.0</u>	<u>10.0</u>
Cobalt	7440-48-4	<u>0.25</u>	<u>1</u>	<u>3.0</u>	<u>10.0</u>
Copper	7440-50-8	<u>0.22</u>	<u>1.5</u>	<u>2.1</u>	<u>15.0</u>
Iron	7439-89-6	<u>2</u>	<u>10</u>	<u>20.0</u>	<u>100.0</u>
Lead	7439-92-1	<u>0.26</u>	<u>1</u>	<u>2.5</u>	<u>10.0</u>
Magnesium	7439-95-4	<u>4.5</u>	<u>50</u>	<u>40.0</u>	<u>500.0</u>
Manganese	7439-96-5	<u>0.25</u>	<u>1</u>	<u>2.5</u>	<u>10.0</u>
Mercury	7439-97-6	<u>0.0086</u>	<u>0.04</u>	<u>0.1</u>	<u>0.25</u>
Nickel	7440-02-0	<u>0.24</u>	<u>1</u>	<u>2.4</u>	<u>10.0</u>
Potassium	7440-09-7	<u>10</u>	<u>100</u>	<u>93.0</u>	<u>1000</u>
Selenium	7782-49-2	<u>1.4</u>	<u>4</u>	<u>13.0</u>	<u>40.0</u>
Silver	7440-22-4	<u>0.09</u>	<u>0.5</u>	<u>0.84</u>	<u>5.0</u>
Sodium	7440-23-5	<u>20</u>	<u>100</u>	<u>250.0</u>	<u>1000</u>
Thallium	7440-28-0	<u>0.84</u>	<u>3</u>	<u>9.0</u>	<u>30.0</u>
Vanadium	7440-62-2	<u>0.19</u>	<u>2</u>	<u>1.9</u>	<u>20.0</u>
Zinc	7440-66-6	<u>0.4</u>	<u>2</u>	<u>3.0</u>	<u>20.0</u>

<sup>a</sup> Specific quantitation limits are highly matrix-dependent; project reporting levels listed here are goals and may not always be achievable.

#### 4.4 Completeness, Representativeness, and Comparability

Completeness, representativeness and comparability goals identified in Section 4.3 and Tables 4-1 and 4-2 of the FWQAPP will be imposed for this investigation.



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

October 23, 2015

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  
Plans  
Remedial Response  
Portage County  
267000859160**

**Subject: Ravenna Army Ammunition Plant, Portage/Trumbull Counties. Approval with Modifications on the "Revised Draft Project Work Plan for Site Inspection at Compliance Restoration Site CC RVAAP-80 Group 2 Propellant Can Tops" for the Ravenna Army Ammunition Plant, Ravenna, Ohio, Dated September 8, 2015, Ohio EPA ID # 267-000859-160**

Dear Mr. Leeper:

The Ohio Environmental Protection Agency (Ohio EPA) has received the "Revised Draft Project Work Plan for Site Inspection at Compliance Restoration Site CC RVAAP-80 Group 2 Propellant Can Tops" 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 September 8, 2015. The report was prepared for the US Army Corps of Engineers (USACE) Louisville District by PIKA International, Inc. under Contract Number W912QR-12-F-0212.

Ohio EPA notes that this revised document includes agreements to collect and dispose of propellant can tops and associated materials identified in this area of concern (AOC). The propellant cans and tops will be inspected, certified as materials documented as safe (MDAS) and consolidated for proper disposal/recycling IAW Department of Defense Instruction (DoDI) 4140.62, USACE EM 385-1-97, Change1, Chapter 1, Section 11, PIKA SOPs, and ORC 3745.27.05c. Ohio EPA also notes that additional sampling areas have been added to the Work Plan, which we believe were necessary. A third addition to this Work Plan was a thorough description of propellant cans and tops, their use, reasons why they are located on the property, and the potential for contamination. Several discussions between the Army National Guard, US Army Corps of Engineers, PIKA and Ohio EPA were held to clarify positions and requirements for the investigation of this AOC. Ohio EPA appreciates and understands the efforts made to provide this revised document.



Pursuant to The Directors Findings and Orders Paragraph 39 (b), Ohio EPA approves the submittal upon satisfactory written response to specified conditions as presented below:

**Revised Draft Project Work Plan for Site Inspection at Compliance Restoration Site  
CC RVAAP-80 Group 2 Propellant Can Tops**

**Comment 1.** Page 26, Section 2.13. An expression is used in this section, "PIKA will clear the locations of the previous anomalies of all propellant can tops..." and, "...the UXO Technicians will clear the area within a one meter radius..." Does this expression mean that the propellant can lids will be removed? Ohio EPA understands from other locations in the documents that these materials will be removed and properly disposed.

**Comment 2.** Appendix B, Figure 5 provides the proposed samples locations for the collection of ISM samples. How was the size of each decision unit determined? It appears some are much larger than others, even though they have a similar number of anomalies. Wouldn't a larger decision unit around the same number of anomalies allow for the possibility of more diluted sample result? Why was the red circle in the northwest part of Figure 5 left partially completed? It is assumed the whole area of the circle is the decision unit. Please provide explanations for these questions.

**Comment 3.** Page 27, Section 2.14, Sentences 4 and 5. Please explain that ISM surface soil samples will be collected within the designated ISM from 0-1 foot and from 1-4 feet below ground surface (bgs). It is understood that propellant can tops and lids were identified at most locations within the top nine inches of the ground surface. It is also understood that the shallow (0-1 foot) samples will be analyzed for TAL metals, and common propellants and perchlorate. Is there a chance soils collected so shallow may have oxidized or in other ways reacted so that the results might be biased low?

**Comment 4.** Appendix D, Sampling and Analysis Plan, page 19, Section 5.6.1 sentence 3 states, "A total five ISM surface soil samples will be collected from 0 to one (1) foot bgs..." Sentence 4 states, "No sediment samples are anticipated to be sampled." What does it mean that "no sediment samples are anticipated to be collected?" This Sampling and Analysis Plan does not agree with page 27, Section 2.14 of the Revised Draft Project Work Plan. Please make the correction. Ohio EPA anticipates samples will also be collected from 1-4 feet bgs at locations shown on Figure 5, and as provided in the Work Plan.

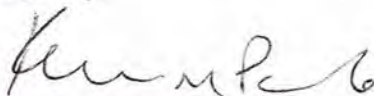
**Comment 5.** Appendix E, Quality Assurance Project Plan, Page 4, Section 2.4.2, paragraph 2, last sentence states, "Multiple smaller areas where anomalies are found may be combined into one designated ISM sample area." This is unclear, please provide additional clarification.

MR. MARK LEEPER  
ARMY NATIONAL GUARD DIRECTORATE  
OCTOBER 23, 2015  
PAGE 3

**Comment 6.** Appendix E, Quality Assurance Plan, Table 4-1. This table provides a soil Reporting Limit of 250 ug/Kg. Will this reporting limit for these compounds exceed the CUGs? Will you report data that is above the Method Detection Limit (MDL) but below the Reporting Limit (RL) as "J" value, or not at all? Why is the RL so much higher than the MDL?

If you have any questions, or request 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/nvr

cc: Katie Tait, OHARNG RTLS  
Kevin Sedlak, ARNG  
Gregory F. Moore, USACE  
Rebecca Haney/Gail Harris, VISTA Sciences Corp.

ec: Bob Princic, Ohio EPA, NEDO DERR  
Rodney Beals, Ohio EPA NEDO DERR  
Justin Burke, Ohio EPA, CO DERR



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

July 29, 2015

Mr. Mark Leeper, P.G., MBA  
Restoration/Cleanup Program Manager  
ARNG Directorate  
111 S. George Mason Dr.  
Arlington, VA 22204

Re: US Army Ravenna Ammunition Plt RVAAP  
Remediation Response  
Project records  
Remedial Response  
Portage County  
267000859212

Subject: Ohio EPA's Review of Final Site Inspection Report, CC-RVAAP-83 Former  
Buildings 1031 and 1039, Project No. 267-000859-212

Dear Mr. Leeper:

The Ohio Environmental Protection Agency (Ohio EPA), Northeast District Office (NEDO) has reviewed the Final Site Inspection Report for CC-RVAAP-83 Former Buildings 1031 and 1039, dated June 15, 2015. The document was prepared by ECC under contract no. W912QR-04-D-0039.

Ohio EPA has reviewed the response to comments and the report and has no further comments. The document is approved.

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 D'Amato  
Project Coordinator  
Ohio EPA - Division of Environmental Response and Revitalization

ED/nvr

ec: Rod Beals, DERR, NEDO  
Bob Princic, DERR, NEDO  
Justin Burke, DERR-CO  
Katie Tait, OHARNG RTLS  
Kevin Sedlak, ARNG  
Gregory F. Moore, USACE  
Mark Nichter, USACE  
Rebecca Haney/Gail Harris, Vista Sciences Corp.  
Ohio EPA, VAP File, CO, DERR at: [records@epa.ohio.gov](mailto:records@epa.ohio.gov)



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

June 16, 2015

**Re: US Army Ravenna Ammunition Plt RVAAP  
Assessment  
Remedial Response  
Portage County  
267000859212**

Mr. Mark Leeper, P.G., MBA  
Restoration/Cleanup Program  
Manager  
ARNG Directorate  
111 S. George Mason Dr.  
Arlington, VA 22204

**Subject: Ohio EPA's Review of Response to Comments, Draft Site Inspection Report,  
CC-RVAAP-83 Former Buildings 1031 and 1039 Project No. 267-000859-155;  
Notice of Deficiency**

Dear Mr. Leeper:

The Ohio Environmental Protection Agency (Ohio EPA), Northeast District Office has reviewed the Army's response to Ohio EPA's April 16, 2015 comment letter, on the Draft Site Inspection Report for CC-RVAAP-83 Former Buildings 1031 and 1039. The response was received on May 21, 2015. The document was prepared by ECC, under contract no. W912QR-04-D-0039.

Ohio EPA finds the response to be acceptable and has no further comments. Please revise the document accordingly and re-submit it for final approval.

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/nvr

ec: Bob Prinic, Supervisor, DERR-NEDO  
Justin Burke, DERR-CO  
Kevin Sedlak, ARNG  
Mark Nichter, USACE

Rod Beals, Manager, DERR-NEDO  
Katie Tait, OHARNG RTLS  
Gregory F. Moore, USACE  
Rebecca Haney/Gail Harris, Vista Sciences





**NATIONAL GUARD BUREAU**

111 SOUTH GEORGE MASON DRIVE  
ARLINGTON VA 22204-1373

May 19, 2015

Ohio Environmental Protection Agency  
DERR-NEDO  
Attn: Ed D'Amato  
2110 East Aurora Road  
Twinsburg, OH 44087-1924

Subject: Former Ravenna Army Ammunition Plant (RVAAP) Restoration Program  
Portage/Trumbull Counties, CC RVAAP-83 Former Buildings 1031 and 1039,  
Draft Site Inspection Report, Ohio EPA ID # 267-000-859-155

Dear Mr. D'Amato:

Enclosed for your review are the responses to the Ohio EPA comments on the *Draft Site Inspection Report* in support of the Environmental Remediation Services (ERS) project at the former Buildings 1031 and 1039 Area of Concern (CC RVAAP-83) at the former Ravenna Army Ammunition Plant (RVAAP).

The Army requests Ohio EPA review these comment responses. Upon approval of these responses, the Army will proceed with the formulation of the Final Site Inspection Report for CC-RVAAP-83.

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

Sincerely,

Mark Leeper  
RVAAP Restoration Program Manager  
Army National Guard Directorate

Attachment

cc: Justin Burke, Ohio EPA, DERR-CO  
Rod Beals, Ohio EPA, DERR-NEDO  
Katie Tait, OHARNG Camp Ravenna  
Kevin Sedlak, ARNG, Camp Ravenna  
Greg Moore, USACE Louisville  
Nat Peters, USACE Louisville  
Eric Cheng, USACE Louisville  
Gail Harris, Vista Sciences



**DRAFT SITE INSPECTION REPORT, REVISION 1**  
**CC RVAAP-83 FORMER BUILDINGS 1031 AND 1039**  
**FORMER RAVENNA ARMY AMMUNITION PLANT, PORTAGE AND TRUMBULL COUNTIES, OHIO**  
**COMMENT RESPONSE TABLE**

Site Inspection Report Submitted – 27 February 2015

Ohio EPA Comments Received – 17 April 2015

Response to Comments Issued – 19 May 2015

Page 1 of 3

Comment Number	Page No. / Line No.	New Page or Sheet	Comment	Recommendation	Response
<i>Ohio EPA (Ed D'Amato)</i>					
1	General		Remove the disclaimer statement at the beginning of the document. This comment has been noted in Ohio EPA's review of previous ECC reports. Please refrain from including it in the future.		The Disclaimer Statement will be removed from the document when the final version is issued. The Disclaimer Statement in Draft reports is included per the Submission Format Guidelines Ravenna Army Ammunition Plant (dated July 22, 2014). The Disclaimer Statement is removed from Final report version. If ECC did not included the Disclaimer Statement in the Draft report version, the ACOE's Administrative Record Document Reviewer, would deem the report non-compliant with the current Ravenna Submission Format Guidelines.
2	Table 5-2		This table lists Resident Child Farmer and Resident Adult Farmer. Per the February 4, 2014 Final Technical Memorandum, Land uses and Revised Risk Assessment Process for RVAAP Installation Restoration Program, these Facility-wide Cleanup Goals (FWCUGs) have		The tables in Section 5 (Tables 5-2 and 5-3) will be revised to remove the word "Farmer" from the terms <i>Resident Child Farmer</i> and <i>Resident Adult Farmer</i> . The column headings in Tables 5-2 and 5-3 will be revised as

**DRAFT SITE INSPECTION REPORT, REVISION 1**  
**CC RVAAP-83 FORMER BUILDINGS 1031 AND 1039**  
**FORMER RAVENNA ARMY AMMUNITION PLANT, PORTAGE AND TRUMBULL COUNTIES, OHIO**  
**COMMENT RESPONSE TABLE**

Site Inspection Report Submitted – 27 February 2015  
Ohio EPA Comments Received – 17 April 2015  
Response to Comments Issued – 19 May 2015

Page 2 of 3

Comment Number	Page No. / Line No.	New Page or Sheet	Comment	Recommendation	Response
			been replaced by: Unrestricted (Residential) Land Use – Resident Receptor (Adult and Child). Please revise the table accordingly.		follows: “ <i>Resident Child Farmer</i> ” and “ <i>Resident Adult Farmer</i> ”.
3	Section 5.2.1		<p>The site history, as described in Section 2.2 of the report, does not discuss any historical uses that would result in MTBE being a potential COC. Please explain the rationale for sampling for MTBE and revise the site history to account for MTBE being a potential COC. U.S. EPA’s web page about the history of MTBE use in fuels may be helpful:</p> <p><a href="http://www.epa.gov/mtbe/faq.htm">http://www.epa.gov/mtbe/faq.htm</a></p>		<p>We agree that the history of this site does not indicate usage of products that would contain or suspected to contain MTBE, as MTBE was primarily fuel a fuel additive to gasoline.</p> <p>Former Building 1039 was utilized as a laboratory and photo laboratory. MTBE was not identified as being used at Former Building 1039 in the HRR, and MTBE was not identified as as a compound of interest at CC RVAAP-83.</p> <p>MTBE was reported by our contract laboratory (CT Laboratories), since MTBE was on the VOC list that was typically reported for analysis of VOC samples.</p>



**DRAFT SITE INSPECTION REPORT, REVISION 1**  
**CC RVAAP-83 FORMER BUILDINGS 1031 AND 1039**  
**FORMER RAVENNA ARMY AMMUNITION PLANT, PORTAGE AND TRUMBULL COUNTIES, OHIO**  
**COMMENT RESPONSE TABLE**

Site Inspection Report Submitted – 27 February 2015

Ohio EPA Comments Received – 17 April 2015

Response to Comments Issued – 19 May 2015

Page 3 of 3

Comment Number	Page No. / Line No.	New Page or Sheet	Comment	Recommendation	Response
					<p>The subsurface soil ISM samples from DU01 were analyzed for VOCs and MTBE was included and reported as part of the labs standard VOC reporting list. This is footnoted in Table 4-3. No VOCs (including MTBE compounds) were detected in any of the subsurface soil ISM samples. Lines 1680 to 1682 will be revised as follows for clarification of this comment:</p> <p><i>“A vertical subsurface soil ISM QA sample from SB03 was collected at the 4- to 10-ft bgs interval and analyzed for VOCs, (<u>including</u> methyl tert-butyl ether [MTBE]), SVOCs, TAL metals, propellants, and explosives. MTBE is not related to the former usage of the AOC but was included in the standard VOC analyte list.”</i></p>
<i>End of Comments</i>					



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

April 16, 2015

Mr. Mark Leeper, P.G., MBA  
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  
Assessment  
Remedial Response  
Portage County  
267000859155**

**Subject: Ohio EPA's Review of Draft Site Inspection Report, CC-RVAAP-83  
Former Buildings 1031 and 1039 Project No. 267-000859-155; Notice  
of Deficiency**

Dear Mr. Leeper:

The Ohio Environmental Protection Agency (Ohio EPA), Northeast District Office (NEDO) has reviewed the Draft Site Inspection Report for CC-RVAAP-83 Former Buildings 1031 and 1039, dated February 27, 2015. The document was prepared by ECC, under contract no. W912QR-04-D-0039.

Ohio EPA has identified the following deficiencies in the report. Ohio EPA will review either a response to comments letter or Response to Comments (RTC) table. However, a revised report will need to be completed prior to final approval of the document.

**Comments:**

1. Remove the disclaimer statement at the beginning of the document. This comment has been noted in Ohio EPA's review of previous ECC reports. Please refrain from including it in the future.
2. **Table 5.2:** This table lists Resident Child Farmer and Resident Adult Farmer. Per the February 4, 2014 Final Technical Memorandum, Land uses and Revised Risk Assessment Process for RVAAP Installation Restoration Program, these Facility-wide Cleanup Goals (FWCUGs) have been replaced by: Unrestricted (Residential) Land Use – Resident Receptor (Adult and Child). Please revise the table accordingly.
3. **Section 5.2.1:** The site history, as described in Section 2.2 of the report, does not discuss any historical uses that would result in MTBE being a potential COC.



MR. MARK LEEPER, P.G., MBA  
ARMY NATIONAL GUARD DIRECTORATE  
APRIL 16, 2015  
PAGE 2

Please explain the rationale for sampling for MTBE and revise the site history to account for MTBE being a potential COC. U.S. EPA's web page about the history of MTBE use in fuels may be helpful: <http://www.epa.gov/mtbe/faq.htm>

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 D'Amato  
Project Coordinator  
Ohio EPA - Division of Environmental Response and Revitalization

ec: Rod Beals, DERR-NEDO, Manager  
Justin Burke, DERR-CO  
Katie Tait, OHARNG RTLS  
Kevin Sedlak, ARNG  
Gregory F. Moore, USACE  
Mark Nichter, USACE  
Rebecca Haney/Gail Harris, Vista Sciences Corp.  
Ohio EPA, VAP File, CO, DERR at: [records@epa.ohio.gov](mailto:records@epa.ohio.gov)





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

September 2, 2015

Mr. Mark Leeper, P.G., MBA  
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  
267000859157**

**Subject: Concurrence of the "Final Remedial Investigation Report for RVAAP-001-R-01 Ramsdell Quarry Landfill Munitions Response Site Version 1.0," Former Ravenna Army Ammunition Plant, Ravenna, Ohio," Dated June 30, 2015 (Work Activity No. 267-000859-157)**

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 replacement pages for the "Final Remedial Investigation Report for RVAAP-001-R-01 Ramsdell Quarry Landfill Munitions Response Site Version 1.0" (the Report) sent in response to Ohio EPA's comments. This document received by Ohio EPA's NEDO on July 1, 2015, was prepared by CB&I Federal Services LLC.

Through the Installation Restoration Program (IRP), the Army proposed that the existing Land Use Controls (LUCs) designed for the Area of Concern (AOC) will be protective of the Ramsdell Quarry Landfill Munitions Response Site (MRS) and will address the potential issue of dioxins and furans. In addition, the LUCs should be inspected, monitored, and/or maintained every five years pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) §121 and the National Contingency Plan (NCP). The Five-Year Reviews for this AOC are currently being conducted through the Property Management Plan. Ohio EPA will recommend that dioxins and furans be investigated in the next Five-Year Review, expected in 2017.

The Military Munitions Response Program (MMRP) requires that munitions of explosive concern (MEC) or concentrated areas of munitions debris (MD) be discovered at a site to justify sampling for potential munitions constituents. Although no MEC/MD was discovered at the MRS, Ohio EPA believes that the former open burning or open demolition of napalm at the MRS may have resulted in the potential release of

MR. MARK LEEPER, P.G., MBA  
ARMY NATIONAL GUARD DIRECTORATE  
SEPTEMBER 2, 2015  
PAGE 2

hazardous by-products such as dioxins and furans. Therefore, Ohio EPA will request further investigation for dioxins and furans during the Facility-Wide Surface Water/Sediment investigation at the AOC.

Ohio EPA has reviewed this documentation and concurs with the decision of No Further Action under the MMRP, with the understanding that further investigation may be warranted under other programs to address any further chemicals of possible concern, that are not deemed as MEC.

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: Gregory F. Moore, USACE, Louisville District  
Katie Tait/Kevin Sedlak, Camp Ravenna Environmental Office, Newton Falls  
Haney/Harris, Camp Ravenna Environmental Office, Vista Sciences, Newton Falls

ec: Rod Beals, Ohio EPA, NEDO, DERR  
Bob Princic, Ohio EPA, NEDO, DERR  
Justin Burke, Ohio EPA, CO, DERR  
Andrew Kocher, Ohio EPA, NEDO, DERR





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

June 17, 2015

Mr. Mark Leeper, P.G., MBA  
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  
267000859157**

**Subject: Review of the "Response to Ohio EPA Comments for the Final Remedial Investigation Report for RVAAP-001-R-01 Ramsdell Quarry Landfill Munitions Response Site Version 1.0", Former Ravenna Army Ammunition Plant, Ravenna, Ohio," Dated September 9, 2014 (Work Activity No. 267-000859-157)**

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 "Response to Ohio EPA Comments for the Final Remedial Investigation Report for RVAAP-001-R-01 Ramsdell Quarry Landfill Munitions Response Site Version 1.0" (the Report) sent in response to Ohio EPA's comments. This document, received by Ohio EPA's NEDO on March 31, 2015, was prepared by CB&I Federal Services LLC.

Through the installation restoration program the Army proposed that the existing Land Use Controls (LUCs) designed for the Area of Concern (AOC) will be protective of the Ramsdell Quarry Landfill Munitions Response Site (MRS) and will address the potential issue of dioxins and furans. In addition, the LUCs should be inspected, monitored, and/or maintained every five years, pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) §121 and the National Contingency Plan (NCP). The Five-Year Reviews for this AOC are currently being conducted through the Property Management Plan. Ohio EPA will recommend that dioxins and furans be investigated in the next Five-Year Review, expected in 2017.

The Military Munitions Response Program (MMRP) requires that munitions of explosive concern (MEC) or concentrated areas of munitions debris (MD) be discovered at a site to justify sampling for potential munitions constituents. Although no MEC/MD were

MR. MARK LEEPER, P.G., MBA  
ARMY NATIONAL GUARD DIRECTORATE  
JUNE 17, 2015  
PAGE 2

discovered at the MRS, Ohio EPA believes that the former open burning or open demolition of napalm at the MRS may have resulted in the potential release of hazardous by-products, such as dioxins and furans. Ohio EPA will request further investigation for dioxins and furans during the Facility-Wide Surface Water/Sediment investigation at the AOC. Please include in the revised final MMRP remedial investigation report all comment letters between Ohio EPA and the Ohio Army National Guard, dating from October 17, 2014, to the present day.

Ohio EPA has reviewed this documentation and has found no significant deficiencies. Please provide a revised final document within 30 days, in accordance with the Findings and Orders for RVAAP.

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: Gregory F. Moore, USACE, Louisville District  
Katie Tait/Kevin Sedlak, Camp Ravenna Environmental Office, Newton Falls  
Haney/Harris, Camp Ravenna Environmental Office, Vista Sciences, Newton Falls

ec: Rod Beals, Ohio EPA, NEDO, DERR  
Bob Princic, Ohio EPA, NEDO, DERR  
Justin Burke, Ohio EPA, CO, DERR  
Andrew Kocher, Ohio EPA, NEDO, DERR





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

May 18, 2015

Mr. Mark Leeper, P.G., MBA  
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  
267000859157

**Subject:** Request for an Extension "Draft Remedial Investigation Report for RVAAP-001-R-01 Ramsdell Quarry Landfill Munitions Response Site Version 1.0", Former Ravenna Army Ammunition Plant, Ravenna, Ohio," Dated September 9, 2014 (Work Activity No. 267-000859-157)

Dear Mr. Leeper:

On September 9, 2014, the Ohio Environmental Protection Agency (Ohio EPA), Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR) received the comments for the "Draft Remedial Investigation Report for RVAAP-001-R-01 Ramsdell Quarry Landfill Munitions Response Site Version 1.0." Since then, multiple comment letters have been sent to address potential issues. Pursuant to the Director's Final Findings and Orders (Orders), the deadline for review on this document was May 15, 2015.

At this time, the Agency has not yet completed the review. This letter is a request for a 20 day extension. This extension would move the due date of this review to June 1, 2015.

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

If you have any questions concerning this correspondence, please do not hesitate to contact me at (330) 963-1235. I look forward to your response.

Sincerely,

Nicholas Roope, Site Coordinator  
Division of Environmental Response and Revitalization

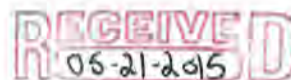
NCR/nvr

cc: Gregory F. Moore, USACE  
Haney/Harris, Vista Sciences

Katie Tait/Kevin Sedlak, Newton Falls

ec: Rod Beals, NEDO, DERR  
Andrew Kocher, NEDO, DERR

Justin Burke, Ohio EPA, CO, DERR







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

March 20, 2015

**Re: US Army Ravenna Ammunition Plt RVAAP  
Remediation Response  
Project records  
Remedial Response  
Portage County  
267000859**

Mr. Mark Leeper, P.G., MBA  
Army National Guard Directorate  
Environmental Programs Division  
ARNG-ILE-CR  
111 South George Mason Drive  
Arlington, VA 22204

**Subject: Addendum to the Comments for the "Draft Remedial Investigation Report for RVAAP-001-R-01 Ramsdell Quarry Landfill Munitions Response Site Version 1.0," Submitted by Ohio EPA February 24, 2015 (Work Activity No. 267-000859-157)**

Dear Mr. Leeper:

The Ohio Environmental Protection Agency (Ohio EPA), Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR) reviewed the document entitled; "Draft Remedial Investigation Report for RVAAP-001-R-01 Ramsdell Quarry Landfill Munitions Response Site Version 1.0," dated September 9, 2014, and submitted a comment letter, dated December 29, 2015, to address the deficiencies found during the review. A response to comments (RTCs) letter was received electronically on January 15, 2015, but no hard copy has been received to date by Ohio EPA. Ohio EPA submitted a comment letter, dated February 24, 2015, in response to the electronically submitted RTCs. A comment in our February 24, 2015 response, referenced the dioxin furan results portion of the report from the Formerly Used Defense Site (FUDS) Former Scioto Ordnance Plant. Please find that this addendum has provided the enclosure referenced.

Ohio EPA would like to provide extra clarification to the comment submitted in the February 24, 2015 letter. Ohio EPA has provided documentation from the FUDS Former Scioto Ordnance Plant to provide background for our request for additional work. In the case of the Former Scioto Ordnance Plant, the result of burning or detonating incendiary bombs has been shown to produce dioxins and furans that were detected in the soil. It appears that these napalm bombs are similar to those referenced at the Ramsdell Quarry Landfill at the RVAAP. If this is the case, additional investigation may be warranted to deal with the potential presence of dioxins and furans in soil.

Ohio EPA reviewed the portion of text stating, "...The napalm bombs that were burned at Ramsdell Quarry were produced for World War II and contained Palmitic acid (coconut oil) and Napthenic acid non-plastics (naptha soap) that would not have produced dioxins or furans." Ohio EPA has found that these are only two of the three major components in napalm, the missing component being gasoline. Since the last detonation of napalm at RVAAP was

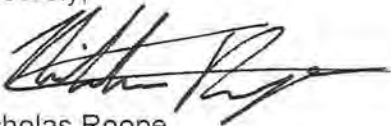
MR. MARK LEEPER, P.G., MBA  
ARMY NATIONAL GUARD DIRECTORATE  
MARCH 20, 2015  
PAGE 2

conducted in 1950, leaded gasoline was still in use. "Automobiles burning leaded gasoline were ranked as the eighth leading source of dioxin in 1987." (An Inventory of Sources and Environmental Releases of Dioxin-Like Compounds in the United States for the Years 1987, 1995, and 2000, EPA/600/P-03/002F, Nov. 2006) The detonation of such a large number of bombs containing the potential compound in such a concentrated area could have resulted in the release of dioxin into the surrounding media.

This appears to be a limited situation that applies only to areas where incendiary bombs were detonated. Ohio EPA would like to present potential paths forward to address this issue of potential dioxins and furans at this area of concern (AOC). First, the Army may consider focused sampling of RQL either under an addendum to the RI or under the FS. Second, the cap on the AOC and use of the fence surrounding the AOC to protect against direct contact could be considered a remedy for direct contact, if a LUC stating that the integrity of the cap and fence would be maintained and any excavation into the AOC would require sampling for these constituents contained in the PMP. Lastly, documentation can be submitted to Ohio EPA to provide a demonstration that the chemical degradation process for the original napalm after ignition will not release dioxins and furans that could affect environmental media.

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

Enclosure

cc: Gregory F. Moore, USACE, Louisville District  
Katie Tait/Kevin Sedlak, Camp Ravenna Environmental Office, Newton Falls  
Haney/Harris, Vista Sciences, Newton Falls

ec: Rod Beals, Ohio EPA, NEDO, DERR  
Justin Burke, Ohio EPA, CO, DERR  
Andrew Kocher, Ohio EPA, NEDO, DERR





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

February 24, 2015

**Re: US Army Ravenna Ammunition Plt RVAAP  
Remediation Response  
Project records  
Remedial Response  
Portage County  
267000859**

Mr. Mark Leeper, P.G., MBA  
Army National Guard Directorate  
Environmental Programs Division  
ARNG-ILE-CR  
111 South George Mason Drive  
Arlington, VA 22204

**Subject: Comments for the "Draft Remedial Investigation Report for RVAAP-001-R-01 Ramsdell Quarry Landfill Munitions Response Site Version 1.0", Former Ravenna Army Ammunition Plant, Ravenna, Ohio," Dated September 9, 2014 (Work Activity No. 267-000859-157)**

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 Remedial Investigation Report for RVAAP-001-R-01 Ramsdell Quarry Landfill Munitions Response Site Version 1.0," dated September 9, 2014. This document received by Ohio EPA's NEDO on September 10, 2014, was prepared by CB&I Federal Services LLC.

1. **General** - Ohio EPA has attached documentation from the Formerly Used Defense Site (FUDS) Former Scioto Ordnance Plant to provide background for Ohio EPA's request for additional sampling. The result of burning or detonating incendiary bombs has been known to produce dioxins and furans within the soil specifically, but could affect other media with time. Ohio EPA recognizes that this PCOC was not evaluated or identified in the Remedial Investigation, however, we cannot determine if this AOC is protective, based on the evaluation of all reasonable, potential releases from site-specific uses, without evaluation of this PCOC.

Since this PCOC was overlooked by the Army and Ohio EPA when the RI Work Plan was approved and sampling has since been completed, Ohio EPA would like to present potential paths forward to address this issue of potential dioxins and furans at this AOC. First, the Army may consider additional sampling of RQL

MR. MARK LEEPER, P.G., MBA  
ARMY NATIONAL GUARD DIRECTORATE  
FEBRUARY 24, 2015  
PAGE 2

either under an addendum to the RI or under the FS. Second, the cap on the AOC and use of the fence surrounding the AOC to protect against direct contact could be considered a remedy for direct contact, if a LUC stating that the integrity of the cap and fence would be maintained and any excavation into the AOC would require sampling for these constituents contained in the PMP.

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: Gregory F. Moore, USACE, Louisville District  
Katie Tait/Kevin Sedlak, Camp Ravenna Environmental Office, Newton Falls  
Haney/Harris, Camp Ravenna Environmental Office, Vista Sciences

ec: Rod Beals, Ohio EPA, NEDO, DERR  
Nancy Zikmanis, Ohio EPA, NEDO, DERR  
Justin Burke, Ohio EPA, CO, DERR  
Andrew Kocher, Ohio EPA, NEDO, DERR



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

December 17, 2015

Mr. Mark Leeper, P.G., MBA  
Army National Guard Directorate  
Environmental Programs Division  
ARNGD-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  
267000859089

**Subject:** Approval for the "Final Action Memorandum, Time-Critical Removal Action, Open Demolition Area #2 MRS, RVAAP-004-R-01 at the Former Ravenna Army Ammunition Plant, Ravenna, Ohio," Dated October 30, 2015, Ohio EPA ID # 267-000859-089

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 Action Memorandum, Time-Critical Removal Action, Open Demolition Area #2 MRS, RVAAP-004-R-01 at the Former Ravenna Army Ammunition Plant, Ravenna, Ohio," dated October 30, 2015. This document, received by Ohio EPA's NEDO on November 3, 2015, was prepared for the Army National Guard Directorate by the U.S. Army Corps of Engineers (USACE) Baltimore District.

Ohio EPA has reviewed this documentation and has found no significant deficiencies. As a result, the "Final Action Memorandum, Time-Critical Removal Action, Open Demolition Area #2 MRS, RVAAP-004-R-01 at the Former Ravenna Army Ammunition Plant, Ravenna, Ohio," has been approved.

If you have any questions or concerns, please do not hesitate to contact me at (330) 963-1249.

Sincerely,

Andrew C. Kocher, Site Coordinator  
Division of Environmental Response and Revitalization

ACK/nvr

cc: Paul E. Green, USACE, Baltimore District      Travis R. McCoun, USACE, Baltimore District  
Katie Tait/Kevin Sedlak, Camp Ravenna      Haney/Harris, Vista Sciences, Newton Falls

ec: Rod Beals, NEDO, DERR      Bob Princic, NEDO, DERR  
Justin Burke, CO, DERR





## NATIONAL GUARD BUREAU

111 SOUTH GEORGE MASON DRIVE  
ARLINGTON VA 22204-1373

November 23, 2015

Ohio Environmental Protection Agency

DERR-NEDO

Attn: Mr. Drew Kocher

2110 East Aurora Road

Twinsburg, OH 44087-1924

Subject: Ravenna Army Ammunition Plant Restoration Program  
Draft Work Plan, Time-Critical Removal Action (TCRA)  
RVAAP-004-R-01 Open Demolition Area #2 (ODA2)  
Former Ravenna Army Ammunition Plant/Camp Ravenna, Portage/Trumbull  
Counties, Ohio, EPA ID #267-00859-089

Dear Mr. Kocher:

Enclosed for your review is one (1) hard copy and three (3) electronic copies of the *Draft Work Plan, Time-Critical Removal Action, RVAAP-004-R-01 Open Demolition Area #2*, dated 23 November 2015. This document was prepared by the USACE-Baltimore in support of the Restoration Program at the former Ravenna Army Ammunition Plant Program (RVAAP) in Portage and Trumbull counties, Ohio.

Please note that the Draft Work Plan identifies the use of a Buried Explosion Module (BEM) for demolition of Munitions of Explosive Concern (MEC) and Material Potentially Presenting an Explosive Hazard (MPPEH) recovered during the TCRA at ODA2. The BEM is a DoD-authorized engineering control that significantly reduces the potential for dispersion of secondary explosive residue and reduces the exclusion zone for detonations to zero feet. The BEM is an extremely effective "low tech" tool being used throughout the country to significantly reduce the potential for secondary impacts to the environment on munitions response sites.

The RCRA unit will not be utilized as part of this TCRA. The BEM will be physically located within the MRS and will be used to demolish all acceptable-to-move items recovered from ODA2. Use of the BEM will not be considered hazardous waste treatment; however, all notification and reporting procedures will be followed as required by the Directors Final Findings and Orders (DFFOs). These include notification to the Ohio EPA before and after demolition operations, maintaining a log of each demolition shot and an inventory of all munitions items demolished, conducting weekly inspection of the BEM at ODA2 while in use, utilizing a Standard Operating Procedure for all demolition operations specifically developed for this project, sampling of the BEM pre- and post- construction, and pre- and post- sampling at Blow-In-Place locations.



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ARLINGTON VA 22204-1373

If questions arise during the review of the document, the ARNG/OHARNG invites the Ohio EPA to request a technical meeting to discuss this methodology prior to submission of comments.

Please contact the undersigned at (703) 607-7955 or [Mark.S.Leeper.civ@mail.mil](mailto:Mark.S.Leeper.civ@mail.mil) if there are issues or concerns with this submission.

Sincerely,

A handwritten signature in black ink, appearing to read "Mark S. Leeper", is positioned below the word "Sincerely,".

Mark S Leeper  
RVAAP Restoration Program Manager  
Army National Guard Directorate

cc: Rod Beals, Ohio EPA, DERR  
Justin Burke, Ohio EPA, DERR  
Bob Princic, Ohio EPA, DERR  
Kevin Sedlak, ARNG, Camp Ravenna  
Katie Tait, OHARNG, Camp Ravenna  
Gail Harris, Vista Science Corp.  
Gregory Moore, USACE, Louisville  
Travis McCoun, USACE, Baltimore



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

October 19, 2015

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

Subject: Ravenna Army Ammunition Plant Restoration Program  
DRAFT Work Plan  
Time-Critical Removal Action  
RVAAP-004-R-01 Open Demolition Area #2  
Camp Ravenna, Portage/Trumbull Counties, Ohio

Dear Mr. Princic:

The following designated Munitions Response Site (MRS) RVAAP-004-R-01 Open Demolition Area #2, located at the former Ravenna Army Ammunition Plant (RVAAP), has a mutually agreed upon Fiscal Year (FY) 2016 Director's Final Findings and Orders (DFFO) milestone that will not be achieved.

The "*Draft Time Critical Removal Action Work Plan*" will not meet its DFFO Milestone. The current milestone was developed earlier in FY15. Additional scope was realized during the planning and development of the Preliminary Draft Work Plan requiring additional level of effort and Army review to refine the proposed technical approach outlined in the document. The FY16 DFFO Milestone for issuance of a "*Draft Time Critical Removal Action Work Plan*" on 26 October 2015 will not be achieved. The Army proposes a revised DFFO Milestone Date of **27 November 2015**.

The Army requests Ohio EPA's review and concurrence with this request for a FY16 DFFO Milestone extension for the RVAAP-004-R-01 Open Demolition Area #2, Time Critical Removal Action Work Plan. Please contact the undersigned at (703) 607-7955 or [mark.s.leeper.civ@mail.mil](mailto:mark.s.leeper.civ@mail.mil) if there are issues or concerns with this submission.

Sincerely,

A handwritten signature in black ink, appearing to read "Mark S. Leeper", is positioned above the printed name.

Mark S Leeper  
RVAAP Restoration Program Manager  
Army National Guard Directorate

cc: Rod Beals, Ohio EPA, DERR



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

cc: Justin Burke, Ohio EPA, DERR  
Katie Tait, ARNG, Camp Ravenna  
Kevin Sedlak, ARNG, Camp Ravenna  
Gregory Moore, USACE, Louisville  
Gail Harris, Vista Science Corp.  
Travis McCoun, USACE, Baltimore



## NATIONAL GUARD BUREAU

111 SOUTH GEORGE MASON DRIVE  
ARLINGTON VA 22204-1373

October 13, 2015

Ohio Environmental Protection Agency  
DERR-NEDO

Attn: Mr. Drew Kocher  
2110 East Aurora Road  
Twinsburg, OH 44087-1924

Subject: Corrected Ohio EPA Project Code  
Ravenna Army Ammunition Plant Restoration Program  
Rocket Ridge (Sand Creek Stream Relocation) Project Summaries for 2013, 2014  
and 2015 RVAAP-004-R-01 Open Demolition Area 2 MRS  
Ohio EPA ID #267-000859-089  
Camp Ravenna, Portage/Trumbull Counties, Ohio

Dear Mr. Kocher:

The following documents were sent to you assembled in a binder and enclosed with a cover letter dated October 7, 2015:

- *Rocket Ridge Project Summary – Sand Creek Stream Relocation, Ravenna, Portage County, Ohio*, prepared by Davey Resource Group and dated September 6, 2013.
- *Rocket Ridge Project Summary – Sand Creek Stream Relocation, Year 1 Monitoring, Camp Ravenna Joint Military Training Center, Paris Township, Portage County, Ohio*, prepared by Davey Resource Group and dated September 25, 2014.
- *Rocket Ridge Project Summary – Sand Creek Stream Relocation, Year 3 Monitoring, Camp Ravenna Joint Military Training Center, Paris Township, Portage County, Ohio*, prepared by Davey Resource Group and dated September 17, 2015.

The cover letter heading and binder cover and title pages that accompanied the letters contained the wrong Ohio EPA coding for this project. The project coding has been corrected for this cover letter and the binder cover and title pages. The following revised documents are being sent to you enclosed with this letter:

- Two (2) REVISED cover and title pages.
- Two (2) REVISED CDs with corrected project coding.

Please replace the hard copy cover and title pages as appropriate. Please replace the CDs with the enclosed CDs. We apologize for the error and inconvenience.





## NATIONAL GUARD BUREAU

111 SOUTH GEORGE MASON DRIVE  
ARLINGTON VA 22204-1373

Please contact the undersigned at (703) 607-7955 or [Mark.S.Leeper.civ@mail.mil](mailto:Mark.S.Leeper.civ@mail.mil) if there are issues or concerns with this submission.

Sincerely,

Mark S Leeper  
RVAAP Restoration Program Manager  
Army National Guard Directorate

cc: Justin Burke, Ohio EPA, DERR (one [1] REVISED electronic copy)  
Eric Cheng, USACE – Louisville (one [1] REVISED electronic copy)  
Greg Moore, USACE – Louisville (one [1] REVISED electronic copy)  
Katie Tait/Kevin Sedlak, Camp Ravenna (one [1] REVISED electronic copy)  
Gail Harris, Vista Science Corp. (two [2] REVISED electronic copies, two [2] REVISED hard copy cover pages and title pages)

Enclosures: Two (2) hard copy Cover and Title Pages, two (2) REVISED electronic copies of Project Summaries



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

September 29, 2015

Mr. Mark Leeper, P.G., MBA  
Army National Guard Directorate  
Environmental Programs Division  
ARNGD-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  
267000859089

**Subject: Approval for the "Draft Action Memorandum, Time-Critical Removal Action, Open Demolition Area #2 MRS, RVAAP-004-R-01 at the Former Ravenna Army Ammunition Plant, Ravenna, Ohio," Dated August 14, 2015, Ohio EPA ID # 267-000859-089**

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 Action Memorandum, Time-Critical Removal Action, Open Demolition Area #2 MRS, RVAAP-004-R-01 at the Former Ravenna Army Ammunition Plant, Ravenna, Ohio," dated August 14, 2015. This document, received by Ohio EPA's NEDO on August 18, 2015, was prepared for the Army National Guard Directorate by the U.S. Army Corps of Engineers (USACE) Baltimore District.

Ohio EPA has reviewed this documentation and has found no significant deficiencies. As a result, the "Draft Action Memorandum, Time-Critical Removal Action, Open Demolition Area #2 MRS, RVAAP-004-R-01 at the Former Ravenna Army Ammunition Plant, Ravenna, Ohio," has been approved. Ohio EPA will be expecting the final document for review and approval.

If you have any questions or concerns, please do not hesitate to contact me at (330) 963-1249.

Sincerely,

Andrew C. Kocher, Site Coordinator  
Division of Environmental Response and Revitalization

ACK/nvr

cc: Paul E. Green, USACE, Baltimore District	Travis R. McCoun, USACE, Baltimore District
Katie Tait/Kevin Sedlak, Camp Ravenna	Haney/Harris, Vista Sciences, Newton Falls
ec: Rod Beals, NEDO, DERR	Bob Princic, NEDO, DERR
Justin Burke, CO, DERR	





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

June 2, 2015

Mr. Mark Leeper, P.G., MBA  
Army National Guard Directorate  
Environmental Programs Division  
ARNGD-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  
267000859089

**Subject: Approval for the "Final Memorandum For The Record, Recommended Path Forward, Open Demolition Area #2 MRS, RVAAP-004-R-01 at the Former Ravenna Army Ammunition Plant, Ravenna, Ohio," Dated March 26, 2015, Ohio EPA ID # 267-000859-089**

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 Memorandum For The Record, Recommended Path Forward, Open Demolition Area #2 MRS, RVAAP-004-R-01 at the Former Ravenna Army Ammunition Plant, Ravenna, Ohio," dated March 26, 2015. This document was prepared by the USACE Baltimore District and was received on March 27, 2015.

Ohio EPA has reviewed this documentation and has found no significant deficiencies. As a result, the "Final Memorandum For The Record, Recommended Path Forward, Open Demolition Area #2 MRS, RVAAP-004-R-01 at the Former Ravenna Army Ammunition Plant, Ravenna, Ohio," has been approved.

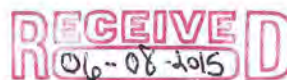
If you have any questions or concerns, please do not hesitate to contact me at (330) 963-1249.

Sincerely,

Andrew C. Kocher, Site Coordinator  
Division of Environmental Response and Revitalization

ACK/nvr

cc: Paul E. Green, USACE, Baltimore District	Travis R. McCoun, USACE, Baltimore District
Katie Tait/Kevin Sedlak, Camp Ravenna	Haney/Harris, Vista Sciences, Newton Falls
ec: Rod Beals, NEDO, DERR	Bob Princic, NEDO, DERR
Justin Burke, CO, DERR	







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

March 26, 2015

**Re: US Army Ravenna Ammunition Plt RVAAP  
Remediation Response  
Project records  
Remedial Response  
Portage County  
267000859**

Mr. Mark Leeper, P.G., MBA  
Army National Guard Directorate  
Environmental Programs Division  
ARNG-ILE-CR  
111 South George Mason Drive  
Arlington, VA 22204

**Subject: Approval for the "Final Remedial Investigation Report for RVAAP-004-R-01  
Open Demolition Area # 2 Munitions Response Site Version 1.0, Former  
Ravenna Army Ammunition Plant, Ravenna, Ohio," Dated February 27, 2015  
(Work Activity No. 267-000859-153)**

Dear Mr. Merkel:

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 Remedial Investigation Report for RVAAP-004-R-01 Open Demolition Area #2 Munitions Response Site Version 1.0, Former Ravenna Army Ammunition Plant, Ravenna, Ohio," dated February 27, 2015. This document, received by Ohio EPA's NEDO on March 3, 2015, was prepared by CB&I Federal Services LLC.

Ohio EPA has reviewed the additions made to this document and has no additional comments. As a result, the "Final Remedial Investigation Report for RVAAP-004-R-01 Open Demolition Area #2 Munitions Response Site Version 1.0" is approved in this final version.

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: Gregory F. Moore, USACE, Louisville District  
Katie Tait/Kevin Sedlak, Camp Ravenna Environmental Office, Newton Falls  
Haney/Harris, Camp Ravenna Environmental Office, Vista Sciences, Newton Falls  
ec: Rod Beals, Ohio EPA, NEDO, DERR  
Justin Burke, Ohio EPA, CO, DERR  
Andrew Kocher, Ohio EPA, NEDO, DERR



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

January 15, 2015

Mr. Mark Leeper, P.G., MBA  
Army National Guard Directorate  
Environmental Programs Division  
ARNG-ILE-CR  
703.607.7955  
111 South George Mason Drive  
Arlington, VA 22204

**Re: US Army Ravenna Ammunition Plt RVAAP  
Remediation Response  
Project Records  
Remedial Response  
Portage County  
267000859**

**Subject: Comments to the "Draft Response to Comments for the Remedial Investigation Report for RVAAP-004-R-01 Open Demolition Area 2, Former Ravenna Army Ammunition Plant, Ravenna, Ohio Version 1.0," Dated January 7, 2015 (Work Activity No. 267-000859-153)**

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 for the Draft Remedial Investigation Report for RVAAP-004-R-01 Open Demolition Area 2, Former Ravenna Army Ammunition Plant, Ravenna, Ohio Version 1.0," dated January 7, 2015. The document addressed the majority of the issues presented by Ohio EPA. This document, received by Ohio EPA's NEDO on January 8, 2015, was prepared by CB&I Federal Services LLC. Comments are as follows:

**Comment on Response to Comment O-2:** Ohio EPA agrees with the response; however, please include a summary of the second half of the response in the conclusions/recommendations section of the Executive Summary and Report. For example: "The recommended next course of action under the MMRP for ODA-2 is to conduct a MRSP meeting to reevaluate the MRS boundary and the Buffer Area. Following this determination, it is recommended that a Feasibility Study be conducted to address remaining MEC and MD." (The MRS will need to be expanded to include the Buffer Area –OR– a new MRS Area of Concern will need to be created that includes the Buffer Area.)

The remaining comments that were reviewed in the "Response to Comments for the Draft Remedial Investigation Report for RVAAP-004-R-01 Open Demolition Area 2,

Northeast District Office • 2110 East Aurora Road • Twinsburg, OH 44087-1924  
www.epa.ohio.gov • (330) 963-1200 • (330) 487-0769 (fax)

**Scanned**

By: *AMH*  
Date: 01-20-2015

**RECEIVED**  
01-20-2015

**E-MAILED**  
01-20-2015 AMH



MR. MARK LEEPER  
ARMY NATIONAL GUARD DIRECTORATE  
JANUARY 15, 2015  
PAGE 2

Former Ravenna Army Ammunition Plant, Ravenna, Ohio Version 1.0," dated January 7, 2015, were accepted, and no further comments are necessary.

If you have any questions or concerns, please do not hesitate to contact me at (330) 963-1245.

Sincerely,



Nicholas Roope  
Site Coordinator  
Division of Environmental Response and Revitalization

NPR/nvr

cc: Gregory F. Moore, USACE, Louisville District  
Katie Tait/Kevin Sedlak, Camp Ravenna Environmental Office, Newton Falls  
Haney/Harris, Camp Ravenna Environmental Office, Vista Sciences, Newton Falls

ec: Rod Beals, Ohio EPA, NEDO, DERR  
Justin Burke, Ohio EPA, CO, DERR  
Andrew Kocher, Ohio EPA, NEDO, DERR



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

September 21, 2015

Mr. Mark Leeper, P.G., MBA  
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  
267000859210**

**Subject: Approval of the "Final No Further Action Record of Decision for RVAAP-008-R-01 Load Line #1A Munitions Response Site, Version 1.0" Former Ravenna Army Ammunition Plant, Ravenna, Ohio: Dated August 14, 2015 (Work Activity No. 267-000859-210)**

Dear Mr. Leeper:

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-008-R-01 Load Line #1A Munitions Response Site, Version 1.0" document dated August 14, 2015. This document received by Ohio EPA's NEDO on August 14, 2015, was prepared by CB&I Federal Services LLC.

The Military Munitions Response Program (MMRP) Remedial Investigation (RI) for the Load Line #1A munitions response site investigated the potential presence of munitions debris and munitions of explosives of concern within the defined portion of the Load Line #1A area. In addition to the MMRP RI, investigation and remediation activities under the installation restoration program have been ongoing at the Load Line #1 area of concern since 1996. As there are no further comments or potential issues to address for the Load Line #1A munitions response site, Ohio EPA concurs with the remedy of no further action and has signed and dated the final record of decision for the Load Line #1 area of concern and will submit a signed copy for your records.



MR. MARK LEEPER, P.G., MBA  
ARMY NATIONAL GUARD DIRECTORATE  
SEPTEMBER 3, 2015  
PAGE 2

If you have any questions or concerns, please do not hesitate to contact me at (614) 644-2896.

Sincerely,

A handwritten signature in black ink, appearing to read "Peter Whitehouse", with a stylized flourish at the end.

Peter Whitehouse  
Division Chief  
Division of Environmental Response and Revitalization

PW:NCR/nvr

cc: Gregory F. Moore, USACE, Louisville District  
Katie Tait/Kevin Sedlak, Camp Ravenna Environmental Office, Newton Falls

ec: Rod Beals, Ohio EPA, NEDO, DERR  
Robert Princic, Ohio EPA, NEDO, DERR  
Justin Burke, Ohio EPA, CO, DERR  
Andrew Kocher, Ohio EPA, NEDO, DERR  
Nicholas Roope, Ohio EPA, NEDO, DERR



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

August 7, 2015

Mr. Mark Leeper, P.G., MBA  
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  
267000859210**

**Subject: Review of the "Draft No Further Action Record of Decision for RVAAP-008-R-01 Load Line # 1A Munitions Response Site Version 1.0," Former Ravenna Army Ammunition Plant, Ravenna, Ohio: Dated July 29, 2015 (Work Activity No. 267-000859-210)**

Dear Mr. Leeper:

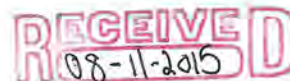
The Ohio Environmental Protection Agency (Ohio EPA), Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR) has received and reviewed the, "Draft No Further Action Record of Decision for RVAAP-008-R-01 Load Line # 1A Munitions Response Site Version 1.0," dated July 29, 2015. This document, received by Ohio EPA's NEDO on July 30, 2015, was prepared by CB&I Federal Services LLC. Ohio EPA has completed the review of the draft record of decision and has no further comments. Please submit the final copy of the document for approval.

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: Gregory F. Moore, USACE, Louisville District  
Katie Tait/Kevin Sedlak, Camp Ravenna Environmental Office, Newton Falls  
Haney/Harris, Camp Ravenna Environmental Office, Vista Sciences, Newton Falls  
ec: Rod Beals, Ohio EPA, NEDO, DERR  
Bob Princic, Ohio EPA, NEDO, DERR  
Justin Burke, Ohio EPA, CO, DERR  
Andrew Kocher, Ohio EPA, NEDO, DERR







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

May 18, 2015

Re: US Army Ravenna Ammunition Plt RVAAP  
Remediation Response  
Plans  
Remedial Response  
Portage County  
267000859210

Mr. Mark Leeper, P.G., MBA  
Army National Guard Directorate  
Environmental Programs Division  
ARNG-ILE-CR  
111 South George Mason Drive  
Arlington, VA 22204

**Subject: Approval of the "Final No Further Action Proposed Plan for RVAAP-008-R-01 Load Line #1A Munitions Response Site, Version 1.0" Former Ravenna Army Ammunition Plant, Ravenna, Ohio: Dated May 6, 2015 (Work Activity No. 267-000859-210)**

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 No Further Action Proposed Plan for RVAAP-008-R-01 Load Line #1A Munitions Response Site, Version 1.0" document, dated May 6, 2015. This document, received by Ohio EPA's Northeast District Office (NEDO) on May 7, 2015, was prepared by CB&I Federal Services, LLC. Ohio EPA concurs with the remedy.

The Military Munitions Response Program (MMRP) Remedial Investigation (RI) for the Load Line #1 munitions response site investigated the potential presence of Munitions Debris and Munitions of Explosives of Concern within a defined portion of the Load Line #1 Area of Concern (AOC). The area investigated was renamed Load Line #1A to differentiate any other areas within the Load Line #1 AOC that may require further investigation under the MMRP. In addition to the MMRP RI, investigation and remediation activities under the installation restoration program have been ongoing at the Load Line #1 area of concern, since 1996.

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

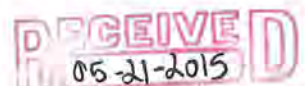
Sincerely,

Nicholas Roope, Site Coordinator  
Division of Environmental Response and Revitalization

NCR/nvr

cc: Gregory F. Moore, USACE  
Haney/Harris, Vista Sciences  
ec: Rod Beals, NEDO, DERR  
Andrew Kocher, NEDO, DERR

Katie Tait/Kevin Sedlak, Newton Falls  
Justin Burke, Ohio EPA, CO, DERR







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

April 14, 2015

Mr. Mark Leeper, P.G., MBA  
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  
267000859210**

**Subject: Approval for the "Draft No Further Action Proposed Plan for RVAAP-008-R-01 Load Line # 1A Munitions Response Site, Version 1.0" Former Ravenna Army Ammunition Plant, Ravenna, Ohio: Dated March 31, 2015 (Work Activity No. 267-000859-210)**

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-008-R-01 Load Line # 1A Munitions Response Site, Version 1.0," dated March 31, 2015. This document, received by Ohio EPA's NEDO on April 1, 2015, was prepared by the CB&I Federal Services, LLC.

Ohio EPA has completed the review of the "Draft No Further Action Proposed Plan for RVAAP-008-R-01 Load Line # 1A Munitions Response Site, Version 1.0" and has no comments. Please add the updated figure and the dates in which the public meeting will take place in the final version of the No Further Action Proposed Plan for RVAAP-008-R-01 Load Line # 1A Munitions Response Site, Version 1.0. Also, note that the work activity number has changed to reflect the progression of the project. When sending documents pertaining to the proposed plan for the Load Line # 1A Munitions Response Site, Version 1.0 in the future please use the 267-000859-210 numerical identification as shown above.

MR. MARK LEEPER, P.G., MBA  
ARMY NATIONAL GUARD DIRECTORATE  
APRIL 15, 2015  
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', with a stylized, flowing script.

Nicholas Roope  
Site Coordinator  
Division of Environmental Response and Revitalization

NCR/nvr

cc: Gregory F. Moore, USACE, Louisville District  
Katie Tait/Kevin Sedlak, Camp Ravenna Environmental Office, Newton Falls  
Haney/Harris, Camp Ravenna Environmental Office, Vista Sciences

ec: Rod Beals, Ohio EPA, NEDO, DERR  
Justin Burke, Ohio EPA, CO, DERR  
Andrew Kocher, Ohio EPA, NEDO, DERR



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

June 18, 2015

Mr. Mark Leeper, P.G., MBA  
Army National Guard 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  
267000859149**

**Subject: Approval for the "Final Remedial Investigation Report for RVAAP-016-R-01 Fuze and Booster Quarry Munitions Response Site, Version 1.0," Former Ravenna Army Ammunition Plant, Ravenna, Ohio; Dated June 5, 2015 (Work Activity No. 267-000859-149)**

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 Remedial Investigation Report for RVAAP-016-R-01 Fuze and Booster Quarry Munitions Response Site, Version 1.0," dated June 5, 2015. This document, received by Ohio EPA-NEDO on June 8, 2015, was prepared by CB&I Federal Services LLC.

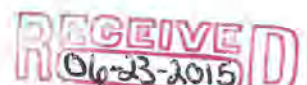
Ohio EPA has reviewed the additions made to this document and has no additional comments. As a result, the "Final Remedial Investigation Report for RVAAP-016-R-01 Fuze and Booster Quarry Munitions Response Site, Version 1.0" is approved in this final version.

Sincerely,

Nicholas Roope, Site Coordinator  
Division of Environmental Response and Revitalization

NCR/nvr

cc: Gregory F. Moore, USACE, Louisville District  
Katie Tait/Kevin Sedlak, Camp Ravenna Environmental Office, Newton Falls  
Haney/Harris, Camp Ravenna Environmental Office, Vista Sciences, Newton Falls  
ec: Rod Beals, Ohio EPA, NEDO, DERR  
Bob Princic, Ohio EPA, NEDO, DERR  
Justin Burke, Ohio EPA, CO, DERR  
Andrew Kocher, Ohio EPA, NEDO, DERR







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

May 27, 2015

Mr. Mark Leeper, P.G., MBA  
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  
267000859149

**Subject:** Review of the "Responses to Ohio EPA Comments on the Draft Remedial Investigation Report for RVAAP-016-R-01 Fuze and Booster Quarry Munitions Response Site, Version 1.0," Former Ravenna Army Ammunition Plant, Ravenna, Ohio; Dated January 16, 2015 (Work Activity No. 267-000859-149)

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; "Responses to Ohio EPA Comments on the Draft Remedial Investigation Report for RVAAP-016-R-01 Fuze and Booster Quarry Munitions Response Site, Version 1.0," dated January 16, 2015. This document, received by Ohio EPA's NEDO on April 17 2015, was prepared by CB&I Federal Services LLC.

Ohio EPA concurs with the responses submitted, and requests that the final document be submitted for approval. 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: Gregory F. Moore, USACE, Louisville District  
Katie Tait/Kevin Sedlak, Camp Ravenna Environmental Office, Newton Falls  
Haney/Harris, Camp Ravenna Environmental Office, Vista Sciences

ec: Rod Beals, Ohio EPA, NEDO, DERR  
Justin Burke, Ohio EPA, CO, DERR  
Andrew Kocher, Ohio EPA, NEDO, DERR

RECEIVED  
06-01-2015



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

March 26, 2015

Mr. Mark Leeper, P.G., MBA  
Army National Guard Directorate  
Environmental Programs Division  
ARNG-ILE-CR  
703.607.7955  
111 South George Mason Drive  
Arlington, VA 22204

**Re: US Army Ravenna Ammunition Plt RVAAP  
Remediation Response  
Project Records  
Remedial Response  
Portage County  
267000859**

**Subject: Comments for the "Draft Remedial Investigation Report for RVAAP-016-R-01 Fuze and Booster Quarry Munitions Response Site, Version 1.0," Former Ravenna Army Ammunition Plant, Ravenna, Ohio," Dated January 16, 2015 (Work Activity No. 267000859149)**

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 Remedial Investigation Report for RVAAP-016-R-01 Fuze and Booster Quarry Munitions Response Site, Version 1.0," dated January 16, 2015. This document, received by Ohio EPA's NEDO on January 20, 2015, was prepared by CB&I Federal Services LLC, under Contract No. W912DR-09-D-0005.

**Issue 1:** Pages ES-3, 1-27, and 9-5: The text states, "...facility personnel have stated that the northern and southern ponds contained munitions items that were not verified as Munitions of Explosive Concern (MEC) or Munitions Debris (MD)." This description of what was reported is confusing to the reader. Did the facility personnel not know if the items were MEC/MD? Or, were the items that the personnel reported not observed/believed to be MEC/MD, based on the description of the items and/or expertise of the individuals providing the description? Please clarify the description of what "...were not verified as MEC/MD..." means in this context.

**Issue 2:** Page 4-30 states that 11 metals are considered Munitions Constituents (MC) associated with munitions; however, the conclusions state that no MC was detected since MEC/MD was not present at the site. The document concludes that there is a level of uncertainty of the presence of MEC/MD that must be determined in the



Feasibility Study., and, as stated in Issue 1, munitions items that are not verified as MEC/MD may be present. Additionally, due to the steep slope, digital geophysical mapping could not be completed to show the slope was clear of potential MEC/MD items. Based on the noted uncertainty, please explain potential sources of elevated metals in sediment with no apparent MEC/MD sources and the rationale for eliminating MC as an MMRP-related concern with this uncertainty still yet to be evaluated fully.

**Issue 3:** A Level III Ecological Risk Assessment was performed with all site related chemicals that exceeded the Level II assessment criteria. However, Section 8.4.1.3 includes the benthic invertebrates as aquatic receptors, and they should be quantitatively assessed in the Level III or retained as receptors of concern. Section 8.3.5.2 summarizes the results of the facility-wide water quality study and that "in situ macro-invertebrate abundance and diversity, as measured through trap sampling, was reduced in the quarry pond."

**Issue 4:** Tables 8-4 and 8-5 summarize the concentrations of chemicals of possible concern (COPECs) and hazard quotients (HQs) for COPECs, respectively. Figure 1-9 shows the close proximity of munition debris locations in the southeast corner of the south pond. The incremental wet sediment sample unit FBQsd-210m results documented multiple COPECs in the southern portion of the south pond. Due to the singular ISM results, chemicals of concern (COCs) (primarily lead) may still remain in higher concentrations than what were found and cannot be fully analyzed under the ecological risk assessment (ERA) as intended. As stated in Section 8.4.5, page 8-62, "The finding of multiple COPECs, in particular metals contamination in the area of sample location FBQsd-210M-001-SD at the southern portion of the south pond, indicates that localized impacts to benthic invertebrate communities inhabiting the wet sediment cannot be ruled out at the Fuze and Booster Quarry MRS. Furthermore, the potential exists for adverse effects associated with food chain transfer." Please explain the next course of action to further define the nature and extent of COCs to address the COPECs.

**Issue 5:** As described in Section 8.4.1.3, two herbivores and two carnivores were assessed, but no invertivores. Refer to Table D-1 of Ohio EPA's DERR *Ecological Risk Assessment Guidance Document*, Revised April 2008. A spotted sandpiper, an invertivore with a relatively small home range, is recommended to assess exposures to the COPECs in the ponds and the benthic invertebrates. The analysis does not focus on species that have a limited home range that will be the most susceptible to contaminants at the MRS. Please address this issue.

**Issue 6:** The risk assessment for this site, based on MC detections, shows unacceptable risk for both the residential/unrestricted scenarios, and for ecological risk without discussion of how to manage this risk or a commitment that risk management of MC will be evaluated in the Feasibility Study. If Ohio EPA can concur that the

MR. MARK LEEPER, P.G., MBA  
ARMY NATIONAL GUARD DIRECTORATE  
MARCH 26, 2015  
PAGE 3

unacceptable risk from MC did not come from MEC/MD releases, Ohio EPA also expects that the risk noted in this military munitions response program (MMRP) investigation will be addressed in the installation restoration program (IRP) investigation for this property, including use of the data and risk evaluations completed and presented in the MMRP IR. Additionally, it should be noted that restriction of use based on the observed unacceptable risk for the unrestricted/residential land use, in this case being the National Guard Trainee, should be included in the project management plan (PMP), assuming that the MC investigation is complete. If the observed conditions in wet sediment are going to be addressed in the IRP investigation, please note that in this document and briefly explain in the response to comments how that transition to the IRP investigation will take place and be tracked.

Please let us know if you would like to schedule a conference call to provide clarity to the paragraph above. 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: Gregory F. Moore, USACE, Louisville District  
Katie Tait/Kevin Sedlak, Camp Ravenna Environmental Office, Newton Falls  
Haney/Harris, Vista Sciences, Newton Falls

ec: Rod Beals, Ohio EPA, NEDO, DERR  
Justin Burke, Ohio EPA, CO, DERR  
Andrew Kocher, Ohio EPA, NEDO, DERR



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

May 18, 2015

Re: US Army Ravenna Ammunition Plt RVAAP  
Remediation Response  
Project records  
Remedial Response  
Portage County  
267000859070

Mr. Mark Leeper, P.G., MBA  
Army National Guard Directorate  
Environmental Programs Division  
ARNG-ILE-CR  
111 South George Mason Drive  
Arlington, VA 22204

**Subject: Approval of the "Final Remedial Investigation Report for RVAAP-032-R-01 40mm Firing Range Munitions Response Site Version 1.0, Former Ravenna Army Ammunition Plant, Ravenna, Ohio," Dated April 30, 2015 (Work Activity No. 267-000859-070)**

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 Remedial Investigation Report for RVAAP-032-R-01 40mm Firing Range Munitions Response Site Version 1.0, Former Ravenna Army Ammunition Plant, Ravenna, Ohio," dated April 30, 2015. This document received by Ohio EPA, Northeast District Office (NEDO) on May 1, 2015, was prepared by CB&I Federal Services, LLC, in response to comments issued by Ohio EPA on April 15, 2015.

Ohio EPA concurs with the "Final Remedial Investigation Report for RVAAP-032-R-01 40mm Firing Range Munitions Response Site Version 1.0, Former Ravenna Army Ammunition Plant, Ravenna, Ohio".

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: Gregory F. Moore, USACE  
Haney/Harris, Vista Sciences  
ec: Rod Beals, NEDO, DERR  
Andrew Kocher, NEDO, DERR

Katie Tait/Kevin Sedlak, Newton Falls  
Justin Burke, Ohio EPA, CO, DERR







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

April 15, 2015

Mr. Mark Leeper, P.G., MBA  
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  
267000859070

**Subject:** Approval of the "Response to Comments for the Draft Remedial Investigation Report for RVAAP-032-R-01 40mm Firing Range Munitions Response Site Version 1.0, Former Ravenna Army Ammunition Plant, Ravenna, Ohio," Dated March 31, 2015 (Work Activity No. 267-000859-070)

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, "Response to Comments for the Draft Remedial Investigation Report for RVAAP-032-R-01 40mm Firing Range Munitions Response Site Version 1.0, Former Ravenna Army Ammunition Plant, Ravenna, Ohio," dated March 31, 2015. This document received by Ohio EPA's NEDO on March 31, 2015, was prepared by CB&I Federal Services LLC.

Ohio EPA has no further comments; please submit the final version of the remedial investigation.

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: Gregory F. Moore, USACE, Louisville District  
Katie Tait/Kevin Sedlak, Camp Ravenna Environmental Office, Newton Falls  
Haney/Harris, Camp Ravenna Environmental Office, Vista Sciences, Newton Falls

ec: Rod Beals, Ohio EPA, NEDO, DERR  
Justin Burke, Ohio EPA, CO, DERR  
Andrew Kocher, Ohio EPA, NEDO, DERR

RECEIVED  
04-21-2015



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

March 20, 2015

Mr. Mark Leeper, P.G., MBA  
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  
267000859**

**Subject: Comments for the "Draft Remedial Investigation Report for RVAAP-032-R-01 40mm Firing Range Munitions Response Site Version 1.0, Former Ravenna Army Ammunition Plant, Ravenna, Ohio," Dated February 13, 2015 (Work Activity No. 267000859070)**

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 Remedial Investigation Report for RVAAP-032-R-01 40mm Firing Range Munitions Response Site Version 1.0, Former Ravenna Army Ammunition Plant, Ravenna, Ohio," dated February 13, 2015. This document received by Ohio EPA's NEDO on February 17, 2015, was prepared by CB&I Federal Services LLC. Please find Ohio EPA comments listed below.

1. **Disposal Records** – Pages 1-23 and 3-20 supply information pertaining to the removal of the berm at the firing range. However, there has been no documentation of where the berm material has been placed. Page 3-20 states that some of the berm material, pea gravel, remains at the site and has been mixed in with the soil. Please provide the location of the remaining berm material that was removed from the site in the report, pages 1-23 and 3-20, and the response to comments.
2. **Off-site Potential** – Figure 1-8 shows that there may be a potential for surface water runoff from the 40mm area of concern (AOC) to the Fuze and Booster Quarry AOC. Please provide, in the text of the report, a demonstration that the 40mm AOC is not a source of potential chemicals of concern (COCs) that are found in the Fuze and Booster Quarry. If this cannot be demonstrated without



MR. MARK LEEPER, P.G., MBA  
ARMY NATIONAL GUARD DIRECTORATE  
MARCH 20, 2015  
PAGE 2

additional fieldwork, please note in the report that this issue will be resolved during the feasibility study.

3. **Conceptual Site Model** – Figures 9-1 and 9-2 of the conceptual site models are using Group 8 as the source area. Please address this issue to reflect the appropriate source area.

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: Gregory F. Moore, USACE, Louisville District  
Katie Tait/Kevin Sedlak, Camp Ravenna Environmental Office, Newton Falls  
Haney/Harris, Vista Sciences, Newton Falls

ec: Rod Beals, Ohio EPA, NEDO, DERR  
Justin Burke, Ohio EPA, CO, DERR  
Andrew Kocher, Ohio EPA, NEDO, DERR



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

September 21, 2015

**Re: US Army Ravenna Ammunition Plt RVAAP  
Remediation Response  
Approval  
Remedial Response  
Portage County  
267000859209**

Mr. Mark Leeper, P.G., MBA  
Army National Guard Directorate  
Environmental Programs Division  
ARNG-ILE-CR  
111 South George Mason Drive  
Arlington, VA 22204

**Subject: Approval of the "Final No Further Action Record of Decision for  
RVAAP-033-R-01 Firestone Test Facility Munitions Response Site,  
Version 1.0" Former Ravenna Army Ammunition Plant, Ravenna,  
Ohio: Dated August 14, 2015 (Work Activity No. 267-000859-209)**

Dear Mr. Leeper:

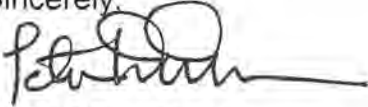
Ohio Environmental Protection Agency (Ohio EPA), Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR) has received and reviewed the, "Final No Further Action Record of Decision for RVAAP-033-R-01 Firestone Test Facility Munitions Response Site, Version 1.0" document dated August 14, 2015. This document received by Ohio EPA's NEDO on August 14, 2015, was prepared by CB&I Federal Services LLC.

The Military Munitions Response Program (MMRP) Remedial Investigation (RI) for the Firestone Test Facility munitions response site investigated the potential presence of munitions debris and munitions of explosives of concern within the defined portion of the Firestone Test Facility area. As there are no further comments or potential issues to address for the Firestone Test Facility munitions response site, Ohio EPA concurs with the remedy of no further action and has signed and dated the final record of decision for the Firestone Test Facility area of concern and will submit a signed copy for your records.

MR. MARK LEEPER, P.G., MBA  
ARMY NATIONAL GUARD DIRECTORATE  
SEPTEMBER 2, 2015  
PAGE 2

If you have any questions or concerns, please do not hesitate to contact me at (614) 644-2896.

Sincerely,

A handwritten signature in black ink, appearing to read 'Peter Whitehouse', with a long horizontal flourish extending to the right.

Peter Whitehouse  
Division Chief  
Division of Environmental Response and Revitalization

PW:NCR/nvr

cc: Gregory F. Moore, USACE, Louisville District  
Katie Tait/Kevin Sedlak, Camp Ravenna Environmental Office, Newton Falls

ec: Rod Beals, Ohio EPA, NEDO, DERR  
Robert Princic, Ohio EPA, NEDO, DERR  
Justin Burke, Ohio EPA, CO, DERR  
Andrew Kocher, Ohio EPA, NEDO, DERR  
Nicholas Roope, Ohio EPA, NEDO, DERR



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

July 27, 2015

Mr. Mark Leeper, P.G., MBA  
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  
267000859209

**Subject:** Review of the "Draft No Further Action Record of Decision for RVAAP-033-R-01 Firestone Test Facility Munitions Response Site Version 1.0," Former Ravenna Army Ammunition Plant, Ravenna, Ohio: Dated July 22, 2015 (Work Activity No. 267-000859-209)

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 "Draft No Further Action Record of Decision for RVAAP-033-R-01 Firestone Test Facility Munitions Response Site, Version 1.0" dated July 22, 2015. This document was received by Ohio EPA, NEDO on July 23, 2015. Ohio EPA has completed the review of the draft record of decision and has no further comments. Please submit the final copy of the document for approval.

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: Gregory F. Moore, USACE, Louisville District  
Katie Tait/Kevin Sedlak, Camp Ravenna Environmental Office, Newton Falls  
Haney/Harris, Camp Ravenna Environmental Office, Vista Sciences, Newton Falls

ec: Rod Beals, Ohio EPA, NEDO, DERR  
Bob Princic, Ohio EPA, NEDO, DERR  
Justin Burke, Ohio EPA, CO, DERR  
Andrew Kocher, Ohio EPA, NEDO, DERR





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

May 18, 2015

**Re: US Army Ravenna Ammunition Plt RVAAP  
Remediation Response  
Plans  
Remedial Response  
Portage County  
267000859209**

Mr. Mark Leeper, P.G., MBA  
Army National Guard Directorate  
Environmental Programs Division  
ARNG-ILE-CR  
111 South George Mason Drive  
Arlington, VA 22204

**Subject: Approval of the "Final No Further Action Proposed Plan for RVAAP-033-R-01 Firestone Test Facility Munitions Response Site Version 1.0," Former Ravenna Army Ammunition Plant, Ravenna, Ohio:  
Dated May 6, 2015 (Work Activity No. 267-000859-209)**

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 No Further Action Proposed Plan for RVAAP-033-R-01 Firestone Test Facility Munitions Response Site Version 1.0," dated May 6, 2015. This document received by Ohio EPA's NEDO on May 7, 2015, was prepared by CB&I Federal Services, LLC. Ohio EPA concurs with this remedy. Additional remedial investigation will be completed in the future under the installation restoration program.

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: Gregory F. Moore, USACE  
Haney/Harris, Vista Sciences

Katie Tait/Kevin Sedlak, Newton Falls

ec: Rod Beals, NEDO, DERR  
Andrew Kocher, NEDO, DERR

Justin Burke, Ohio EPA, CO, DERR

RECEIVED  
05 21-2015





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

April 14, 2015

Mr. Mark Leeper, P.G., MBA  
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  
267000859209**

**Subject: Approval for the "Draft No Further Action Proposed Plan for RVAAP-033-R-01 Firestone Test Facility Munitions Response Site Version 1.0," Former Ravenna Army Ammunition Plant, Ravenna, Ohio, Dated March 31, 2015 (Work Activity No. 267-000859-209)**

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-033-R-01 Firestone Test Facility Munitions Response Site Version 1.0," dated March 31, 2015. This document, received by Ohio EPA's NEDO on April 1, 2015, was prepared by CB&I Federal Services LLC.

Ohio EPA has reviewed this documentation and has no comments. As a result, the "Draft No Further Action Proposed Plan for RVAAP-033-R-01 Firestone Test Facility Munitions Response Site Version 1.0" is approved in this version. Please add the dates in which the public meeting will take place in the final version, and note that the work activity number has changed to reflect the progression of the project. When sending documents pertaining to the proposed plan for the Firestone Test Facility Munitions Response Site in the future please use the 267-000859-209 numerical identification as shown above.

MR. MARK LEEPER, P.G., MBA  
ARMY NATIONAL GUARD DIRECTORATE  
APRIL 15, 2015  
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', with a stylized, flowing script.

Nicholas Roope  
Site Coordinator  
Division of Environmental Response and Revitalization

NCR/nvr

cc: Gregory F. Moore, USACE, Louisville District  
Katie Tait/Kevin Sedlak, Camp Ravenna Environmental Office, Newton Falls  
Haney/Harris, Camp Ravenna Environmental Office, Vista Sciences

ec: Rod Beals, Ohio EPA, NEDO, DERR  
Justin Burke, Ohio EPA, CO, DERR  
Andrew Kocher, Ohio EPA, NEDO, DERR



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

December 3, 2015

**Re: US Army Ravenna Ammunition Plt RVAAP  
Remediation Response  
Approval  
Remedial Response  
Portage County  
267000859226**

Mr. Mark Leeper, P.G., MBA  
Army National Guard Directorate  
Environmental Programs Division  
ARNG-ILE-CR  
111 South George Mason Drive  
Arlington, VA 22204

**Subject: Approval of the "Final No Further Action Record of Decision for  
RVAAP-034-R-01 Sand Creek Dump Munitions Response Site,  
Version 1.0" Former Ravenna Army Ammunition Plant, Ravenna,  
Ohio: Dated September 29, 2015 (Work Activity No. 267-000859-226)**

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 No Further Action Record of Decision for RVAAP-034-R-01 Sand Creek Dump Munitions Response Site, Version 1.0" document, dated September 29, 2015. This document received by Ohio EPA's NEDO on September 30, 2015, was prepared by CB&I Federal Services LLC.

The Military Munitions Response Program (MMRP) Remedial Investigation (RI) for the RVAAP-034-R-01 Sand Creek Dump Munitions Response Site (MRS) investigated the potential presence of munitions debris and munitions of explosives of concern within the defined portion of the MRS area. The MRS was investigated due to historical knowledge and reports of potential munitions items being dumped between 1950 through 1960. The site is collocated with an installation restoration program area of concern (Sand Creek Disposal Road Landfill) that will continue to be addressed after no further action has occurred for the MMRP. No evidence of MEC or source of MC was found at the MRS during the RI field work. Based on these results, no risks associated with exposures to MEC or MC appear to be present. As there are no further comments or potential issues to address for the MRS, Ohio EPA concurs with the remedy of no further action and has signed and dated the final record of decision for the MRS and will submit a signed copy for your records.



Mr. Mark Leeper, P.G., MBA  
Army National Guard Directorate  
Page 2

If you have any questions or concerns, please do not hesitate to contact me at (614) 644-2896.

Sincerely,



Peter Whitehouse  
Division Chief  
Division of Environmental Response and Revitalization

PW:NCR/nvr

- cc: Gregory F. Moore, USACE, Louisville District  
Katie Tait/Kevin Sedlak, Camp Ravenna Environmental Office, Newton Falls  
Haney/Harris, Camp Ravenna Environmental Office, Vista Sciences, Newton Falls
- ec: Rod Beals, Ohio EPA, NEDO, DERR  
Robert Princic, Ohio EPA, NEDO, DERR  
Justin Burke, Ohio EPA, CO, DERR  
Andrew Kocher, Ohio EPA, NEDO, DERR  
Nicholas Roope, Ohio EPA, NEDO, DERR



September 21, 2015

Re: US Army Ravenna Ammunition Plt RVAAP  
Remediation Response  
Plans  
Remedial Response  
Portage County  
267000859226

Mr. Mark Leeper, P.G., MBA  
Army National Guard Directorate  
Environmental Programs Division  
ARNG-ILE-CR  
111 South George Mason Drive  
Arlington, VA 22204

**Subject:** Review of the "Draft No Further Action Record of Decision for RVAAP-034-R-01 Sand Creek Dump Munitions Response Site, Version 1.0," Former Ravenna Army Ammunition Plant, Ravenna, Ohio: Dated August 31, 2015 (Work Activity No. 267-000859-226)

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 "Draft No Further Action Record of Decision for RVAAP-034-R-01 Sand Creek Dump Munitions Response Site Version 1.0," dated August 31, 2015. This document received by Ohio EPA's NEDO on September 1, 2015, was prepared by CB&I Federal Services LLC. Ohio EPA has completed the review of the draft record of decision and has no further comments. Please submit the final copy of the document for approval.

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: Gregory F. Moore, USACE, Louisville District  
Katie Tait/Kevin Sedlak, Camp Ravenna Environmental Office, Newton Falls  
Haney/Harris, Camp Ravenna Environmental Office, Vista Sciences, Newton Falls  
ec: Rod Beals, Ohio EPA, NEDO, DERR  
Bob Princic, Ohio EPA, NEDO, DERR  
Justin Burke, Ohio EPA, CO, DERR  
Andrew Kocher, Ohio EPA, NEDO, DERR

RECEIVED  
09-24-2015





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

July 27, 2015

Re: US Army Ravenna Ammunition Plt RVAAP  
Remediation Response  
Plans  
Remedial Response  
Portage County  
267000859226

Mr. Mark Leeper, P.G., MBA  
Army National Guard Directorate  
Environmental Programs Division  
ARNG-ILE-CR  
111 South George Mason Drive  
Arlington, VA 22204

Subject: Approval of the "Final No Further Action Proposed Plan for RVAAP-034-R-01 Sand Creek Dump Munitions Response Site, Version 1.0" Former Ravenna Army Ammunition Plant, Ravenna, Ohio: Dated May 28, 2015 (Work Activity No. 267-000859-226)

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 No Further Action Proposed Plan for RVAAP-034-R-01 Sand Creek Dump Munitions Response Site, Version 1.0" document, dated May 28, 2015 and received by Ohio EPA's NEDO on May 29, 2015.

The Military Munitions Response Program (MMRP) Remedial Investigation (RI) for the Sand Creek Dump munitions response site investigated only the potential presence of munitions debris, munitions of explosive concern, and associated munitions constituents within the defined portion of the Sand Creek Dump. Ohio EPA concurs with the preferred remedy of no further action described in this MMRP Proposed Plan for concerns at the Sand Creek Dump Munitions Response Site.

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

Sincerely,

Peter Whitehouse, Division Chief  
Division of Environmental Response and Revitalization

cc: Gregory F. Moore, USACE, Louisville District  
Katie Tait/Kevin Sedlak, Camp Ravenna Environmental Office, Newton Falls  
Haney/Harris, Camp Ravenna Environmental Office, Vista Sciences, Newton Falls  
ec: Rod Beals, Ohio EPA, NEDO, DERR  
Robert Princic, Ohio EPA, NEDO, DERR  
Justin Burke, Ohio EPA, CO, DERR  
Andrew Kocher, Ohio EPA, NEDO, DERR  
Nicholas Roope, Ohio EPA, NEDO, DERR



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

May 18, 2015

Re: US Army Ravenna Ammunition Plt RVAAP  
Remediation Response  
Plans  
Remedial Response  
Portage County  
267000859226

Mr. Mark Leeper, P.G., MBA  
Army National Guard Directorate  
Environmental Programs Division  
ARNG-ILE-CR  
111 South George Mason Drive  
Arlington, VA 22204

**Subject:** Review of the "Draft No Further Action Proposed Plan for RVAAP-034-R-01 Sand Creek Dump Munitions Response Site," Former Ravenna Army Ammunition Plant, Ravenna, Ohio: Dated April 23, 2015 (Work Activity No. 267-000859-226)

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-034-R-01 Sand Creek Dump Munitions Response Site," dated April 24, 2015. This document, received by Ohio EPA's Northeast District Office (NEDO) on April 23, 2015, was prepared by the CB&I Federal Services, LLC. Ohio EPA has no comments. Please add dates in which the public meeting will take place in the final version of the No Further Action Proposed Plan for the RVAAP-034-R-01 Sand Creek Dump Munitions Response Site. Also, note that the work activity number has changed to reflect the progression of the project. When sending documents pertaining to the proposed plan for the Sand Creek Dump Munitions Response Site, in the future, please use the 267-000859-226 numerical identification, as shown above.

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: Gregory F. Moore, USACE  
Haney/Harris, Vista Sciences

Katie Tait/Kevin Sedlak, Newton Falls

ec: Rod Beals, NEDO, DERR  
Andrew Kocher, NEDO, DERR

Justin Burke, Ohio EPA, CO, DERR





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

March 31, 2015

Mr. Mark Leeper, P.G., MBA  
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  
267000859158

**Subject: Comments for the "Final Remedial Investigation Report for RVAAP-034-R-01 Sand Creek Dump Munitions Response Site, Version 1.0," Former Ravenna Army Ammunition Plant, Ravenna, Ohio," Dated March 24, 2015 (Work Activity No. 267000859158)**

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 Remedial Investigation Report for RVAAP-034-R-01 Sand Creek Dump Munitions Response Site, Version 1.0," Former Ravenna Army Ammunition Plant, Ravenna, Ohio," dated March 24, 2015. This document, received by Ohio EPA's NEDO on March 25, 2015, was prepared by CB&I Federal Services LLC.

Ohio EPA has reviewed the document and has no comments. As a result, the "Final Remedial Investigation Report for RVAAP-034-R-01 Sand Creek Dump Munitions Response Site, Version 1.0" is approved in this final version.

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: Gregory F. Moore, USACE, Louisville District  
Katie Tait/Kevin Sedlak, Camp Ravenna Environmental Office, Newton Falls  
Haney/Harris, Camp Ravenna Environmental Office, Vista Sciences  
ec: Rod Beals, Ohio EPA, NEDO, DERR  
Justin Burke, Ohio EPA, CO, DERR  
Andrew Kocher, Ohio EPA, NEDO, DERR





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

February 25, 2015

Mr. Mark Leeper, P.G., MBA  
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  
267000859**

**Subject: Approval of the "Draft Remedial Investigation Report for RVAAP-034-R-01 Sand Creek Dump Munitions Response Site Version 1.0", Former Ravenna Army Ammunition Plant, Ravenna, Ohio" Dated February 10, 2015 (Work Activity No. 267000859158)**

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 Remedial Investigation Report for RVAAP-034-R-01 Sand Creek Dump Munitions Response Site Version 1.0," dated September 9, 2014. This document, received by Ohio EPA's NEDO on February 10, 2015, was prepared by CB&I Federal Services, LLC. Ohio EPA has reviewed the document and approves the draft with no comments.

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: Gregory F. Moore, Louisville District      Katie Tait/Kevin Sedlak, Newton Falls  
Haney/Harris, Vista Sciences

ec: Rod Beals, NEDO, DERR      Justin Burke, Ohio EPA, CO, DERR  
Andrew Kocher, NEDO, DERR





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

December 3, 2015

**Re: US Army Ravenna Ammunition Plt RVAAP  
Remediation Response  
Approval  
Remedial Response  
Portage County  
267000859227**

Mr. Mark Leeper, P.G., MBA  
Army National Guard Directorate  
Environmental Programs Division  
ARNG-ILE-CR  
111 South George Mason Drive  
Arlington, VA 22204

**Subject: Approval of the "Final No Further Action Record of Decision for  
RVAAP-062-R-01 Water Works #4 Dump Munitions Response Site,  
Version 1.0" Former Ravenna Army Ammunition Plant, Ravenna,  
Ohio: Dated September 29, 2015 (Work Activity No. 267-000859-227)**

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 No Further Action Record of Decision for RVAAP-062-R-01 Water Works #4 Dump Munitions Response Site, Version 1.0" document, dated September 29, 2015. This document received by Ohio EPA's NEDO on September 30, 2015, was prepared by CB&I Federal Services LLC.

The Military Munitions Response Program (MMRP) Remedial Investigation (RI) for the Water Works #4 Dump Munitions Response Site (MRS) investigated the potential presence of munitions debris and munitions of explosives of concern within the defined portion of the MRS area. The MRS was investigated due to historical knowledge and reports of potential munitions items being dumped between 1941 through 1949. No installation restoration work has occurred at this site. No evidence of MEC or source of MC was found at the MRS during the RI field work. Based on these results, no risks associated with exposures to MEC or MC appear to be present. As there are no further comments or potential issues to address for the MRS, Ohio EPA concurs with the remedy of no further action and has signed and dated the final record of decision for the MRS and will submit a signed copy for your records.

**RECEIVED**  
12-9-2015



MR. MARK LEEPER, P.G., MBA  
ARMY NATIONAL GUARD DIRECTORATE  
PAGE 2

If you have any questions or concerns, please do not hesitate to contact me at (614) 644-2896.

Sincerely,

A handwritten signature in black ink, appearing to read "Peter Whitehouse", with a long horizontal flourish extending to the right.

Peter Whitehouse  
Division Chief  
Division of Environmental Response and Revitalization

PW:NCR/nvr

- cc: Gregory F. Moore, USACE, Louisville District  
Katie Tait/Kevin Sedlak, Camp Ravenna Environmental Office, Newton Falls  
Haney/Harris, Camp Ravenna Environmental Office, Vista Sciences, Newton Falls
- ec: Rod Beals, Ohio EPA, NEDO, DERR  
Robert Princic, Ohio EPA, NEDO, DERR  
Justin Burke, Ohio EPA, CO, DERR  
Andrew Kocher, Ohio EPA, NEDO, DERR  
Nicholas Roope, Ohio EPA, NEDO, DERR

September 21, 2015

Re: US Army Ravenna Ammunition Plant RVAAP  
Remediation Response  
Plans  
Remedial Response  
Portage County  
267000859227

Mr. Mark Leeper, P.G., MBA  
Army National Guard Directorate  
Environmental Programs Division  
ARNG-ILE-CR  
111 South George Mason Drive  
Arlington, VA 22204

**Subject: Review of the "Draft No Further Action Record of Decision for RVAAP-062-R-01 Water Works #4 Dump Munitions Response Site, Version 1.0," Former Ravenna Army Ammunition Plant, Ravenna, Ohio: Dated August 31, 2015 (Work Activity No. 267-000859-227)**

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 "Draft No Further Action Record of Decision for RVAAP-062-R-01 Water Works #4 Dump Munitions Response Site Version 1.0," dated August 31, 2015. This document received by Ohio EPA's NEDO on September 1, 2015, was prepared by CB&I Federal Services LLC. Ohio EPA has completed the review of the draft record of decision and has no further comments. Please submit the final copy of the document for approval.

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: Gregory F. Moore, USACE, Louisville District  
Katie Tait/Kevin Sedlak, Camp Ravenna Environmental Office, Newton Falls  
Haney/Harris, Camp Ravenna Environmental Office, Vista Sciences, Newton Falls  
ec: Rod Beals, Ohio EPA, NEDO, DERR  
Bob Princic, Ohio EPA, NEDO, DERR  
Justin Burke, Ohio EPA, CO, DERR  
Andrew Kocher, Ohio EPA, NEDO, DERR



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

July 1, 2015

Mr. Mark Leeper, P.G., MBA  
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  
267000859227**

**Subject: Approval of the "Final No Further Action Proposed Plan for RVAAP-062-R-01 Water Works # 4 Dump Munitions Response Site, Version 1.0" Former Ravenna Army Ammunition Plant, Ravenna, Ohio: Dated May 28, 2015 (Work Activity No. 267-000859-227)**

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 No Further Action Proposed Plan for RVAAP-062-R-01 Water Works #4 Dump Munitions Response Site, Version 1.0" document, dated May 28, 2015. This document, received by Ohio EPA's NEDO on May 29, 2015, was prepared by CB&I Federal Services LLC. Ohio EPA concurs with the remedy of no further action.

The Military Munitions Response Program (MMRP) Remedial Investigation (RI) for the Water Works # 4 Dump munitions response site investigated the potential presence of munitions debris and munitions of explosives of concern within the defined portion of the Water Works # 4 Dump. No items were discovered warranting further action, and the site is not collocated with installation restoration program work.

If you have any questions or concerns, please do not hesitate to contact me at (614) 644-2896.

Sincerely,

Peter Whitehouse, Division Chief  
Division of Environmental Response and Revitalization

cc: Gregory F. Moore, USACE, Louisville District  
Katie Tait/Kevin Sedlak, Camp Ravenna Environmental Office, Newton Falls  
Haney/Harris, Camp Ravenna Environmental Office, Vista Sciences, Newton Falls  
ec: Rod Beals, Ohio EPA, NEDO, DERR  
Robert Princic, Ohio EPA, NEDO, DERR  
Justin Burke, Ohio EPA, CO, DERR  
Andrew Kocher, Ohio EPA, NEDO, DERR  
Nicholas Roope, Ohio EPA, NEDO, DERR





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

May 18, 2015

Mr. Mark Leeper, P.G., MBA  
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  
267000859227

**Subject: Review of the "Draft No Further Action Proposed Plan for RVAAP-062-R-01 Water Work #4 Dump Munitions Response Site" Former Ravenna Army Ammunition Plant, Ravenna, Ohio: Dated April 23, 2015 (Work Activity No. 267-000859-227)**

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-062-R-01 Water Work #4 Dump Munitions Response Site," dated April 24, 2015. This document, received by Ohio EPA's NEDO on April 23, 2015, was prepared by the CB&I Federal Services, LLC. Ohio EPA has no comments. Please add the dates in which the public meeting will take place in the final version of the No Further Action Proposed Plan for the RVAAP-062-R-01 Water Work #4 Dump Munitions Response Site. Also, note that the work activity number has changed to reflect the progression of the project. When sending documents pertaining to the proposed plan for the RVAAP-062-R-01 Water Work #4 Dump Munitions Response Site in the future, please use the 267-000859-227 numerical identification, as shown above.

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: Gregory F. Moore, USACE  
Haney/Harris, Vista Sciences

Katie Tait/Kevin Sedlak, Newton Falls

ec: Rod Beals, NEDO, DERR  
Andrew Kocher, NEDO, DERR

Justin Burke, Ohio EPA, CO, DERR







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

March 30, 2015

**Re: US Army Ravenna Ammunition Plt RVAAP  
Remediation Response  
Project Records  
Remedial Response  
Portage County  
267000859**

Mr. Mark Leeper, P.G., MBA  
Army National Guard Directorate  
Environmental Programs Division  
ARNG-ILE-CR  
111 South George Mason Drive  
Arlington, VA 22204

**Subject: Comments for the "Final Remedial Investigation Report for RVAAP-062-R-01 Water Work #4 Dump Munitions Response Site, Version 1.0," Former Ravenna Army Ammunition Plant, Ravenna, Ohio," Dated March 10, 2015 (Work Activity No. 267-000859-159)**

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 Remedial Investigation Report for RVAAP-062-R-01 Water Work #4 Dump Munitions Response Site, Version 1.0," Former Ravenna Army Ammunition Plant, Ravenna, Ohio," dated March 10, 2015. This document, received by Ohio EPA's NEDO on March 10, 2015, was prepared by CB&I Federal Services LLC.

Ohio EPA has reviewed the document and has no comments. As a result, the "Final Remedial Investigation Report for RVAAP-062-R-01 Water Work #4 Dump Munitions Response Site, Version 1.0" is approved in this final version.

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 at the end.

Nicholas Roope  
Site Coordinator  
Division of Environmental Response and Revitalization

NCR/nvr

cc: Gregory F. Moore, USACE, Louisville District  
Katie Tait/Kevin Sedlak, Camp Ravenna Environmental Office, Newton Falls  
Haney/Harris, Camp Ravenna Environmental Office, Vista Sciences  
ec: Rod Beals, Ohio EPA, NEDO, DERR  
Justin Burke, Ohio EPA, CO, DERR  
Andrew Kocher, Ohio EPA, NEDO, DERR

**RECEIVED**  
04-02-2015



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

February 26, 2015

Mr. Mark Leeper, P.G., MBA  
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  
267000859

**Subject:** Approval of the Response to Comments for the "Draft Remedial Investigation Report for RVAAP-062-R-01 Water Work # 4 Dump Munitions Response Site, Version 1.0," Former Ravenna Army Ammunition Plant, Ravenna, Ohio," Dated January 15, 2015 (Work Activity No. 267-000859-159)

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 response to comments for the document entitled, "Draft Remedial Investigation Report for RVAAP-062-R-01 Water Work # 4 Dump Munitions Response Site, Version 1.0," on January 15, 2015. Please note, this document was received by Ohio EPA's NEDO electronically. However, a hard copy has not been received to date.

Ohio has reviewed this documentation and has found no significant deficiencies. Please provide a final document or replacement pages within 30 days, in accordance with the Findings and Orders for RVAAP.

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/hvr

cc: Gregory F. Moore, USACE, Louisville District  
Katie Tait/Kevin Sedlak, Camp Ravenna Environmental Office, Newton Falls  
Haney/Harris, Camp Ravenna Environmental Office, Vista Sciences

ec: Rod Beals, Ohio EPA, NEDO, DERR  
Justin Burke, Ohio EPA, CO, DERR  
Andrew Kocher, Ohio EPA, NEDO, DERR







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

July 16, 2015

Mr. Mark Leeper, P.G., MBA  
Army National Guard Directorate  
Environmental Programs Division  
ARNGD-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  
267000859150

**Subject: Approval of the "Final Remedial Investigation Report for RVAPP-063-R-01 Group 8 Munition Response Site at the Ravenna Army Ammunition Plant, Ravenna, Ohio," Dated May 19, 2015, Ohio EPA ID # 267-000859-150**

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 Remedial Investigation Report for RVAPP-063-R-01 Group 8 Munition Response Site at the Ravenna Army Ammunition Plant, Ravenna, Ohio," dated May 19, 2015. This document, received on May 20, 2015, was prepared for the U.S. Army Corps of Engineers, by CB&I Federal Services LLC.

Ohio EPA has reviewed this documentation and concurs with the final report. As a result, the "Final Remedial Investigation Report for RVAPP-063-R-01 Group 8 Munition Response Site at the Ravenna Army Ammunition Plant, Ravenna, Ohio" has been approved.

If you have any questions or concerns, please do not hesitate to contact me at (330) 963-1249.

Sincerely,

Andrew C. Kocher, Site Coordinator  
Division of Environmental Response and Revitalization

ACK/nvr

cc: Gregory F. Moore, USACE, Louisville District  
Katie Tait/Kevin Sedlak, Camp Ravenna  
Haney/Harris, Vista Sciences, Newton Falls

ec: Rod Beals, NEDO, DERR  
Justin Burke, CO, DERR



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

April 13, 2015

Mr. Mark Leeper, P.G., MBA  
Army National Guard Directorate  
Environmental Programs Division  
ARNGD-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  
267000859150

**Subject: Comments of the "Draft Remedial Response Report for RVAPP-063-R-01 Group 8 Munition Response Site at the Ravenna Army Ammunition Plant, Ravenna, Ohio," Dated February 23, 2015, Ohio EPA ID # 267-000859-150**

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 Remedial Response Report for RVAPP-063-R-01 Group 8 Munition Response Site at the Ravenna Army Ammunition Plant, Ravenna, Ohio,*" dated February 23, 2015. This document, received by Ohio EPA's NEDO on February 24, 2015, was prepared for the U.S. Army Corps of Engineers (USACE) Baltimore District, by CB&I Federal Services LLC.

Ohio EPA has reviewed this documentation and has comments listed below:

**Comment O-1 (General Comment, including, but not limited to Table 4-3, Table 4-4, Figures 4-6 to Figure 4-9, Table 8-2 to Table 8-4, numerous text locations, etc.):**

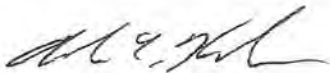
- a.) Please explain the use of field duplicate analytical data. Traditionally, field duplicate data is used for QA/QC but is also treated as actual sample results and the greater value within a Decision Unit is presented, and used for risk assessment.
- b.) In the text, tables, and figures (throughout the report) field duplicate analytical results were not reported. Please include the analytical results of the field duplicates. Please update the appropriate text, tables, and figures within the report. For example: On Figure 4-7, the results for metals are not shown for GR8SS-005M-001-SO; either add the analytical results for the duplicate or report the highest value. (For barium it would be 415 mg/kg instead of the 257 mg/kg shown).



- c.) Please explain the discrepancy in the analytical values between the sample and its corresponding duplicate. For example: Please explain the large variability for Aroclor-1254 between sample GR8SS-004M-001-SO (0.58 mg/kg) and GR8SS-005M-001-SO (2.7 mg/kg). Typically, ISM sampling duplicates do not have much variability due to extensive sample processing (i.e., drying, sieving, grinding, and sub-sampling).
- d.) On Table 4-7, only eight of the metals results are shown. Please add values for the other three metals (aluminum, lead, and strontium) on Table 4-7.
- e.) On Table 8-3, the value for Aroclor-1254 is listed as "7.0.74". Please correct this value. Note: Pursuant to the above comments, the maximum value of Aroclor-1254 should be 2.7 mg/kg.
- f.) After completing the above adjustments, please update all risk assessment calculations appropriately, if the maximum concentrations have changed.

If you have any questions or concerns, please do not hesitate to contact me by phone at (330) 963-1249.

Sincerely,



Andrew C. Kocher  
Site Coordinator  
Division of Environmental Response and Revitalization

ACK/nvr

cc: Gregory F. Moore, USACE, Louisville District  
Katie Tait/Kevin Sedlak, Camp Ravenna  
Haney/Harris, Vista Sciences, Newton Falls

ec: Rod Beals, NEDO, DERR  
Justin Burke, CO, DERR



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

April 20, 2015

Mr. Mark Leeper, P.G., MBA  
Army National Guard Directorate  
Environmental Programs Division  
ARNGD-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  
267000859161

**Subject:** Approval for the "Final Remedial Response Report for RVAPP-019-R-01 Landfill North of Winklepeck and RVAAP-060-R-01 Block D Igloo Munition Response Sites Version 1.0 at the Ravenna Army Ammunition Plant, Ravenna, Ohio," Dated March 3, 2015, Ohio EPA IDs # 267-000859-151 and 267-000859-161

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 Remedial Response Report for RVAPP-019-R-01 Landfill North of Winklepeck and RVAAP-060-R-01 Block D Igloo Munition Response Sites Version 1.0 at the Ravenna Army Ammunition Plant, Ravenna, Ohio," dated March 3, 2015. This document, received on March 6, 2015, was prepared for the U.S. Army Corps of Engineers by CB&I Federal Services LLC.

Ohio EPA has reviewed this documentation and concurs with the final report. As a result, the "Final Remedial Response Report for RVAPP-019-R-01 Landfill North of Winklepeck and RVAAP-060-R-01 Block D Igloo Munition Response Sites Version 1.0 at the Ravenna Army Ammunition Plant, Ravenna, Ohio" has been approved.

If you have any questions or concerns, please do not hesitate to contact me at (330) 963-1249.

Sincerely,

Andrew C. Kocher, Site Coordinator  
Division of Environmental Response and Revitalization

ACK/nvr

cc: Gregory F. Moore, USACE, Louisville District    Katie Tait/Kevin Sedlak, Camp Ravenna  
Haney/Harris, Vista Sciences, Newton Falls

ec: Rod Beals, NEDO, DERR

Justin Burke, CO, DERR





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

February 19, 2015

Mr. Mark Leeper, P.G., MBA  
Army National Guard Directorate  
Environmental Programs Division  
ARNGD-ILE-CR  
111 South George Mason Drive  
Arlington, VA 22204

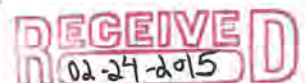
**Re: US Army Ravenna Ammunition Plt RVAAP  
Remediation Response  
Project Records  
Remedial Response  
Portage County  
267000859**

**Subject: Approval for the "Responses to Ohio EPA Comments for the Draft Remedial Response Report for RVAPP-019-R-01 Landfill North of Winklepeck and RVAAP-060-R-01 Block D Igloo Munition Response Sites Version 1.0 at the Ravenna Army Ammunition Plant, Ravenna, Ohio," Dated January 15, 2015, Ohio EPA IDs # 267-000859-151 and 267-000859-161**

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, "Responses to Ohio EPA Comments for the Draft Remedial Response Report for RVAPP-019-R-01 Landfill North of Winklepeck and RVAAP-060-R-01 Block D Igloo Munition Response Sites Version 1.0 at the Ravenna Army Ammunition Plant, Ravenna, Ohio," dated January 15, 2015. This document was prepared for the Army Guard National Directorate, by CB&I Federal Services LLC.

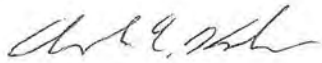
Ohio EPA has reviewed this documentation and concurs with the responses. As a result, the "Responses to Ohio EPA Comments for the Draft Remedial Response Report for RVAPP-019-R-01 Landfill North of Winklepeck and RVAAP-060-R-01 Block D Igloo Munition Response Sites Version 1.0 at the Ravenna Army Ammunition Plant, Ravenna, Ohio" has been approved. Please provide a revised document within 30 days, in accordance with the Findings and Orders for RVAAP.



MR. MARK LEEPER, P.G., MBA  
ARMY NATIONAL GUARD DIRECTORATE  
FEBRUARY 19, 2015  
PAGE 2

If you have any questions or concerns, please do not hesitate to contact me at (330) 963-1249.

Sincerely,



Andrew C. Kocher  
Site Coordinator  
Division of Environmental Response and Revitalization

ACK/nvr

cc: Paul E. Green, USACE, Baltimore District  
Travis R. McCoun, USACE, Baltimore District  
Katie Tait/Kevin Sedlak, Camp Ravenna  
Haney/Harris, Vista Sciences, Newton Falls

ec: Rod Beals, NEDO, DERR  
Justin Burke, CO, DERR





**NATIONAL GUARD BUREAU**

111 SOUTH GEORGE MASON DRIVE  
ARLINGTON VA 22204-1373

December 9, 2015

Ohio Environmental Protection Agency  
DERR-NEDO  
Attn: Rod Beals, Environmental Manager  
2110 East Aurora Road  
Twinsburg, OH 44087-1924

Subject: Ravenna Army Ammunition Plant (RVAAP) Restoration Program  
Portage/Trumbull Counties, Monthly Activity Report

Dear Mr. Beals:

Enclosed for your review is the "RVAAP Restoration Program – DFFO Monthly Summary Report – November 2015". The report summarizes Installation Restoration Program environmental activities conducted at the former RVAAP for the period from November 1, 2015 through November 30, 2015. 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.

Please contact the undersigned at (703) 607-7995 or [mark.s.leeper.civ@mail.mil](mailto:mark.s.leeper.civ@mail.mil) if there are issues or concerns with this submission.

Sincerely,

A handwritten signature in black ink, appearing to read "Mark S. Leeper", is positioned above the printed name.

Mark S. Leeper, P.G., MBA  
RVAAP Restoration Program Manager  
Army National Guard Directorate

Attachment

cc: Bob Princic, Ohio EPA, DERR-NEDO  
Justin Burke, Ohio EPA, CO  
Kevin Sedlak, ARNG, Camp Ravenna  
Katie Tait, OHARNG, Camp Ravenna  
Greg Moore, USACE Louisville  
Pat Ryan, Leidos-REIMS  
Gail Harris, Vista Sciences Corporation

**RVAAP RESTORATION PROGRAM - DFFO MONTHLY SUMMARY REPORT  
NOVEMBER 2015**

**A. Status of project activities for reporting period (November 2015)**

<b>PROJECT NAME</b>	<b>USACE TECH MGR /Contractor</b>	<b>PROJECT STATUS</b>
RI/FS Completion Contract for IRP AOCs (formerly PBA08)	N. Peters / Leidos	<p>The Army previously requested an extension for submittal of revised RI documents for AOCs that were under the expired PBA-08 contract. The Ohio EPA granted the extension to 180 days after a new contract was awarded (i.e., March 30, 2016). The new contract was awarded to Leidos on September 29, 2015.</p> <p>The Contractor submitted a Final Project Management Plan to the Army on November 10, which includes a schedule that prioritizes the potential Missile Defense Agency (MDA) sites. The Contractor held a meeting with Ohio EPA and the Army on November 18, 2015 to discuss results and preliminary recommendations on Load Lines 5, 6, 7, 8, and 11, which are some of the MDA sites.</p>
RVAAP-50, Atlas Scrap Yard, VEG Pilot Study and Feasibility Study	E. Cheng / Alliant	Field activities for the pilot study at the Atlas Scrap Yard were conducted from November 16 - 20, 2015. Representatives from the Ohio EPA observed the VEG pilot system in operation at the site on November 20, 2015.
RVAAP-28, Suspected Mustard Agent Burial Site	CELRL	No updates at this time.
RVAAP-03 & RVAAP-34, ODA1 and Sand Creek Disposal Road Landfill	E. Cheng / CELRL	No updates at this time.

**RVAAP RESTORATION PROGRAM - DFFO MONTHLY SUMMARY REPORT  
NOVEMBER 2015**

PROJECT NAME	USACE TECH MGR /Contractor	PROJECT STATUS
Facility Wide Ground Water Monitoring	N. Peters / EQM  M. Leeper & K. Sedlak / Weston	<p>The Army's contractor, the TEC-Weston Joint Venture Team (JV Team), received a Notice to Proceed on 18 August 2015. The Contract Kick-Off Meeting was held on 22 September 2015. Meeting minutes were submitted to NGB on 5 October 2015. A site reconnaissance was conducted on 23-24 September 2015. The Initial Scoping Meeting at the OEPA Twinsburg office was held on 14 October 2015. Draft meeting minutes were prepared by VISTA. A Technical Approach Outline was prepared for use during the meeting. The new "Draft Remedial Investigation/Feasibility Study (RI/FS) Work Plan" DFFO FY16 Milestone of 28 March 2016 was approved by the Ohio EPA, based on the change in contractors. The new Draft Annual FWGW Report DFFO Milestone of mid-February of each year was also approved by the Ohio EPA, to better enable the incorporation of groundwater findings from the second half of each year, and allow the performance of semi-annual field efforts in more temperate months.</p> <p>The JV Team is currently preparing the RI/FS Work Plan, which includes the SAP/QAPP and HASP. They are also preparing the Well Abandonment Work Plan.</p> <p>The Draft Phase I Archaeological Work Plan was submitted on 13 November 2015. It was subsequently decided to delay this work plan finalization until completion of the RI/FS Work Plan, scheduled for 11 December 2015.</p> <p>The JV Team has been conducting extensive file reviews, data queries, and map production regarding AOC-specific evaluations. NGB reviewed the AOC-specific approach, and it will be presented to the Ohio EPA on 7 December 2015. The Army received Ohio EPA comments on the RVAAP-66 Draft Facility-Wide Groundwater Report on the July 2015 Sampling Event in a letter dated November 17, 2015. The Army and its contractor began preparing a Response to Comments letter.</p>
Group #2 Propellant Cans	J. Trumble / PIKA	<p>A conditional approval letter was received from the Ohio EPA on October 29, 2015, dated October 23, 2015. The Army responded to the comments by email on November 23, 2015, and received a request for clarification on November 24, 2015. Clarification was sent on December 2, 2015, and the same day, Ohio EPA requested the responses be officially sent in.</p>
Historical Well Abandonment	Q. La / Plexus	<p>The Army submitted the Final Work Plan to the Ohio EPA on July 21, 2015. In a letter dated August 3, 2015, the Ohio EPA submitted its approval of the Work Plan. The field work associated with the well abandonment was completed on October 9, 2015. The Pre-Draft Historical Well Abandonment Completion Report was provided to the Army on November 12, 2015. The Army provided comments on November 16, 2015. Incorporation of comments for the Pre-Draft Historical Well Abandonment Completion Report is being completed with an anticipated date of December 31, 2015.</p>

**RVAAP RESTORATION PROGRAM - DFFO MONTHLY SUMMARY REPORT  
NOVEMBER 2015**

PROJECT NAME	USACE TECH MGR /Contractor	PROJECT STATUS
PMP Appendices	N. Peters / CELRL	<p>The Project Management Plan (PMP) Appendices for Erie Burning Grounds, Open Demolition Area 2, Load Line 12, Fuze and Booster Quarry and Central Burn Pits will be developed when the general PMP text and Winklepeck PMP Appendix are issued and approved as part of the Winklepeck RA activities. The Ramsdell Quarry Landfill PMP appendix was submitted to the Ohio EPA in the Final RA Report, which was approved by the Ohio EPA. The Ramsdell PMP appendix has been added to the PMP.</p>
RVAAP-05, Winklepeck Burning Grounds	N. Peters / Tetra Tech Q. La / CELRL	<p>The Contractor for the Remedial Action (RA) (Tetra Tech) submitted planning documents for Army review on November 30, 2015. These documents are supplements to the approved RD and include, for Army review, a Draft Site Safety and Health Plan, Draft Traffic Plan, Draft Site Layout Plan, and Draft Construction Quality Control Plan. A Preliminary Draft Waste Management Plan was also submitted. This document will be submitted as a Draft for Ohio EPA review after the Army review is completed and appropriate revisions are made.</p> <p>The stabilization of the Sand Creek stream diversion and the ODA2 culvert replacement were contracted with the RA at WBG. Tetra Tech is developing required planning documents for these actions.</p> <p>The review and processing of the quarterly LUC report and future related draft submittal are on-schedule. The FY 2015 Final 3<sup>rd</sup> Quarter LUC Report was provided to the Ohio EPA on October 30, 2015. The FY 2015 Draft 4<sup>th</sup> Quarter LUC Report was provided to the Ohio EPA on October 1, 2015. The Army is awaiting response from the Ohio EPA. The Pre-draft FY 2015 Annual LUC Report was provided to the Army for review on October 27, 2015 with RTC comments resolved on December 1, 2015. The Draft FY 2015 Annual LUC Report is being completed with an anticipated date of December 27, 2015.</p>
RVAAP-51, Dump Along Paris Windham Road	N. Peters / CELRL	<p>The Army team reviewed a revised Proposed Plan (PP) which follows the approved Final Site Characterization/Focused Feasibility Study. Army comments were provided to LRL. The Draft PP is being revised.</p>
PBA 13 Supplemental RI/FS for multiple AOCs	Q. La / Leidos	<p>The Work Plan for the work at LL1-4, and 12 was sent to the Ohio EPA on January 31, 2015; meeting the DFFO date. Two coordination meetings with the Ohio EPA were completed on April 2, 2015 and May 19, 2015. The Ohio EPA provided comments on July 2, 2015. The Army submitted RTCs on August 18, 2015 to the Ohio EPA. The Ohio EPA provided comments to the RTCs in a letter dated November 27, 2015. The Army is coordinating a response/meeting to discuss comments.</p> <p>The Preliminary Draft Work Plan for the facility wide surface water/wet sediment review was submitted to the Ohio EPA for review on July 23, 2015. The Army is awaiting response from the Ohio EPA. An extension for Ohio EPA's review (December 4, 2015) was requested and approved in a letter dated October 15, 2015.</p>



**RVAAP RESTORATION PROGRAM - DFFO MONTHLY SUMMARY REPORT  
NOVEMBER 2015**

<b>PROJECT NAME</b>	<b>USACE TECH MGR /Contractor</b>	<b>PROJECT STATUS</b>
Identification of Solid Waste Management Units at Former RVAAP/Camp Ravenna	K. Sedlak and M. Leeper / AECOM	The ARNG issued a contract to AECOM on the September 30, 2015 for the evaluation, identification and management of potential solid waste disposal sites at the facility. The Draft Project Management Plan was issued to the Army on October 29, 2015. Comments on the document were submitted by the Army and the contractor is currently revising the document. The kickoff meeting was held on 17 November 2015.
TCRA at ODA2	Travis McCoun / CENAB	Baltimore USACE issued the Draft TCRA Work Plan for ODA2 MRS on 25 NOV 2015. NAB is currently awaiting acceptance of the Final TCRA Action Memorandum.

**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 development of the AOC-specific evaluation process and template, along with the initial set of three AOCs being used for discussion purposes, required more effort than anticipated when first discussed at the Initial Scoping Meeting. This delayed submittal of the Preliminary Draft RI/FS Work Plan, but will not impact the schedule for regulator review of this submittal scheduled to begin on 29 January 2016.

**F. Indicate how much soil and groundwater was generated and/or transported and disposed as part of RVAAP restoration activities**

Approximately 1,500 gallons of decontamination water and displaced well water (IDW) was generated in September and October 2015 during the well abandonment project conducted by Plexus. The IDW was sampled on October 9, 2015 and is being stored in poly tanks at Building 1036 awaiting

**RVAAP RESTORATION PROGRAM - DFFO MONTHLY SUMMARY REPORT  
NOVEMBER 2015**

characterization and proper disposal. Analytical results revealed a pH above 12.5. Therefore, the contractor conducted neutralization to bring the pH within nonhazardous levels. The contractor is currently working on the finalization of the IDW report and the waste profile. Disposal of the nonhazardous waste is planned for December 2015.

**G. Describe activities planned for the following month (December 2015)**

1. The contractor for the RA at RVAAP-05 Winklepeck Burning Grounds will continue preparing required planning documents for the ODA2 culvert replacement and stabilization the Sand Creek stream diversion. The Army team will be reviewing planning documents the contractor has prepared for the RA.
2. The Army will issue hard copies of the approved Final Site Characterization/Focused FS for Paris Windham Dump. The Army will also submit the Revised Draft Proposed Plan for the Paris Windham Dump.
3. Leidos, working under the 2015 RI/FS Completion Contract, will continue to revise and update the Load Line 9 and Load Line 7 RI/FS Reports.
4. Pending agreement and changes based upon the Ohio EPA letter, the final Group 2 Propellant Can Tops plans will be distributed, and fieldwork scheduled (weather permitting).
5. The contractor for the Historical Well Abandonment will provide the Army the Draft Historical Well Completion Report.
6. The Army's contractor will submit a Response to Comments letter for the Ohio EPA comments on the RVAAP-66 Draft Facility-Wide Groundwater Report on the July 2015 Sampling Event. The anticipated submittal date is December 4, 2015.
7. Submittal of the Preliminary Draft Well Abandonment Work Plan and the Preliminary Draft RI/FS Work Plan.
8. Teleconference meeting with the NGB and Ohio EPA regarding the AOC-specific evaluations being conducted as part of the RI/FS Work Plan scoping effort.
9. Preparation of the 2015 Annual FWGW Report.



## NATIONAL GUARD BUREAU

111 SOUTH GEORGE MASON DRIVE  
ARLINGTON VA 22204-1373

November 10, 2015

Ohio Environmental Protection Agency  
DERR-NEDO  
Attn: Rod Beals, Environmental Manager  
2110 East Aurora Road  
Twinsburg, OH 44087-1924

Subject: Ravenna Army Ammunition Plant (RVAAP) Restoration Program  
Portage/Trumbull Counties, Monthly Activity Report

Dear Mr. Beals:

Enclosed for your review is the "RVAAP Restoration Program – DFFO Monthly Summary Report – October 2015". The report summarizes Installation Restoration Program environmental activities conducted at the former RVAAP for the period from October 1, 2015 through October 31, 2015. 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.

Please contact the undersigned at (703) 607-7995 or [mark.s.leeper.civ@mail.mil](mailto:mark.s.leeper.civ@mail.mil) if there are issues or concerns with this submission.

Sincerely,

A handwritten signature in cursive script, appearing to read "Mark S. Leeper", is located below the "Sincerely," text.

Mark S. Leeper, P.G., MBA  
RVAAP Restoration Program Manager  
Army National Guard Directorate

### Attachment

cc: Bob Princic, Ohio EPA, DERR-NEDO  
Justin Burke, Ohio EPA, CO  
Kevin Sedlak, ARNG, Camp Ravenna  
Katie Tait, OHARNG, Camp Ravenna  
Greg Moore, USACE Louisville  
Pat Ryan, Leidos-REIMS  
Gail Harris, Vista Sciences Corporation

**RVAAP RESTORATION PROGRAM - DFFO MONTHLY SUMMARY REPORT  
OCTOBER 2015**

**A. Status of project activities for reporting period (October 2015)**

<b>PROJECT NAME</b>	<b>USACE TECH MGR /Contractor</b>	<b>PROJECT STATUS</b>
RI/FS Completion Contract for IRP AOCs (formerly PBA08)	N. Peters / Leidos	<p>The Army previously requested an extension for submittal of revised RI documents for AOCs that were under the expired PBA-08 contract. The Ohio EPA granted the extension to 180 days after a new contract was awarded (i.e., March 30, 2016). The new contract was awarded to Leidos on September 29, 2015.</p> <p>The Contractor prepared a Draft Project Management Plan for the Army, which includes a schedule that prioritizes the potential Missile Defense Agency (MDA) sites. The Contractor resolved Army comments. The Contractor has also begun preparing for a meeting with Ohio EPA in November to present findings for the MDA NFA sites.</p>
RVAAP-50, Atlas Scrap Yard, VEG Pilot Study and Feasibility Study	E. Cheng / Alliant	<p>On October 14, 2015, the Draft Work Plan was submitted for concurrent review by the Ohio EPA and Army stakeholders. On October 30, 2015, the Ohio EPA submitted comments on the Draft Work Plan.</p> <p>On October 30, 2015, the Army submitted to the Ohio EPA notice of fieldwork scheduled for November 16, 2015 in support of the pilot test.</p>
RVAAP-28, Suspected Mustard Agent Burial Site	CELRL	No updates at this time.
RVAAP-03 & RVAAP-34, ODA1 and Sand Creek Disposal Road Landfill	E. Cheng / CELRL	No updates at this time.



**RVAAP RESTORATION PROGRAM - DFFO MONTHLY SUMMARY REPORT  
OCTOBER 2015**

PROJECT NAME	USACE TECH MGR /Contractor	PROJECT STATUS
Facility Wide Ground Water Monitoring	N. Peters / EQM  M. Leeper & K. Sedlak / Weston	<p>On October 23, 2015, the Army's Contractor submitted the Draft Facility-Wide Groundwater Monitoring Program RVAAP-66 Report on the July 2015 Sampling Event, for Ohio EPA review.</p> <p>A groundwater scoping meeting was held at the Ohio EPA's NEDO office on October 14, 2015.</p> <p>Weston submitted the Draft Project Management Plan and Quality Control Plan to the Army on October 16, 2015. Army comments on the document have been submitted to Weston and currently being addressed.</p>
Group #2 Propellant Cans	J. Trumble / PIKA	<p>A conditional approval letter was received from the Ohio EPA on October 29, 2015, dated October 23, 2015. The Army team is reviewing the letter, and will likely provide a response to Ohio EPA, and have the contractor make the final changes to the project plans. Once the plans are distributed as final, the fieldwork will begin.</p>
Historical Well Abandonment	Q. La / Plexus	<p>The Army submitted the Final Work Plan to the Ohio EPA on July 21, 2015. In a letter dated August 3, 2015, the Ohio EPA submitted its approval of the Work Plan. The field work associated with the well abandonment was completed on October 9, 2015. The Pre-Draft Historical Well Abandonment Completion Report is anticipated to be completed on November 6, 2015.</p>
PMP Appendices	N. Peters / CELRL	<p>The Project Management Plan (PMP) Appendices for Erie Burning Grounds, Open Demolition Area 2, Load Line 12, Fuze and Booster Quarry and Central Burn Pits will be developed when the general PMP text and Winklepeck PMP Appendix are issued and approved as part of the Winklepeck RA activities. The Ramsdell Quarry Landfill PMP appendix was submitted to the Ohio EPA in the Final RA Report, which was approved by the Ohio EPA. The Ramsdell PMP appendix has been added to the PMP.</p>

**RVAAP RESTORATION PROGRAM - DFFO MONTHLY SUMMARY REPORT  
OCTOBER 2015**

PROJECT NAME	USACE TECH MGR /Contractor	PROJECT STATUS
RVAAP-05, Winklepeck Burning Grounds	N. Peters / Tetra Tech Q. La / CELRL	<p>The Contractor for the Remedial Action (RA) (Tetra Tech) finalized a Project Management Plan for the Army and began working on planning documents.</p> <p>The review and processing of the quarterly LUC report and future related draft submittal are on-schedule. The FY 2015 Final 3<sup>rd</sup> Quarter LUC Report was provided to the Ohio EPA on October 30, 2015. The FY 2015 Draft 4<sup>th</sup> Quarter LUC Report was provided to the Ohio EPA on October 1, 2015. The Army is awaiting response from the Ohio EPA. The FY 2015 Annual LUC Report was provided to the Army for review on October 27, 2015.</p>
RVAAP-51, Dump Along Paris Windham Road	N. Peters / CELRL	<p>The Army team reviewed a revised Proposed Plan (PP) which follows the approved Final Site Characterization/Focused Feasibility Study. Army comments were provided to LRL. The Draft PP is being revised.</p>
PBA 13 Supplemental RI/FS for multiple AOCs	Q. La / Leidos	<p>The Work Plan for the work at LL1-4, and 12 was sent to the Ohio EPA on January 31, 2015; meeting the DFFO date. Two coordination meetings with the Ohio EPA were completed on April 2, 2015 and May 19, 2015. The Ohio EPA provided comments on July 2, 2015. The Army submitted RTCs on August 18, 2015 to the Ohio EPA. The Army is awaiting response from the Ohio EPA.</p> <p>The Preliminary Draft Work Plan for the facility wide surface water/wet sediment review was submitted to the Ohio EPA for review on July 23, 2015. The Army is awaiting response from the Ohio EPA.</p>
Identification of Solid Waste Management Units at Former RVAAP/Camp Ravenna	K. Sedlak and M. Leeper / AECOM	<p>The ARNG issued a contract to AECOM on the September 30, 2015 for the evaluation, identification and management of potential solid waste disposal sites at the facility. The Draft Project Management Plan was issued to the Army on October 29, 2015. Comments on the document were submitted by the Army and the contractor is currently revising the document.</p>
TCRA at ODA2	N. Peters / CELRL	<p>The scope of work includes a TCRA, MEC surface sweeps, stabilization of the Sand Creek stream diversion, and culvert replacement. Baltimore USACE issued the Final Action Memo to the Ohio EPA and Army on November 2, 2015. Baltimore USACE is currently responding to Army comments on the Preliminary Draft TCRA Work Plan. The stabilization of the Sand Creek stream diversion and the ODA2 culvert replacement were contracted with the RA at WBG and awarded on July 31, 2015. Required planning documents are being developed.</p>

**RVAAP RESTORATION PROGRAM - DFFO MONTHLY SUMMARY REPORT  
OCTOBER 2015**

**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**

Approximately 1,500 gallons of decontamination water and displaced well water (IDW) was generated in September and October 2015 during the well abandonment project conducted by Plexus. The IDW was sampled on October 9, 2015 and is being stored in poly tanks at Building 1036 awaiting characterization and proper disposal.

**G. Describe activities planned for the following month (November 2015)**

1. The contractor for the RA at RVAAP-05 Winklepeck Burning Grounds will continue preparing required planning documents.
2. The Army will issue the Final Site Characterization/Focused FS for Paris Windham Dump. The LRL will use Army comments to prepare the Revised Final Proposed Plan associated with the Paris Windham Dump.
3. Meetings will be held with Ohio EPA during the week of November 16 to discuss general topics related to risk assessment and use of FWCUGs and to present and discuss RI findings for MDA sites that are expected to be NFA. Leidos will also provide a final Project Management Plan for the 2015 RI/FS Completion Contract.
4. The Army will hold a kickoff meeting for the solid waste management unit identification contract for Camp Ravenna/former RVAAP.
5. Pending agreement and changes based upon the Ohio EPA letter, the final Group 2 Propellant Can Tops plans will be distributed, and fieldwork scheduled. Mobilization will likely not occur until after the Thanksgiving weekend.
6. The contractor for the Historical Well Abandonment will provide the Army the Pre-Draft Historical Well Completion Report.

**RVAAP RESTORATION PROGRAM - DFFO MONTHLY SUMMARY REPORT  
OCTOBER 2015**

7. Field activities for the pilot study at the Atlas Scrap Yard are scheduled to begin on November 16, 2015.





**NATIONAL GUARD BUREAU**

111 SOUTH GEORGE MASON DRIVE  
ARLINGTON VA 22204-1373

October 8, 2015

Ohio Environmental Protection Agency  
DERR-NEDO  
Attn: Rod Beals, Environmental Manager  
2110 East Aurora Road  
Twinsburg, OH 44087-1924

Subject: Ravenna Army Ammunition Plant (RVAAP) Restoration Program  
Portage/Trumbull Counties, Monthly Activity Report

Dear Mr. Beals:

Enclosed for your review is the "RVAAP Restoration Program – DFFO Monthly Summary Report – September 2015". The report summarizes Installation Restoration Program environmental activities conducted at the former RVAAP for the period from September 1, 2015 through September 30, 2015. 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.

Please contact the undersigned at (703) 607-7995 or [mark.s.leeper.civ@mail.mil](mailto:mark.s.leeper.civ@mail.mil) if there are issues or concerns with this submission.

Sincerely,

A handwritten signature in black ink, appearing to read "Mark S. Leeper", is positioned below the word "Sincerely,".

Mark S. Leeper, P.G., MBA  
RVAAP Restoration Program Manager  
Army National Guard Directorate

Attachment

cc: Bob Princic, Ohio EPA, DERR-NEDO  
Justin Burke, Ohio EPA, CO  
Kevin Sedlak, ARNG, Camp Ravenna  
Katie Tait, OHARNG, Camp Ravenna  
Greg Moore, USACE Louisville  
Pat Ryan, Leidos-REIMS  
Gail Harris, Vista Sciences Corporation

**RVAAP RESTORATION PROGRAM - DFFO MONTHLY SUMMARY REPORT  
SEPTEMBER 2015**

**A. Status of project activities for reporting period (September 2015)**

<b>PROJECT NAME</b>	<b>USACE TECH MGR /Contractor</b>	<b>PROJECT STATUS</b>
RI/FS Completion for Fifteen IRP AOCs (formerly PBA08)	N. Peters / Leidos	In a letter dated March 26, 2015, the Army requested an extension for submittal of revised RI documents for 14 of the AOCs currently under the PBA-08 contract. The extension request was for 180 days after a new contract is awarded. The current contract ended July 6, 2015. The Ohio EPA agreed to the extension request in a letter dated March 31, 2015 and received by the Army on April 6, 2015. A new contract to complete the 14 AOCs mentioned above and the Atlas Scrap Yard RI was awarded to Leidos on September 29, 2015.
RVAAP-50, Atlas Scrap Yard, VEG Pilot Study and Feasibility Study	E. Cheng / Alliant	Project was awarded to the prime contractor, Alliant Corporation. The subcontractor conducting the pilot study will be Endpoint Consulting, Inc. On September 22, 2015, Endpoint provided an overview of the pilot test technology to Army and Ohio EPA stakeholders. Preparations of the Project Management Plan, Work Plan, and Site Safety and Health Plan were initiated in September 2015.
PBA-09 Fourteen MMRP MRSs	Travis McCoun / CBI	<ul style="list-style-type: none"> <li>As of September 30, 2015, all of the final RI reports for the MMRP have been approved by the Ohio EPA.</li> <li>As of September 30, 2015, all of the final Proposed Plans for the MMRP have been approved by the Ohio EPA:</li> <li>As of September 30, 2015, the draft RODs for the following MRSs have been approved by the Ohio EPA: <ul style="list-style-type: none"> <li>Firestone Test Facility (7/27/15)</li> <li>Load Line #1A (8/7/15)</li> <li>Sand Creek Dump (9/21/15)</li> <li>Load Line #1A (9/21/15)</li> </ul> </li> <li>As of September 30, 2015, the final RODs for the following MRSs have been approved by the Ohio EPA: <ul style="list-style-type: none"> <li>Firestone Test Facility (9/21/15)</li> <li>Load Line #1A (9/21/15)</li> </ul> The NGB is waiting on authorizing signatures for these RODs from the Army and the Ohio EPA </li> <li>The final RODs for Water Works #4 Dump and Sand Creek Dump were issued to the Ohio EPA for review and approval on September 29, 2015.</li> </ul>
RVAAP-28, Suspected Mustard Agent Burial Site	CELRL	No updates at this time.

**RVAAP RESTORATION PROGRAM - DFFO MONTHLY SUMMARY REPORT  
SEPTEMBER 2015**

PROJECT NAME	USACE TECH MGR /Contractor	PROJECT STATUS
RVAAP-03 & RVAAP-34, ODA1 and Sand Creek Disposal Road Landfill	E. Cheng / CELRL	No updates at this time.
Facility Wide Ground Water Monitoring	N. Peters / EQM  M. Leeper & K. Sedlak / Weston	<p>On September 2, 2015, the Army received Ohio EPA approval for the Army's Response to Comments for the Facility-Wide Groundwater Monitoring Program RVAAP-66 Report on the March 2015 Sampling Event. On September 21, 2015, the Final Report for the March 2015 Sampling event was submitted to Ohio EPA.</p> <p>On September 11, 2015, the Army's Contractor submitted the Preliminary Draft Facility-Wide Groundwater Monitoring Program RVAAP-66 Report on the July 2015 Sampling Event, for Army review.</p> <p>A kick-off meeting for the new Facility-Wide Groundwater contract was held at Camp Ravenna on September 22, 2015.</p>
Group #2 Propellant Cans	J. Trumble / PIKA	The revised draft project work plans were shipped to the Ohio EPA, to be received on September 08, 2015. The documents are currently undergoing Ohio EPA review.
Historical Well Abandonment	Q. La / Plexus	The Army submitted the Final Work Plan to the Ohio EPA on July 21, 2015. In a letter dated August 3, 2015, the Ohio EPA submitted its approval of the Work Plan. The field work associated with the well abandonment is being implemented and is anticipated to be completed on October 6, 2015.
PMP Appendices	N. Peters / CELRL	The Project Management Plan (PMP) Appendices for Erie Burning Grounds, Open Demolition Area 2, Load Line 12, Fuze and Booster Quarry and Central Burn Pits will be developed when the general PMP text and Winklepeck PMP Appendix are issued and approved as part of the Winklepeck RA activities. The Ramsdell Quarry Landfill PMP appendix was submitted to the Ohio EPA in the Final RA Report, which was approved by the Ohio EPA. The Ramsdell PMP appendix has been added to the PMP.

**RVAAP RESTORATION PROGRAM - DFFO MONTHLY SUMMARY REPORT  
SEPTEMBER 2015**

<b>PROJECT NAME</b>	<b>USACE TECH MGR /Contractor</b>	<b>PROJECT STATUS</b>
RVAAP-05, Winklepeck Burning Grounds	N. Peters / CELRL Q. La / CELRL	<p>On September 22, 2015, the kick-off meeting for the Remedial Action (RA) that will be pursuant to the <i>Final Explanation of Significant Differences (ESD) for Post ROD Changes to the Remedy for Winklepeck Burning Grounds</i> was held. On September 30, 2015, the Army received a letter from the Ohio EPA approving the Final Remedial Design that will govern that RA.</p> <p>The review and processing of the quarterly LUC report and future related draft submittal are on-schedule. The FY 2015 Final Second Quarter LUC Report was provided to the Ohio EPA on July 23, 2015. The FY 2015 Draft 3<sup>rd</sup> Quarter LUC Report was provided to the Ohio EPA on July 21, 2015. The FY 2015 Draft 4<sup>th</sup> Quarter LUC Report was provided to the Ohio EPA on October 1, 2015. The Army is awaiting response from the Ohio EPA.</p>
RVAAP-51, Dump Along Paris Windham Road	N. Peters / CELRL	The Louisville District provided the Army team with a revised Proposed Plan (PP) on October 1, 2015 which follows the approved Final Site Characterization/Focused Feasibility Study. The PP is in Army review.
PBA 13 Supplemental RI/FS for multiple AOCs	Q. La / Leidos	<p>The Work Plan for the work at LL1-4, and 12 was sent to the Ohio EPA on January 31, 2015; meeting the DFFO date. Two coordination meetings with the Ohio EPA were completed on April 2, 2015 and May 19, 2015. The Ohio EPA provided comments on July 2, 2015. The Army submitted RTCs on August 18, 2015 to the Ohio EPA. The Army is awaiting response from the Ohio EPA.</p> <p>The Preliminary Draft Work Plan for the facility wide surface water/wet sediment review was submitted to the Ohio EPA for review on July 23, 2015. The Army is awaiting response from the Ohio EPA.</p>
TCRA at ODA2	N. Peters / CELRL	The scope of work includes a TCRA, MEC surface sweeps, stabilization of the Sand Creek stream diversion, and culvert replacement. The Army received the Preliminary Draft Action Memo on July 7, 2015 and submitted comments to Baltimore USACE. Baltimore USACE is currently resolving comments and working on the draft Action Memo to be submitted to the Ohio EPA. Baltimore USACE is also developing the Work Plan for the ODA2 TCRA. The stabilization of the Sand Creek stream diversion and the ODA2 culvert replacement were contracted with the RA at WBG and awarded on July 31, 2015. Required planning documents are being developed.

**B. Describe difficulties encountered during the reporting period and actions taken to rectify any difficulties**

None

**C. Identify changes in key personnel**

None



**RVAAP RESTORATION PROGRAM - DFFO MONTHLY SUMMARY REPORT  
SEPTEMBER 2015**

**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**

1. Facility-Wide Groundwater Program: Approval of the Draft Groundwater RI/FS Work Plan has been delayed due to unresolved issues associated with RVAAP's background monitoring well network and the GW risk assessment screening process. The Army awarded a new contract in August of 2015 (under ARNGD administration) to complete the RI/FS/PP/ROD for RVAAP-66 Facility-Wide Groundwater. This new contract was issued to Weston. Weston is working on a schedule and a Groundwater RI Work Plan.
2. Additional schedule activities needed for USACE in-house work: AOCs with currently known delays affected by the activities include completion of an FS for ODA1 and Sand Creek.

**F. Indicate how much soil and groundwater was generated and/or transported and disposed as part of RVAAP restoration activities**

Three drums (approximately 1200 pounds) of nonhazardous purge/decon water from the July 2015 groundwater sampling event conducted by EQM was shipped out for proper disposal on 24 September 2015.

As part of the well abandonment/closure activities/field work conducted by Plexus in September 2015, approximately 1600 pounds of scrap metal and 21.62 tons of concrete have been generated and sent for recycling. 525 gallons of liquid (water) IDW was also generated and is being stored in poly tanks awaiting characterization and proper disposal.

**G. Describe activities planned for the following month (October 2015)**

1. Under the Army's PBA09 contract, it is anticipated that the final RODs for Water Works #4 Dump and Sand Creek Dump will be approved by the Ohio EPA. Once the authorizing signatures for the final RODs for Load Line #1A and Firestone Test Facility are received, they will be issued to stakeholders. CB&I will respond to any comments received for the documents that are currently in with the Ohio EPA for review.
2. The contractor for the RA at RVAAP-05 Winklepeck Burning Grounds will finalize the Project Management Plan and begin preparing required planning documents.
3. The Army will review the Revised Final Proposed Plan associated with RVAAP-51, Dump along Paris Windham Road.
4. The Army will submit the Draft Facility-Wide Groundwater Monitoring report for the July 2015 sampling event. The Army will hold a groundwater scoping meeting on October 14, 2015 with the Ohio EPA.
5. The Army will hold a kick-off meeting for the Vista contract for this FY in October 2015 at Camp Ravenna.

**RVAAP RESTORATION PROGRAM - DFFO MONTHLY SUMMARY REPORT  
SEPTEMBER 2015**

6. Under the RI/FS Completion Contract, Leidos and the Army will prepare a schedule for the activities to be conducted under that contract.
7. The Army will hold a kickoff meeting for the solid waste management unit identification contract for Camp Ravenna/former RVAAP.



**NATIONAL GUARD BUREAU**

111 SOUTH GEORGE MASON DRIVE  
ARLINGTON VA 22204-1373

September 9, 2015

Ohio Environmental Protection Agency  
DERR-NEDO  
Attn: Rod Beals, Environmental Manager  
2110 East Aurora Road  
Twinsburg, OH 44087-1924

Subject: Ravenna Army Ammunition Plant (RVAAP) Restoration Program  
Portage/Trumbull Counties, Monthly Activity Report

Dear Mr. Beals:

Enclosed for your review is the "RVAAP Restoration Program – DFFO Monthly Summary Report – August 2015". The report summarizes Installation Restoration Program environmental activities conducted at the former RVAAP for the period from August 1, 2015 through August 31, 2015. 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.

Please contact the undersigned at (703) 607-7995 or [mark.s.leeper.civ@mail.mil](mailto:mark.s.leeper.civ@mail.mil) if there are issues or concerns with this submission.

Sincerely,

A handwritten signature in black ink, appearing to read "Mark S. Leeper", is positioned above the typed name.

Mark S. Leeper, P.G., MBA  
RVAAP Restoration Program Manager  
Army National Guard Directorate

Attachment

cc: Bob Princic, Ohio EPA, DERR-NEDO  
Justin Burke, Ohio EPA, CO  
Kevin Sedlak, ARNG, Camp Ravenna  
Katie Tait, OHARNG, Camp Ravenna  
Greg Moore, USACE Louisville  
Pat Ryan, Leidos-REIMS  
Gail Harris, Vista Sciences Corporation

**RVAAP RESTORATION PROGRAM - DFFO MONTHLY SUMMARY REPORT  
AUGUST 2015**

**A. Status of project activities for reporting period (August 2015)**

<b>PROJECT NAME</b>	<b>USACE TECH MGR /Contractor</b>	<b>PROJECT STATUS</b>
RVAAP-01, Ramsdell Quarry Landfill	N. Peters/Leidos	The Remedial Action is complete. LTM is ongoing.
PBA-08 Eighteen IRP AOCs	N. Peters /Leidos	In a letter dated March 26, 2015, the Army requested an extension for submittal of revised RI documents for 14 of the AOCs currently under the PBA-08 contract. The extension request was for 180 days after a new contract is awarded. The current contract ended July 6, 2015. The Ohio EPA agreed to the extension request in a letter dated March 31, 2015 and received by the Army on April 6, 2015. As of August 2015, the scope of work had been developed and contract procurement is currently underway.
PBA-11 Fourteen Compliance Restoration (CR) Sites	E. Cheng/ECC	<p>On August 14, 2015, the Ohio EPA issued its approval of the CC RVAAP-83 (Buildings 1031 &amp; 1039) Draft SI report.</p> <p>On August 18, 2015, the Army issued the CC RVAAP-73 (Facility-Wide Coal Storage) Draft RI report to the Ohio EPA.</p> <p>On August 5, 2015, the Ohio EPA issued follow-on comments to the Army-submitted Comment Response Table for the CC RVAAP-74 (Bldg 1034 Motor Pool Hydraulic Lift) Draft RI report.</p> <p>On August 22, 2015, the period of performance for the contract task order with ECC expired. It is anticipated that the completion of the remaining documents will be covered under a new contract action that is forecasted to be awarded in June 2016.</p>



**RVAAP RESTORATION PROGRAM - DFFO MONTHLY SUMMARY REPORT  
AUGUST 2015**

PROJECT NAME	USACE TECH MGR /Contractor	PROJECT STATUS
PBA-09 Fourteen MMRP MRSS	Travis McCoun/CBI	<ul style="list-style-type: none"> <li>As of August 31, 2015, the final RI reports for the following MRSSs have been approved by the Ohio EPA: <ul style="list-style-type: none"> <li>Erie Burning Grounds (9/22/14)</li> <li>Open Demolition Area #2 (3/26/15)</li> <li>Load Line #1A (9/22/14)</li> <li>Landfill North of Winklepeck (4/20/15)</li> <li>Firestone Test Facility (11/25/14)</li> <li>Sand Creek Dump (3/31/15)</li> <li>Atlas Scrap Yard (11/25/14)</li> <li>Block D Igloo (4/20/15)</li> <li>Water Works #4 Dump (3/30/15)</li> <li>40mm Firing Range (5/18/15)</li> <li>Fuze and Booster Quarry (6/18/15)</li> <li>Group 8 MRS (7/16/15)</li> </ul> </li> <li>Ramsdell Quarry MRS – The Ohio EPA has requested that the recent correspondence between the Ohio EPA and the Army be included in the final RI Report before they approve it. Requested material was submitted to Ohio EPA on 6/30/15. Ohio EPA approval of the final RI report is pending.</li> <li>As of August 31, 2015, the final Proposed Plans for the following MRSSs have been approved by the Ohio EPA: <ul style="list-style-type: none"> <li>Load Line #1A (5/18/15)</li> <li>Firestone Test Facility (5/18/15)</li> <li>Water Works #4 Dump (7/1/15)</li> <li>Sand Creek Dump (7/27/15)</li> </ul> </li> <li>As of August 31, 2015, the draft RODs for the following MRSSs have been approved by the Ohio EPA: <ul style="list-style-type: none"> <li>Firestone Test Facility (7/27/15)</li> <li>Load Line #1A (8/7/15)</li> </ul> </li> <li>The draft RODs for Water Works #4 Dump and Sand Creek Dump were issued to the Ohio EPA for review on August 31, 2015.</li> </ul>
RVAAP-28, Suspected Mustard Agent Burial Site	Huntsville/USACE	<p>The USACE-LRL coordinated with ARNG to set-up review of the SI report and the USACE-Huntsville Center of Expertise for Military Munitions developed a contingency plan. The revised draft SI report was issued to the Ohio EPA on March 2, 2015. The Army received an approval letter from the Ohio EPA on April 27, 2015 approving the Draft Site inspection Report as is (no comments). On July 16, 2015, the Ohio EPA approved the Revised Final SI Report issued by USACE-Huntsville.</p>
RVAAP-03 & RVAAP-34, ODA1 and Sand Creek Disposal Road Landfill	E. Cheng/CELRL	No updates at this time.

**RVAAP RESTORATION PROGRAM - DFFO MONTHLY SUMMARY REPORT  
AUGUST 2015**

PROJECT NAME	USACE TECH MGR /Contractor	PROJECT STATUS
Facility Wide Ground Water Monitoring	N. Peters/EQM	<p>On August 20, 2015, the Army submitted responses to the Ohio EPA's comments on the Draft Facility-Wide Groundwater Report for the March 2015 sampling event.</p> <p>In August 2015, the new Facility-Wide Groundwater contract was awarded to Weston Solutions, Inc.</p>
Group #2 Propellant Cans	J. Trumble/PIKA	<p>Final Approval on the responses to Army comments for the revised Work Plan and APP/HASP was achieved on August 31, 2015.</p>
Historical Well Abandonment	Q. La/Plexus	<p>The Army submitted the Final Work Plan to the Ohio EPA on July 21, 2015. In a letter dated August 3, 2015, the Ohio EPA submitted its approval of the Work Plan. The field work associated with the well abandonment is scheduled from September 14 to October 2, 2015.</p>
PMP Appendices	N. Peters/CELRL	<p>PMP Appendices for Erie Burning Grounds, Open Demolition Area 2, Load Line 12, Fuze and Booster Quarry and Central Burn Pits will be developed when the general PMP text and Winklepeck PMP Appendix are issued and approved as part of the Winklepeck RA activities. The Ramsdell Quarry Landfill PMP appendix was submitted to the Ohio EPA in the Final RA Report, which was approved by the Ohio EPA. The Ramsdell PMP appendix has been added to the PMP.</p>

**RVAAP RESTORATION PROGRAM - DFFO MONTHLY SUMMARY REPORT  
AUGUST 2015**

PROJECT NAME	USACE TECH MGR /Contractor	PROJECT STATUS
RVAAP-05, Winklepeck Burning Grounds	N. Peters/CELRL Q. La/CELRL	<p>The Army awarded a contract for the Remedial Action that will be pursuant to the <i>Final Explanation of Significant Differences (ESD) for Post ROD Changes to the Remedy for Winklepeck Burning Grounds</i>, submitted to the Ohio EPA on March 27, 2015. The contract was awarded on July 31, 2015.</p> <p>The review and processing of the quarterly LUC report and future related draft submittal are on-schedule. The FY 2015 Final Second Quarter LUC Report was provided to the Ohio EPA on July 23, 2015. The FY 2015 Draft 3<sup>rd</sup> Quarter LUC Report was provided to the Ohio EPA on July 21, 2015. The Army is awaiting response from the Ohio EPA.</p>
RVAAP-51, Dump Along Paris Windham Road	N. Peters/CELRL	<p>The Army continued working on the Proposed Plan which follows the approved Final Site Characterization/Focused Feasibility Study.</p>
PBA 13 Supplemental RI/FS for multiple AOCs	Q. La /Leidos	<p>The Work Plan for the work at LL1-4, and 12 was sent to the Ohio EPA on January 31, 2015; meeting the DFFO date. Two coordination meetings with the Ohio EPA were completed on April 2, 2015 and May 19, 2015. The Ohio EPA provided comments on July 2, 2015. The Army submitted RTCs on August 18, 2015 to the Ohio EPA. The Army is awaiting response from the Ohio EPA.</p> <p>The Preliminary Draft Work Plan for the facility wide surface water/wet sediment review was submitted to the Ohio EPA for review on July 23, 2015. The Army is awaiting response from the Ohio EPA.</p>
TCRA at ODA2	N. Peters	<p>The scope of work includes a TCRA, MEC surface sweeps, stabilization of the Sand Creek stream diversion, and culvert replacement. The Army received the Preliminary Draft Action Memo on July 7, 2015 and submitted comments to Baltimore USACE. Baltimore USACE is currently resolving comments and working on the draft Action Memo to be submitted to the Ohio EPA. Baltimore USACE is also developing the Work Plan for the ODA2 TCRA. The stabilization of the Sand Creek stream diversion and the ODA2 culvert replacement were contracted with the RA at WBG and awarded on July 31, 2015.</p>

**B. Describe difficulties encountered during the reporting period and actions taken to rectify any difficulties**

None

**C. Identify changes in key personnel**

None

**RVAAP RESTORATION PROGRAM - DFFO MONTHLY SUMMARY REPORT  
AUGUST 2015**

**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**

1. Facility-Wide Groundwater Program: Approval of the Draft Groundwater RI/FS Work Plan has been delayed due to unresolved issues associated with RVAAP's background monitoring well network and the GW risk assessment screening process. The Army currently plans to award a new contract (under ARNGD administration) to complete the RI/FS/PP/ROD for RVAAP-66 Facility-Wide Groundwater. This new contract was issued to Weston in August 2015. The existing groundwater Contract (under USACE administration) will continue with the required FWGWMP requirements for the July sampling event, which consist of semi-annual groundwater monitoring/reporting.
2. Additional schedule activities needed for USACE in-house work: AOCs with currently known delays affected by the activities include completion of an FS for ODA1 and Sand Creek.

**F. Indicate how much soil and groundwater was generated and/or transported and disposed as part of RVAAP restoration activities**

No soil IDW was generated or disposed in August 2015.

Three drums of IDW associated with the July groundwater sampling event are currently being stored in Building 1036 awaiting analytical results prior to disposal. The drums are being inspected on a weekly basis. The IDW report was approved by the Army on August 14, 2015. The IDW is currently scheduled for disposal pending the disposal company's approval of the waste profiles.

**G. Describe activities planned for the following month (September 2015)**

1. Under the Army's PBA09 contract, it is anticipated that the final RI report for Ramsdell Quarry Landfill, the final RODs for Load Line #1A and Firestone Test Facility, and the draft RODs for Water Works #4 Dump and Sand Creek Dump will be approved by the Ohio EPA. CB&I will respond to comments received for the documents that are currently in with the Ohio EPA for review.
2. Responses will be provided to the Army comments on the Revised Work Plan for the Group 2 Propellant Can Tops, and the draft work plan will be submitted to the Ohio EPA for review.
3. The Army will submit a Final Remedial Design at RVAAP-05 Winklepeck Burning Grounds.
4. The contract for Remedial Action (RA) at RVAAP-05 Winklepeck Burning Grounds will be initiated by having the contractor prepare a Project Management Plan. A kick-off meeting is currently scheduled to be held on September 22, 2015 at Camp Ravenna.
5. The Army will continue with preparation of the Revised Final Proposed Plan associated



**RVAAP RESTORATION PROGRAM - DFFO MONTHLY SUMMARY REPORT  
AUGUST 2015**

with RVAAP-51, Dump along Paris Windham Road.

6. The Army will submit the Preliminary Draft Facility-Wide Groundwater Monitoring report for the July 2015 sampling event.
7. The Army will submit the Final Facility-Wide Groundwater Monitoring report for the March 2015 sampling event.
8. The Army will hold a kick-off meeting for the new Facility-Wide Groundwater contract on September 2015 at Camp Ravenna.



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

August 10, 2015

Ohio Environmental Protection Agency  
DERR-NEDO  
Attn: Rod Beals, Environmental Manager  
2110 East Aurora Road  
Twinsburg, OH 44087-1924

Subject: Ravenna Army Ammunition Plant (RVAAP) Restoration Program  
Portage/Trumbull Counties, Monthly Activity Report

Dear Mr. Beals:

Enclosed for your review is the "RVAAP Restoration Program – DFFO Monthly Summary Report – July 2015". The report summarizes Installation Restoration Program environmental activities conducted at the former RVAAP for the period from July 1, 2015 through July 31, 2015. 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.

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

Sincerely,

A handwritten signature in black ink, appearing to read "Mark S. Leeper", is positioned below the word "Sincerely,".

Mark S. Leeper, P.G., MBA  
RVAAP Restoration Program Manager  
Army National Guard Directorate

Attachment

cc: Bob Princic, Ohio EPA, DERR-NEDO  
Justin Burke, Ohio EPA, CO  
Kevin Sedlak, ARNG, Camp Ravenna  
Katie Tait, OHARNG, Camp Ravenna  
Greg Moore, USACE Louisville  
Pat Ryan, Leidos-REIMS  
Gail Harris, Vista Sciences Corporation

**RVAAP RESTORATION PROGRAM - DFFO MONTHLY SUMMARY REPORT  
JULY 2015**

**A. Status of project activities for reporting period (July 2015)**

RVAAP-01, Ramsdell Quarry Landfill	N. Peters/Leidos	The Remedial Action is complete. LTM is ongoing.
PBA-08 Eighteen IRP AOCs	N. Peters /Leidos	<p>The Final <i>Remedial Investigation Report for Soil, Sediment, and Surface Water at RVAAP-43 Load Line 10</i> was shipped to stakeholders on July 1, 2015.</p> <p>The Final <i>Remedial Investigation Report for Soil, Sediment, and Surface Water at RVAAP-50 Atlas Scrap Yard</i> was shipped to stakeholders on July 1, 2015.</p> <p>In a letter dated March 26, 2015, the Army requested an extension for submittal of revised RI documents for 14 of the AOCs currently under the PBA-08 contract. The extension request was for 180 days after a new contract is awarded. The current contract ended July 6, 2015. The Ohio EPA agreed to the extension request in a letter dated March 31, 2015 and received by the Army on April 6, 2015. In July, the Army continued developing the scope of work for a new contract which will be awarded to finalize the unfinished RI and FS reports remaining for the 14 AOCs. The Army also developed the internal government cost estimate.</p>
PBA-11 Fourteen Compliance Restoration (CR) Sites	E. Cheng/ECC	<p>On July 8, 2015, the Army issued responses to the Ohio EPA comments on the CC RVAAP-68 (Electrical Substations) Draft RI report. The Ohio EPA approved these responses on July 15, 2015. The Final RI report was issued on July 30, 2015.</p> <p>On July 9, 2015, the Army issued responses to the Ohio EPA comments on the CC RVAAP-74 (Bldg 1034 Motor Pool Hydraulic Lift) Draft RI report.</p> <p>On July 15, 2015, the Ohio EPA issued its approval of the CC RVAAP-72 (Facility-Wide USTs) Final SI report.</p> <p>On July 15, 2015, the Ohio EPA issued its approval of the Army's response to comments on the CC RVAAP-75 (George Road STP Mercury Spill) Draft SI report. This effort is on-hold pending resolution of the Ohio EPA's request to amend the Property Management Plan.</p> <p>On July 21, 2015, the Army issued the CC RVAAP-70 (East Classification Yard) Draft SI report to the Ohio EPA.</p>

**RVAAP RESTORATION PROGRAM - DFFO MONTHLY SUMMARY REPORT  
JULY 2015**

PBA-09 Fourteen MMRP MRSs	Travis McCoun/CBI	<ul style="list-style-type: none"> <li>As of July 31, 2015, the final RI reports for the following MRSs have been approved by the Ohio EPA: <ul style="list-style-type: none"> <li>Erie Burning Grounds (9/22/14)</li> <li>Open Demolition Area #2 (3/26/15)</li> <li>Load Line #1A (9/22/14)</li> <li>Landfill North of Winklepeck (4/20/15)</li> <li>Firestone Test Facility (11/25/14)</li> <li>Sand Creek Dump (3/31/15)</li> <li>Atlas Scrap Yard (11/25/14)</li> <li>Block D Igloo (4/20/15)</li> <li>Water Works #4 Dump (3/30/15)</li> <li>40mm Firing Range (5/18/15)</li> <li>Fuze and Booster Quarry (6/18/15)</li> <li>Group 8 MRS (7/16/15)</li> </ul> </li> <li>Ramsdell Quarry MRS – The Ohio EPA has requested that the recent correspondence between the Ohio EPA and the Army be included in the final RI Report before they approve it. Requested material was submitted to Ohio EPA on 6/30/15. Ohio EPA approval of the final RI report is pending.</li> <li>As of July 31, 2015, the final Proposed Plans for the following MRSs have been approved by the Ohio EPA: <ul style="list-style-type: none"> <li>Load Line #1A (5/18/15)</li> <li>Firestone Test Facility (5/18/15)</li> <li>Water Works #4 Dump (7/1/15)</li> </ul> </li> <li>Sand Creek Dump MRS –Ohio EPA approved the Draft NFA Proposed Plan on 5/18/15. The final NFA Proposed Plan was submitted to Ohio EPA for approval on 5/28/15. Ohio EPA approval is pending.</li> <li>The draft Record of Decision for the following MRSs have been issued to the Ohio EPA for review: <ul style="list-style-type: none"> <li>Firestone Test Facility (7/21/15)</li> <li>Load Line #1A (7/29/15)</li> </ul> </li> </ul>
RVAAP-28, Suspected Mustard Agent Burial Site	Huntsville/USACE	The USACE-LRL coordinated with ARNG to set-up review of the SI report and the USACE-Huntsville Center of Expertise for Military Munitions developed a contingency plan. The revised draft SI report was issued to the Ohio EPA on March 2, 2015. The Army received an approval letter from the Ohio EPA on April 27, 2015 approving the Draft Site inspection Report as is (no comments). The Revised Final SI Report was issued by Huntsville USACE to the Ohio EPA on May 6, 2015. Ohio EPA approval is pending.
RVAAP-03 & RVAAP-34, ODA1 and Sand Creek Disposal Road Landfill	E. Cheng/CELRL	No updates at this time.



**RVAAP RESTORATION PROGRAM - DFFO MONTHLY SUMMARY REPORT  
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Facility Wide Ground Water Monitoring	N. Peters/EQM	<p>The Army's contractor prepared the Draft Facility-wide Groundwater Monitoring Program RVAAP-66 Report on the March 2015 Sampling Event. The report was submitted to stakeholders on July 1, 2015.</p> <p>The Army's contractor conducted the Facility-wide Groundwater Monitoring Program RVAAP-66 July 2015 Sampling Event on July 14-24, 2015.</p>
Group #2 Propellant Cans	J. Trumble/PIKA	<p>The Army turned over the last set of comments to the contractor for the revised Work Plan and APP/HASP on August 3, 2015.</p>
Historical Well Abandonment	Q. La/Plexus	<p>The Draft Work Plan was submitted to the Ohio EPA on January 28, 2015. In a letter, dated April 2, 2015, the Ohio EPA provided comments on the work plan. Response to comments was provided to the Ohio EPA on May 6, 2015. In a letter, dated June 25, 2015, the Ohio EPA indicated that comment responses were satisfactory but indicated that well sealing guidelines were updated in March 2015 and the final work plan should reference the updated guidance and well closure activities should be conducted in accordance with the updated guidance. The Army submitted the Final Work Plan to the Ohio EPA on July 21, 2015. The Army is awaiting the Ohio EPA's response.</p>
PMP Appendices	N. Peters/CELRL	<p>PMP Appendices for Erie Burning Grounds, Open Demolition Area 2, Load Line 12, Fuze and Booster Quarry and Central Burn Pits will be developed when the general PMP text and Winklepeck PMP Appendix are issued and approved as part of the Winklepeck RA activities. The Ramsdell Quarry Landfill PMP appendix was submitted to the Ohio EPA in the Final RA Report, which was approved by the Ohio EPA. The Ramsdell PMP appendix has been added to the PMP.</p>

**RVAAP RESTORATION PROGRAM - DFFO MONTHLY SUMMARY REPORT  
JULY 2015**

RVAAP-05, Winklepeck Burning Grounds	N. Peters/CELRL Q. La/CELRL	<p>The Army awarded a contract for the Remedial Action that will be pursuant to the <i>Final Explanation of Significant Differences (ESD) for Post ROD Changes to the Remedy for Winklepeck Burning Grounds</i>, submitted to the Ohio EPA on March 27, 2015. The contract was awarded on July 31, 2015.</p> <p>The FY 2015 Pre-Draft Third Quarter LUC Report was provided to the Army for review on June 23, 2015 and all comments were addressed on July 16, 2015. The review and processing of this report and future related draft submittal is on-schedule. The FY 2015 Final Second Quarter LUC Report was provided to the Ohio EPA on July 23, 2015.</p>
RVAAP-51, Dump Along Paris Windham Road	N. Peters/CELRL	The Army continued working on the Proposed Plan which follows the approved Final Site Characterization/Focused Feasibility Study.
PBA 13 Supplemental RI/FS for multiple AOCs	Q. La /Leidos	<p>The Work Plan for the work at LL1-4, and 12 was sent to the Ohio EPA on January 31, 2015; meeting the DFFO date. Two coordination meetings with the Ohio EPA were completed on April 2, 2015 and May 19, 2015. The Ohio EPA provided comments on July 2, 2015. The Army is reviewing the comments and preparing responses.</p> <p>The Preliminary Draft Work Plan for the facility wide surface water/wet sediment review was submitted to the Ohio EPA for review on July 23, 2015. The Army is awaiting response from the Ohio EPA.</p>
TCRA at ODA2	N. Peters	Planning and funding for this project are currently underway. The scope of work will include a TCRA, MEC surface sweeps, stabilization of the Sand Creek stream diversion, and culvert replacement. The Army received the Preliminary Draft Action Memo on July 7, 2015 and submitted comments to Baltimore USACE. Baltimore USACE is currently resolving comments and working on the draft Action Memo to be submitted to the Ohio EPA. The stabilization of the Sand Creek stream diversion and the ODA2 culvert replacement were contracted with the RA at WBG and awarded on July 31, 2015.

**B. Describe difficulties encountered during the reporting period and actions taken to rectify any difficulties**

None

**C. Identify changes in key personnel**

None

**RVAAP RESTORATION PROGRAM - DFFO MONTHLY SUMMARY REPORT  
JULY 2015**

**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**

1. Facility-Wide Groundwater Program: Approval of the Draft Groundwater RI/FS Work Plan has been delayed due to unresolved issues associated with RVAAP's background monitoring well network and the GW risk assessment screening process. The Army currently plans to award a new contract under ARNGD administration) to complete the RI/FS/PP/ROD for RVAAP-66 Facility-Wide Groundwater. The existing groundwater Contract (under USACE administration) will continue with the required FWGWMP requirements for the July sampling event, which consist of semi-annual groundwater monitoring/reporting.
2. Additional schedule activities needed for USACE in-house work: AOCs with currently known delays affected by the activities include completion of an FS for ODA1 and Sand Creek. Additional information is provided in Section A.

**F. Indicate how much soil and groundwater was generated and/or transported and disposed as part of RVAAP restoration activities**

No soil IDW was generated or disposed in July 2015.

Three drums of IDW associated with the July groundwater sampling event are currently being stored in Building 1036 awaiting analytical results prior to disposal. The drums are being inspected on a weekly basis.

The IDW consisting of nonhazardous soil cuttings (400 pounds) and decon water (200 pounds) generated as part of sampling activities by ECC in April and May 2015 was properly transported and disposed of on July 14, 2015. The IDW Report was reviewed and approved by the Army on June 16, 2015. Waste profiles for the waste were reviewed and approved by the Army on 26 June 2015.

**G. Describe activities planned for the following month (August 2015)**

1. Under the Army's PBA09 contract, it is anticipated that the final RI report for Ramsdell Quarry Landfill and the final Proposed Plan for Water Works #4 Dump will be approved by the Ohio EPA. The draft RODs for Water Works #4 Dump and Sand Creek Dump MRSs will be issued to the Ohio EPA following Army legal review. CB&I will respond to comments received for the draft RODs for Load Line #1A and Firestone Test Facility MRSs that are currently in with the Ohio EPA for review.
2. Responses will be provided to the Army comments on the Revised Work Plan for the Group 2 Propellant Can Tops. The contractor will then produce the draft work plan and submit it to the Ohio EPA for review.
3. The Army will submit a Final Remedial Design at RVAAP-05 Winklepeck Burning Grounds.

**RVAAP RESTORATION PROGRAM - DFFO MONTHLY SUMMARY REPORT  
JULY 2015**

4. The contract for Remedial Action (RA) at RVAAP-05 Winklepeck Burning Grounds will be initiated by having the contractor prepare a Project Management Plan. A kick-off meeting has not been scheduled yet.
5. The Army will continue with preparation of the Revised Final Proposed Plan associated with RVAAP-51, Dump along Paris Windham Road.
6. The Army will issue the Final RI report for CC RVAAP-74 (Bldg 1034 Motor Pool Hydraulic Lift) to the Ohio EPA.
7. The Army will respond to the Ohio EPA comments on the CC-RVAAP-70 (East Classification Yard) Draft SI report.
8. The Army will issue the Draft RI report for CC-RVAAP-73 (Facility-Wide Coal Storage) to the Ohio EPA.
9. The Army will issue the Draft RI report for CC-RVAAP-69 (Bldg 1048 Fire Station) to the Ohio EPA.





**NATIONAL GUARD BUREAU**

111 SOUTH GEORGE MASON DRIVE  
ARLINGTON VA 22204-1373

July 8, 2015

Ohio Environmental Protection Agency  
DERR-NEDO  
Attn: Rod Beals, Environmental Manager  
2110 East Aurora Road  
Twinsburg, OH 44087-1924

Subject: Ravenna Army Ammunition Plant (RVAAP) Restoration Program  
Portage/Trumbull Counties, Monthly Activity Report

Dear Mr. Beals:

Enclosed for your review is the "RVAAP Restoration Program – DFFO Monthly Summary Report – June 2015". The report summarizes Installation Restoration Program environmental activities conducted at the former RVAAP for the period from June 1, 2015 through June 30, 2015. The 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.

Please contact the undersigned at (703) 607-7995 or [mark.s.leeper.civ@mail.mil](mailto:mark.s.leeper.civ@mail.mil) if there are issues or concerns with this submission.

Sincerely,

A handwritten signature in black ink, appearing to read "Mark S. Leeper", is located below the "Sincerely," text.

Mark S. Leeper, P.G., MBA  
RVAAP Restoration Program Manager  
Army National Guard Directorate

Attachment

cc: Bob Princic, Ohio EPA, DERR-NEDO  
Justin Burke, Ohio EPA, CO  
Kevin Sedlak, ARNG, Camp Ravenna  
Katie Tait, OHARNG, Camp Ravenna  
Greg Moore, USACE Louisville  
Pat Ryan, Leidos-REIMS  
Gail Harris, Vista Sciences Corporation

**RVAAP RESTORATION PROGRAM- DFFO MONTHLY SUMMARY REPORT  
JUNE 2015**

**A. Status of project activities for reporting period (June 2015)**

PROJECT NAME	USACE TECH MGR /Contractor	PROJECT STATUS
RVAAP-01, Ramsdell Quarry Landfill	N. Peters/Leidos	The Remedial Action is complete. LTM is ongoing.
PBA-08 Eighteen IRP AOCs	N. Peters /Leidos	<p>On October 14, 2014, the Army received Ohio EPA comments on the revised responses for the <i>Revised Draft 2 Remedial Investigation Report for Soil, Sediment, and Surface Water at RVAAP-43 Load Line 10</i> in which the Ohio EPA asked for additional revisions. On October 30, 2014, the Army sent an email to the Ohio EPA requesting a working meeting to address comments on the Load Line 10 RI. An on-site stakeholders' working/resolution meeting occurred on December 8 and 9, 2014. The Contractor prepared the Final RI Report for Load Line 10, based on recommended resolutions developed at the December meeting. The Final RI was shipped to stakeholders on July 1, 2015.</p> <p>The Army submitted the "Draft Remedial Investigation Report for Soil, Sediment, and Surface Water at RVAAP-50 Atlas Scrap Yard" to the Ohio EPA on June 18, 2014. The Ohio EPA issued a letter on July 14, 2014 requesting a 45-day extension. Subsequently, the Ohio EPA submitted an email correspondence to the Army on September 19, 2014, requesting a Technical Project Planning (TPP) meeting to work through a list of concerns with the subject document. The Army received a formal comment letter from Ohio EPA on September 29, 2014 with partial comments on the document. The Army began working on a Response to Comments in preparation for a TPP meeting but it was decided at the Load Line 10 meeting to push out the TPP until a full set of comments from the Ohio EPA was assembled. Ohio EPA provided comments on March 6, 2015. A contract modification was awarded in April, allowing the contractor to move forward on revising the Atlas Scrap Yard RI. A comment resolution meeting was held on May 28, 2015, and the Contractor has prepared a Final RI and a Preliminary Draft FS report for Atlas Scrap Yard. The Final RI was shipped to stakeholders on July 1, 2015.</p> <p>In a letter dated March 26, 2015, the Army requested an extension for submittal of revised RI documents for 14 of the AOCs currently under the PBA-08 contract. The extension request was for 180 days after a new contract is awarded. The current contract ends July 6, 2015. The Ohio EPA agreed to the extension request in a letter dated March 31, 2015 and received by the Army on April 6, 2015. In June, the Army began developing the scope of work for a new contract which will be awarded to finalize the unfinished RI and FS reports remaining for the 14 AOCs.</p> <p>On June 29, 2015, the storm water controls at Building 1200 and Anchor Test Area were removed.</p>

**RVAAP RESTORATION PROGRAM- DFFO MONTHLY SUMMARY REPORT  
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PROJECT NAME	USACE TECH MGR /Contractor	PROJECT STATUS
PBA-09 Fourteen MMRP MRSS	Travis McCoun/CBI	<ul style="list-style-type: none"> <li>• As of June 30, 2015, the final RI reports for the following MRSSs have been approved by the Ohio EPA: <ul style="list-style-type: none"> <li>- Erie Burning Grounds (9/22/14)</li> <li>- Open Demolition Area #2 (3/26/15)</li> <li>- Load Line #1A (9/22/14)</li> <li>- Landfill North of Winklepeck (4/20/15)</li> <li>- Firestone Test Facility (11/25/14)</li> <li>- Sand Creek Dump (3/31/15)</li> <li>- Atlas Scrap Yard (11/25/14)</li> <li>- Block D Igloo (4/20/15)</li> <li>- Water Works #4 Dump (3/30/15)</li> <li>- 40mm Firing Range (5/18/15)</li> <li>- Fuze and Booster Quarry (6/18/15)</li> </ul> </li> <li>• Ramsdell Quarry MRS – The Ohio EPA has requested that the recent correspondence between the Ohio EPA and the Army be included in the final RI Report before they approve it. Requested material was submitted to Ohio EPA on 6/30/15.</li> <li>• Group 8 MRS – Ohio EPA comments on the Draft RI Report were received on 4/13/15. A comment clarification call was held on 4/27/15 between the Army, CB&amp;I, and Ohio EPA at the request of the Ohio EPA. The Final RI Report was submitted to the Ohio EPA with responses to comments on 5/19/15. Ohio EPA approval is due 7/6/15.</li> <li>• As of June 30, 2015, the final Proposed Plans for the following MRSSs have been approved by the Ohio EPA: <ul style="list-style-type: none"> <li>- Load Line #1A (5/18/15)</li> <li>- Firestone Test Facility (5/18/15)</li> </ul> </li> <li>• Water Works #4 Dump MRS –Ohio EPA approved the Draft NFA Proposed Plan on 5/18/15. The final NFA Proposed Plan was submitted on 5/28/15.</li> <li>• Sand Creek Dump MRS –Ohio EPA approved the Draft NFA Proposed Plan on 5/18/15. The final NFA Proposed Plan was submitted on 5/28/15.</li> <li>• CB&amp;I presented the proposed plans for Load Line #1A, Firestone Test Facility, Water Works #4 Dump, and Sand Creek Dump MRSSs to the public at the June 3, 2015 RAB. The 30-day public comment period for Load Line #1A and Firestone Test Facility MRSSs concluded on June 26, 2015. The 30-day public comment period for Water Works #4 Dump and Sand Creek Dump MRSSs will conclude on July 3, 2015.</li> </ul>

**RVAAP RESTORATION PROGRAM- DFFO MONTHLY SUMMARY REPORT  
JUNE 2015**

PROJECT NAME	USACE TECH MGR /Contractor	PROJECT STATUS
PBA-11 Fourteen Compliance Restoration (CR) Sites	E. Cheng/ECC	<p>On June 4, 2015, the Ohio EPA approved the responses to its comments on the CC-RVAAP-83 Draft SI report. The Army issued the Final SI report on June 15, 2015.</p> <p>On June 22, 2015, the Army issued responses made by the Ohio EPA on the CC-RVAAP-72 Draft SI report. On June 25, 2015, the Ohio EPA approved the responses to its comments on the report.</p> <p>On June 8, 2015, the Army issued its response to the Ohio EPA comments on CC-RVAAP-75.</p> <p>On June 23, 2015, the Ohio EPA submitted its comments on the CC-RVAAP-68 Draft RI report.</p> <p>On June 25, 2015, the Ohio EPA submitted its comments on the CC-RVAAP-74 Draft RI report.</p>
RVAAP-28, Suspected Mustard Agent Burial Site	Huntsville/USACE	<p>The USACE-LRL coordinated with ARNG to set-up review of the SI report and the USACE-Huntsville Center of Expertise for Military Munitions developed a contingency plan. The revised draft SI report was issued to the Ohio EPA on March 2, 2015. The Army received an approval letter from the Ohio EPA on April 27, 2015 approving the Draft Site inspection Report as is (no comments). The Revised Final SI Report was issued by Huntsville USACE to the Ohio EPA on May 6, 2015.</p>
RVAAP-03 & RVAAP-34, ODA1 and Sand Creek Disposal Road Landfill	E. Cheng/CELRL	<p>The ODA1 RI/FS and Sand Creek Disposal Road Landfill RI will resume as an in-house Project Work Order by the USACE Louisville District.</p>
Igloos	E. Cheng/CELRL	<p>On June 11, 2015, the Ohio EPA submitted its concurrence with the information paper titled, "Summary of the Findings of the Historical Review and Risk Evaluation of the Storage Magazines and Appended Information Paper for the Former Ravenna Army Ammunition Plant, dated January 29, 2015." The information paper was finalized and added to the administrative record on June 30, 2015.</p>



**RVAAP RESTORATION PROGRAM- DFFO MONTHLY SUMMARY REPORT  
JUNE 2015**

PROJECT NAME	USACE TECH MGR /Contractor	PROJECT STATUS
Facility Wide Ground Water Monitoring	N. Peters/EQM	The Army's contractor prepared the Draft Facility-wide Groundwater Monitoring Program RVAAP-66 Report on the March 2015 Sampling Event. The report was submitted to stakeholders on July 1, 2015.
Group #2 Propellant Cans	J. Trumble/PIKA	The contractor submitted the revised Work Plan and APP/HASP to the Army for review on June 25, 2015.
Historical Well Abandonment	Q. La/Plexus	The Draft Work Plan was submitted to the Ohio EPA on January 28, 2015. In a letter, dated April 2, 2015, the Ohio EPA provided comments on the work plan. Response to comments was provided to the Ohio EPA on May 6, 2015. In a letter, dated June 25, 2015, the Ohio EPA indicated that comment responses were satisfactory but indicated that well sealing guidelines were updated in March 2015 and the final work plan should reference the updated guidance and well closure activities should be conducted in accordance with the updated guidance. The Army and its contractor are preparing the Final Work Plan which will be updated in accordance with the new March 2015 guidance.
PMP Appendices	N. Peters/CELRL	PMP Appendices for Erie Burning Grounds, Open Demolition Area 2, Load Line 12, Fuze and Booster Quarry and Central Burn Pits will be developed when the general PMP text and Winklepeck PMP Appendix are issued and approved as part of the Winklepeck RA activities. The Ramsdell Quarry Landfill PMP appendix was submitted to the Ohio EPA in the Final RA Report, which was approved by the Ohio EPA. The Ramsdell PMP appendix has been added to the PMP.

**RVAAP RESTORATION PROGRAM- DFFO MONTHLY SUMMARY REPORT  
JUNE 2015**

PROJECT NAME	USACE TECH MGR /Contractor	PROJECT STATUS
RVAAP-05, Winklepeck Burning Grounds	N. Peters/CELRL Q. La/CELRL	<p>On June 10, 2015, the Army received the Ohio EPA's comment letter on the Draft Remedial Design. The Army is developing a response to Ohio EPA's comments.</p> <p>The Army finished the Request for Proposal (RFP) package for the Remedial Action that will be pursuant to the <i>Final Explanation of Significant Differences (ESD) for Post ROD Changes to the Remedy for Winklepeck Burning Grounds</i>, submitted to the Ohio EPA on March 27, 2015. The RFP was sent out June 8, 2015.</p> <p>The FY 2015 Pre-Draft Third Quarter LUC Report was provided to the Army for review on June 23, 2015. The review of this report and future related draft submittal is on-schedule. The FY 2015 Draft Second Quarter LUC Report was provided to the Ohio EPA on May 27, 2015.</p>
RVAAP-51, Dump Along Paris Windham Road	N. Peters/CELRL	The Army continued working on the Proposed Plan which follows the approved Final Site Characterization/Focused Feasibility Study.
PBA 13 Supplemental RI/FS for multiple AOCs	Q. La /Leidos	<p>The Work Plan was sent to the Ohio EPA on the January 31, 2015; meeting the DFFO date. Two coordination meetings with the Ohio EPA were completed on April 2, 2015 and May 19, 2015. The Army is awaiting comments on the Work Plan from the Ohio EPA.</p> <p>The Preliminary Draft Work Plan for the facility wide surface water/wet sediment review was provided to the Army for review on April 24, 2015. The Army provided comments to the contractor on May 8, 2015 and June 2, 2015. The contractor provided response to comments on June 18, 2015. The Army is currently reviewing the response to comments.</p>
TCRA at ODA2	E. Cheng/N. Peters	Planning and funding for this project are currently underway. The scope of work is anticipated to include a TCRA, MEC surface sweeps, stabilization of the Sand Creek stream diversion, and culvert replacement.

**B. Describe difficulties encountered during the reporting period and actions taken to rectify any difficulties**

None

**C. Identify changes in key personnel**

None

**RVAAP RESTORATION PROGRAM- DFFO MONTHLY SUMMARY REPORT  
JUNE 2015**

**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**

1. Facility-Wide Groundwater Program: Approval of the Draft Groundwater RI/FS Work Plan has been delayed due to unresolved issues associated with RVAAP's background monitoring well network and the GW risk assessment screening process. The Army currently plans to award a new contract under ARNGD administration) to complete the RI/FS/PP/ROD for RVAAP-66 Facility-Wide Groundwater. The existing groundwater Contract (under USACE administration) will continue with the required FWGWMP requirements for the July sampling event, which consist of semi-annual groundwater monitoring/reporting.
2. Additional schedule activities needed for USACE in-house work: AOCs with currently known delays affected by the activities include completion of an FS for ODA1 and Sand Creek. Additional information is provided in Section A.

**F. Indicate how much soil and groundwater was generated and/or transported and disposed as part of RVAAP restoration activities**

No soil or groundwater waste was generated or disposed in June 2015. IDW consisting of nonhazardous soil cuttings and decon water generated as part of sampling activities by ECC in April and May 2015 is currently being properly managed on-site. The IDW Report was reviewed and approved by the Army in June 2015. Waste profiles for the waste were reviewed and approved by the Army on 26 June 2015. Transport and disposal of the waste is currently being arranged.

**G. Describe activities planned for the following month (July 2015)**

1. Under the Army's PBA09, the final RI reports for Ramsdell Quarry Landfill and Group 8 MRSs and the final proposed plans for Water Works #4 Dump and Sand Creek Dump MRSs will be approved by the Ohio EPA. The preliminary draft RODs for Load Line #1A, Firestone Test Facility, Water Works #4 Dump, and Sand Creek Dump MRSs will be issued for Army legal review. Following resolution of Army comments on these documents, the RODs will be issued as drafts to the Ohio EPA.
2. Responses will be provided to Ohio EPA comments on the Revised Work Plan for the Group 2 Propellant Can Tops. The Army will review the pre draft work plans for the Group 2 Propellant Can Top SI, and the contractor will begin to create the draft plans
3. The Army will submit responses to Ohio EPA comments on the Draft Remedial Design at RVAAP-05 Winklepeck Burning Grounds.
4. Proposals for the Remedial Action (RA) at RVAAP-05 Winklepeck Burning Grounds are due July 9, 2015. The contract for the removal action is expected to be awarded in late July or early August, assuming sufficient funding from Army Environmental Command is available.

**RVAAP RESTORATION PROGRAM- DFFO MONTHLY SUMMARY REPORT  
JUNE 2015**

5. The Army will continue with preparation of the Revised Final Proposed Plan associated with RVAAP-51, Dump along Paris Windham Road.
6. The Army Contractor plans to submit the *"Draft Facility-Wide Groundwater Monitoring Program RVAAP-66 Facility-Wide Groundwater Report on the March 2015 Sampling Event"* for stakeholder review.
7. The USACE and ARNG will resolve remaining comments of the Preliminary Draft Work Plan for the Facility-Wide Surface Water/Wet Sediment with the contractor.
8. The USACE and ARNG will provide comments to the FY14 Preliminary Draft Third Quarter LUC Inspection Report.
9. The Army will submit Final SI reports for CC-RVAAP-72 and -75 to the Ohio EPA.
10. The Army will submit the Draft SI report for CC-RVAAP-70 to the Ohio EPA.
11. The Army will submit the Draft RI report for CC-RVAAP-73 to the Ohio EPA.
12. The IDW drums generated by the follow-on sampling activities in support of the PBA11 CR Sites project will be transported and disposed off-site.
13. Responses will be provided to the Ohio EPA comments on the Draft Work Plan for the Interim Removal Action Historical Well Abandonment. The contractor will begin revising the Work Plan to incorporate the new guidance associated with the State of Ohio Technical Guidance for Sealing Unused Wells.



**NATIONAL GUARD BUREAU**

111 SOUTH GEORGE MASON DRIVE  
ARLINGTON VA 22204-1373

June 8, 2015

Ohio Environmental Protection Agency  
DERR-NEDO  
Attn: Rod Beals, Environmental Manager  
2110 East Aurora Road  
Twinsburg, OH 44087-1924

Subject: Ravenna Army Ammunition Plant (RVAAP) Restoration Program  
Portage/Trumbull Counties, Monthly Activity Report

Dear Mr. Beals:

Enclosed for your review is the "RVAAP Restoration Program – DFFO Monthly Summary Report – May 2015". The report summarizes Installation Restoration Program environmental activities conducted at the former RVAAP for the period from May 1, 2015 through May 31, 2015. The 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.

Please contact the undersigned at (703) 607-7995 or [mark.s.leeper.civ@mail.mil](mailto:mark.s.leeper.civ@mail.mil) if there are issues or concerns with this submission.

Sincerely,

A handwritten signature in black ink, appearing to read "M. Leeper", is positioned below the "Sincerely," text.

Mark S. Leeper, P.G., MBA  
RVAAP Restoration Program Manager  
Army National Guard Directorate

Attachment

cc: Justin Burke, Ohio EPA, CO  
Kevin Sedlak, ARNG, Camp Ravenna  
Katie Tait, OHARNG, Camp Ravenna  
Nat Peters, USACE Louisville  
Pat Ryan, Leidos-REIMS  
Gail Harris, Vista Sciences Corporation



**RVAAP RESTORATION PROGRAM - DFFO MONTHLY SUMMARY REPORT  
MAY 2015**

**A. Status of project activities for reporting period (May 2015)**

PROJECT NAME	USACE TECH MGR /Contractor	PROJECT STATUS
RVAAP-01, Ramsdell Quarry Landfill	N. Peters/Leidos	The Remedial Action is complete. LTM is ongoing.
PBA-08 Eighteen IRP AOCs	N. Peters /Leidos	<p>On October 14, 2014, the Army received Ohio EPA comments on the revised responses for the <i>Revised Draft 2 Remedial Investigation Report for Soil, Sediment, and Surface Water at RVAAP-43 Load Line 10</i> in which the Ohio EPA asked for additional revisions. On October 30, 2014, the Army sent an email to the Ohio EPA requesting a working meeting to address comments on the Load Line 10 RI. An on-site stakeholders' working/resolution meeting occurred on December 8 and 9, 2014. The Contractor is preparing the Final RI Report for Load Line 10, based on recommended resolutions developed at the December meeting.</p> <p>The Draft RAR for RVAAP-13 Building 1200 was approved by the Ohio EPA in a letter dated May 4, 2015. The Contractor issued the Final RAR for Building 1200 on May 14, 2015.</p> <p>The Army submitted the "Draft Remedial Investigation Report for Soil, Sediment, and Surface Water at RVAAP-50 Atlas Scrap Yard" to the Ohio EPA on June 18, 2014. The Ohio EPA issued a letter on July 14, 2014 requesting a 45-day extension. Subsequently, the Ohio EPA submitted an email correspondence to the Army on September 19, 2014, requesting a Technical Project Planning (TPP) meeting to work through a list of concerns with the subject document. The Army received a formal comment letter from Ohio EPA on September 29, 2014 with partial comments on the document. The Army began working on a Response to Comments in preparation for a TPP meeting but it was decided at the Load Line 10 meeting to push out the TPP until a full set of comments from the Ohio EPA was assembled. Ohio EPA provided comments on March 6, 2015. A contract modification was awarded in April, allowing the contractor to move forward on revising the Atlas Scrap Yard RI. A comment resolution meeting was held on May 28, 2015, and the Contractor has begun working on a Revised RI and an FS report for Atlas Scrap Yard.</p> <p>In a letter dated March 26, 2015, the Army requested an extension for submittal of revised RI documents for 14 of the AOCs currently under the PBA-08 contract. The extension request was for 180 days after a new contract is awarded. The current contract ends July 6, 2015. The Ohio EPA agreed to the extension request in a letter dated March 31, 2015 and received by the Army on April 6, 2015.</p>

**RVAAP RESTORATION PROGRAM - DFFO MONTHLY SUMMARY REPORT  
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PROJECT NAME	USACE TECH MGR /Contractor	PROJECT STATUS
PBA-09 Fourteen MMRP MRSs	Travis McCoun/CBI	<ul style="list-style-type: none"> <li>• As of May 30, 2015, the final RI reports for the following MRSs have been approved by the Ohio EPA: <ul style="list-style-type: none"> <li>- Erie Burning Grounds (9/22/14)</li> <li>- Open Demolition Area #2 (3/26/15)</li> <li>- Load Line #1A (9/22/14)</li> <li>- Landfill North of Winklepeck (4/20/15)</li> <li>- Firestone Test Facility (11/25/14)</li> <li>- Sand Creek Dump (3/31/15)</li> <li>- Atlas Scrap Yard (11/25/14)</li> <li>- Block D Igloo (4/20/15)</li> <li>- Water Works #4 Dump (3/30/15)</li> </ul> </li> <li>• Ramsdell Quarry MRS –The Final RI Report was submitted to the Ohio EPA with responses to comments on 1/27/15. Ohio EPA comments on the responses or approval of the RI report are overdue.</li> <li>• Fuze and Booster Quarry MRS – Ohio EPA comments on the Draft RI Report were received on 3/30/15. Responses were submitted to Ohio EPA on 4/17/15. Ohio EPA approval is due 6/1/15.</li> <li>• 40mm Firing Range MRS – Draft RI Report was approved by the Ohio EPA on 4/15/15. The Final RI Report was submitted to the Ohio EPA on 4/30/15. Ohio EPA approval is due 6/14/15.</li> <li>• Group 8 MRS – Ohio EPA comments on the Draft RI Report were received on 4/13/15. A comment clarification call was held on 4/27/15 between the Army, CB&amp;I, and Ohio EPA at the request of the Ohio EPA. The Final RI Report was submitted to the Ohio EPA with responses to comments on 5/19/15. Ohio EPA approval is due 7/6/15</li> <li>• Load Line #1A MRS –The Final NFA Proposed Plan was approved by Ohio EPA on 5/18/15.</li> <li>• Firestone Test Facility MRS – The Final NFA Proposed Plan was approved by Ohio EPA on 5/18/15.</li> <li>• Water Works #4 Dump MRS –Ohio EPA approved the Draft NFA Proposed Plan on 5/18/15. Army legal review comments indicating that the document was legally sufficient were received on 26 May 2015. The Final NFA Proposed Plan is currently in production.</li> <li>• Sand Creek Dump MRS –Ohio EPA approved the Draft NFA Proposed Plan on 5/18/15. Army legal review comments indicating that the document was legally sufficient were received on 28 May 2015. The Final NFA Proposed Plan is currently in production.</li> </ul>

**RVAAP RESTORATION PROGRAM - DFFO MONTHLY SUMMARY REPORT  
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PROJECT NAME	USACE TECH MGR /Contractor	PROJECT STATUS
PBA-11 Fourteen Compliance Restoration (CR) Sites	E. Cheng/ECC	<p>In a letter dated May 13, 2015, the Ohio EPA submitted comments on the CC-RVAAP-72 Draft SI report.</p> <p>On May 19, 2015, the Army issued the CC-RVAAP-83 Draft SI report to the Ohio EPA.</p> <p>From May 12 through 14, 2015, follow-on soil sampling was conducted by the Army contractor at CC-RVAAP-79.</p>
RVAAP-28, Suspected Mustard Agent Burial Site	Huntsville/USACE	<p>The USACE-LRL coordinated with ARNG to set-up review of the SI report and the USACE-Huntsville Center of Expertise for Military Munitions developed a contingency plan. The revised draft SI report was issued to the Ohio EPA on March 2, 2015. The Army received an approval letter from the Ohio EPA on April 27, 2015 approving the Draft Site inspection Report as is (no comments). The Revised Final SI Report was issued by Huntsville USACE to the Ohio EPA on May 6, 2015.</p>
RVAAP-03 & RVAAP-34, ODA1 and Sand Creek Disposal Road Landfill	E. Cheng/CELRL	<p>USACE will complete the RI/FS for ODA1 and RI for Sand Creek as an in-house effort. Additional phases and work will require new contract action, which would be projected for award in FY16.</p>
Igloos	E. Cheng/CELRL	<p>The Information Paper dated January 28, 2015 summarizing the Army's findings from its historical review and risk evaluation of the storage magazines is currently under review by the Ohio EPA.</p>

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PROJECT NAME	USACE TECH MGR /Contractor	PROJECT STATUS
Facility Wide Ground Water Monitoring	N. Peters/EQM	Four drums of IDW from the March 2015 groundwater sampling event were transported for offsite disposal as nonhazardous waste on May 15, 2015.
Group #2 Propellant Cans	J. Trumble/PIKA	A modification of the task order was completed on May 22, 2015 to coordinate the work plan comment resolution, conduct additional sampling, and remove the propellant cans and tops.
Historical Well Abandonment	Q. La/Plexus	The Draft Work Plan was submitted to the Ohio EPA on January 28, 2015. In a letter, dated April 2, 2015, the Ohio EPA provided comments on the work plan. Response to comments was provided to the Ohio EPA prior to May 6, 2015. The Army is awaiting Ohio EPA approval of the response to comments.
PMP Appendices	N. Peters/CELRL	Draft PMP Appendices for Erie Burning Grounds, Open Demolition Area 2, Load Line 12, Fuze and Booster Quarry and Central Burn Pits are on hold until an update of the general PMP text and Winklepeck PMP Appendix is issued and approved. The Ramsdell Quarry Landfill PMP appendix was submitted to the Ohio EPA in the Final RA Report.

**RVAAP RESTORATION PROGRAM - DFFO MONTHLY SUMMARY REPORT  
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<b>PROJECT NAME</b>	<b>USACE TECH MGR /Contractor</b>	<b>PROJECT STATUS</b>
RVAAP-05, Winklepeck Burning Grounds	N. Peters/CELRL Q. La/CELRL	<p>The Army began developing the Request for Proposal package for the Remedial Action that will be pursuant to the <i>Final Explanation of Significant Differences (ESD) for Post ROD Changes to the Remedy for Winklepeck Burning Grounds</i>, submitted to the Ohio EPA on March 27, 2015.</p> <p>The FY 2015 Draft Second Quarter LUC Report was provided to the Ohio EPA on May 27, 2015.</p>
RVAAP-51, Dump Along Paris Windham Road	N. Peters/CELRL	The Army continued developing the Proposed Plan, which will follow the approved Final Site Characterization/Focused Feasibility Study.
PBA 13 Supplemental RI/FS for multiple AOCs	Q. La /Leidos	<p>The Work Plan was sent to the Ohio EPA on the January 31, 2015; meeting the DFFO date. Two coordination meetings with the Ohio EPA were held on April 2, 2015 and May 19, 2015. The Army is awaiting comments on the Work Plan from the Ohio EPA.</p> <p>The Preliminary Draft Work Plan for the facility wide surface water/wet sediment review was provided to the Army and ARNG for review on April 24, 2015. The Work Plan is currently in the review process.</p>
TCRA at ODA2	E. Cheng/N. Peters	Planning and funding for this project are currently underway. The scope of work is anticipated to include a TCRA, MEC surface sweeps, stabilization of the Sand Creek stream diversion, and culvert replacement.

**B. Describe difficulties encountered during the reporting period and actions taken to rectify any difficulties**

None

**C. Identify changes in key personnel**

None



**RVAAP RESTORATION PROGRAM - DFFO MONTHLY SUMMARY REPORT  
MAY 2015**

**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**

1. Facility-Wide Groundwater Program: Approval of the Draft Groundwater RI/FS Work Plan has been delayed due to unresolved issues associated with RVAAP's background monitoring well network and the GW risk assessment screening process. The Army currently plans to award a new contract under ARNGD administration) to complete the RI/FS/PP/ROD for RVAAP-66 Facility-Wide Groundwater. The existing groundwater Contract (under USACE administration) will continue with the required FWGWMP requirements, which consist of semi-annual groundwater monitoring/reporting and annual reporting.
2. Additional schedule activities needed for USACE in-house work: AOCs with currently known delays affected by the activities include completion of an FS for ODA1 and Sand Creek. Additional information is provided in Section A.

**F. Indicate how much contaminated soil was removed and contaminated groundwater was pumped and where such contaminated media were disposed**

Four 55-gallon drums of IDW were generated during the March 2015 groundwater sampling event. Three of the drums contain purged groundwater and one of the drums contains decontamination fluids. The IDW Report and waste profile was approved by the Army. The nonhazardous waste was picked up and transported for offsite disposal on 15 May 2015.

One 55-gallon drum of IDW soil and one 55-gallon drum of decon liquids were generated during the April 2015 sampling conducted in support of the PBA11 CR Sites project. Additional IDW was added to the drums during the follow-on sampling event conducted by the Army contractor in May 2015. Laboratory analysis for waste characterization purposes has been completed and an IDW letter report is under Army review. Weekly inspections of the IDW drums have taken place throughout the month of May 2015.

**G. Describe activities planned for the following month (June 2015)**

1. Leidos will work to finalize the RVAAP-43 Load Line 10 RI Report to be consistent with changes requested by the Ohio EPA. Leidos will revise the Atlas Scrap Yard RI Report to produce a final document consistent with agreements developed in the May 28 comment resolution meeting. Leidos will also develop an FS report for Atlas Scrap Yard. Leidos will mobilize for grading and reseeding the Building 1200 Remedial Action site and will continue site inspections. The Army and Leidos anticipate that vegetation will be adequate to allow removal of the silt fence by the end of June. Leidos will continue site inspections of the Anchor Test Area Remedial Action site. Site inspections have shown adequate grass cover, so the silt fence will be removed by the end of June.
2. Under the Army's PBA09, the Draft RI report for Fuze and Booster Quarry MRS will be finalized and submitted following resolution of regulatory comments. The Final RI reports for Ramsdell Quarry Landfill and 40mm Firing Range will be approved by the Ohio EPA. The Final NFA Proposed Plans for Sand Creek Dump and Water Works #4 Dump will be

**RVAAP RESTORATION PROGRAM - DFFO MONTHLY SUMMARY REPORT**  
**MAY 2015**

submitted. The NFA Proposed Plans for Load Line #1A, Firestone Test Facility, Sand Creek Dump, and Water Works #4 Dump will be presented at the 6/3/15 Public Meeting.

3. Responses will be provided to Ohio EPA comments on the Revised Work Plan for the Group 2 Propellant Can Tops. The contractor will begin revising the project plans to include collection and disposal of the propellant cans, and tops.
4. The Army will solicit proposals for the Remedial Action (RA) at RVAAP-05 Winklepeck Burning Grounds. The Performance Work Statement for the RA at Winklepeck will also include slope stabilization activities at Rocket Ridge and a culvert replacement for Sand Creek at the ODA2 access road.
5. The Army will proceed with preparation of the Revised Final Proposed Plan associated with RVAAP-51, Dump along Paris Windham Road.
6. The Army Contractor plans to submit the *"Draft Facility-Wide Groundwater Monitoring Program RVAAP-66 Facility-Wide Groundwater Report on the March 2015 Sampling Event"* for stakeholder review.
7. The USACE will provide comments of the Preliminary Draft Work Plan for the Facility-Wide Surface Water/Wet Sediment to the contractor.
8. The FY15 Preliminary Draft Third Quarter LUC Inspection report will be ready for Army review.
9. The Army will submit responses to Ohio EPA comments on the CC-RVAAP-72 and -75 SI reports.
10. The Army anticipates comments from the Ohio EPA review of the CC-RVAAP-68 and -74 Draft RI reports.
11. The IDW drums generated by the follow-on sampling activities in support of the PBA11 CR Sites project will be transported and disposed off-site following the approval of the IDW letter report.



**NATIONAL GUARD BUREAU**

111 SOUTH GEORGE MASON DRIVE  
ARLINGTON VA 22204-1373

May 8, 2015

Ohio Environmental Protection Agency  
DERR-NEDO  
Attn: Rod Beals, Environmental Manager  
2110 East Aurora Road  
Twinsburg, OH 44087-1924

Subject: Ravenna Army Ammunition Plant (RVAAP) Restoration Program  
Portage/Trumbull Counties, Monthly Activity Report

Dear Mr. Beals:

Enclosed for your review is the "RVAAP Restoration Program – DFFO Monthly Summary Report – April 2015". The report summarizes Installation Restoration Program environmental activities conducted at the former RVAAP for the period from April 1, 2015 through April 30, 2015. The 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.

Please contact the undersigned at (703) 607-7995 or [mark.s.leeper.civ@mail.mil](mailto:mark.s.leeper.civ@mail.mil) if there are issues or concerns with this submission.

Sincerely,

A handwritten signature in black ink, appearing to read "Mark S. Leeper", is positioned below the word "Sincerely,".

Mark S. Leeper, P.G., MBA  
RVAAP Restoration Program Manager  
Army National Guard Directorate

cc: Justin Burke, Ohio EPA, CO  
Kevin Sedlak, ARNG, Camp Ravenna  
Katie Tait, OHARNG, Camp Ravenna  
Nat Peters, USACE Louisville  
Pat Ryan, Leidos-REIMS  
Gail Harris, Vista Sciences Corporation

**RVAAP RESTORATION PROGRAM- DFFO MONTHLY SUMMARY REPORT  
APRIL 2015**

**A. Status of project activities for reporting period (April 2015)**

PROJECT NAME	USACE TECH MGR /Contractor	PROJECT STATUS
RVAAP-01, Ramsdell Quarry Landfill	N. Peters/Leidos	The Remedial Action is complete. LTM is ongoing.
PBA-08 Eighteen IRP AOCs	N. Peters /Leidos	<p>On October 14, 2014, the Army received Ohio EPA comments on the revised responses for the <i>Revised Draft 2 Remedial Investigation Report for Soil, Sediment, and Surface Water at RVAAP-43 Load Line 10</i> in which the Ohio EPA asked for additional revisions. On October 30, 2014, the Army sent an email to the Ohio EPA requesting a working meeting to address comments on the Load Line 10 RI. An on-site stakeholders' working/resolution meeting occurred on December 8 and 9, 2014. Based on recommended resolutions developed at the meeting, the Army anticipates submitting the Final RI after a pending contract modification to sustain additional project work efforts.</p> <p>Ohio EPA issued a letter approving the Draft Remedial Action Report (RAR) for RVAAP-48 Anchor Test Area on March 17, 2015. The Final RAR for RVAAP-48 Anchor Test Area was submitted on April 16, 2015. The Draft RAR for RVAAP-13 Building 1200 was submitted for Ohio EPA review on March 17, 2015. Ohio EPA review comments were pending in April.</p> <p>The Army submitted the "Draft Remedial Investigation Report for Soil, Sediment, and Surface Water at RVAAP-50 Atlas Scrap Yard" to the Ohio EPA on June 18, 2014. The Ohio EPA issued a letter on July 14, 2014 requesting a 45-day extension. Subsequently, the Ohio EPA submitted an email correspondence to the Army on September 19, 2014, requesting a Technical Project Planning (TPP) meeting to work through a list of concerns with the subject document. The Army received a formal comment letter from Ohio EPA on September 29, 2014 with partial comments on the document. The Army began working on a Response to Comments in preparation for a TPP meeting but it was decided at the Load Line 10 meeting to push out the TPP until a full set of comments from the Ohio EPA was assembled. Ohio EPA provided comments on March 6, 2015. A contract modification was awarded in April, allowing the contractor to move forward on revising the Atlas Scrap Yard RI. A comment resolution meeting has been scheduled for May 28, 2015 and the Army and contractor are working on responses to Ohio EPA comments.</p> <p>In a letter dated March 26, 2015, the Army requested an extension for submittal of revised RI documents for 14 of the AOCs currently under the PBA-08 contract. The extension request was for 180 days after a new contract is awarded. The current contract ends July 6, 2015. The Ohio EPA agreed to the extension request in a letter dated March 31, 2015 and received by the Army on April 6, 2015.</p>

**RVAAP RESTORATION PROGRAM- DFFO MONTHLY SUMMARY REPORT  
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PROJECT NAME	USACE TECH MGR /Contractor	PROJECT STATUS
CERCLA 5-YR Review Report	Buffalo District/USACE	The 30-day public comment period for this document concluded on April 11, 2015.
PBA-09 Fourteen MMRP MRSs	Travis McCoun/CBI	<p>The current status of the reporting for each of the MRSs are as follows:</p> <ul style="list-style-type: none"> <li>Block D Igloo MRS – Final RI Report was approved by Ohio EPA on 4/20/15.</li> <li>Landfill North of Winklepeck MRS – Final RI Report was approved by Ohio EPA on 4/20/15.</li> <li>Water Works #4 Dump MRS – Final RI Report was approved by Ohio EPA on 3/30/14. The Preliminary Draft NFA Proposed Plan was approved by the Army on 4/9/15. The Draft NFA Proposed Plan was submitted for concurrent review by Army legal and the Ohio EPA on 4/23/15.</li> <li>Sand Creek Dump MRS – Final RI Report was approved by Ohio EPA 3/31/15. The Preliminary Draft NFA Proposed Plan was approved by the Army on 4/21/15. The Draft NFA Proposed Plan was submitted for concurrent review by Army legal and the Ohio EPA on 4/23/15.</li> <li>Fuze and Booster Quarry MRS – Ohio EPA comments on the Draft RI Report were received on 3/30/15. Responses were submitted to Ohio EPA on 4/17/15.</li> <li>40mm Firing Range MRS – Draft RI Report was approved by the Ohio EPA on 4/15/15. The Final RI Report was submitted to the Ohio EPA on 4/30/15.</li> <li>Group 8 MRS – Ohio EPA comments on the Draft RI Report were received on 4/13/15. Ohio EPA has requested a comment clarification call.</li> <li>Load Line #1A MRS –Draft NFA Proposed Plan was approved by Ohio EPA on 4/14/15. Waiting on RAB date before sending final version.</li> <li>Firestone Test Facility MRS – Draft NFA Proposed Plan was approved by Ohio EPA on 4/14/15. Waiting on RAB date before sending final version.</li> </ul>



**RVAAP RESTORATION PROGRAM- DFFO MONTHLY SUMMARY REPORT  
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PROJECT NAME	USACE TECH MGR /Contractor	PROJECT STATUS
PBA-11 Fourteen Compliance Restoration (CR) Sites	E. Cheng/ECC	<p>On April 2, 2015, the Army issued the CC-RVAAP-68 Draft RI report to the Ohio EPA.</p> <p>On April 9, 2015, the Army issued the CC-RVAAP-72 Draft SI report to the Ohio EPA.</p> <p>In a letter dated April 16, 2015, the Ohio EPA submitted comments on the CC-RVAAP-75 Draft SI report.</p> <p>In a letter dated April 16, 2015, the Ohio EPA submitted comments on the CC-RVAAP-83 Draft SI report.</p> <p>During the month of April, follow-on soil sampling was conducted at CC-RVAAP-69 and -79.</p>
RVAAP-28, Suspected Mustard Agent Burial Site	Huntsville/USACE	<p>The USACE-LRL coordinated with ARNG to set-up review of the SI report and the USACE-Huntsville Center of Expertise for Military Munitions developed a contingency plan. The revised draft SI report was issued to the Ohio EPA on March 2, 2015. The Army received an approval letter from the Ohio EPA on April 27, 2015 approving the Draft Site inspection Report as is (no comments).</p>
RVAAP-03 & RVAAP-34, ODA1 and Sand Creek Disposal Road Landfill	E. Cheng/CELRL	<p>Based on prioritization of the other AOCs currently under contract and the work affiliated with them being completed, these two AOCs are delayed until a later date TBD. Continued action at these sites will likely require a new contract action.</p>
Igloos	E. Cheng/CELRL	<p>On February 23, 2015, the Army received an email correspondence from the Ohio EPA requesting additional information regarding the storage igloos Information Paper. The Army response to this correspondence is expected to be finalized pending the Ohio EPA's full review and comment on the Information Paper.</p>

**RVAAP RESTORATION PROGRAM- DFFO MONTHLY SUMMARY REPORT  
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PROJECT NAME	USACE TECH MGR /Contractor	PROJECT STATUS
Facility Wide Ground Water Monitoring	N. Peters/EQM	<p>The Ohio EPA approved the <i>"Final Facility-Wide Groundwater Monitoring Program RVAAP-66 Facility-Wide Groundwater Report on the October 2014 Sampling Event"</i> in a letter dated April 2, 2015.</p> <p>The Ohio EPA approved the <i>Final Facility-Wide Groundwater Monitoring Program RVAAP-66 Facility-Wide Annual Report for 2014</i> in a letter dated April 7, 2015.</p> <p>The Army Contractor submitted the Draft IDW Report for the March sampling event to the Army on April 10 and received Army approval on April 15, 2015. The waste profile was reviewed and approved by the Army on April 15, 2015. The Contractor is working with the disposal company to transport and dispose of the drums offsite as nonhazardous waste.</p>
Group #2 Propellant Cans	J. Trumble/PIKA	<p>A modification of the task order is being developed to coordinate the work plan comment resolution, conduct additional sampling, and address the propellant can tops.</p>
Historical Well Abandonment	Q. La/Plexus	<p>The Draft Work Plan was submitted to the Ohio EPA on January 28, 2015. In a letter, dated April 2, 2015, the Ohio EPA provided comments on the work plan. Response to comments is on-schedule and will be provided to the Ohio EPA prior to May 7, 2015.</p>
PMP Appendices	N. Peters/CELRL	<p>Draft PMP Appendices for Erie Burning Grounds, Open Demolition Area 2, Load Line 12, Fuze and Booster Quarry and Central Burn Pits are on hold until an update of the general PMP text and Winklepeck PMP Appendix is issued and approved. The Ramsdell Quarry Landfill PMP appendix was submitted to the Ohio EPA in the Final RA Report.</p>

**RVAAP RESTORATION PROGRAM- DFFO MONTHLY SUMMARY REPORT  
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PROJECT NAME	USACE TECH MGR /Contractor	PROJECT STATUS
RVAAP-05, Winklepeck Burning Grounds	N. Peters/CELRL Q. La/CELRL	<p>The Army continued developing the Scope of Work for the Remedial Action that will be pursuant to the <i>Final Explanation of Significant Differences (ESD) for Post ROD Changes to the Remedy for Winklepeck Burning Grounds</i>, submitted to the Ohio EPA on March 27, 2015.</p> <p>The FY 2015 Preliminary Draft Second Quarter LUC Report was provided to the Army for review on April 6, 2015. That USACE and OHARNG/ARNG have provided their comments to the Contractor. The review of this report and future Draft submittal to the Ohio EPA is on-schedule.</p>
RVAAP-51, Dump Along Paris Windham Road	N. Peters/CELRL	<p>The Army began working on the Proposed Plan which follows the approved Final Site Characterization/Focused Feasibility Study.</p>
PBA 13 Supplemental RI/FS for multiple AOCs	Q. La /Leidos	<p>The Work Plan was sent to the Ohio EPA on the January 31, 2015; meeting the DFFO date. A coordination meeting with the Ohio EPA was completed on April 2, 2015. The Army is awaiting comments on the Work Plan from the Ohio EPA.</p> <p>The Preliminary Draft Work Plan for the facility wide surface water/wet sediment review was provided to the Army and ARNG for review on April 24, 2015. The Work Plan is currently in the review process and is on-schedule.</p>
TCRA at ODA2	E. Cheng/N. Peters	<p>Planning and funding for this project are currently underway. The scope of work is anticipated to include a TCRA, MEC surface sweeps, stabilization of the Sand Creek stream diversion, and culvert replacement.</p>

**B. Describe difficulties encountered during the reporting period and actions taken to rectify any difficulties**

None

**C. Identify changes in key personnel**

None

**RVAAP RESTORATION PROGRAM- DFFO MONTHLY SUMMARY REPORT  
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**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**

1. Facility-Wide Groundwater Program: Approval of the Draft Groundwater RI/FS Work Plan has been delayed due to unresolved issues associated with RVAAP's background monitoring well network and the GW risk assessment screening process. The Army currently plans to award a new contract under ARNGD administration) to complete the RI/FS/PP/ROD for RVAAP-66 Facility-Wide Groundwater. The existing groundwater Contract (under USACE administration) will continue with the required FWGWMP requirements, which consist of semi-annual groundwater monitoring/reporting and annual reporting.
2. Additional schedule activities needed for USACE in-house work: AOCs with currently known delays affected by the activities include completion of an FS for ODA1 and Sand Creek. Additional information is provided in Section A.

**F. Indicate how much contaminated soil was removed and contaminated groundwater was pumped and where such contaminated media were disposed**

Four 55-gallon drums of IDW were generated during the March 2015 groundwater sampling event. Three of the drums contain purged groundwater and one of the drums contains decontamination fluids. The IDW Report has been approved by the Army and arrangements are being made with the disposal company for transportation and off-site disposal of the drums.

One 55-gallon drum of IDW soil and one 55-gallon drum of decon liquids were generated during the April 2015 sampling conducted in support of the PBA11 CR Sites project. Laboratory analysis of the waste characterization samples is currently underway.

**G. Describe activities planned for the following month (May 2015)**

1. The Army anticipates awarding a contract modification to Leidos to allow them to finalize the RVAAP-43 Load Line 10 RI Report to be consistent with changes requested by the Ohio EPA. The Army and Leidos will proceed with comment resolution for the Atlas Scrap Yard RI Report. A comment resolution meeting with the Ohio EPA is scheduled for May 28, 2015.
2. Under the Army's PBA09, the remaining Draft RI reports for Fuze and Booster Quarry MRS and Group 8 MRS will be finalized and submitted following resolution of regulatory comments. It is expected that the Final RI reports for Ramsdell Quarry Landfill and 40mm Firing Range will be approved by the Ohio EPA. It is expected that the draft NFA Proposed Plans for Sand Creek Dump and Water Works #4 Dump that have been submitted for concurrent Army legal and Ohio EPA reviews will be approved. Final versions of the NFA Proposed Plans for Load Line #1, Firestone Test Facility, Sand Creek Dump, and Water Works #4 Dump will be submitted to the Ohio EPA following determination of a date for a RAB or a PP public meeting.

**RVAAP RESTORATION PROGRAM- DFFO MONTHLY SUMMARY REPORT  
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3. A modification of the Group 2 Propellant Can Tops contract is being developed by the Army to coordinate the work plan comment resolution, conduct additional sampling, and address the propellant can tops.
4. The Army is preparing a Performance Work Statement (PWS) for the Remedial Action at RVAAP-05 Winklepeck Burning Grounds. The Army anticipates receiving comments from the Ohio EPA on the Remedial Design. The Army will respond to those comments and will incorporate any necessary changes into the PWS. The PWS for the RA at Winklepeck will also include slope stabilization activities at Rocket Ridge and a culvert replacement for Sand Creek at the ODA2 access road.
5. The Army will submit appropriate copies of the Revised Final Site Characterization/ Focused Feasibility Study for RVAAP-51, Dump along Paris Windham Road, to Ohio EPA and other stakeholders. The Army also will proceed with preparation of the Revised Final Proposed Plan associated with the site.
6. The Army Contractor plans to submit the *"Pre-draft Facility-Wide Groundwater Monitoring Program RVAAP-66 Facility-Wide Groundwater Report on the March 2015 Sampling Event"* for Army review. The four drums of IDW, generated during the March sampling event, will be transported and disposed of off-site.
7. The USACE and OHARNG/ARNG will provide comments of the Preliminary Draft Work Plan for the Facility-Wide Surface Water/Wet Sediment to the contractor.
8. The FY15 Preliminary Draft Second Quarter LUC Inspection report will be ready for stakeholder review.
9. The field work for the FY15 Preliminary Draft Third Quarter LUC Inspection report will be started.
10. The Army will submit responses to Ohio EPA comments on the CC-RVAAP-75 and -83 SI reports.





**NATIONAL GUARD BUREAU**

111 SOUTH GEORGE MASON DRIVE  
ARLINGTON VA 22204-1373

April 10, 2015

Ohio Environmental Protection Agency  
DERR-NEDO  
Attn: Rod Beals, Environmental Manager  
2110 East Aurora Road  
Twinsburg, OH 44087-1924


Subject: Ravenna Army Ammunition Plant (RVAAP) Restoration Program  
Portage/Trumbull Counties, Monthly Activity Report

Dear Mr. Beals:

Enclosed for your review is the RVAAP Restoration Program – DFFO Monthly Summary Report for March 2015. The report summarizes Installation Restoration Program activities conducted at the former RVAAP from March 1, 2015 through March 31, 2015. The 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.

Please contact the undersigned at (703) 607-7995 or [mark.s.leeper.civ@mail.mil](mailto:mark.s.leeper.civ@mail.mil) if there are issues or concerns with this submission.

Sincerely,

  
Mark S. Leeper, P.G., MBA  
RVAAP Restoration Program Manager  
Army National Guard Directorate

cc: Justin Burke, Ohio EPA, CO  
Kevin Sedlak, ARNG, Camp Ravenna  
Katie Tait, OHARNG, Camp Ravenna  
Nat Peters, USACE Louisville  
Pat Ryan, Leidos-REIMS  
Gail Harris, Vista Sciences Corporation

**RVAAP RESTORATION PROGRAM- DFFO MONTHLY SUMMARY REPORT  
MARCH 2015**

**A. Status of project activities for reporting period (March 2015)**

PROJECT NAME	USACE TECH MGR /Contractor	PROJECT STATUS
RVAAP-01, Ramsdell Quarry Landfill	N. Peters/Leidos	In a letter dated February 27, 2015 (received on March 5), the Ohio EPA approved the Final RA Completion Report without comments. The draft RA report was submitted to the Ohio EPA on November 14, 2014. The Remedial Action is complete. LTM is ongoing.
PBA-08 Eighteen IRP AOCs	N. Peters /Leidos	<p>On October 14, 2014, the Army received Ohio EPA comments on the revised responses for the <i>Revised Draft 2 Remedial Investigation Report for Soil, Sediment, and Surface Water at RVAAP-43 Load Line 10</i> in which the Ohio EPA asked for additional revisions. On October 30, 2014, the Army sent an email to the Ohio EPA requesting a working meeting to address comments on the Load Line 10 RI. An on-site stakeholders' working/resolution meeting occurred on December 8 and 9, 2014. Based on recommended resolutions developed at the meeting, the Army anticipates submitting the Final RI after a pending contract modification to sustain additional project work efforts.</p> <p>The Draft Remedial Action Report (RAR) for RVAAP-48 Anchor Test Area was submitted to Ohio EPA on January 27, 2015. Ohio EPA issued a letter approving the RAR on March 17, 2015. The Draft RAR for Building 1200 was submitted for Ohio EPA review on March 17, 2015.</p> <p>The Army submitted the "Draft Remedial Investigation Report for Soil, Sediment, and Surface Water at RVAAP-50 Atlas Scrap Yard" to the Ohio EPA on June 18, 2014. The Ohio EPA issued a letter on July 14, 2014 requesting a 45-day extension. Subsequently, the Ohio EPA submitted an email correspondence to the Army on September 19, 2014, requesting a Technical Project Planning (TPP) meeting to work through a list of concerns with the subject document. The Army received a formal comment letter from Ohio EPA on September 29, 2014 with partial comments on the document. The Army began working on a Response to Comments in preparation for a TPP meeting but it was decided at the Load Line 10 meeting to push out the TPP until a full set of comments from the Ohio EPA was assembled. Ohio EPA provided comments on March 6, 2015. The Army and the contractor are working on comment responses and on a contract modification to allow the contractor to move the project forward.</p> <p>In a letter dated March 26, 2015, the Army requested an extension for submittal of revised RI documents for 14 of the AOCs currently under the PBA-08 contract. The extension request was for 180 days after a new contract is awarded. The current contract ends July 6, 2015. The Ohio EPA agreed to the extension request in a letter dated March 31, 2015 and received by the Army on April 6, 2015.</p>

**RVAAP RESTORATION PROGRAM- DFFO MONTHLY SUMMARY REPORT  
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PROJECT NAME	USACE TECH MGR /Contractor	PROJECT STATUS
CERCLA 5-YR Review Report	Buffalo District/USACE	<p>The USACE District has initiated filing actions of the 2012 document and associated CRT with Ohio EPA comments to be placed in the two designated repositories stored at the Newton Falls (Trumbull Co.) and Ravenna (Portage Co.) Public Libraries and on rvaap.org. A public notice will also be issued. This path forward was presented to the Ohio EPA in emails dated November 14 and December 23, 2014. No feedback was received. The document was placed in the repositories and the rvaap.org on March 11, 2015 and the public notice was be issued on March 8, 2015.</p>
PBA-09 Fourteen MMRP MRSs	Travis McCoun/CBI	<p>The current status of the reporting for each of the MRSs are as follows:</p> <ul style="list-style-type: none"> <li>• Block D Igloo MRS – Final RI Report submitted for Ohio EPA approval on 3/4/15.</li> <li>• Landfill North of Winklepeck MRS – Final RI Report submitted for Ohio EPA approval on 3/4/15.</li> <li>• Water Works #4 Dump MRS – Final RI Report submitted for Ohio EPA approval on 3/9/15. Preliminary Draft Proposed Plan submitted for Army review on 3/24/15.</li> <li>• Sand Creek Dump MRS – Final RI Report submitted for Ohio EPA approval on 3/24/15.</li> <li>• Open Demolition Area #2 MRS – The Ohio EPA approved the Final RI Report on 3/26/15</li> <li>• Ramsdell Quarry Landfill MRS – Ohio EPA comments on the Final RI Report were received from Ohio EPA on 3/26/15. Responses were submitted to Ohio EPA on 3/31/15.</li> <li>• 40mm Firing Range MRS – Ohio EPA comments on the Final RI Report were received from the Ohio EPA on 3/26/14. Responses were submitted to Ohio EPA on 3/31/15</li> <li>• Load Line #1A MRS – The Army approved responses to comments on the Preliminary Draft NFA Proposed Plan on 3/27/15. Draft NFA Proposed Plan was submitted for Ohio EPA review on 3/31/15.</li> <li>• Firestone Test Facility MRS – The Army approved responses to comments on the Preliminary Draft NFA Proposed Plan on 3/27/15. Draft NFA Proposed Plan was submitted for Ohio EPA review on 3/31/15.</li> </ul>

**RVAAP RESTORATION PROGRAM- DFFO MONTHLY SUMMARY REPORT  
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PROJECT NAME	USACE TECH MGR /Contractor	PROJECT STATUS
PBA-11 Fourteen Compliance Restoration (CR) Sites	E. Cheng/ECC	<p>In a letter dated March 3, 2015, the Ohio EPA sent its concurrence with the Final SI reports for CC-RVAAP-77 (Bldg 1037 Laundry Wastewater Sump) and CC-RVAAP-71 (Barn #5 Petroleum Release).</p> <p>In a letter dated March 4, 2015, a Field Change Notification was submitted to the Ohio EPA for additional field sampling at CC-RVAAP-69 (Building 1048 Fire Station). The Ohio EPA submitted its response on March 24, 2015.</p> <p>On March 6, 2015, the Army submitted the Draft RI report for CC-RVAAP-74 (Building 1034 Motor Pool Hydraulic Lift) to the Ohio EPA.</p> <p>On March 12, 2015, the Army submitted the Draft SI report for CC-RVAAP-75 (George Road Sewer Treatment Plant Mercury Spill) to the Ohio EPA.</p> <p>On March 23, 2015, the Army submitted a notification of field work to the Ohio EPA for the field sampling event scheduled for April 6 to 15, 2015.</p>
RVAAP-28, Suspected Mustard Agent Burial Site	Huntsville/USACE	<p>The USACE-LRL coordinated with ARNG to set-up review of the SI report and the USACE-Huntsville Center of Expertise for Military Munitions developed a contingency plan. The revised draft SI report was issued to the Ohio EPA on March 2, 2015. The Army is awaiting comments from the Ohio EPA.</p>
RVAAP-03 & RVAAP-34, ODA1 and Sand Creek Disposal Road Landfill	E. Cheng/CELRL	<p>Based on prioritization of the other AOCs currently under contract and the work affiliated with them being completed, these two AOCs are delayed until a later date TBD. Continued action at these sites will likely require a new contract action.</p>
Igloos	E. Cheng/CELRL	<p>On February 23, 2015, the Army received an email correspondence from the Ohio EPA requesting additional information regarding the storage igloos Information Paper. The Army response to this correspondence is expected to be finalized following the Ohio EPA's full review and comment on the paper and teleconference meeting scheduled to take place on April 21, 2015. .</p>

**RVAAP RESTORATION PROGRAM- DFFO MONTHLY SUMMARY REPORT  
MARCH 2015**

PROJECT NAME	USACE TECH MGR /Contractor	PROJECT STATUS
Facility Wide Ground Water Monitoring	N. Peters/EQM	<p>The Army Contractor completed the Facility-Wide Groundwater Monitoring Program March 2015 groundwater sampling event March 9-13 and March 23-25, 2015.</p> <p>The Army Contractor submitted the <i>"Final Facility-Wide Groundwater Monitoring Program RVAAP-66 Facility-Wide Groundwater Report on the October 2014 Sampling Event"</i> to all stakeholders, including the Ohio EPA, on March 20, 2015.</p> <p>The Army Contractor submitted the <i>"Final Facility-Wide Groundwater Monitoring Program RVAAP-66 Facility-Wide Groundwater Report on the July 2014 Sampling Event"</i> to all stakeholders, including the Ohio EPA, on March 13, 2015.</p> <p>The Army Contractor submitted the <i>Final Facility-Wide Groundwater Monitoring Program RVAAP-66 Facility-Wide Annual Report for 2014</i> to all stakeholders, including the Ohio EPA, on March 30, 2015.</p>
Group #2 Propellant Cans	J. Trumble/PIKA	A modification of the task order is being developed to coordinate the work plan comment resolution, conduct additional sampling, and address the propellant can tops.
Historical Well Abandonment	Q. La/Plexus	The Draft Work Plan was submitted to the Ohio EPA on January 28, 2015. The Army is awaiting response from Ohio EPA.
PMP Appendices	N. Peters/CELRL	Draft PMP Appendices for Erie Burning Grounds, Open Demolition Area 2, Load Line 12, Fuze and Booster Quarry and Central Burn Pits are on hold until an update of the general PMP text and Winklepeck PMP Appendix is issued and approved. The Ramsdell Quarry Landfill PMP appendix was submitted to the Ohio EPA in the Final RA Report.



**RVAAP RESTORATION PROGRAM- DFFO MONTHLY SUMMARY REPORT  
MARCH 2015**

<b>PROJECT NAME</b>	<b>USACE TECH MGR /Contractor</b>	<b>PROJECT STATUS</b>
RVAAP-05, Winklepeck Burning Grounds	N. Peters/CELRL Q. La/CELRL	<p>The Army submitted the <i>Final Explanation of Significant Differences (ESD) for Post ROD Changes to the Remedy for Winklepeck Burning Grounds</i> to the Ohio EPA on March 27, 2015.</p> <p>The Army received approval of the Draft FY2014 Annual Report for the Quarterly LUC Inspections and the Draft First Quarter FY2015 LUC Report in two discrete letters dated March 17, 2015. The Second Quarter FY 2015 LUC Report is currently in the drafting process and on-schedule.</p>
RVAAP-51, Dump Along Paris Windham Road	N. Peters/CELRL	<p>The revised Final Site Characterization/Focused Feasibility Study was submitted electronically on February 5, 2015 for Ohio EPA review. The Ohio EPA approved the document in a letter dated March 19, 2015 and received March 23, 2015.</p>
PBA 13 Supplemental RI/FS for multiple AOCs	Q. La /Leidos	<p>The Work Plan was sent to the Ohio EPA on the January 31, 2015; meeting the DFFO date. The Army is awaiting response from Ohio EPA. A coordination meeting with the Ohio EPA is pending.</p> <p>The Preliminary Draft Work Plan for the facility wide surface water/wet sediment review is in the drafting process. .</p>
TCRA at ODA2	E. Cheng/N. Peters	<p>Planning and funding for this project are currently underway. The scope of work is anticipated to include a TCRA, MEC surface sweeps, stabilization of the Sand Creek stream diversion, and culvert replacement.</p>

**B. Describe difficulties encountered during the reporting period and actions taken to rectify any difficulties**

None

**C. Identify changes in key personnel**

None

**RVAAP RESTORATION PROGRAM- DFFO MONTHLY SUMMARY REPORT  
MARCH 2015**

**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**

1. Facility-Wide Groundwater Program: Approval of the Draft Groundwater RI/FS Work Plan has been delayed due to unresolved issues associated with RVAAP's background monitoring well network and the GW risk assessment screening process. The Army currently plans to award a new contract under ARNGD administration) to complete the RI/FS/PP/ROD for RVAAP-66 Facility-Wide Groundwater. The existing groundwater Contract (under USACE administration) will continue with the required FWGWMP requirements, which consist of semi-annual groundwater monitoring/reporting and annual reporting.
2. Additional schedule activities needed for USACE in-house work: AOCs with currently known delays affected by the activities include completion of an FS for ODA1 and Sand Creek. Additional information is provided in Section A.

**F. Indicate how much contaminated soil was removed and contaminated groundwater was pumped and where such contaminated media were disposed**

Four 55-gallon drums of IDW were generated during the March 2015 groundwater sampling event. Three of the drums contain purged groundwater and one of the drums contains decontamination fluids. Disposal is pending receipt of analytical results.

**G. Describe activities planned for the following month (April 2015)**

1. The Army anticipates awarding contract modifications to Leidos to allow them to finalize the RVAAP-43 Load Line 10 RI Report to be consistent with changes requested by the Ohio EPA and to allow them to proceed on comment resolution for the Atlas Scrap Yard RI Report.
2. A modification of the Group 2 Propellant Can Tops contract is being developed by the Army to coordinate the work plan comment resolution, conduct additional sampling, and address the propellant can tops.
3. The Army is preparing a Performance Work Statement (PWS) for the Remedial Action at RVAAP-05 Winklepeck Burning Grounds. The Army anticipates receiving comments from the Ohio EPA on the Remedial Design. The Army will respond to those comments and will incorporate any necessary changes into the PWS. The PWS for the RA at Winklepeck will also include slope stabilization activities at Rocket Ridge and a culvert replacement for Sand Creek at the ODA2 access road.
4. The Army will submit appropriate copies of the Revised Final Site Characterization/ Focused Feasibility Study for RVAAP-51, Dump along Paris Windham Road, to Ohio EPA and other stakeholders. The Army also will proceed with preparation of the Revised Final Proposed Plan associated with the site.
5. The Army Contractor plans to begin work on the *"Final Facility-Wide Groundwater*

**RVAAP RESTORATION PROGRAM- DFFO MONTHLY SUMMARY REPORT**  
**MARCH 2015**

*Monitoring Program RVAAP-66 Facility-Wide Groundwater Report on the March 2015 Sampling Event."*

6. Army to issue the Draft RI report for CC-RVAAP-68 (Electric Substations) and the Draft SI report for CC-RVAAP-72 (Facility-Wide USTs) to the Ohio EPA.
7. The Preliminary Draft Work Plan for the Facility-Wide Surface Water/Wet Sediment Review will be submitted for Army review.
8. The Preliminary Draft Second Quarter LUC Inspection report will be completed for Army review.
9. The Army/ECC will conduct field sampling activities at the site on April 6 through 15, 2015 in support of the PBA11 CR Sites project.
10. A teleconference meeting between the Ohio EPA and Army stakeholders is scheduled to take place on April 21, 2015 to discuss the storage igloos information paper.



**NATIONAL GUARD BUREAU**

111 SOUTH GEORGE MASON DRIVE  
ARLINGTON VA 22204-1373

March 10, 2015

Ohio Environmental Protection Agency  
DERR-NEDO  
Attn: Rod Beals, Environmental Manager  
2110 East Aurora Road  
Twinsburg, OH 44087-1924

Subject: Ravenna Army Ammunition Plant (RVAAP) Restoration Program  
Portage/Trumbull Counties, Monthly Activity Report

Dear Mr. Beals:

Enclosed for your review is the "RVAAP Restoration Program – DFFO Monthly Summary Report –February 2015". The report summarizes Installation Restoration Program activities conducted at the former RVAAP for the period from February 1, 2015 through February 28, 2015. The 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.

Please contact the undersigned at (703) 607-7995 or [mark.s.leeper.civ@mail.mil](mailto:mark.s.leeper.civ@mail.mil) if there are issues or concerns with this submission.

Sincerely,

A handwritten signature in black ink, appearing to read "Mark S. Leeper", is positioned above the typed name.

Mark S. Leeper, P.G., MBA  
RVAAP Restoration Program Manager  
Army National Guard Directorate

cc: Justin Burke, Ohio EPA, CO  
Kevin Sedlak, ARNG, Camp Ravenna  
Katie Tait, OHARNG, Camp Ravenna  
Nat Peters, USACE Louisville  
Pat Ryan, Leidos-REIMS  
Gail Harris, Vista Sciences Corporation

**RVAAP RESTORATION PROGRAM- DFFO MONTHLY SUMMARY REPORT  
FEBRUARY 2015**

**A. Status of project activities for reporting period (February 2015)**

RVAAP-01 Ramsdell Quarry Landfill	N. Peters/Leidos	The RA asbestos surface clean-up was completed on November 07, 2014. The draft RA Report was submitted to the Ohio EPA on November 14, 2014. In a letter dated January 16, 2015, the Ohio EPA approved the report without comments. A change page packet for the Final RA Completion Report was delivered to the Ohio EPA on February 2, 2015.
PBA-08 Eighteen IRP AOCs	N. Peters /Leidos	<p>The Army submitted the <i>"Revised Draft 2 Remedial Investigation Report for Soil, Sediment, and Surface Water at RVAAP-43 Load Line 10"</i> to the Ohio EPA on April 17, 2014. This document serves as the PBA08 model RI document. On April 29, 2014, the Ohio EPA issued a letter to the Army requesting a 30-day time extension for the review of the Load Line 10 report. On July 1, 2014, the Ohio EPA issued a letter to the Army providing review comments on the report. The Army and Ohio EPA attended a meeting on July 29, 2014 to address and discuss the comments. Pursuant to the meeting, the Ohio EPA submitted a follow on letter to the Army on August 11, 2014, and the Army submitted revised responses to the Ohio EPA on August 25, 2014. On October 14, 2014, the Army received Ohio EPA comments on the revised responses for the Load Line 10 RI Report in which the Ohio EPA asked for additional revisions. On October 30, 2014, the Army sent an email to Ohio EPA requesting a working meeting to address comments on the Load Line 10 RI. An on-site stakeholders' working/resolution meeting occurred on December 8 and 9, 2014. Based on recommended resolutions developed at the meeting, the Army anticipates submitting Final RI mid March 2015 pending contract modification to sustain additional project work efforts.</p> <p>The Army submitted the <i>"Final Remedial Design for Soil, Sediment, and Surface Water at RVAAP-13 Building 1200 and RVAAP-48 Anchor Test Area"</i> on August 28, 2014. The Ohio EPA approved the document in a letter correspondence dated September 3, 2014 with the remedial actions commencing for both sites on November 17, 2014. The Draft Remedial Action Report (RAR) for RVAAP-48 Anchor Test Area was submitted to Ohio EPA on January 27, 2015. Ohio EPA comments are expected in March 2015. On January 7, 2015, The Army and Leidos met with the Ohio EPA regarding the Building 1200 RVAAP-13 soil removal. The Ohio EPA agreed that no additional soil removal was required to meet Unrestricted (Residential) Land Use at Building 1200. The meeting minutes were documented in a January 21, 2015 Memorandum for Record that has been provided to the Ohio EPA. The Preliminary Draft RAR for Building 1200 was submitted for Army review on February 12, 2015. The Draft RAR for Building 1200 will be submitted in March for Ohio EPA review.</p> <p>(continued on next page)</p>



**RVAAP RESTORATION PROGRAM- DFFO MONTHLY SUMMARY REPORT  
FEBRUARY 2015**

PROJECT NAME	USACE TECH MGR /Contractor	PROJECT STATUS
PBA-08 Eighteen IRP AOCs (cont'd)	N. Peters /Leidos	<p>The Army submitted the "Draft Remedial Investigation Report for Soil, Sediment, and Surface Water at RVAAP-50 Atlas Scrap Yard" to the Ohio EPA on June 18, 2014. The Ohio EPA issued a letter on July 14, 2014 requesting a 45-day extension. Subsequently, the Ohio EPA submitted an email correspondence to the Army on September 19, 2014, requesting a Technical Project Planning (TPP) meeting to work through a list of concerns with the subject document. The Army received a formal comment letter from Ohio EPA on September 29, 2014 with partial comments on the document. The Army began working on a Response to Comments in preparation for a TPP meeting but it was decided at the Load Line 10 meeting to push out the TPP until a full set of comments from the Ohio EPA was assembled. The Ohio EPA's Brian Tucker (Risk Assessor) still is reviewing the document. Comments are anticipated in March 2015. Following the Ohio EPA's full review of the RVAAP-50 Draft RI, a TPP meeting between stakeholders will be scheduled. Additionally, the remaining RI Reports for the other 14 outstanding AOCs, including Facility-wide Sewers, are on hold until the Load Line 10 and Atlas Scrap Yard template documents are resolved.</p>
CERCLA 5-YR Review Report	Buffalo District/USACE	<p>The USACE District has initiated filing actions of the 2012 document and associated CRT with Ohio EPA comments to be placed in the two designated repositories stored at the Newton Falls (Trumbull Co.) and Ravenna (Portage Co.) Public Libraries and on rvaap.org. A public notice will also be issued. This path forward was presented to the Ohio EPA in emails dated November 14 and December 23, 2014. No feedback was received. The document will be placed in the repositories and the public notice will be issued in March 2015.</p>
PBA-09 Fourteen MMRP MRSs	Travis McCoun/CBI	<p>The current status of the reporting for each of the MRSs are as follows:</p> <ul style="list-style-type: none"> <li>• Sand Creek Dump – Draft RI Report submitted for Ohio EPA review on 2/10/15.</li> <li>• 40mm Firing Range – Draft RI Report submitted for Ohio EPA review on 2/13/15.</li> <li>• Group 8 – Draft RI Report submitted for Ohio EPA review on 2/23/15</li> <li>• Open Demolition Area #2 – Received second round of Ohio EPA comments for Draft RI Report on 1/15/2014. Responses submitted with the Final RI Report on 2/27/15.</li> </ul>

**RVAAP RESTORATION PROGRAM- DFFO MONTHLY SUMMARY REPORT  
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PROJECT NAME	USACE TECH MGR /Contractor	PROJECT STATUS
PBA-11 Fourteen Compliance Restoration (CR) Sites	E. Cheng/ECC	<p>The Final SI reports for CC-RVAAP-77 (Bldg 1037 Laundry Wastewater Sump) and CC-RVAAP-71 (Barn #5 Petroleum Release) were issued to the Ohio EPA on February 11 and 12, 2015, respectively.</p> <p>The Draft SI report for CC-RVAAP-83 (Former Buildings 1031 &amp; 1039) was issued to the Ohio EPA on February 27, 2015.</p> <p>The Army received two letters of correspondence dated February 19, 2015 from the Ohio EPA indicating the acceptance of the Final SI reports for CC-RVAAP-71 &amp; -77.</p> <p>It is expected that the contracted work in support of the CC-RVAAP-78 (Quarry Pond Surface Dump) RI will be put on-hold pending further development on the investigation at the site under a separate contract action.</p>
RVAAP-28 Suspected Mustard Agent Burial Site	Huntsville/USACE	<p>USACE-Huntsville Center of Expertise for Military Munitions developed and finalized a contingency plan for RVAAP-28. The revised draft SI report was issued to the Army in December 2014 and Army comments have been submitted and resolved. The revised SI will be issued in March 2015.</p>
RVAAP-03 & - 34 ODA1 and Sand Creek Disposal Road Landfill	E. Cheng/CELRL	<p>Based on prioritization of the other AOCs currently under contract and the work affiliated with them being completed, these two AOCs are delayed until a later date TBD. Continued action at these sites will likely require a new contract action.</p>
Igloos	E. Cheng/CELRL	<p>On January 30, 2015, the Army submitted the "Technical Memorandum Summary of the Findings of Historical Review and Risk Evaluation of the Storage Magazines on the Former Ravenna Army Ammunition Plant and Appended Information Paper containing Documentation to Support Findings." This submittal was not previously reported on the DFFO Monthly Report for January 2015.</p> <p>On February 23, 2015, the Army received an email correspondence from the Ohio EPA requesting additional information regarding the storage igloos. The Army response to the Ohio EPA is expected to be finalized and sent in March 2015.</p>

**RVAAP RESTORATION PROGRAM- DFFO MONTHLY SUMMARY REPORT  
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PROJECT NAME	USACE TECH MGR /Contractor	PROJECT STATUS
Facility Wide Ground Water Monitoring	N. Peters/EQM	<p>The Army Contractor submitted the <i>"Draft Facility-Wide Groundwater Monitoring Program RVAAP-66 Facility-Wide Groundwater Report on the October 2014 Sampling Event"</i> to stakeholders, including the Ohio EPA, on February 11, 2015.</p> <p>The Army Contractor submitted the response to Ohio EPA comments on the <i>Draft 2014 Annual Groundwater Report</i> on February 24, 2015.</p> <p>The Army Contractor submitted the <i>Final Facility-Wide Groundwater Monitoring Program RVAAP-66 Semiannual Groundwater Monitoring Addendum for 2015</i> on February 24, 2015.</p> <p>The Army Contractor submitted notification of the upcoming Facility-Wide Groundwater Monitoring Program March 2015 sampling event on February 13, 2015. Sampling of the wells is scheduled to occur during the week of March 9, 2015.</p>
Group #2 Propellant Cans	J. Trumble/Pika	<p>A modification of the task order is being developed to coordinate the work plan comment resolution, conduct additional sampling, and address the propellant can tops.</p>
Historical Well Abandonment	Q. La/Plexus	<p>The Draft Work Plan was submitted to the Ohio EPA on January 28, 2015. That Army is awaiting response from the Ohio EPA.</p>
PMP Appendices	N. Peters/CELRL	<p>Draft PMP Appendices for Erie Burning Grounds, Open Demolition Area 2, Load Line 12, Fuze and Booster Quarry and Central Burn Pits are on hold until an update of the general PMP text and Winklepeck PMP Appendix is issued and approved. The Ramsdell Quarry Landfill PMP appendix was submitted to the Ohio EPA in the Final RA Report.</p>

**RVAAP RESTORATION PROGRAM- DFFO MONTHLY SUMMARY REPORT  
FEBRUARY 2015**

PROJECT NAME	USACE TECH MGR /Contractor	PROJECT STATUS
RVAAP-05 Winklepeck Burning Grounds	N. Peters/CELRL Q. La/CELRL	<p>On October 28, 2014, the Army received comments from the Ohio EPA on the Draft Explanation of Significant Differences (ESD) for Post ROD Changes to the Remedy. On November 26, the Army submitted proposed responses to comments electronically to the Ohio EPA along with an electronic version (Revision 1) of the document. The Ohio EPA agreed to back check the changes in the electronic file before the Army creates additional hardcopies or CDs. Ohio EPA provided comments on the Army responses in an email on December 1, 2014. Subsequently the Army prepared an electronic response to comments and the Ohio EPA asked for some further clarifications. During January, the Army coordinated the needed changes with Ohio EPA staff and prepared a final response to comments. The Final ESD document and Response to comments were submitted electronically to Ohio EPA on February 3, 2015. On February 10, 2015, the Army received an email from the Ohio EPA asking for an additional clarification on the groundwater LUC language. The Army responded electronically to that request, with proposed language, on February 17, 2015. The Ohio EPA provided oral concurrence during a schedule call on February 19, 2015. The Army anticipates a written concurrence followed by submittal of the Final ESD in March 2015.</p> <p>The final version of the FY2014 Annual Report for the Quarterly LUC Inspections was submitted on the January 13, 2015 to the Ohio EPA. The draft first quarter FY2015 LUC Report was submitted on February 5, 2015. That Army is awaiting response from Ohio EPA for both reports.</p>
RVAAP-51 Dump Along Paris Windham Road	N. Peters/CELRL	<p>In January, additional evaluation was conducted for the full-time receptor (Commercial/Industrial Land Use). The revised Final Document was submitted electronically on February 5, 2015 for Ohio EPA review. The Army anticipates a response from Ohio EPA in March 2015.</p>
PBA 13 Supplemental RI/FS for multiple AOCs	Q. La/Leidos	<p>The Work Plan was sent to the Ohio EPA on the January 31, 2015; meeting the DFFO date. That Army is awaiting response from the Ohio EPA.</p> <p>The Army, ARNG and Leidos conducted a TPP meeting for the Site-wide Surface Water/Wet Sediment project on February 12, 2015. The project is on schedule.</p>
TCRA at ODA2	E. Cheng/Nat Peters	<p>MEC surface sweeps, a TCRA removal action, and culvert replacement will occur at ODA2 in FY15/FY16. Planning and funding for this project are currently underway.</p>

**RVAAP RESTORATION PROGRAM- DFFO MONTHLY SUMMARY REPORT  
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**B. Describe difficulties encountered during the reporting period and actions taken to rectify any difficulties**

- 1.) None

**C. Identify changes in key personnel**

- 1.) Jay Trumble will serve as the new technical manager on the Group #2 Propellant Cans project.

**D. List target and actual completion dates for each element of activity, including project completion**

- 1.) 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**

- 1.) Facility-wide Groundwater Program:
  - Approval of the Draft Groundwater RI/FS Work Plan has been delayed due to unresolved issues associated with RVAAP's background monitoring well network and the GW risk assessment screening process. The Army currently plans to award a new contract under ARNGD administration) to complete the RI/FS/PP/ROD for RVAAP-66 Facility-Wide Groundwater. The existing groundwater Contract (under USACE administration) will continue with the required FWGWMP requirements, which consist of semi-annual groundwater monitoring/reporting through FY15.
- 2.) Additional schedule activities needed for USACE in-house work:
  - AOCs with currently known delays affected by the activities include completion of an FS for ODA1 and Sand Creek. Additional information is provided in Section A.

**F. Indicate how much contaminated soil was removed and contaminated groundwater was pumped and where such contaminated media were disposed**

None noted for February 2015. There is currently no IDW stored onsite.

**G. Describe activities planned for the following month (March 2015)**

- 1.) The Army anticipates awarding a contract modification to Leidos to allow them to finalize the RVAAP-43 Load Line 10 RI Report to be consistent with changes requested by the Ohio EPA.
- 2.) Under the Army's PBA09, the remaining draft remedial investigation reports for Fuze and Booster Quarry MRS, Water Works #4 Dump MRS, 40mm Firing Range MRS, Sand Creek Dump MRS, and Group 8 MRS will be finalized and submitted to Ohio EPA once the regulator and Army finish comment resolution and final approval of the set of MRS RIs that are currently under discussion/resolution which includes Landfill



**RVAAP RESTORATION PROGRAM- DFFO MONTHLY SUMMARY REPORT  
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North of Winklepeck; Block D Igloo; Ramsdell Quarry Landfill MRS; Water Works #4 Dump; and Open Demolition Area #2 .

- 3.) A modification of the Group 2 Propellant Can Tops contract is being developed by the Army to coordinate the work plan comment resolution, conduct additional sampling, and address the propellant can tops.
- 4.) The Army issued revised formal responses to Ohio EPA comments on the Draft Explanation of Significant Differences, Revision 1, for RVAAP-05 Winklepeck Burning Grounds on February 3, 2015 and provided a subsequent clarification on February 17, 2015. The Army anticipates that the final document will be issued in March 2015, if the comment response is accepted by the Ohio EPA.
- 5.) The Draft Remedial Action Report for RVAAP-13/Bldg 1200 will be submitted for Ohio EPA review in March.
- 6.) Pending Ohio EPA review and acceptance of the Army's response to comments, the Army will submit the Revised Final Site Characterization/Focused Feasibility Study for RVAAP-51, Dump along Paris Windham Road to Ohio EPA. The Army also anticipates proceeding with preparation of the Revised Final Proposed Plan associated with the site.
- 7.) The Army Contractor plans to submit the *"Final Facility-Wide Groundwater Monitoring Program RVAAP-66 Facility-Wide Groundwater Report on the July 2014 Sampling Event"* to all stakeholders, including the Ohio EPA, on March 11, 2015.
- 8.) The Army Contractor plans to conduct the March 2015 groundwater sampling event during the week of March 9, 2015.
- 9.) The Army, ARNG, and Plexus will conduct a site reconnaissance associated with the historical well abandonment project on March 16 and 17, 2015, to assess any remaining wetlands issues and begin tree clearance for access before the cutting restriction for the northern long-eared bat begins on April 1, 2015.
- 10.) Army to issue the Draft RI report for CC-RVAAP-74 (Bldg 1034 Motor Pool Hydraulic Lift) and the Draft SI report for CC-RVAAP-75 (George Road Sewer Treatment Plant Mercury Spill) to the Ohio EPA.



**NATIONAL GUARD BUREAU**

111 SOUTH GEORGE MASON DRIVE  
ARLINGTON VA 22204-1373

February 6, 2015

Ohio Environmental Protection Agency  
DERR-NEDO  
Attn: Rod Beals, Environmental Manager  
2110 East Aurora Road  
Twinsburg, OH 44087-1924

Subject: Ravenna Army Ammunition Plant (RVAAP) Restoration Program  
Portage/Trumbull Counties, Monthly Activity Report

Dear Mr. Beals:

Enclosed for your review is the "RVAAP Restoration Program – DFFO Monthly Summary Report – January 2015". The report summarizes Installation Restoration Program environmental activities conducted at the former RVAAP for the period from January 1, 2015 through January 31, 2015. The 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.

Please contact the undersigned at (703) 607-7995 or [mark.s.leeper.civ@mail.mil](mailto:mark.s.leeper.civ@mail.mil) if there are issues or concerns with this submission.

Sincerely,

A handwritten signature in black ink, appearing to read "Mark S. Leeper", is positioned below the word "Sincerely,".

Mark S. Leeper, P.G., MBA  
RVAAP Restoration Program Manager  
Army National Guard Directorate

cc: Justin Burke, Ohio EPA, CO  
Kevin Sedlak, ARNG, Camp Ravenna  
Katie Tait, OHARNG, Camp Ravenna  
Nat Peters, USACE Louisville  
Pat Ryan, Leidos-REIMS  
Gail Harris, Vista Sciences Corporation

**RVAAP RESTORATION PROGRAM- DFFO MONTHLY SUMMARY REPORT  
JANUARY 2015**

**A. Status of project activities for reporting period (January 2015)**

PROJECT NAME	USACE TECH MGR /Contractor	PROJECT STATUS
RVAAP-01 Ramsdell Quarry Landfill	N. Peters/Leidos	The RA asbestos surface clean-up was completed on November 07, 2014. The draft RA Report was submitted to the Ohio EPA on November 14, 2014. In a letter dated January 16, 2015, the Ohio EPA approved the report without comments. The Final RA Completion Report is expected to be submitted on February 3, 2015.
PBA-08 Eighteen IRP AOCs	N. Peters /Leidos	<p>The Army submitted the <i>"Revised Draft 2 Remedial Investigation Report for Soil, Sediment, and Surface Water at RVAAP-43 Load Line 10"</i> to the Ohio EPA on April 17, 2014. This document serves as the PBA08 model RI document. On April 29, 2014, the Ohio EPA issued a letter to the Army requesting a 30-day time extension for the review of the Load Line 10 report. On July 1, 2014, the Ohio EPA issued a letter to the Army providing review comments on the report. The Army and Ohio EPA attended a meeting on July 29, 2014 to address and discuss the comments. Pursuant to the meeting, the Ohio EPA submitted a follow on letter to the Army on August 11, 2014, and the Army submitted revised responses to the Ohio EPA on August 25, 2014. On October 14, 2014, the Army received Ohio EPA comments on the revised responses for the Load Line 10 RI Report in which the Ohio EPA asked for additional revisions. On October 30, 2014, the Army sent an email to Ohio EPA requesting a working meeting to address comments on the Load Line 10 RI. An on-site stakeholders' working/resolution meeting occurred on December 8 and 9, 2014. Based on recommended resolutions developed at the meeting, the Army anticipates submitting Final RI mid March 2015 pending contract modification to sustain additional project work efforts.</p> <p>The Army submitted the <i>"Final Remedial Design for Soil, Sediment, and Surface Water at RVAAP-13 Building 1200 and RVAAP-48 Anchor Test Area"</i> on August 28, 2014. The Ohio EPA approved the document in a letter correspondence dated September 3, 2014 with the remedial actions commencing for both sites on November 17, 2014. The Draft Remedial Action Report (RAR) for RVAAP-48 Anchor Test Area was submitted to Ohio EPA on January 27, 2015. On January 7, 2015, The Army and Leidos met with the Ohio EPA regarding the Building 1200 RVAAP-13 soil removal. The Ohio EPA agreed that no additional soil removal was required to meet Unrestricted (Residential) Land Use at Building 1200. The meeting minutes were documented in a January 21, 2015 Memorandum for Record that has been provided to the Ohio EPA. The Preliminary Draft RAR for Building 1200 is being prepared and is expected to be submitted for Army review by mid-February.</p> <p>(continued on next page)</p>

**RVAAP RESTORATION PROGRAM- DFFO MONTHLY SUMMARY REPORT  
JANUARY 2015**

PROJECT NAME	USACE TECH MGR /Contractor	PROJECT STATUS
PBA-08 Eighteen IRP AOCs (cont'd)	N. Peters /Leidos	The Army submitted the "Draft Remedial Investigation Report for Soil, Sediment, and Surface Water at RVAAP-50 Atlas Scrap Yard" to the Ohio EPA on June 18, 2014. The Ohio EPA issued a letter on July 14, 2014 requesting a 45-day extension. Subsequently, the Ohio EPA submitted an email correspondence to the Army on September 19, 2014, requesting a Technical Project Planning (TPP) meeting to work through a list of concerns with the subject document. The Army received a formal comment letter from Ohio EPA on September 29, 2014 with partial comments on the document. The Army began working on a Response to Comments in preparation for a TPP meeting but it was decided at the Load Line 10 meeting to push out the TPP until a full set of comments from the Ohio EPA was assembled. The Ohio EPA's Brian Tucker (Risk Assessor) still is reviewing the document and will provide comments in February 2015. Following the Ohio EPA's full review of the RVAAP-50 Draft RI, a TPP meeting between stakeholders will be scheduled. Additionally, the remaining RI Reports for the other 14 outstanding AOCs, including Facility-wide Sewers, are on hold until the Load Line 10 and Atlas Scrap Yard template documents are resolved.
CERCLA 5-YR Review Report	Buffalo District/USACE	The USACE District has initiated filing actions of the 2012 document and associated CRT with Ohio EPA comments to be placed in the two designated repositories stored at the Newton Falls (Trumbull Co.) and Ravenna (Portage Co.) Public Libraries and on rvaap.org. A public notice will also be issued. This path forward was presented to the Ohio EPA in emails dated November 14 and December 23, 2014. No feedback was received. The document will be placed in the repositories and the public notice will be issued in February 2015.
PBA-09 Fourteen MMRP MRSs	Travis McCoun/CBI	<p>The current status of the reporting for each of the MRSs are as follows:</p> <ul style="list-style-type: none"> <li>• Ramsdell Quarry Landfill – Final RI Report submitted on 1/26/15 for Ohio EPA approval.</li> <li>• Open Demolition Area #2 – Received second round of Ohio EPA comments for Draft RI Report on 1/15/2014. Responses will be submitted with the Final RI Report to be submitted in February.</li> <li>• Load Line 1A – Final RI Report (Version 2.0) approved on 9/22/2014. NFA Proposed Plan was submitted for Army review on 1/20/15.</li> <li>• Landfill North of Winklepeck – No responses were received on Draft RI Report from Ohio EPA. Final RI Report is combined with the Block D Igloo MRS.</li> <li>• Firestone Test Facility – Final RI Report approved on 11/25/2014. NFA Proposed Plan was submitted for Army review 1/21/15.</li> <li>• Atlas Scrap Yard – Final RI Report (Version 2.0) approved on 9/22/2014.</li> <li>• Erie Burning Grounds – Final RI Report approved on 9/22/2014</li> <li>• Fuze and Booster Quarry – Draft RI Report submitted for Ohio EPA review on 1/16/2014.</li> <li>• Water Works # 4 Dump – Submitted responses to Ohio EPA comments for Draft RI Report on 1/15/2015.</li> </ul>

**RVAAP RESTORATION PROGRAM- DFFO MONTHLY SUMMARY REPORT  
JANUARY 2015**

PROJECT NAME	USACE TECH MGR /Contractor	PROJECT STATUS
PBA-09 Fourteen MMRP MRSs	Travis McCoun/CBI (Cont'd Fm/ Page 2)	<ul style="list-style-type: none"> <li>Block D Igloo – Submitted responses to Ohio EPA comments for Draft RI Report on 1/15/2015.</li> <li>Block D Igloo-TD – no work required outside the facility due to reduction in Block D Igloo area. This MRS was addressed in the Block D Igloo RI report.</li> <li>40mm Firing Range – Draft RI Report to be submitted for Ohio EPA review week ending 2/5/15.</li> <li>Group 8 – Draft RI Report to be submitted for Ohio EPA review week 2/12/15</li> </ul>
PBA-11 Fourteen Compliance Restoration (CR) Sites	E. Cheng/ECC	On January 23, 2015, the Army received letters of correspondence from the Ohio EPA indicating their acceptance of the Draft SI reports for CC-RVAAP-71 & -77 without any additional comment.
RVAAP-28 Suspected Mustard Agent Burial Site	Huntsville/USACE	The USACE-LRL coordinated with ARNG to set-up review of the SI report and the USACE-Huntsville Center of Expertise for Military Munitions developed a contingency plan. The revised draft SI report was issued to the Army in December 2014. Army comments on the revised SI will be issued in February 2015.
RVAAP-03 & - 34 ODA1 and Sand Creek Disposal Road Landfill	E. Cheng/CELRL	Based on prioritization of the other AOCs currently under contract and the work affiliated with them being completed, these two AOCs are delayed until a later date TBD. Continued action at these sites will likely require a new contract action.
Igloos	E. Cheng/CELRL	On January 28, 2015, the Army submitted a technical memorandum on the summary of the findings of the Historical Review and Risk Evaluation of the former RVAAP storage magazines to the Ohio EPA.



**RVAAP RESTORATION PROGRAM- DFFO MONTHLY SUMMARY REPORT  
JANUARY 2015**

PROJECT NAME	USACE TECH MGR /Contractor	PROJECT STATUS
Facility Wide Ground Water Monitoring	N. Peters/EQM	<p>The Army Contractor submitted a response to the Army's comments on the <i>"Preliminary Draft Facility-Wide Groundwater Monitoring Program RVAAP-66 Facility-Wide Groundwater Report on the October 2014 Sampling Event"</i> to the Army on January 27, 2015. The Draft document is expected to be submitted to all stakeholders, including the Ohio EPA, on February 8, 2015.</p> <p>The Army Contractor submitted the <i>Draft 2014 Annual Groundwater Report</i> to the regulator December 11, 2014. The Army received comments from the Ohio EPA in a letter dated January 27, 2015.</p>
Group #2 Propellant Cans	Q. La/Pika	<p>The Army is currently producing an explanation of the history of the site/prop cans on the site. A modification of the contract is being developed to coordinate the work plan comment resolution, conduct additional sampling, and address the propellant can tops.,</p>
Historical Well Abandonment	Q. La/Plexus	<p>The contractor, Army, and OHARNG held a teleconference on January 20, 2015 to resolve Army comments on the Preliminary Draft Work Plan for historical well closure. All comments were resolved. The Draft Work Plan was submitted to the Ohio EPA on January 28, 2015.</p>
PMP Appendices	N. Peters/CELRL	<p>Draft PMP Appendices for Erie Burning Grounds, Open Demolition Area 2, Load Line 12, Fuze and Booster Quarry and Central Burn Pits are on hold until an update of the general PMP text and Winklepeck PMP Appendix is issued and approved. The Ramsdell Quarry Landfill PMP appendix was submitted to the Ohio EPA in the Final RA Report.</p>

**RVAAP RESTORATION PROGRAM- DFFO MONTHLY SUMMARY REPORT  
JANUARY 2015**

PROJECT NAME	USACE TECH MGR /Contractor	PROJECT STATUS
RVAAP-05 Winklepeck Burning Grounds	N.Peters/CELRL Q. La/CELRL	<p>On October 28, 2014, the Army received comments from the Ohio EPA on the Draft Explanation of Significant Differences (ESD) for Post ROD Changes to the Remedy. On November 26, the Army submitted proposed responses to comments electronically to the Ohio EPA along with an electronic version (Revision 1) of the document. The Ohio EPA agreed to back check the changes in the electronic file before the Army creates additional hardcopies or CDs. Ohio EPA provided comments on the Army responses in an email on December 1, 2014. Subsequently the Army prepared an electronic response to comments and the Ohio EPA asked for some further clarifications. During January, the Army coordinated the needed changes with Ohio EPA staff and prepared a final response to comments. The Final ESD document and Response to comments will be submitted electronically during the first week of February.</p> <p>The final version of the FY2014 Annual Report for the Quarterly LUC Inspections was submitted on the 13th of January to the Ohio EPA.</p>
RVAAP-51 Dump Along Paris Windham Road	N.Peters/CELRL	<p>In January, additional evaluation was conducted for the full-time receptor (Commercial/Industrial Land Use) and the document was revised and provided for Army review. The revised Final Document will be submitted electronically in February for Ohio EPA review.</p>
PBA for Supplemental RI/FS for multiple AOCs	Q. La/Pika	<p>The Army, OHARNG, and the contractor held a teleconference to resolve comments on the Draft Work Plan for Load Lines 1-4, and 12 on the 15th of January. The Work Plan was sent to the Ohio EPA on the 31st of January; meeting the DFFO date.</p>
Environmental Remediation Services at ODA2	E. Cheng/PIKA	<p>The Army is preparing plans and funding for the project in January.</p>

**B. Describe difficulties encountered during the reporting period and actions taken to rectify any difficulties**

1.) None

**RVAAP RESTORATION PROGRAM- DFFO MONTHLY SUMMARY REPORT  
JANUARY 2015**

**C. Identify changes in key personnel**

- 1.) None

**D. List target and actual completion dates for each element of activity, including project completion**

- 1.) 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**

- 1.) Facility-wide Groundwater Program:
  - Approval of the Draft Groundwater RI/FS Work Plan has been delayed due to unresolved issues associated with RVAAP's background monitoring well network and the GW risk assessment screening process. The Army currently plans to award a new contract under ARNGD administration) to complete the RI/FS/PP/ROD for RVAAP-66 Facility-Wide Groundwater. The existing groundwater Contract (under USACE administration) will continue with the required FWGWMP requirements, which consist of semi-annual groundwater monitoring/reporting and annual reporting.
- 2.) Additional schedule activities needed for USACE in-house work:
  - AOCs with currently known delays affected by the activities include completion of an FS for ODA1 and Sand Creek. Additional information is provided in Section A.

**F. Indicate how much contaminated soil was removed and contaminated groundwater was pumped and where such contaminated media were disposed**

None noted for January 2015

**G. Describe activities planned for the following month (FEBRUARY 2015)**

- 1.) The Final Remedial Action Report (RAR) for RVAAP-01 Ramsdell Quarry Landfill will be submitted in February. The anticipated submittal date is February 19, 2015.
- 2.) Under the Army's PBA09, the remaining draft remedial investigation reports for Fuze and Booster Quarry MRS, Water Works #4 Dump MRS, 40mm Firing Range MRS, Sand Creek Dump MRS, and Group 8 MRS will be finalized and submitted to Ohio EPA once the regulator and Army finish comment resolution and final approval of the set of MRS RIs that are currently under discussion/resolution which includes Landfill North of Winklepeck; Block D Igloo; Ramsdell Quarry Landfill MRS; Water Works #4 Dump; and Open Demolition Area #2 .
- 3.) A modification of the Group 2 Propellant Can Tops contract is being developed by the Army to coordinate the work plan comment resolution, conduct additional sampling, and address the propellant can tops.

**RVAAP RESTORATION PROGRAM- DFFO MONTHLY SUMMARY REPORT  
JANUARY 2015**

- 4.) The Army plans to issue revised formal responses to Ohio EPA comments on the Draft Explanation of Significant Differences, Revision 1, for RVAAP-05 Winklepeck Burning Grounds by February 3, 2014. The final document will be issued in February 2015, if the comment response is accepted by the Ohio EPA.
- 5.) Preparation of the Preliminary Draft Remedial Action Report for RVAAP-13/Bldg 1200 will continue in February with the document submitted for Army review by the middle of the month. At that time, Army review will commence.
- 6.) CERCLA 5-yr Review Report: The Army will publish the Public Notice subsequent with placement of the document into the two public repositories in February 2015.
- 7.) Submit the Revised Final Site Characterization/Focused Feasibility Study for RVAAP-51, Dump along Paris Windham Road to Ohio EPA. Begin funding and contract proceedings in order to proceed with the Proposed Plan/Public meeting associated with the site.
- 8.) The *"Draft Facility-Wide Groundwater Monitoring Program RVAAP-66 Facility-Wide Groundwater Report on the October 2014 Sampling Event"* is expected to be submitted to all stakeholders, including the Ohio EPA, on February 8, 2015.
- 9.) The Army Contractor submitted the *Draft 2014 Annual Groundwater Report* to the regulator December 11, 2014. The Army anticipates that a response to comments will be prepared in February 2015.
- 10.) The Army and Leidos will conduct a TPP meeting for the Surface Water/Wet Sediment project on February 12, 2015.
- 11.) Army to issue Final SI reports for CC-RVAAP-71 & -77 to the Ohio EPA.



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

January 6, 2015

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

Subject: Ravenna Army Ammunition Plant (RVAAP) Restoration Program  
Portage/Trumbull Counties, Monthly Activities Report

Dear Ms. Zikmanis:

Enclosed for your review is the "RVAAP Restoration Program – DFFO Monthly Summary Report –December, 2014". The report summarizes Installation Restoration Program environmental activities conducted at RVAAP for the period 1 December 2014 through 31 December 2014. The 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.

Please contact the undersigned at (703) 607-7995 or [mark.s.leeper.civ@mail.mil](mailto:mark.s.leeper.civ@mail.mil) if there are issues or concerns with this submission.

Sincerely,

A handwritten signature in black ink, appearing to read "Mark S. Leeper", is positioned below the word "Sincerely,".

Mark S. Leeper, P.G., MBA  
RVAAP Restoration Program Manager  
Army National Guard Directorate

cc: Rod Beals, Ohio EPA, DERR-NEDO  
Justin Burke, Ohio EPA, CO  
Kevin Sedlak, ARNG, Camp Ravenna  
Katie Tait, OHARNG, Camp Ravenna  
Nat Peters, USACE Louisville  
Pat Ryan, Leidos-REIMS  
Gail Harris, Vista Sciences Corporation



**RVAAP RESTORATION PROGRAM- DFFO MONTHLY SUMMARY REPORT  
DECEMBER 2014**

**A. Status of project activities for reporting period (December 2014)**

RVAAP-01 Ramsdell Quarry Landfill	T. Chanda/Leidos	The RA work was completed on November 07, 2014 with the shipment of asbestos waste offsite to an approved asbestos landfill. The draft RA Completion Report was submitted to the Ohio EPA on November 14, 2014 with the regulator's response scheduled for December 29, 2014; response still pending as of December 31, 2014.
PBA-08 Eighteen IRP AOCs	N. Peters /Leidos	<p>The Army submitted the <i>"Revised Draft 2 Remedial Investigation Report for Soil, Sediment, and Surface Water at RVAAP-43 Load Line 10"</i> to the Ohio EPA on April 17, 2014. This document serves as the PBA08 model RI document. On April 29, 2014, the Ohio EPA issued a letter to the Army requesting a 30-day time extension for the review of the Load Line 10 report. On July 1, 2014, the Ohio EPA issued a letter to the Army providing review comments on the report. The Army and Ohio EPA attended a meeting on July 29, 2014 to address and discuss the comments. Pursuant to the meeting, the Ohio EPA submitted a follow on letter to the Army on August 11, 2014, and the Army submitted revised responses to the Ohio EPA on August 25, 2014. On October 14, 2014, the Army received Ohio EPA comments on the revised responses for the Load Line 10 RI Report in which the Ohio EPA asked for additional revisions. On October 30, 2014, the Army sent an email to Ohio EPA requesting a working meeting to address comments on the Load Line 10 RI. An on-site stakeholders' working/resolution meeting occurred on December 8 and 9, 2014. Based on recommended resolutions developed at the meeting, the Army anticipates submitting Final RI mid March 2015 pending contract modification to sustain additional project work efforts.</p> <p>The Army submitted the <i>"Final Remedial Design for Soil, Sediment, and Surface Water at RVAAP-13 Building 1200 and RVAAP-48 Anchor Test Area"</i> on August 28, 2014. The Ohio EPA approved the document in a letter correspondence dated September 3, 2014 with the remedial actions commencing for both sites on November 17, 2014. The RVAAP-48 remedial action is complete and the preliminary draft Remedial Action Report is being prepared by the contractor for Army review. RVAAP-13 soil removal and in-situ soil confirmation is still ongoing as of December 31, 2014.</p> <p>The Army submitted correspondence to the Ohio EPA on February 4, 2014, requesting regulatory review of the Revised Draft RVAAP-67 Facility Wide Sewers RI/FS Comment Response Table (CRT) and Conceptual Site Exposure Model (CSEM). The Army received the Ohio EPA's response to comments on the CSEM Comment 0-2 &amp; 0-4 which the Army responded back on June 3, 2014 with a revised CRT. Since the Army's last response to comments, the Ohio EPA has provided no further comment. The RI/FS for Facility Wide Sewers is curtailed from further Ohio EPA comment/review until such time as the LL#10 model/template report completes the Ohio EPA-Army resolution phase (status as of December 31, 2014).</p>

**RVAAP RESTORATION PROGRAM- DFFO MONTHLY SUMMARY REPORT  
DECEMBER 2014**

PROJECT NAME	USACE TECH MGR /Contractor	PROJECT STATUS
PBA-08 Eighteen IRP AOCs (cont'd)		<p>The Army submitted the <i>"Draft Remedial Investigation Report for Soil, Sediment, and Surface Water at RVAAP-50 Atlas Scrap Yard"</i> to the Ohio EPA on June 18, 2014. The Ohio EPA issued a letter on July 14, 2014 requesting a 45-day extension. Subsequently, the Ohio EPA submitted an E-Mail correspondence to the Army on September 19, 2014, requesting a Technical Project Planning (TPP) meeting to work through a list of concerns with the subject document. The Army received a formal comment letter from the Ohio EPA on September 29, 2014. The Army began working on a Response to Comments in preparation for a TPP but, a December 18, 2014 Ohio EPA email stated that Ohio EPA's Brian Tucker (Risk Assessor) is still reviewing the document and will provide his comments sometime in January 2015. Following the receipt and review of the regulator's comments on the entire RVAAP-50 Draft RI, a TPP resolution meeting between stakeholders will follow shortly thereafter. Additionally, the remaining RI Reports for the 14 outstanding AOCs are on hold until the Load Line 10 and Atlas Scrap Yard template documents are resolved.</p>
CERCLA 5-YR Review Report	Buffalo District/USACE	<p>The USACE District has initiated filing actions of the 2012 document to be journalized into the official RVAAP Administrative Record; inclusive with submittal into the two designated repositories stored at the Newton Falls (Trumbull Co.) and Ravenna (Portage Co.) Public Libraries. A path forward for the 5 Year Review has been submitted to the Ohio EPA via email. The Army has requested regulatory feedback on the proposed path forward for the 5 Year Review which is still outstanding. The draft public notice is under Army revision as of December 31, 2014.</p>
PBA-09 Fourteen MMRP MRSs	Travis McCoun/CBI	<p>Based on the August approval of the responses to comments, the Army had submitted to Ohio EPA the Final RI reports for Atlas Scrap Yard MRS (version 2), Final Load Line 1A MRS (version 2), Firestone Test Facility MRS and the Erie Burning Grounds MRSs. The Ohio EPA submitted additional comments for the Firestone Test Facility and Atlas Scrap Yard MRS RI Reports on September 22, 2014 which were responded to by the Army on October 6, 2014. After reviewing the responses, the Ohio EPA submitted more comments for the Firestone Test Facility MRS RI Report on October 17, 2014.</p> <p>On September 9 &amp; 12, 2014, the Ramsdell Quarry Landfill &amp; Open Demolition Area #2 Draft RIs respectively were sent to Ohio EPA for review. On September 26, 2014, Draft RIs for Landfill North of Winklepeck MRS &amp; the D Block Igloo MRS were sent to the Ohio EPA for subsequent review and comment/approval. The Army received comments for the Ramsdell Quarry Landfill RI Report on October 22, 2014 resulting in further resolution between parties. The Army received Ohio EPA letter dated December 10, 2014 in response to Open Demolition Area #2 Draft RI report. The Army received Ohio EPA comment letters dated December 29, 2014 referencing D-Block Igloo, Landfill North of Winklepeck, and Ramsdell Quarry Landfill MRSs. It should be noted that Ohio EPA cited the Landfill North of Winklepeck MRS in their comment letter subject line but no comments were discerned from the regulator's applicable commentary. The Army is currently working on the responses to the regulator's comments received as of December 31, 2014.</p>

**RVAAP RESTORATION PROGRAM- DFFO MONTHLY SUMMARY REPORT  
DECEMBER 2014**

PBA-09 Fourteen MMRP MRSs	Travis McCoun/CBI (Cont'd Fm/ Page 2)	The Army submitted the Draft RVAAP-062-R-01 Water Works #4 Dump MRS RI dated December 18, 2014 to the Ohio EPA. Ohio EPA submitted its review comments to the Draft RI in a letter dated December 29, 2014. The Army is currently working on responses to the regulator's comments as of December 31, 2014.
PBA-11 Fourteen Compliance Restoration (CR) Sites	E. Cheng/ECC	On December 5, 2014, the Army submitted its response to Ohio EPA's comments from their review of the Draft SI report for CC-RVAAP-71 BARN NO. 5 PETROLEUM RELEASE.
RVAAP-28 Suspected Mustard Agent Burial Site	Huntsville/USACE	USACE/LRL coordinated with ARNG to set-up review of the SI report and develop a contingency plan by the USACE Huntsville Center of Expertise for Military Munitions, the Army's leader in Chemical Warfare Material. The contingency plan has been finalized. The draft SI report was submitted to the Army on December 23, 2014 and is under Army review.
RVAAP-03 & - 34 ODA1 and Sand Creek Disposal Road Landfill	E. Cheng/CELRL	Based on prioritization of the other AOCs currently under contract and the work affiliated with them being completed, these two AOCs are delayed until a later date TBD. Continued action at these sites will likely require a new contract action.
Igloos	E. Cheng/CELRL	The Army is currently gathering historical information and performing a risk analysis on current sampling data in support of the "lines of evidence" approach (as presented in the Army's correspondence dated June 25, 2014) as well as determining the sampling approach for the storage igloos.
Facility Wide Ground Water Monitoring	N. Peters/EQM	<p>The Army submitted the response to comments on the draft and the <i>"Final Facility-Wide Groundwater Monitoring Program RVAAP-66 Facility-Wide Groundwater Report on the May 2014 Sampling Event"</i> to the Ohio EPA on November 7, 2014. Ohio EPA approval of final version was received in a letter dated December 17, 2014.</p> <p>The <i>Draft Addendum to the Facility-wide Ground Water Monitoring Program Plan for 2015</i> monitoring was submitted to the Ohio EPA on October 9, 2014. The Army received comments from the Ohio EPA in a letter dated November 25, 2014 on December 1, 2014 with the Army submitting its response to comments letter to the regulator on December 19, 2014</p> <p>The Army submitted the <i>"Draft Facility-Wide Groundwater Monitoring Program RVAAP-66 Facility-Wide Groundwater Report on the July 2014 Sampling Event"</i> to the Ohio EPA on November 9, 2014. The Ohio EPA comment letter was received on December 4, 2014 and response to comments was submitted December 30 2014.</p>

**RVAAP RESTORATION PROGRAM- DFFO MONTHLY SUMMARY REPORT  
DECEMBER 2014**

Facility Wide Ground Water Monitoring  (Cont'd fm/ Page 2)	N. Peters/EQM	<p>The Army Contractor submitted the <i>Preliminary Draft 2014 Annual Groundwater Report</i> for Army review on October 31, 2014. Army review was completed in November. The Draft document was submitted to the regulator December 11, 2014.</p> <p>The army received the preliminary draft for the Facility Wide Groundwater Monitoring program for the October 2014 sampling on December 22, 2014 and is under Army Review.</p> <p>The Army submitted the draft IDW report for the October 2014 groundwater sampling event to the Ohio EPA on November 24, 2014. On December 8, 2014 the Army received regulatory approval upon the subject submittal. One 55-gallon drum of IDW (approximately 15 gallons of purge water) was picked up and transported for disposal on 29 December 2014.</p>
CC RVAAP-80 Group 2 Propellant Can	Q. La/Pika	The Army is currently producing an explanation of the history of the site/prop cans on the site, which was part of one of the Ohio EPA comments on the revised final WP for the current SI. Once the history is complete, the Army would like to have a call to go over the history, and the current work. A modification to the task order will be needed before moving forward; still pending as of December 31, 2014.
Historical Well Abandonment	Q. La/Plexus	The contractor responses to Army comments on the preliminary draft work plan were submitted to the Army on May 13, 2014. The Army responded to the contractor's comments dictating further revisions to the preliminary work plan that prescribed a site visit that took place between on November 12 -13, 2014 to clarify the work plan concerns. The updated work plan was provided by the contractor on December 5, 2014. All Army comments were received by the contract on December 22, 2014, awaiting responses.
PMP Appendices	N. Peters/CELRL	Draft PMP Appendices for Erie Burning Grounds, Open Demolition Area 2, Load Line 12, Fuze and Booster Quarry and Central Burn Pits are on hold until an update of the general PMP text and Winklepeck PMP Appendix is issued and approved. The Ramsdell Quarry Landfill PMP appendix was developed as part of the Final RD for the AOC. Additional parts of the PMP appendix (figure and legal description) are currently being developed by the Army and will be submitted to the Ohio EPA in 2015 for review. LUC management for RQL started in December 2014 and will be reported as required in an annual report for the LUCs at RQL..

**RVAAP RESTORATION PROGRAM- DFFO MONTHLY SUMMARY REPORT  
DECEMBER 2014**

RVAAP-05 Winklepeck Burning Grounds	N.Peters/CELRL Q. La/CELRL	<p>The Army submitted the Draft Remedial Design (i.e., Work Plan for the Remedial Action) to Ohio EPA electronically on November 14, 2014 meeting the DFFO Milestone date of November 15, 2014. Hardcopy and CDs were submitted on November 18, 2014.</p> <p>On October 28, 2014, the Army received comments from the Ohio EPA on the Draft Explanation of Significant Differences (ESD) for Post ROD Changes to the Remedy. On November 26, the Army submitted proposed responses to comments electronically to the Ohio EPA along with an electronic version (Revision 1) of the document. The Ohio EPA agreed to back check the changes in the electronic file before the Army creates additional hardcopies or CDs. Ohio EPA provided comments on the Army responses in an email on December 1, 2014 subsequently the Army has been preparing its response to comments.</p> <p>The 2014 Annual LUC Report was submitted to Ohio EPA on November 14, 2014 with the Army receiving a regulatory letter of approval for the Annual LUC Report dated December 10, 2014.</p>
RVAAP-05 Winklepeck Burning Grounds (Cont'd fm/ Page 4)	N.Peters/CELRL Q. La/CELRL	<p>The Army received Ohio EPA's approval via letters dated December 10, 2014 for the 1<sup>st</sup>, 3<sup>rd</sup>, and 4<sup>th</sup> Quarter LUC Reports for FY14. In another Ohio EPA December 10, 2014 letter, the regulator tentatively approved the Draft FY2014 Annual Report for the Quarterly LUC Inspections requesting a final version for review and approval. Army will be submitting this final version early January 2015.</p>
RVAAP-51 Dump Along Paris Windham Road	N.Peters/CELRL	<p>The Army submitted the Final Site Characterization/Focused Feasibility Study to the Ohio EPA electronically on September 22, 2014, with CDs and hard copy delivered by September 26, 2014. The Army received a response letter dated November 10, 2014 from Ohio EPA on November 14, 2014. The Army held a comment clarification call with the regulator on December 04, 2014. Based on the discussions on the call, revisions to the document are currently underway. The revised final document is slated to be issued in early February 2015.</p>
PBA for Supplemental RI/FS for multiple AOCs	Q. La/Pika	<p>A Data Gap Analysis Approach letter to facilitate the completion of the RVAAP's Addendum RI/FS Work Plan at Load Lines 1-4 and 12 was provided to the Ohio EPA on September 17, 2014. The Ohio EPA replied with comments in a letter dated November 13, 2014. A collective meeting (i.e., Army, OHARNG, Ohio EPA, and Leidos) occurred on October 21, 2014 to discuss comments. Subsequently, a letter was provided to the Ohio EPA on December 3, 2014. The Army is on schedule to meet the DFFO date of January 31, 2015 for the submittal of the Work Plan to Ohio EPA.</p>



**RVAAP RESTORATION PROGRAM- DFFO MONTHLY SUMMARY REPORT  
DECEMBER 2014**

Environmental Remediation Services at ODA2	E. Cheng/PIKA	The Army submitted the Final Removal Action Report for Environmental Remediation Services at ODA2 to the Ohio EPA on December 22, 2014. This report outlined the actions completed during the destruction and off-site disposal of MEC and MPPEH items at ODA2. The Ohio EPA approved the final report in its correspondence to the Army dated December 29, 2014.
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**B. Describe difficulties encountered during the reporting period and actions taken to rectify any difficulties**

- 1.) None

**C. Identify changes in key personnel**

- 1.) Army Program Manager is Mark Leeper effective December 3, 2014.

**D. List target and actual completion dates for each element of activity, including project completion**

- 1.) 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**

- 1.) Facility-wide Groundwater Program:
  - Approval of the Draft Groundwater RI/FS Work Plan has been delayed due to unresolved issues associated with RVAAP's background monitoring well network and the GW risk assessment screening process. The Army currently plans to award a new contract under ARNGD administration) to complete the RI/FS/PP/ROD for RVAAP-66 Facility-Wide Groundwater. The existing groundwater Contract (under USACE administration) will continue with the required FWGWMP requirements, which consist of semi-annual groundwater monitoring/reporting and annual reporting.
- 2.) Additional schedule activities needed for USACE in-house work:
  - AOCs with currently known delays affected by the activities include completion of an FS for ODA1 and Sand Creek. Additional information is provided in Section A.

**F. Indicate how much contaminated soil was removed and contaminated groundwater was pumped and where such contaminated media were disposed**

One drum of IDW from the October sampling event is currently stored in a steel 55-gallon drum staged on secondary containment within Building 1036. The IDW report was submitted for Ohio EPA review on November 24, 2014. Ohio EPA approved the IDW report via letter dated December 3, 2014 resulting in the transport and off-site disposal of the IDW on December 29, 2014.

**RVAAP RESTORATION PROGRAM- DFFO MONTHLY SUMMARY REPORT  
DECEMBER 2014**

At RVAAP-13/ Building 1200 an estimated 402 tons of nonhazardous contaminated soil was hauled off in November/December 2014 to the disposal facility: Envirite of Ohio, Inc., 2050 Central Ave. S.E., Canton, OH 44707. The RA is still ongoing as of December 31, 2014 (awaiting confirmation results prior to site restoration).

At RVAAP-48/Anchor Test Area (ATA) an estimated 45 tons of nonhazardous contaminated soil was hauled off on December 1 and 2, 2014 to the disposal facility: Envirite of Ohio, Inc., 2050 Central Ave. S.E., Canton, OH 44707. The AOC has been backfilled and seeded and covered in straw.

**G. Describe activities planned for the following month (JANUARY 2015)**

- 1.) The Ohio EPA is scheduled to complete their 45-day DFFO review and comment to the Army pertinent to the RVAAP-01 Ramsdell Quarry Landfill Draft Remedial Action Report (RAR); their scheduled date of completion is December 29, 2014; due to holidays Army is anticipating regulatory response early January 2015.
- 2.) Under the Army's PBA09, the remaining draft remedial investigation reports for Fuze and Booster Quarry MRS, Water Works #4 Dump MRS, 40mm Firing Range MRS, Sand Creek Dump MRS, and Group 8 MRS will be finalized and submitted to Ohio EPA once the regulator and Army finish comment resolution and final approval of the set of MRS RIs that are currently under discussion/resolution which includes Landfill North of Winklepeck; Block D Igloo; Ramsdell Quarry Landfill MRS; Water Works #4 Dump; and Open Demolition Area #2 .
- 3.) The Army anticipates a discussion with Ohio EPA relative to the history/path forward for the SI at CC RVAAP-80, Group 2 Propellant Can Tops. A call between the Ohio EPA and the Army is being arranged for sometime at the end of January 2015.
- 4.) The Army plans to address Ohio EPA comments on the Draft Explanation of Significant Differences, Revision 1, for RVAAP-05 Winklepeck Burning Grounds (received December 1, 2014) and issue the final document in mid-January 2015.
- 5.) RVAAP-13/Bldg 1200 will continue RA process with soil removal and confirmation sampling where at that completion will proceed preparing the Preliminary Draft Remedial Action Report for Army Review
- 6.) RVAAP-48/Anchor Test RA: Area is being restored and the contractor is developing the completion report, anticipate a preliminary draft for Army review in January.
- 7.) CERCLA 5-yr Review Report: Following Ohio EPA's review of the document the Army will proceed to publish the Public Notice subsequent with filling the document into the two public repositories.
- 8.) The Army sent a letter dated 3 December 2014 acknowledging Ohio EPA comments regarding the approach letter for Load Line 1-4 & 12 and indicated that those comments will be addressed in the work plan scheduled to be submitted at the end of January 2015.
- 9.) Begin funding and contract proceedings in order to proceed with the Proposed Plan/Public meeting associated with the RVAAP-51, Dump Along Paris Windham Road.

**RVAAP RESTORATION PROGRAM- DFFO MONTHLY SUMMARY REPORT  
DECEMBER 2014**

- 10.) Response to Ohio EPA's comments where submitted December 19, 2014, Army is awaiting on the *Draft Addendum to the Facility-wide Ground Water Monitoring Program Plan for 2015* monitoring.
- 11.) Submit to Ohio EPA final version of FY2014 Annual Report for the Quarterly LUC Inspections



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

November 27, 2015

Mr. Mark Leeper  
Army Nation 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: Comments on the August 14, 2015 Response to Comments on the  
“Draft PBA 13 Remedial Investigation Sample and Analysis Plan  
Addendum for Load Lines 1, 2, 3, 4 and 12” for the Former Ravenna  
Army Ammunition Plant (RVAAP)” Document, Dated January 30,  
2015 (Work Activity No. 267-000859-030)**

Dear Mr. Leeper:

The Ohio Environmental Protection Agency (Ohio EPA) received the draft PBA 13 Remedial Investigation Sample and Analysis Plan (SAP) Addendum for Load Lines 1, 2, 3, 4, and 12. Each of these Load Line areas of concern (AOCs) has undergone several investigations and remedial action decisions to characterize the nature and extent of contamination, as well as evaluate human and ecological health risks. Previous remediation activities focused only on the National Guard Trainee receptor. Additional evaluation of data gaps for the unrestricted land use and possible sampling is proposed by this SAP Addendum.

The Final Technical Memorandum: Land Uses and Revised Risk Assessment Process for the RVAAP Installation Restoration Program, or Technical Memorandum, states if an AOC fails to meet the Unrestricted Land Use, then a Feasibility Study (FS) will be completed to evaluate cleanup options for all three land uses noted in the Technical Memorandum.

The responses you provided in the August 14, 2015 letter adequately addressed our comments except for two of our comments. We still need clarification and concurrence

from you on Comment #2 regarding ISM methodology and Comment #18 regarding the appropriate surface water standards.

**Comment # 2:** Due to the difference between the ISM methodology proposed for these Load Lines with current ISM sampling guidance, Ohio EPA suggests discrete samples be collected at these Load Lines to expedite the application of the work plans. Discrete samples may also be more efficient at these AOCs considering the investigations have been proposed to evaluate remedy modifications and an extensive amount of historical data related to prior investigations and remedial efforts at these Load Lines is available. Areas with historical exceedances should be bound horizontally by collecting one discrete sample on each side of the area, and bound vertically by collecting one sample from the middle of the area; the sampling can be repeated as needed. The proposed sample depth intervals (0-1, 1-3, 3-5, 5-7, 7-13 feet) remain appropriate, and samples can be collected and held, as desired. The Winklepeck Burning Grounds Work Plan is a good resource to utilize. Ohio EPA can help with determining sample locations and depths prior to submittal of a revised work plan. For a specific example, regarding the proposed ISM sample LL2sb-628M at Load Line 2 (inset DA-6 on Plate B-3), discrete samples can be placed on each side of the prior remediation area (green hashed area) to determine horizontal extent, and one discrete sample collected from the middle of this area to determine vertical extent, perhaps starting at a depth of 4 feet since prior sampling reported an exceedance of residential facility wide clean up goals in the 2-3 foot sampling interval.

While discrete sampling is suggested for these Load Lines, Ohio EPA understands the usefulness of ISM sampling, when conducted appropriately. Therefore, Ohio EPA may consider ISM sampling, if it was designed and conducted in accordance with current ISM sampling guidance protocols, including a minimum of 30 aliquots, replicates, and clearly defined decision units.

**Comment # 18:** Regardless of whether surface water concentrations were determined from a single-sample event at one location, are averages calculated from samples taken at multiple locations, or are averages calculated from multiple samples collected over a period of time from a single location, the data must also be compared to the Outside the Mixing Zone Average (OMZA) value, in addition to the other criteria cited in the report (OMZM, Human Health, etc.). For ecological receptors, the OMZA is the surface water criteria used to determine if chemical concentrations are protective of aquatic life short term exposure. While the OMZA criteria for human health and aquatic life should be compared against ambient samples averaged over a 30-day period, if only one sample is collected, that data is considered the 'average'. Include the OMZAs in the ecological

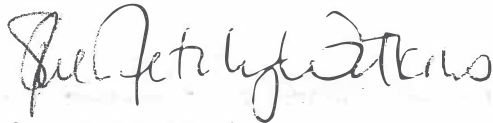


MR. MARK LEEPER  
ARMY NATION GUARD DIRECTORATE  
NOVEMBER 27, 2015  
PAGE 3

screening criteria tables (A-5, B-5, C-5, and D-5), and in the future in Load Line 12's (RVAAP-44) to-be-submitted-under-separate-cover report.

If you have questions or need clarification regarding the comments, please feel free to contact me at (330) 963-1201 or e-mail at [susan.netzly-watkins@epa.ohio.gov](mailto:susan.netzly-watkins@epa.ohio.gov).

Sincerely,



Sue Netzly-Watkins  
Site Coordinator  
Division of Environmental Response and Revitalization

SN-W/nvr

cc: Kevin Sedlak, ARNG-ILE, Camp Ravenna  
Katie Tait, OHARNG, Camp Ravenna  
Quyet La, USACE Louisville  
Nat Peters, USACE Louisville  
Gail Harris, Vista Sciences Corp  
Gregory F. Moore, USACE, Louisville District  
Vasudha Peterson, Leidos

ec: Rod Beals, Ohio EPA, NEDO, DERR  
Bob Princic, Ohio EPA, NEDO, DERR  
Justin Burke, Ohio EPA, CO-DERR  
Brian Tucker, Ohio EPA, CO-DERR  
Carrie Rasik, Ohio EPA, CO-DERR



**NATIONAL GUARD BUREAU**

111 SOUTH GEORGE MASON DRIVE  
ARLINGTON VA 22204-1373

October 15, 2015

Ohio Environmental Protection Agency  
DERR-NEDO  
Attn: Nicholas Roope, Site Coordinator  
2110 East Aurora Road  
Twinsburg, OH 44087-1924

Subject: Concurrence for Request for Review Extension for the Ravenna Army Ammunition Plant (RVAAP – Camp Ravenna) Restoration Program, Portage/Trumbull Counties, Draft Remedial Investigation Work Plan for Sediment and Surface Water

Dear Mr. Nicholas Roope:

On October 7, 2015, the Army received a 60-day Extension Request for review of the *Draft Remedial Investigation Work Plan for Sediment and Surface Water* at Camp Ravenna to a review deadline of December 4, 2015. The Army approves the extension request to December 4, 2015.

Upon receiving the Ohio EPA's comments on the *Draft Remedial Investigation Work Plan for Sediment and Surface Water*, the Army feels that it would be beneficial to hold a conference call or meeting to discuss concerns your office may have associated with the work plan.

Please contact the undersigned at (703) 607-7955 or [Mark.S.Leeper.civ@mail.mil](mailto:Mark.S.Leeper.civ@mail.mil) if there are issues or concerns with this submission.

Sincerely,

A handwritten signature in black ink, appearing to read "Mark Leeper", is positioned above the typed name.

Mark Leeper, P.G., MBA  
RVAAP Restoration Program Manager  
Army National Guard Directorate

cc: Rodney Beals, Ohio EPA, DERR-NEDO  
Robert Princic, Ohio EPA, DERR-NEDO  
Andrew Kocher, Ohio EPA, DERR-NEDO  
Justin Burke, Ohio EPA, CO  
Kevin Palombo, Ohio EPA, DERR-NEDO  
Kevin Sedlak, ARNG, Camp Ravenna  
Katie Tait, OHARNG, Camp Ravenna  
Greg Moore, USACE Louisville  
Quyet La, USACE Louisville  
Vasu Peterson, Leidos  
Gail Harris, Vista Sciences Corporation



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

October 7, 2015

Mr. Mark Leeper, P.G., MBA  
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  
267000859067

**Subject:** Request for an Extension for the Review of the "Draft Remedial Investigation Work Plan for Sediment and Surface Water" Former Ravenna Army Ammunition Plant, Ravenna, Ohio; Contract No. W912QR-12-D-0020; Dated July 23, 2015 (Work Activity No. 267-000859-067)

Dear Mr. Leeper:

On July 24, 2015, the Ohio Environmental Protection Agency (Ohio EPA), Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR) received the comments for the "Draft Remedial Investigation Work Plan for Sediment and Surface Water". Pursuant to the Director's Final Findings and Orders (Orders), the deadline for review on this document is September 9, 2015.

However, this document is undergoing further review by Ohio EPA staff. The letter requests an extension of 60 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 December 4, 2015.

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", with a stylized flourish at the end.

Nicholas Roope, Site Coordinator  
Division of Environmental Response and Revitalization

NCR/nvr

- cc: Gregory F. Moore, USACE, Louisville District  
Katie Tait/Kevin Sedlak, Camp Ravenna Environmental Office, Newton Falls  
Haney/Harris, Camp Ravenna Environmental Office, Vista Sciences, Newton Falls
- ec: Rod Beals, Ohio EPA, NEDO, DERR  
Robert Princic, Ohio EPA, NEDO, DERR  
Justin Burke, Ohio EPA, CO, DERR  
Andrew Kocher, Ohio EPA, NEDO, DERR  
Kevin Palombo, Ohio EPA, NEDO, DERR





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

October 7, 2015

Mr. Mark Leeper, P.G., MBA  
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  
267000859067

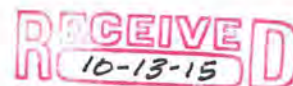
**Subject:** Request for an Extension for the Review of the "Draft Remedial Investigation Work Plan for Sediment and Surface Water" Former Ravenna Army Ammunition Plant, Ravenna, Ohio; Contract No. W912QR-12-D-0020; Dated July 23, 2015 (Work Activity No. 267-000859-067)

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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/nvr

- cc: Gregory F. Moore, USACE, Louisville District  
Katie Tait/Kevin Sedlak, Camp Ravenna Environmental Office, Newton Falls  
Haney/Harris, Camp Ravenna Environmental Office, Vista Sciences, Newton Falls
- ec: Rod Beals, Ohio EPA, NEDO, DERR  
Robert Princic, Ohio EPA, NEDO, DERR  
Justin Burke, Ohio EPA, CO, DERR  
Andrew Kocher, Ohio EPA, NEDO, DERR  
Kevin Palombo, Ohio EPA, NEDO, DERR



## NATIONAL GUARD BUREAU

111 SOUTH GEORGE MASON DRIVE  
ARLINGTON VA 22204-1373

October 2, 2015

Ohio Environmental Protection Agency  
DERR-NEDO  
Attn: Mr. Bob Princic  
2110 East Aurora Road  
Twinsburg, Ohio 44087-1924

Subject: Ravenna Army Ammunition Plant (RVAAP) Restoration Program  
Portage/Trumbull Counties  
Use of UFP-QAPP for RVAAP Restoration Program

Dear Mr. Princic:

As discussed on our schedule call on 27 August 2015, the Army restoration team is proposing to use the Uniform Federal Policy for Quality Assurance Project Plans (UFP-QAPP) as a standard format for Work Plans for the Ravenna Army Ammunition Plant (RVAAP) Restoration Program. As discussed and requested on the schedule call and to support this approach, the Army would like to provide additional information about the UFP-QAPP.

### **Description of the UFP-QAPP**

The UFP-QAPP is a consensus document prepared by the Intergovernmental Data Quality Task Force (IDQTF), a working group made up of representatives from the U.S. Environmental Protection Agency (USEPA), the Department of Defense (DoD), and the Department of Energy (DOE). Originally issued in 2005, the UFP-QAPP was developed to provide procedures and guidance for consistently implementing the national consensus standard ANSI/ASQ E-4, *Quality Systems for Environmental Data and Technology Programs*, for the collection and use of environmental data at Federal facilities. It provides instructions for preparing QAPPs for any environmental data collection operation. It assists environmental professionals in streamlining the systematic planning process for quality program planning, reducing review time, revisions and cost, and increasing the success rate for quality program plan approval.

The UFP-QAPP Manual was issued in March 2005 and consists of the following parts:

- Part 1: UFP-QAPP Manual – general guidance and instructions for preparing QAPPs;
- Part 2A: UFP-QAPP Workbook – a collection of templates or worksheets that, once completed, addresses all required elements of a QAPP;

Subject: Use of UFP-QAPP for RVAAP Restoration Program, Former RVAAP/Camp Ravenna, Portage/Trumbull Counties, Ohio

- Part 2B: UFP-QAPP Compendium – specifications for minimum quality assurance (QA) and quality control (QC) activities for hazardous waste projects;
- Part 2C: Example QAPPs – documents illustrating the implementation of the UFP-QAPP and use of the worksheets for different types of projects in a “graded approach”.

The UFP-QAPP benefits all areas of environmental projects, for example:

- Through systematic, and more upfront stringent planning, the UFP-QAPP is designed to assist environmental professionals in effectively collecting and analyzing field data. For example, the guidance document contains a manual and comprehensive worksheets to ensure completeness and consistency early in a project.
- The UFP-QAPP worksheets ensure consistency, thereby facilitating a faster document review and project approval. Field crew and laboratory staff benefit from readily available standard operating procedures and clearly referenced QA/QC requirements in a single, comprehensive document.
- A “graded approach” provides flexibility when drafting project plans. The UFP-QAPP’s graded approach enables project planners to tailor the plan’s level of detail based on a project’s intended use of the results and the degree of confidence needed in decision making.
- As the single standard for project/program planning documentation, the UFP-QAPP eliminates common documentation issues among the government, contractors, and regulators, including format, content, terminologies, procedures, supporting documentation, expectations, and review process.

A UFP-QAPP integrates technical and quality control aspects of a project throughout its life cycle, including planning, implementation, assessment, and corrective actions. The UFP-QAPP presents the steps that will be taken to ensure that environmental data collected are of the correct type and quality required for a specific decision or use. It presents an organized and systematic description of the ways in which quality assurance (QA) and quality control (QC) will be applied to the collection and use of environmental data.

### **Applicable Memorandums Issued for the UFP-QAPP**

On 7 June 2005, a Memorandum was issued by Mr. Thomas P. Dunne, Deputy Assistant Administrator for the USEPA, to the Regional Administrators of the USEPA transmitting the final UFP-QAPP and providing guidance to the Regions on the policy for all data collection at Federal facility hazardous waste sites. It indicated that the policy is a result of the work of the IDQTF, chaired by the Director of the Federal Facilities Restoration and Reuse Office, and it reflects significant input and review from a variety of USEPA Headquarters offices, by every USEPA Regional Office, as well as USEPA’s partners in the endeavor – DoD and the DOE. The directive indicated that the UFP-QAPP is designated for use in Federal facility projects where environmental data are collected. It was designed to be applicable for all environmental data collection related to hazardous waste investigations (e.g., for the purpose of cleanup under the CERCLA program and

Subject: Use of UFP-QAPP for RVAAP Restoration Program, Former RVAAP/Camp Ravenna, Portage/Trumbull Counties, Ohio

the RCRA corrective action program) as well as data collection related to active management of hazardous waste generated by RCRA facilities. The Memorandum concluded that the UFP-QAPP was created to address the real and perceived inconsistencies and deficiencies in data quality that result in greater costs, time delays, and the potential for response actions that result in unaddressed risk. The UFP-QAPP employs a graded approach designed to encourage a level of detail consistent with the scope and complexity of the project. It is a tool that can be used cost-effectively for many different projects.

On 21 December 2005, a Memorandum was issued by Mr. James E. Woolford, Director of the USEPA Federal Facilities Restoration and Reuse Office, and Mr. Reggie Cheatham, Director of the USEPA, Quality Staff, Office of Environmental Information, discussing the applicability of the UFP-QAPP and indicating that it had been approved by the Office of Solid Waste and Emergency Response (OSWER) and the DoD for use at federal facility hazardous waste sites. The Memorandum indicated that QAPPs prepared and approved according to the UFP-QAPP meet all the requirements of *EPA requirements for Quality Assurance Project Plans, (QA/R-5)* issued by the Quality Staff of the Office of Environmental Information. The Memorandum indicated that the UFP-QAPP was in use by several USEPA Regions for Federal facilities as well as other fund lead and responsible party lead Superfund projects, and has been demonstrated to be helpful and effective in improving QAPP plan and implementation.

In a Memorandum dated 11 April 2006, Mr. Alex A. Beehler, Assistant Deputy Under Secretary of Defense (Environment, Safety, and Occupational Health), announced that Mr. Thomas Dunne, Acting Administrator for the USEPA OSWER, joined him in signing the UFP-QAPP, thereby formally adopting the policy for use at Federal facility hazardous waste sites. The purpose of the Memorandum was to request that Components begin immediate implementation of this policy.

In doing research on the UFP-QAPP and for this letter, the Army also identified that the UFP-QAPP Manual was identified on the *General Guidance Document and Reference List for Use with Ohio EPA DERR Remedial Response Program Statements of Work and Orders*.

### **Federal Facilities in the State of Ohio where the UFP-QAPP is Being Used**

- Lockbourne Air Force Base, Columbus, Franklin County, Ohio
- Lake Erie Sites (Lake Erie Shoreline MRS, Lake Erie Shoreline MRS Residential, West Sister Island MRS), Port Clinton, Ottawa County, Ohio
- Wright Patterson Air Force Base, Dayton, Montgomery County, Ohio

### **Additional Resources**

The following is a list of websites where additional information on the UFP-QAPP can be found:

Subject: Use of UFP-QAPP for RVAAP Restoration Program, Former RVAAP/Camp Ravenna, Portage/Trumbull Counties, Ohio

<http://www2.epa.gov/fedfac/assuring-quality-federal-cleanups>

<http://www2.epa.gov/fedfac/uniform-federal-policy-quality-assurance-project-plans-training-materials>

<https://clu-in.org/search/t.focus/id/569/>

<http://www.denix.osd.mil/edqw/Documents.cfm>

## **Path Forward**

The current plan is for the Army to introduce the UFP-QAPP to the RVAAP restoration team by using it for the Time Critical Removal Action Work Plan at the Open Demolition Area #2 (ODA2) and for the Pilot Study for Atlas Scrap Yard.

We hope that the information provided is sufficient and meet your needs. Please contact the undersigned at (703) 607-7955 or [mark.s.leeper.civ@mail.mil](mailto:mark.s.leeper.civ@mail.mil) with any questions or if additional information is needed. Please note that the Army has a great resource, USACE, who is well-versed in the UFP-QAPP and is willing to present on the topic if the Ohio EPA thinks it would be beneficial.

Sincerely,



Mark Leeper  
RVAAP Restoration Program Manager  
Army National Guard Directorate

cc: Rod Beals, Ohio EPA, NEDO-DERR  
Justin Burke, Ohio EPA, CO-DERR  
Kevin Sedlak, ARNG, Camp Ravenna  
Katie Tait, OHARNG, Camp Ravenna  
Greg Moore, USACE Louisville  
Gail Harris, Vista Sciences





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

August 14, 2015

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

Subject: Responses to Comments on the Draft Remedial Investigation Sample and Analysis Plan Addendum for Load Lines 1-4 and 12 for the Former Ravenna Army Ammunition Plant (RVAAP) Restoration Program, Portage/Trumbull Counties (Work Activity No. 267-000859-030)

Dear Ms. Netzly-Watkins:

The Army appreciates your time and comments on the *Draft PBA 13 Remedial Investigation Sample and Analysis Plan Addendum for Load Lines 1,2,3,4 and 12* dated July 2, 2015. Enclosed for your approval are responses to your comments with text revisions which will be incorporated in the final document. We would be pleased to schedule a resolution meeting if you anticipate the need for additional comments or discussion. A hardcopy of this letter can be provided at your request.

Please contact the undersigned at (703) 607-7955 or [Mark.S.Leeper.civ@mail.mil](mailto:Mark.S.Leeper.civ@mail.mil) if there are issues or concerns with this submission.

Sincerely,

LEEPER.MARK.S.10  
95051282

Digitally signed by LEEPER.MARK.S.1095051282  
DN: c=US, o=U.S. Government, ou=DoD,  
ou=PKI, ou=USA,  
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Date: 2015.08.17 15:59:37 -04'00'

Mark Leeper  
RVAAP Restoration Program Manager  
Army National Guard Directorate

cc: Rod Beals, Ohio EPA, NEDO-DERR  
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Greg Moore, USACE Louisville  
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**Responses to Ohio EPA Comments (dated July 7, 2015)**  
***Draft PBA13 Remedial Investigation Sample and Analysis Plan Addendum***  
***for Load Lines 1, 2, 3, 4 and 12***  
**Former Ravenna Army Ammunition Plant (RVAAP), January 30, 2015**  
**(Work Activity No. 267-000859-030)**

1) General Comment Regarding Determining Decision Units within AOCs

Please ensure that an iterative sampling approach is used to determine the extent of contamination. The boundaries of a decision unit may expand or contract depending upon sample results. We assume the decision units will be determined with Ohio EPA input.

***Response:** Comment acknowledged. It is anticipated that this will be the last sampling event to address data gaps for the FS given the extent of data available at the Load Lines. The size and location of Incremental Sample Method (ISM) samples are clearly defined in the SAP as required to satisfy nature and extent. Decision units will be developed and evaluated in the RI/FS using existing and new data. A Technical Project Planning (TPP) meeting could be conducted prior to submittal of the RI/FS to streamline review and ensure team understanding.*

2) General Comment Regarding Incremental Sampling Method (ISM) Sampling

The sampling plan indicates either ISM or discrete sampling may be conducted for determining the extent of contamination at these proposed sample locations. The work plan does not always clearly state when samples will be collected as an ISM or collected as a discrete sample. Please provide rational and clarification as to the sample collection method that will be used.

Perhaps it is time to revisit the Final Facility Wide Sampling and Analysis Plan for possible revisions. As noted in this 2015 SAP Addendum, the ISM sampling proposed in this work plan is not consistent with the ISM sampling protocol outlined in the 2011 Final Facility Wide Sampling and Analysis Plan for Environmental Investigations, but will follow the sampling protocol outlined in the prior consultant's, Prudent, Load Line 1-4 and 12 sampling plan. The 2011 Final Facility Wide Sampling and Analysis Plan for Environmental Investigations document notes that the plan will likely need to be amended in the future due to the evolving science on subsurface ISM sampling methods.

***Response:** Each AOC appendix includes tables with proposed sample locations and provides sample details (i.e., Table A-10). The third column indicates the sample type (discrete or ISM sample).*

*Comment acknowledged. Although the FWSAP does not include procedures for collecting subsurface ISM samples, the program precedent for the subsurface ISM*

*sample procedures was established with the approval (from all stakeholders) of the Final Work Plan for Sampling & Closure of Load Lines 1, 2, 3, 4, 12 (RVAAP- 08, 09, 10, 11, and 12) and Other Areas of Concern prepared by Prudent in 2010. This report provided sufficient rationale and justification for collecting a reduced number of aliquots (i.e., sub-samples) for subsurface ISM samples.*

3) General Comment Regarding Chemicals of Interest and Chemicals of Concern

a). The report identifies that the list of chemicals of interest (COIs) is larger than the list of chemicals of concern (COCs) in the interim record of decision (ROD) since the interim ROD contains only COCs exceeding national guard trainee Clean Up Goals (CUGs), and that COIs were developed from chemicals identified as exceeding residential risk in the Phase II Remedial Investigation (RI) (2004). Based on these facts, screening of chemicals of potential concern has already occurred; therefore, when the residential FWCUGs are used in the report they should be referred to as remedial goal objectives (RGOs) or clean up goals (CUGs) rather than screening criteria. In addition, the term screening should only be used when CUGs of one order of magnitude below the risk and hazard goal (i.e., ELCR 1E-6 and HQ -0.1), i.e., screening values, are used in the process.

**ACTION ITEM:** Revise the text throughout the document to be consistent with the proper use of screening and CUGs.

**Response:** *Agree. Terminology will be changed as requested. A few examples are below.*

- 1) *The second and fourth bullets in Section 3.2 Data Gap Analysis will be revised as follows—*
  - *Perform the data screen on a sample-by-sample basis using the current residential screening criteria Remedial Goal Objectives (RGOs) (all media). The residential RGOs are the residential FWCUGs at a target risk level of 1E-05 and a target hazard quotient of 1;*
  - *Perform a detailed evaluation of each sample location that exceeds residential RGOs and/or ecological screening criteria to determine if nature and extent is defined to complete evaluation of land uses*
- 2) *The second paragraph on Section 3.2.2.1 Human Health COIs will be revised as follows – “Upon completion of data collection activities conducted as part of this SAP Addendum, all available chemical data, including newly acquired data, will be evaluated ~~to determine chemicals of potential concern (COPCs)~~ in the RI/FS Addendum for each AOC.”*
- 3) *The last sentence in Section 4.10.2 Use of FWCUGs in the HHRA will be added as follows: “When residential FWCUGs at a target risk level of 1E-05 and target hazard index of 1 are used in the report they will be referred to as RGOs.”*

b). The plates in the appendices (A-3, B-3, C-3, and E-3) and figure D-12 identify former remediation areas (green-hashed areas) that were addressed in an interim ROD under the National Guard trainee receptor. Since the interim ROD CUGs were for the National Guard trainee, the former remediation areas may not meet residential remediation goals. Many of the former remediation areas on the plates are not bounded by discrete or ISM samples, are not identified as either meeting (grey) or exceeding (red) residential CUGS, and are not indicated as being included in the data-gap sampling (yellow); therefore, it is unclear how these former National Guard trainee CUG remediation areas will be handled going forward.

**ACTION ITEM:** Please clarify how the former National Guard trainee CUG remediation areas that appear to be unbounded will be sampled to determine extent for meeting residential remediation goals.

**Response:** *Areas where remediation has already occurred are not likely to be source areas and likely only exceed residential remediation goals. As noted in Section 3.2.4 “Concentrations only exceeding residential criteria (below NGT and Industrial/Commercial criteria) are typically not indicative of source areas and are likely attributable to residual contamination; these areas will generally be further addressed in the FS and no additional sampling will be recommended for the RI. Professional judgment will be applied to some areas only exceeding residential criteria that may be indicative of an undelineated source and additional sampling will be recommended at these locations”*

*For areas where exceedances of residential remediation goals remain unbounded, development of the remedial alternative in the FS will include final confirmation samples collected to verify the extent of contamination has been addressed.*

c). Human health and ecological COI lists provided in the appendices do not match, and should contain the same COIs. For example, in table A-4 for Load Line 1: RDX, antimony, TNT, and dieldrin are identified as human health COIs for surface water and sediment, but are omitted as ecological COIs in Table A-

5. For example, the human health sediment screening criteria for antimony is 28.2 mg/kg, and the ecological Ohio sediment reference value (SRV) is 1.8 mg/kg, but antimony is not included as an ecological COI.

**ACTION ITEM:** Revision is needed to include all appropriate ecological COIs, or provide justification as to why a particular COI is a human health COI, but not an ecological COI when the ecological screening criteria is more conservative than the human health screening criteria, as provided in the example above. Also, provide the appropriate sediment reference value(s).

**Response:** *It is possible but unlikely that the human health and ecological COIs would ever be the same because of how they were derived. The Phase II RIs completed for each of the five AOCs presented the results of human health screening evaluations that*

*identified COCs exceeding residential screening criteria. These COCs were compiled for each medium under investigation in this RI/FS Addendum and identified as COIs (Section 3.2.2.1). The Phase II RIs completed for Load Lines 1 through 4 presented the results of ecological risk evaluations that identified chemical of ecological concern (COECs) or chemicals of potential ecological concern (COPECs). These COECs and COPECs were compiled for surface water and sediment and identified as COIs (Section 3.2.2.2). As a result, there never was an expectation that the lists would be the same nor was any checking deemed necessary to explain inconsistencies between the lists. For Load Line 1, RDX, antimony, TNT, and dieldrin were not identified as COPECs in the SERA. The SRVs in Table A-5 are consistent with those used in the PBA08 RIs and are from the EOLP column of Attachment H in the Ohio EPA Ecorisk Guidance.*

Project Scope Section 3.1 indicates that surface water and sediments samples will be collected at Load Lines 1 through 4; however, the proposed sampling summary Section 3.3 shows surface water sampling will be only conducted at Load Line 3.

**ACTION ITEM:** Clarify why surface water samples will be collected only at Load Line 3 and not at Load Lines 1, 2, and 4. Section 3.2.4.3 noted that a weight of evidence (WOE) evaluation was used for screening COIs that exceed the ecological screening criteria, but the 2015 SAP Addendum is not clear what that WOE was.

**Response:**

*Text in Section 3.1 will be amended to read: “Conduct surface and subsurface soil, surface water, and sediment sampling as needed at Load Lines 1 through 4 to finalize the RI/FS Addendum for each AOC”. The WOE evaluation conducted at each AOC is identified below.*

**Load Line 1-** Sections A.5.2.1 and A.5.2.2 present both the human health and ecological surface water evaluations and WOE. Chemicals that exceed the screening criteria in surface water at the four aggregates are limited; therefore, no additional samples are recommended. The existing surface water data will be used in the Addendum RI.

**Load Line 2-** Sections B.5.2.1 and B.5.2.2 present the surface water evaluations. Chemicals did not exceed the screening criteria in surface water at the two aggregates; therefore, no additional samples are recommended.

**Load Line 4-** Sections D.5.2.1 and D.5.2.2 present the surface water evaluations. D.5.2.2 provides WOE for chemicals in each aggregate exceeding ecological screening criteria. Chemicals that exceed the screening criteria in surface water at the three aggregates are limited; therefore, no additional samples are recommended (this is summarized for surface water on page D-51; lines 38-41). The existing surface water data will be used in the Addendum RI.

**Load Line 12-** Surface water and sediment are not included in this investigation. These media were evaluated independently of soil during the PBA08 contract and are addressed in the *Phase III RI Report for Wet Sediment and Surface Water at RVAAP-12 Load Line 12*



(USACE 2012).

*Additionally, the ecological WOE is discussed in Section 3.2.3.2. To clarify, the fourth bullet in Section 3.2.4.2 will be modified as follows: “All COI concentrations that exceed the ecological screening criteria were assessed using a WOE evaluation **(discussed in Section 3.2.3.2)**. If WOE results indicate that there is not enough evidence to interpret the occurrence of the exceedance, a new sample was proposed for only those COIs that exceeded the screening criteria”*

4) Surface Water and Sediment (3.2.4.3)- first bullet item at top of page 3-10

The act of demolition or remediation can mobilize soils to allow impacted media to run off into water ways, if storm water controls are not implemented correctly. The act of demolition is not always synonymous with improving the environmental conditions to eliminate further assessment of the surface water or sediment pathway. Based on the data in the tables included in this sampling plan, surface water and sediment samples were last collected in 2000, 2001, and 2003. More recent data from surface water and sediments were not provided. It is not clear if the prior data were screened using the appropriate ecological screening values, so additional assessment of these media may be needed.

**ACTION ITEM:** Confirm the appropriate screening value was used when the COIs were screened initially.

***Response:*** *All applicable historical data were screened against updated and appropriate screening values. Historical screening values were not used unless they were part of the updated screening hierarchy.*

5) Section 3.2.2.3 discusses potential soil leaching COIs, and section 4.9 states a RI/FS Addendum Report will include an updated SESOIL model for the soil leaching COIs identified for each AOC (LL 1, 2, 3, 4, and 12). However, the screening criteria used to identify each soil leaching COIs is not provided in the 'Human Health Screening Criteria' tables in the Appendices. The soil leaching to ground water pathway screening criteria or RGOs need to be included in the report. See previous comments for PBA08 projects that specify ground water as the primary receptor of concern for compounds leaching from soils.

**ACTION ITEM:** Model inputs and/or soil leaching screening criteria or RGOs should be provided.

***Response:*** *At the end of each Soil Leaching Evaluation Section, a table will be added that provides the soil leaching screening criteria (SSLs, Site-specific SSLs, groundwater screening criteria MCLs and/or RSLs) for the soil leaching COIs to be evaluated in the RI.*

6) Section 3.2.3.2 states those COIs with exceedances were reviewed using the following

criteria to make data gap sampling decisions. One criterion is to "eliminate non-toxic chemicals (e.g., nitrocellulose)." Section 8.5.2.3 further clarifies this criteria by stating, "North Ponds Aggregate- There were no discrete exceedances in sediment. Nitrocellulose was detected, but this explosive is essentially non-toxic."

**ACTION ITEM:** The term "non-toxic" should be justified or documented. In addition, for ecological assessment, non-toxic stressors, examples of which include nitrates, pH, and salinity, are still evaluated, if appropriate. Ensure that the ecological screening process discusses non-chemical stressors, if appropriate.

**Response:** *The following reference will be added to Section B.5.2.1: "Nitrocellulose was detected, but this explosive is essentially non-toxic because stomach impaction would occur before toxicity (USEPA 1987)." Non-toxic stressors such as nitrates are evaluated if there is historical information suggesting there could have been a non-toxic stressor release (for instance, Load Line 12 had previously been leased by a fertilizer company to make ammonium nitrate fertilizers).*

*USEPA. 1987. Health Advisory for Nitrocellulose. Office of Drinking Water. September 1987.*

7) Surface Soil Sampling (4.1.1) Incremental Sampling (4.1.1.1) How does a sampler know when to collect a discrete vs. ISM? The plan is not clear from the narrative in Section 4.0 when these sampling methods will be used. This is described in greater detail in the Appendices, but is not in concert with what is noted in Section 4. The sampling plan (Section 4) indicates that only discrete samples will be collected in LL 12, due to how sampling was conducted in previous sampling events, but the LL12 sampling appendix suggests only ISM samples will be collected.

**ACTION ITEM:** Provide clarity regarding the sampling method that should be used to obtain the media being sampled.

**Response:** *Clarification provided. Each AOC appendix includes tables with proposed sample locations and provides sample details (i.e., Table A-10). The third column indicates the sample type (discrete or ISM sample). Section 4.0 will be updated as follows to reflect that ISM and discrete samples will be collected at Load Line 12, Page 4-4, Lines 10-11.*

~~*"To maintain consistency with historical sampling procedures, discrete subsurface samples will be collected at Load Line 12. Direct-push sample collection..."*~~

8) Section 4.2 states, "Ten sediment samples will be collected as discrete samples using ten aliquots per sample. Ten separate aliquots will be collected at random locations within an area with an approximate 5-ft radius to the same depth. These 10 aliquots will be composited"

**ACTION ITEM:** It is recommended that sediment samples be completed as ISM samples after defining the appropriate sediment decision units for lotic waterbodies or ditches being addressed as surface water. In similar sediment evaluations, 100 meter stream lengths have been used. Ponds and lakes would likely require discrete sampling to define the extent of contamination in sediment and representative contaminant concentrations. The 2011 Facility-Wide Sampling and Analysis Plan for Environmental Investigations describes methods to follow for collecting dry or wet sediments. It is not clear why other sampling methods are proposed in this plan. Revise the sampling plans as appropriate.

Please clarify where and how the sediment samples will be collected. The depth of these sediment samples needs clarification.

**Response:** *Clarification. The method provided in the Draft Work Plan to collect sediment samples was previously specified by Ohio EPA during the development of the PBA08 Work Plan.*

*As requested in this comment, the Work Plan will be revised so that 1) stream samples will be collected as ISM samples at roughly 100 meters in length per sample (contingent upon overall length of decision unit); and 2) sediment in ponds and lakes will be collected as discrete samples. The sediment samples will be collected from 0-1 ft bgs and analyzed for the specific analytes presented in each site's "Proposed Sediment Sampling Locations" table (e.g., Table A-15 for Load Line 1). The results of the sample analyses will be evaluated individually against the screening criteria for the specified analytes.*

*The text and figures will be revised accordingly.*

9) Section 4.10 states an updated HHRA will be submitted, and that the HHRA will be used to identify COCs and locations recommended for evaluation in an FS. Given that a remedy and interim ROD were previously completed for these five AOCs, the AOCs could go directly into Feasibility Studies, if the prior Phase II data are reliable, or after the data-gap analysis samples are collected. This would basically consist of the values from the decision units (or applicable exposure point concentrations of appropriate areas) being compared to the appropriate CUGs (multiple chemical adjustments may be needed). Both residential and commercial CUGs should be used in the focused FS to evaluate differences (e.g., costs, volumes of material to be treated) and recommend a preferred remedial option(s). This would also be a de-facto risk assessment, because, if concentrations of COCs are above CUGs, then there would be unacceptable risk.

**ACTION ITEM:** Evaluate the option to go directly into a Feasibility Study.

**Response:** *The Army deems it necessary to complete an RI. Since new samples are proposed to determine nature and extent, the additional data should be evaluated in an RI. The RI will include a re-analysis of the data for different receptors than done previously. In*

*addition, the Revised Risk Assessment/Land Use Tech Memo has requirements for the evaluation of three Land Uses in the RI/FS. Following the Tech Memo and the fact we are determining N&E for various Land Uses precludes the ability to skip the RI phase. The document to be prepared following field investigation is an Addendum RI/FS which will combine (into a single report) the summary of existing and new data with evaluation and comparison of remedial alternatives specific to land use options. The RI component of this report will be streamlined and the FS components will feature prominently.*

10) Section 4.10.1 states for ISM sampling an EU can consist of "a group of ISM samples". Reminder that, per Ohio EPA's June 2014 and November 2014 comments, while there may be some instances where adjacent and small ISM areas could be combined to make larger exposure areas or decision units, results from ISM samples should usually not be combined with either discrete or other ISM data to calculate EPCs and should be considered independent decision units. If small groups of ISM samples are combined, it should be based on site-specific information, such as the extent of contamination, the type or types of COCs, their concentrations, and spatial considerations.

**ACTION ITEM:** The work plans should specify and explain the rationale behind the proposed decision units and EUs, and be approved prior to sampling.

**Response:** *Agree. As noted by the commenter, if small groups of ISM samples are combined it should be based on site-specific information such as the extent of contamination. Therefore, the decision to combine ISM data cannot be made until after sample results are reviewed to determine extent of contamination in the Addendum RI/FS. In general, each ISM sample will be evaluated as a separate exposure unit. The following text will be added to Section 4.10.1: "In most cases, where ISM samples are available, each ISM sample will be evaluated as a separate EU".*

11) Will the exposure point concentration (EPC) be a maximum detection or a 95% UCL? This is not identified in section 4.10.1 of the document. Per U.S. EPA, EPCs are to be the 95% UCL of the mean.

**ACTION ITEM:** Please clarify.

**Response:** *Agree. If enough discrete data are available for an EU, the EPC will be the 95% UCL of the mean. However, it is anticipated that most EUs will be defined by a single ISM sample. In all cases U.S. EPA guidance regarding use of minimum number of samples and calculation of 95% UCL using ProUCL will be followed.*

12) The appendices contain a number of discrete and ISM samples that "don't warrant additional investigation" or "do not require additional delineation to determine extent" and are not bound by other discrete or ISM samples. For example, at LL 1, Plate A-3 inset CB-4 and CA-6, discrete sample LL1-024 and ISM LL1ss-609. The report does not identify what will be done with these samples. It is assumed this data will be carried

forward in the process, but it is not clear how extent is resolved. Another example, LL 2 sample LL2ss-100-0778 contains the maximum concentration of lead for this AOC, but it is not clear if the data point has been fully bound by data that is below the resident screening criteria. Metals are not included in the additional sampling proposed for this AOC. No additional samples are proposed in the area of this sample.

**ACTION ITEM:** Please clarify how these kinds of areas will be addressed.

***Response:*** The examples noted were evaluated per the decision rules identified in Section 3.2.4. Section 3.2.4.1 and 3.2.4.2 will be amended to clarify how exceedances will be carried through the RI/FS process. This will include risk assessment and WOE evaluation. Samples that do not appear to be bound likely only occur for residential remediation goals and may be further evaluated in the FS as locations warranting removal under the residential land use alternative.

- LL1-024 – the arsenic concentration (18.6 mg/kg) is above the surface soil background screening value of 15.4 mg/kg but is considered to be naturally occurring because it is less than the subsurface background screening value of 19.8 mg/kg and less than other naturally occurring arsenic levels for this area. This will likely be addressed in the WOE section of the RI. Description of the exceedance at LL1-024 will be added to Section A.4.2.2.
- LL1ss-609 – the concentrations of these COIs, benzo(a)pyrene and PCB-1254 (0.24 mg/kg and 4.9 mg/kg), are very close to their Residential FWCUGs (0.221 mg/kg and 1.2 mg/kg) and below their Industrial RSLs (2.9 mg/kg and 10 mg/kg). If remediation is required in this area, development of the remedial alternative in the FS will include final confirmation samples collected to verify the extent of contamination has been addressed. LL1ss-609 is discussed in detail in Section A.4.2.1.
- LL2ss-100 – although lead at this discrete sample location exceeds the residential screening criteria, this sample has numerous ISM samples that overlap and replace the sample (including ISM sample LL2ss-300M); all with no exceedances. Discrete sample data that is replaced with an ISM will not be carried through to the RI/FS. LL2ss-100 is discussed in detail in Section B.4.2.9.
- As noted in Section 3.2.4 of the SAP Addendum, “Concentrations only exceeding residential criteria (below NGT and Industrial/Commercial screening criteria) are typically not indicative of source areas and are likely attributable to residual contamination; these areas will generally be further addressed in the FS and no additional sampling will be recommended for the RI.” These areas under the residential land use scenarios will be evaluated in an FS where pre-delineation sampling may be required or confirmation samples will be a part of the alternative to verify attainment of remediation goals.

13) Field Quality Control Sampling Procedures. Page 4-5, Lines 25-43 (FSP): Please note that per conference call on May 7, 2015, between the NGB and Ohio EPA, it was agreed upon that from this point forward that the primary sample results will be reported as long as the field duplicate data do not exceed the acceptance criteria of 30% relative percent difference. When the field duplicate result exceeds this criterion, the data shall be evaluated to determine the source of the difference. This usually would



result in resampling that particular sampling location. In lieu of resampling, the conservative approach may be used, which would be to report the highest concentration of that particular analyte (from the field duplicate). In addition, all duplicate sample data should be included in tables and figures as part of typical summary reporting information.

**ACTION ITEM:** Include as warranted.

**Response:** *This work plan was submitted January 30, 2015 before the May 7, 2015 decision was made to change the screening approach. The data screens in the work plan will remain unchanged with regards to the use of duplicate samples. However, new data collected will be evaluated under the May 7, 2015 decision.*

14) Section B.5.2.1 states one sample will be collected from the middle of Kelly's pond.

**ACTION ITEM:** Samples should also be collected at inlet from LL 2, to assess if run-off occurred since the remedial actions were completed.

**Response:** *Agree. A sediment sample at the inlet from LL2 will be added to the proposed sampling approach for Load Line 2 to determine if current concentrations present ongoing concern.*

15) Table B-16: 2,4-DNT should be marked as a 'Soil to Groundwater CMCOPC', based on the text in section B-6, line 19.

**ACTION ITEM:** Please change or provide clarification

**Response:** *Agree. 2,4-DNT will be revised to be marked as a 'Soil to Groundwater CMCOPC'.*

16) Section D.5.2.2 states manganese was screened out from the upstream segment of the waterway, because the average concentrations in the downstream segments of the waterway were below background values. However, the source of the exceedances in the upstream segment has not been identified, and the upstream segment will not be evaluated in another AOC's report.

**ACTION ITEM:** Unless the detections of manganese in the upstream segment are below a background value or ESL, the upstream segment should not be eliminated from further discussions. In addition, maximum site concentrations are to be used in the background screening. For additional details, see:

- <http://www.epa.gov/ate/oh.us/portals/30/rules/Use%20of%20Background%20for%20RR%20Sites.pdf>.

**Response:** *Maximum site concentrations were used in the background screening. In the Weight-of-Evidence evaluation to determine if additional sampling was required, average concentration also were used. While further sampling is not proposed for manganese, a Level I Scoping ERA will be conducted for Load Line 4. A Level I Scoping ERA will evaluate whether the AOC had past releases, the potential for current contamination, and if there are important ecological resources in or near the AOC. If an AOC has*

*contaminants but lacks important ecological resources, the ERA process will stop at Level I. Contamination and important ecological resources must both be present to proceed to a Level II Screening ERA.*

17) The Ohio EPA ecological SRVs for iron (LL1 Table A-5) and manganese (LL1, Table A-5 and LL4, Table D-5), or site-specific background values, should be used instead of marking the sediment screening level as "NA".

**ACTION ITEM:** Please change or provide clarification.

**Response:** *As defined in the footnotes, "NA = Not applicable because the analyte was not a chemical of interest for that medium." As a result, SRVs or site-specific background values are not required for iron and manganese in Tables A-5 and D-5.*

18) In the data tables for surface water, a number of the ecological screening criteria for surface water is marked as "NA" when an Outside the Mixing Zone Average (OMZA) value exists; the OMZA should be used. The 2008 Ohio EPA Guidance for Conducting Ecological Risk Assessment (Page 3-6) states that the surface water chemical concentrations are to be compared to the chemical criteria pursuant to OAC 3745-1. The outside mixing zone average criteria for human health and aquatic life should be compared against ambient samples averaged over a 30-day period. It is not clear if the data used to calculate the average were collected within a window of 30 days. Single ambient samples are not to exceed the OMZM.

**ACTION ITEM:** If COIs were screened out from further evaluation, because it was compared to the OMZM or removed because there was no calculated OMZA value available on Ohio EPA, Division Of Surface Water's water quality standards table, further assessment of the COI may be warranted for ecological risk. Chemical concentrations are to be compared to the chemical criteria pursuant to OAC 3745-1.

**Response:** *Average surface water concentrations were based on multiple samples from different locations. Multiple surface water samples collected within a window of 30 days from the same location are not available. Thus, all detected COI concentrations from individual sample locations were screened against the OMZM unless only an OMZA was available.*

19) Surface Water and sediment in load line 12 AOC are being assessed in the PBA08. It would seem that a complete Conceptual Site Model (CSM) of the dynamics of this AOC may not be available until the PBA08 study has been completed.

**ACTION ITEM:** Additional assessment of this area may be needed at a later date.

**Response:** *Comment acknowledged.*

20) The "Proposed Sampling Locations" Tables in the appendices list the "Number of

Proposed Subsurface ISM Sub-borings". It is unclear if these borings are the number of samples to be collected to comprise the ISM sample, or the number of ISM samples. For a single ISM sample, generally about 30 sub-samples should be taken to comprise the ISM sample.

**ACTION ITEM:** Clarify the number of aliquots to be collected for each ISM sample

**Response:** *Sub-borings are the number of samples to be collected to comprise the ISM sample (i.e., aliquots). As noted in response to Comment 2, subsurface ISM sample procedures were established with the approval (from all stakeholders) of the Final Work Plan for Sampling & Closure of Load Lines 1, 2, 3, 4, 12 (RVAAP- 08, 09, 10, 11, and 12) and Other Areas of Concern prepared by Prudent in 2010. The number of Proposed Subsurface ISM Sub-borings (or aliquots) is based on the total square footage of the subsurface ISM and is consistent with the approach developed in Prudent's report as detailed in Section 4.1.2.1 of this SAP Addendum.*



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

August 3, 2015

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  
267000859207**

**Subject: Ravenna Army Ammunition Plant, Portage/Trumbull Counties.  
Approval of the Final Interim Removal Action Work Plan for  
Historical Well Abandonment Activities, Dated July 21, 2015, Ohio  
EPA ID # 267-000859-207**

Dear Mr. Leeper:

The Ohio Environmental Protection Agency (Ohio EPA) has received the "Final Interim Removal Action Work Plan for Historical Well Abandonment Activities" 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 July 22, 2015. The report was prepared for the US Army Corps of Engineers (USACE) Louisville District by Plexus Scientific Corporation, under Contract Number W912QR-12-D-0010.

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

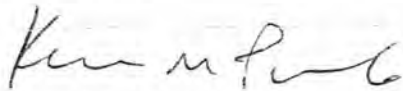
Pursuant to the CERCLA process, the property owner usually can anticipate the expected land uses to assist in ensuring that the investigation addresses all receptors for both current and future land uses. Be advised that due to land use uncertainty, Ohio EPA may require additional work in the future to address data gaps. As mentioned

MR. MARK LEEPER  
ARMY NATIONAL GUARD DIRECTORATE  
AUGUST 3, 2015  
PAGE 2

previously, it is incumbent upon the Army to finalize land use at Camp Ravenna as soon as possible, otherwise additional work and schedule slippage may result.

Please include Ohio EPA's unique project number (267-000859-207) that can be found in the subject line of this letter with all return communications regarding this activity. 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: Katie Tait, OHARNG RTLS  
Kevin Sedlak, ARNG  
Gregory F. Moore, USACE  
Rebecca Haney/Gail Harris, VISTA Sciences Corp.

ec: Bob Princic, Ohio EPA NEDO DERR  
Rodney Beals, Ohio EPA NEDO DERR  
Justin Burke, Ohio EPA, CO DERR





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

July 2, 2015

Mr. Mark Leeper, P.G., MBA  
Restoration/Cleanup Program Manager  
ARNG Directorate  
111 S. George Mason Dr.  
Arlington, VA 22204

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

**Subject:** Comment on the "Draft PBA 13 Remedial Investigation Sample and Analysis Plan Addendum for Load Lines 1, 2, 3, 4 and 12" for the Former Ravenna Army Ammunition Plant (RVAAP)" Document, Dated January 30, 2015 (Work Activity No. 267-000859-030)

Dear Mr. Leeper:

The Ohio Environmental Protection Agency (Ohio EPA) received the draft PBA 13 Remedial Investigation Sample and Analysis Plan (SAP) Addendum for Load Lines 1, 2, 3, 4, and 12. Each of the Load Line AOCs has undergone several investigations and remedial action decisions to characterize the nature and extent of contamination, as well as evaluate human and ecological health risks. Previous remediation activities focused only on the National Guard Trainee receptor. Additional evaluation of data gaps for the unrestricted land use and possible sampling is proposed by this SAP Addendum.

The Final Technical Memorandum: Land Uses and Revised Risk Assessment Process for the RVAAP Installation Restoration Program, or Technical Memorandum, states if an AOC fails to meet the Unrestricted Land Use, then a Feasibility Study (FS) will be completed to evaluate cleanup options for all three land uses noted in the Technical Memorandum.

Below are both general and specific comments regarding the SAP Addendum:

1) General Comment Regarding Determining Decision Units within AOCs

Please ensure that an iterative sampling approach is used to determine the extent of contamination. The boundaries of a decision unit may expand or contract depending upon sample results. We assume the decision units will be determined with Ohio EPA input.

2) General Comment Regarding Incremental Sampling Method (ISM) Sampling

The sampling plan indicates either ISM or discrete sampling may be conducted for determining the extent of contamination at these proposed sample locations. The work plan does not always clearly state when samples will be collected as an ISM or collected as a discrete sample. Please provide rational and clarification as to the sample collection method that will be used.

Perhaps it is time to revisit the Final Facility Wide Sampling and Analysis Plan for possible revisions. As noted in this 2015 SAP Addendum, the ISM sampling proposed in this work plan is not consistent with the ISM sampling protocol outlined in the 2011 Final Facility Wide Sampling and Analysis Plan for Environmental Investigations, but will follow the sampling protocol outlined in the prior consultant's, Prudent, Load Line 1-4 and 12 sampling plan. The 2011 Final Facility Wide Sampling and Analysis Plan for Environmental Investigations document notes that the plan will likely need to be amended in the future due to the evolving science on subsurface ISM sampling methods.

3) General Comment Regarding Chemicals of Interest and Chemicals of Concern

a). The report identifies that the list of chemicals of interest (COIs) is larger than the list of chemicals of concern (COCs) in the interim record of decision (ROD) since the interim ROD contains only COCs exceeding national guard trainee Clean Up Goals (CUGs), and that COIs were developed from chemicals identified as exceeding residential risk in the Phase II Remedial Investigation (RI) (2004). Based on these facts, screening of chemicals of potential concern has already occurred; therefore, when the residential FWCUGs are used in the report they should be referred to as remedial goal objectives (RGOs) or clean up goals (CUGs) rather than screening criteria. In addition, the term screening should only be used when CUGs of one order of magnitude below the risk and hazard goal (*i.e.*, ELCR 1E-6 and HQ -0.1), *i.e.*, screening values, are used in the process.

**ACTION ITEM:** Revise the text throughout the document to be consistent with the proper use of screening and CUGs.

- b). The plates in the appendices (A-3, B-3, C-3, and E-3) and figure D-12 identify former remediation areas (green-hashed areas) that were addressed in an interim ROD under the National Guard trainee receptor. Since the interim ROD CUGs were for the National Guard trainee, the former remediation areas may not meet residential remediation goals. Many of the former remediation areas on the plates are not bounded by discrete or ISM samples, are not identified as either meeting (grey) or exceeding (red) residential CUGs, and are not indicated as being included in the data-gap sampling (yellow); therefore, it is unclear how these former National Guard trainee CUG remediation areas will be handled going forward.

**ACTION ITEM:** Please clarify how the former National Guard trainee CUG remediation areas that appear to be unbounded will be sampled to determine extent for meeting residential remediation goals.

- c). Human health and ecological COI lists provided in the appendices do not match, and should contain the same COIs. For example, in table A-4 for Load Line 1: RDX, antimony, TNT, and dieldrin are identified as human health COIs for surface water and sediment, but are omitted as ecological COIs in Table A-5. For example, the human health sediment screening criteria for antimony is 28.2 mg/kg, and the ecological Ohio sediment reference value (SRV) is 1.8 mg/kg, but antimony is not included as an ecological COI.

**ACTION ITEM:** Revision is needed to include all appropriate ecological COIs, or provide justification as to why a particular COI is a human health COI, but not an ecological COI when the ecological screening criteria is more conservative than the human health screening criteria, as provided in the example above. Also, provide the appropriate sediment reference value(s).

Project Scope Section 3.1 indicates that surface water and sediments samples will be collected at Load Lines 1 through 4; however, the proposed sampling summary Section 3.3 shows surface water sampling will be only conducted at Load Line 3.

**ACTION ITEM:** Clarify why surface water samples will be collected only at Load Line 3 and not at Load Lines 1, 2, and 4. Section 3.2.4.3 noted that a weight of evidence (WOE) evaluation was used for screening COIs that exceed



the ecological screening criteria, but the 2015 SAP Addendum is not clear what that WOE was.

4) Surface Water and Sediment (3.2.4.3) - first bullet item at top of page 3-10

The act of demolition or remediation can mobilize soils to allow impacted media to run off into water ways, if storm water controls are not implemented correctly. The act of demolition is not always synonymous with improving the environmental conditions to eliminate further assessment of the surface water or sediment pathway. Based on the data in the tables included in this sampling plan, surface water and sediment samples were last collected in 2000, 2001, and 2003. More recent data from surface water and sediments were not provided. It is not clear if the prior data were screened using the appropriate ecological screening values, so additional assessment of these media may be needed.

**ACTION ITEM:** Confirm the appropriate screening value was used when the COIs were screened initially.

5) Section 3.2.2.3 discusses potential soil leaching COIs, and section 4.9 states a RI/FS Addendum Report will include an updated SESOIL model for the soil leaching COIs identified for each AOC (LL 1, 2, 3, 4, and 12). However, the screening criteria used to identify each soil leaching COIs is not provided in the 'Human Health Screening Criteria' tables in the Appendices. The soil leaching to ground water pathway screening criteria or RGOs need to be included in the report. See previous comments for PBA08 projects that specify ground water as the primary receptor of concern for compounds leaching from soils.

**ACTION ITEM:** Model inputs and/or soil leaching screening criteria or RGOs should be provided.

6) Section 3.2.3.2 states those COIs with exceedances were reviewed using the following criteria to make data gap sampling decisions. One criterion is to "eliminate non-toxic chemicals (e.g., nitrocellulose)." Section B.5.2.3 further clarifies this criteria by stating, "North Ponds Aggregate – There were no discrete exceedances in sediment. Nitrocellulose was detected, but this explosive is essentially non-toxic."

**ACTION ITEM:** The term "non-toxic" should be justified or documented. In addition, for ecological assessment, non-toxic stressors, examples of which include

nitrites, pH, and salinity, are still evaluated, if appropriate. Ensure that the ecological screening process discusses non-chemical stressors, if appropriate.

- 7) Surface Soil Sampling (4.1.1) Incremental Sampling (4.1.1.1) How does a sampler know when to collect a discrete vs. ISM? The plan is not clear from the narrative in Section 4.0 when these sampling methods will be used. This is described in greater detail in the Appendices, but is not in concert with what is noted in Section 4. The sampling plan (Section 4) indicates that only discrete samples will be collected in LL 12, due to how sampling was conducted in previous sampling events, but the LL12 sampling appendix suggests only ISM samples will be collected.

**ACTION ITEM:** Provide clarity regarding the sampling method that should be used to obtain the media being sampled.

- 8) Section 4.2 states, "Ten sediment samples will be collected as discrete samples using ten aliquots per sample. Ten separate aliquots will be collected at random locations within an area with an approximate 5-ft radius to the same depth. These 10 aliquots will be composited"

**ACTION ITEM:** It is recommended that sediment samples be completed as ISM samples after defining the appropriate sediment decision units for lotic waterbodies or ditches being addressed as surface water. In similar sediment evaluations, 100 meter stream lengths have been used. Ponds and lakes would likely require discrete sampling to define the extent of contamination in sediment and representative contaminant concentrations. The 2011 Facility-Wide Sampling and Analysis Plan for Environmental Investigations describes methods to follow for collecting dry or wet sediments. It is not clear why other sampling methods are proposed in this plan. Revise the sampling plans as appropriate.

Please clarify where and how the sediment samples will be collected. The depth of these sediment samples needs clarification.

- 9) Section 4.10 states an updated HHRA will be submitted, and that the HHRA will be used to identify COCs and locations recommended for evaluation in an FS. Given that a remedy and interim ROD were previously completed for these five AOCs, the AOCs could go directly into Feasibility Studies, if the prior Phase II data are reliable, or after the data-gap analysis samples are collected. This would basically



consist of the values from the decision units (or applicable exposure point concentrations of appropriate areas) being compared to the appropriate CUGs (multiple chemical adjustments may be needed). Both residential and commercial CUGs should be used in the focused FS to evaluate differences (e.g., costs, volumes of material to be treated) and recommend a preferred remedial option(s). This would also be a de-facto risk assessment, because, if concentrations of COCs are above CUGs, then there would be unacceptable risk.

**ACTION ITEM:** Evaluate the option to go directly into a Feasibility Study.

- 10) Section 4.10.1 states for ISM sampling an EU can consist of "a group of ISM samples". Reminder that, per Ohio EPA's June 2014 and November 2014 comments, while there may be some instances where adjacent and small ISM areas could be combined to make larger exposure areas or decision units, results from ISM samples should usually not be combined with either discrete or other ISM data to calculate EPCs and should be considered independent decision units. If small groups of ISM samples are combined, it should be based on site-specific information, such as the extent of contamination, the type or types of COCs, their concentrations, and spatial considerations.

**ACTION ITEM:** The work plans should specify and explain the rationale behind the proposed decision units and EUs, and be approved prior to sampling.

- 11) Will the exposure point concentration (EPC) be a maximum detection or a 95% UCL? This is not identified in section 4.10.1 of the document. Per U.S. EPA, EPCs are to be the 95% UCL of the mean.

**ACTION ITEM:** Please clarify.

- 12) The appendices contain a number of discrete and ISM samples that "don't warrant additional investigation" or "do not require additional delineation to determine extent" and are not bound by other discrete or ISM samples. For example, at LL 1, Plate A-3 inset CB-4 and CA-6, discrete sample LL1-024 and ISM LL1ss-609. The report does not identify what will be done with these samples. It is assumed this data will be carried forward in the process, but it is not clear how extent is resolved. Another example, LL 2 sample LL2ss-100-0778 contains the maximum concentration of lead for this AOC, but it is not clear if the data point has been fully bound by data that is below the resident screening criteria. Metals are not

included in the additional sampling proposed for this AOC. No additional samples are proposed in the area of this sample.

**ACTION ITEM:** Please clarify how these kinds of areas will be addressed.

- 13) Field Quality Control Sampling Procedures. Page 4-5, Lines 25-43 (FSP): Please note that per conference call on May 7, 2015, between the NGB and Ohio EPA, it was agreed upon that from this point forward that the primary sample results will be reported as long as the field duplicate data do not exceed the acceptance criteria of 30% relative percent difference. When the field duplicate result exceeds this criterion, the data shall be evaluated to determine the source of the difference. This usually would result in resampling that particular sampling location. In lieu of resampling, the conservative approach may be used, which would be to report the highest concentration of that particular analyte (from the field duplicate). In addition, all duplicate sample data should be included in tables and figures as part of typical summary reporting information.

**ACTION ITEM:** Include as warranted.

- 14) Section B.5.2.1 states one sample will be collected from the middle of Kelly's pond.

**ACTION ITEM:** Samples should also be collected at inlet from LL 2, to assess if run-off occurred since the remedial actions were completed.

- 15) Table B-16: 2,4-DNT should be marked as a 'Soil to Groundwater CMCOPC', based on the text in section B-6, line 19.

**ACTION ITEM:** Please change or provide clarification

- 16) Section D.5.2.2 states manganese was screened out from the upstream segment of the waterway, because the average concentrations in the downstream segments of the waterway were below background values. However, the source of the exceedances in the upstream segment has not been identified, and the upstream segment will not be evaluated in another AOC's report.

**ACTION ITEM:** Unless the detections of manganese in the upstream segment are below a background value or ESL, the upstream segment should not be eliminated

from further discussions. In addition, maximum site concentrations are to be used in the background screening. For additional details, see:

- <http://www.epa.state.oh.us/portals/30/rules/Use%20of%20Background%20for%20RR%20Sites.pdf>.

- 17). The Ohio EPA ecological SRVs for iron (LL1 Table A-5) and manganese (LL1, Table A-5 and LL4, Table D-5), or site-specific background values, should be used instead of marking the sediment screening level as "NA".

**ACTION ITEM:** Please change or provide clarification.

- 18). In the data tables for surface water, a number of the ecological screening criteria for surface water is marked as "NA" when an Outside the Mixing Zone Average (OMZA) value exists; the OMZA should be used. The 2008 Ohio EPA Guidance for Conducting Ecological Risk Assessment (Page 3-6) states that the surface water chemical concentrations are to be compared to the chemical criteria pursuant to OAC 3745-1. The outside mixing zone average criteria for human health and aquatic life should be compared against ambient samples averaged over a 30-day period. It is not clear if the data used to calculate the average were collected within a window of 30 days. Single ambient samples are not to exceed the OMZM.

**ACTION ITEM:** If COIs were screened out from further evaluation, because it was compared to the OMZM or removed because there was no calculated OMZA value available on Ohio EPA, Division Of Surface Water's water quality standards table, further assessment of the COI may be warranted for ecological risk. Chemical concentrations are to be compared to the chemical criteria pursuant to OAC 3745-1.

- 19) Surface Water and sediment in load line 12 AOC are being assessed in the PBA08. It would seem that a complete Conceptual Site Model (CSM) of the dynamics of this AOC may not be available until the PBA08 study has been completed.

**ACTION ITEM:** Additional assessment of this area may be needed at a later date.

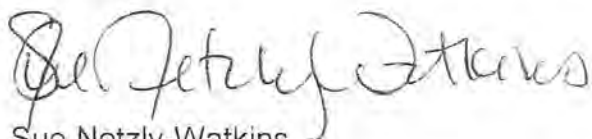
- 20) The "Proposed Sampling Locations" Tables in the appendices list the "Number of Proposed Subsurface ISM Sub-borings". It is unclear if these borings are the

number of samples to be collected to comprise the ISM sample, or the number of ISM samples. For a single ISM sample, generally about 30 sub-samples should be taken to comprise the ISM sample.

**ACTION ITEM:** Clarify the number of aliquots to be collected for each ISM sample.

If you have questions or need clarification regarding the comments, please feel free to contact me at (330) 963-1201 or e-mail at [susan.netzly-watkins@epa.ohio.gov](mailto:susan.netzly-watkins@epa.ohio.gov).

Sincerely,



Sue Netzly-Watkins  
Site Coordinator  
Division of Environmental Response and Revitalization

SN-W/nvr

cc: Kevin Sedlak, ARNG-ILE, Camp Ravenna  
Katie Tait, OHARNG, Camp Ravenna  
Quyet La, USACE Louisville  
Nat Peters, USACE Louisville  
Gail Harris, Vista Sciences Corp  
Gregory F. Moore, USACE, Louisville District  
Vasudha Peterson, Leidos

ec: Rod Beals, Ohio EPA, NEDO, DERR  
Justin Burke, Ohio EPA, CO-DERR  
Brian Tucker, Ohio EPA, CO-DERR  
Carrie Rasik, Ohio EPA, CO-DERR





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

June 25, 2015

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  
267000859207

**Subject:** Ravenna Army Ammunition Plant, Portage/Trumbull Counties.  
Approval with Modifications for the Response to Ohio EPA  
Comments on the Draft Work Plan for Interim Removal Action  
Historical Well Abandonment Activities Former Ravenna Army  
Ammunition Plant, Ravenna, Ohio, Dated May 6, 2015, Ohio EPA ID #  
267-000859-207

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 response to our comments on the document entitled: "Draft Interim Removal Action Work Plan (IRAWP) for Historical Well Abandonment Activities," Former Ravenna Army Plant Portage and Trumbull Counties, Ohio. The response to comments was received at Ohio EPA, NEDO on May 7, 2015. The document was prepared for the U.S. Army Corps of Engineers (USACE), Louisville District, by Plexus Scientific Corporation, under contract number W912QR-12-D-0010.

The response to Ohio EPA comments was based on 10 comments included in a letter to the National Guard Bureau, dated April 2, 2015. Based on our review, we found the responses to be satisfactory. We do want to make you are aware of an update that occurred recently. As stated on page 3-4, Section 3.4, "Plexus will conduct all well abandonment activities in accordance with the State of Ohio Technical Guidance for Sealing Unused Wells (ODNR, 1996) (Appendix A)." This guidance was updated March, 2015 and Ohio EPA expects the abandonment activities will follow this update: <http://epa.ohio.gov/portals/28/documents/gwqcp/wellsealguid.pdf>. The "Draft Interim Removal Action Work Plan for Historical Well Abandonment Activities" should be finalized based on this updated guidance.

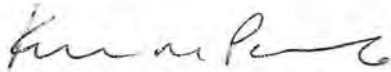


MR. MARK LEEPER  
RAVENNA ARMY AMMUNITION PLANT  
JUNE 25, 2015  
PAGE 2

Pursuant to the CERCLA process, the property owner usually can anticipate the expected land uses to assist in ensuring that the investigation addresses all receptors for both current and future land uses. Be advised that due to land use uncertainty, Ohio EPA may require additional work in the future to address data gaps. It is incumbent upon the Army to finalize land use at camp Ravenna as soon as possible, otherwise additional work and schedule slippage may result.

If you have any questions concerning this correspondence, or wish to request a meeting to discuss, please do not hesitate to contact me at (330) 963-1292.

Sincerely,



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

KMP/nvr

cc: Katie Tait, OHARNG RTLS  
Kevin Sedlak, ARNG  
Gregory F. Moore, USACE  
Rebecca Haney/Gail Harris, VISTA Sciences Corp.

ec: Bob Princic, Ohio EPA NEDO DERR  
Rodney Beals, Ohio EPA NEDO DERR  
Justin Burke, Ohio EPA, CO DERR



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

June 11, 2015

**Re: US Army Ravenna Ammunition Plt RVAAP  
Remediation Response  
Remedial Response  
Project Records  
Portage County  
267000859224**

Mr. Mark Leeper, P.G., MBA  
Army National Guard Directorate  
Environmental Programs Division  
ARNG-ILE-CR  
111 South George Mason Drive  
Arlington, VA 22204

**Subject: Approval to the Submittal of the "Summary of the Findings of the Historical Review and Risk Evaluation of the Storage Magazines and Appended Information Paper for the Former Ravenna Army Ammunition Plant (RVAAP)" Document, Dated January 28, 2015 (Work Activity No. 267-000859-224)**

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, "Summary of the Findings of the Historical Review and Risk Evaluation of the Storage Magazines and Appended Information Paper for the former Ravenna Army Ammunition Plant (RVAAP)," dated January 28, 2015. Based on the weight of evidence demonstration included in the January 2015 document, Ohio EPA concurs with the decision that no further action is necessary at this time for the Storage Magazines ("igloos"). However, if the results of the facility-wide surface water or ground water investigations indicate that the igloos may be a potential source of contamination, Ohio EPA reserves the right to request additional investigation of the igloo areas.

### **Background**

Ohio EPA requested the United States Army Corps of Engineers (USACE) collect historical information and sampling data to determine how the igloos were managed and determine if there were releases from this area that would require assessment of this area as an Area of Concern (AOC).

## Discussion

The January 2015 report provided a comprehensive discussion of the historical uses of the igloos. The January 2015 report also provided a discussion of the housekeeping activities and the 2011 data collection activities conducted in this area.

The USACE applied a "weight of evidence approach" in the analysis of this information, which is summarized below. (See page 22 of the January 2015 report for the full evaluation.)

USACE conducted a targeted sampling effort to screen specific igloos for potential releases and for potential reuse, and a review of the historical records regarding the use of the igloos. The January 2015 report concluded that soils were reported to contain no explosives/propellants, polychlorinated biphenols, pesticides, or volatile organic compounds requiring additional evaluation due to the low frequency of detections and low concentrations of detected Chemicals of Concern (COCs). Igloo Area "Group 7" appeared to have the data points that contained COCs above detection limits, as summarized below:

- A component of explosives/propellants, 2,6-dinitrotoluene, was detected above the screening Facility-Wide Clean-up Goals (FWCUGs) criteria of  $1 \times 10^{-6}$  and Hazard Index of 0.1 at igloo area "Group 7" in soil and sediment (dry sediment).
- Arsenic was also detected as the only metal in soil exceeding the FWCUGs  $1.0 \times 10^{-6}$  screening criteria. The concentration was 31.2 mg/kg in a soil sample from Group 7, Igloo HB-312. The background concentration for arsenic at RVAAP is 15.4 mg/kg for surface soil and 19.8 mg/kg for subsurface soil.
- Benzo(a)pyrene was the only semi-volatile organic compound identified in surface soil in any of the igloos sampled. The author of the report attributed the detection of benzo(a)pyrene to the proximity of the sampling location to railroad traffic on the nearby railroad track. The sample concentration that exceeded the FWCUGs screening criteria was 5.4 mg/kg and was found in Group 7 Igloo HA-306. This igloo was serviced by railroad.

Ohio EPA also reviewed data on Ravenna Army Ammunition Plant's Environmental Information Management System (REIMS). REIMS data documented detections of 2,6-dinitrotoluene in the sediments of waterways located down gradient of the igloos. Sediment data was not discussed in the January 2015 report. Because of the proximity of these water ways to the igloos and no other AOCs identified to date, these detections suggest possible release(s) of this COC in the past.

MR. MARK LEEPER  
ARMY NATIONAL GUARD DIRECTORATE  
JUNE 11, 2015  
PAGE 3

## Conclusion

Based on our review of the January 2015 "Summary of the Findings of the Historical Review and Risk Evaluation of the Storage Magazines and Appended Information Paper for the former Ravenna Army Ammunition Plant (RVAAP)", Ohio EPA concurs with the decision that no further action is necessary at this time for the igloos. However, if the results of the surface water or ground water investigations indicate that the igloos may be a potential source of contamination, Ohio EPA reserves the right to request additional investigation of the igloo areas.

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: Gregory F. Moore, USACE, Louisville District  
Katie Tait/Kevin Sedlak, Camp Ravenna Environmental Office, Newton Falls  
Haney/Harris, Camp Ravenna Environmental Office, Vista Sciences, Newton Falls

ec: Rod Beals, Ohio EPA, NEDO, DERR  
Bob Princic, Ohio EPA, NEDO, DERR  
Sue Netzly-Watkins, Ohio EPA, NEDO, DERR  
Justin Burke, Ohio EPA, CO, DERR  
Andrew Kocher, Ohio EPA, NEDO, DERR





**NATIONAL GUARD BUREAU**

111 SOUTH GEORGE MASON DRIVE  
ARLINGTON VA 22204-1373

May 6, 2015

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

Subject: Ravenna Army Ammunition Plant Restoration Program  
Response to Comments  
Draft Interim Removal Action Work Plan for Historical Well Abandonment  
Camp Ravenna, Portage/Trumbull Counties, Ohio

Dear Mr. Kocher:

Enclosed for your review are the response to comments for the *Interim Removal Action Work Plan for Historical Well Abandonment Activities*. They have been prepared in support of the Environmental Support Services 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 Plexus Scientific Corporation under Contract No. W912QR-12-D-0010.

Please contact the undersigned at (703) 607-7955 or [Mark.S.Leeper.civ@mail.mil](mailto:Mark.S.Leeper.civ@mail.mil) if there are issues or concerns with this submission.

Sincerely,

A handwritten signature in black ink, appearing to read "Mark S. Leeper", is positioned below the "Sincerely," text.

Mark S Leeper  
RVAAP Restoration Program Manager  
Army National Guard Directorate

cc: Justin Burke, Ohio EPA, DERR (one [1] electronic copy)  
Quyet C. La, USACE – Louisville (one [1] electronic copy)  
Gail Harris, Vista Science Corp. (two [2] hard copies)  
Katie Tait and Kevin Sedlak, Camp Ravenna (one [1] hard copy)



### Comment Resolution Table

Comments prepared by: Ohio EPA (Kevin Palombo)

Comments dated: 2 April 2015

Responses prepared by: Craig Hebert

Responses dated: 6 May 2015

Cmt. No.	Page or Sheet	Comment	Response
1	1	Page 1-1, Section 1.1, sentence 1, states that " ... this IRAWP outlines the methods and procedures for the abandonment of historical water production wells located within or down gradient of known Areas of Concern (AOCs) or Munitions Response Sites (MRSSs) or within potentially impacted groundwater plumes ... " Are these wells currently impacted by site activities? It is understood that this project does not include options for sampling these historical wells, but Ohio EPA requests that a detailed log based on surface elevation, total depth, estimate of bedrock surface from historical data, and current static water level, be prepared. This data would be useful data for interpretations during facility wide ground water program activities. It would be a loss of an opportunity not use the information these wells provide.	<p>The basis for selection of wells for abandonment was based solely on potential for being within or downgradient of AOCs, MRSSs, or groundwater plume and on actual or projected current conditions at the wells. As a result, there is no definitive information regarding total impact or threat of impact at the individual wells.</p> <p>The information that Plexus has regarding the wells has been previously summarized in the 2013 <i>Final Former Water Production Wells and Oil and Gas Wells Survey at Ravenna Army Ammunition Plant and Camp Ravenna</i>. If the Ohio EPA needs a copy of this report, the report can be provided to the Ohio EPA for reference.</p> <p>Plexus will record depths to water and depths to bottom at each well prior to beginning abandonment and will provide this information in a table within the completion report.</p>
2	2	Page 1-1, Section 1.1, sentence 2, states, "The activities described ... include the process for abandonment of 25 of 44 verified production wells ... " What was the reasoning to select only 25 of 44 wells? Will the remaining 19 wells be abandoned under a different contract? The fact that they remain will continue to allow potential conduits for contaminants to reach deep parts of aquifers across the base.	The 25 wells to be abandoned are part of the scope associated with this contract. Under a new groundwater contract, 10 wells are anticipated to be abandoned. The remaining 9 wells will be abandoned through future task orders to be issued by ARNG and OHARNG due to the ineligibility under DERP.
3	2	Table 3-3. The Title of the Table does not match the Title on the Table of Contents. Please correct the discrepancy.	The title of table 3.3 has been changed to match the Table of Contents title as requested.
4	2	Table 5-1 was not included in the submittal. Please provide Table 5-1	Table 5-1 is not a part of the attached tables but was included within the text. Table 5-1 has been moved to be with the other tables to avoid future confusion.

**Comment Resolution Table**

**Comments prepared by:** Ohio EPA (Kevin Palombo)

**Comments dated:** 2 April 2015

**Responses prepared by:** Craig Hebert

**Responses dated:** 6 May 2015

5	2	<p>Page 3-4, Section 3.4, paragraph 3 states that the depth to ground water and total depth will be recorded. The abandonment of the 25 of 44 production wells identified on the property provides an opportunity to collect information that will assist in the overall facility-wide ground water evaluation. All data can be useful and should be recorded and included in the Interim Removal Action Report. If a copy of the original well log for the wells being abandoned is available, please provide a copy in the Report. Data such as the well depth, diameter, static water level, debris in the well, odors, floating hydrocarbons is all very useful to the facility wide evaluation and should be included for each well.</p>	<p>Agree. The text has been modified to read: "Plexus will compose a letter for the Army notifying the Ohio EPA prior to beginning any abandonment activities. Submittal of the letter will be coordinated with OHARNG. Additionally, prior to beginning abandonment activities at each well, depths to groundwater and depths to bottom will be measured from the top of casing (TOC) and ground surface for submittal to the ODNr in the well sealing reports. Any observations made during the abandonment process such as odor, sheen on surface of water or debris within the well, as well as the static water levels will be recorded and be included as notes within the depth to water table in the completion report. Water table elevations will also be calculated and provided in the table using the depth to water from ground surface and survey elevations provided in the 2013 Vista Sciences well survey report (Vista, 2013). These notes will also be submitted with the well sealing reports to the ODNr."</p>
6	2	<p>Page 3-5, Section 3.4.2., Paragraph 4 is unclear. The paragraph needs to clarify "casings exposed at the surface" and "buried casings were exposed". Is this paragraph discussing a time after the slurry was added? Why is bagged gravel being added to make up for lost volume instead of additional slurry?</p>	<p>Paragraph 4 has been modified as shown below in quotations. Gravel has been kept as an alternative for filling excavations to address areas where drainage may be a concern or if there is concern with leaving an excavation open long enough for the added slurry to cure before replacing overlying soil. This backfill is not intended to be used inside the well, but for excavated areas around the well where there is not enough native material to complete backfill.</p> <p>"After the slurry has reached the surface, the casing will be cut off to a depth of three feet bgs. At locations where the casings were exposed at the surface, the remaining open hole will be 12 inches or less and the</p>

### Comment Resolution Table

Comments prepared by: Ohio EPA (Kevin Palombo)

Comments dated: 2 April 2015

Responses prepared by: Craig Hebert

Responses dated: 6 May 2015

			hole will be backfilled with bentonite chips. At locations where buried casings were exposed by removing soil over and around the casing, additional cement slurry or bagged gravel pack will be emplaced at the bottom of the excavated area if it is required to make up for any lost volume. The remaining depression will be backfilled with the soil removed to expose the casing."
7	2	Page 3-5, paragraph 2, sentence 1 and page 3-8, section 3.4.4, paragraph 1, sentence 2. Please remove the period after the acronym OHARNG.	Noted. The periods following the acronym have been removed from both locations in the text as requested.
8	2	Page 3-5, Section 3.4.2, paragraph 2, sentence 4. This sentence states, "... the slurry will be allowed to settle before proceeding with the final steps of the abandonment process". A time limit was not presented in the report that defines the time the slurry will be allowed to settle. Ohio EPA wants to be assured that the slurry is allowed to settle or sufficiently "harden" enough to accept the final material, at least overnight	The text has been modified to reads: "Once the grouting process has been completed, the slurry will be allowed to settle overnight before proceeding with the final steps of the abandonment process."
9	2	Page 3-6, Section 3.4.3.1: Sections describing the handling of waste water and solid waste do not mention the size of the containers to be used for storage. Please provide this information.	The text has been modified to read: "It is anticipated that frac tanks, with capacities of up to 21,000 gallons, will be used for the storage of the generated liquid waste. Smaller containers (300 gallon totes or drums) will be used if smaller volumes of water are produced or if smaller volumes of water are determined to require segregation. Standard 55-gallon drums and/or 20 cubic yard roll-offs will be used to store the generated solid waste."
10	3	Figures 2-1 and 2-2 show the potentiometric surface maps of both unconsolidated and bedrock aquifers. These maps are noted to be from 2011. Several more recent maps have been prepared that would be more accurate, particularly the bedrock surface interpretations which have changed since 2011. It is advised that a more recent map be consulted to	This was the dataset provided to the contractor at time of contract award so these figures were the basis for selection of the wells to be abandoned. The 19 wells not selected as part of this scope of work will be abandoned under future task orders.

**Comment Resolution Table**

**Comments prepared by:** Ohio EPA (Kevin Palombo)

**Comments dated:** 2 April 2015

**Responses prepared by:** Craig Hebert

**Responses dated:** 6 May 2015

		assure or verify the wells that are chosen to be abandoned are in fact down gradient of areas of concern.	
Additional			<p>Following a March 2015 reconnaissance visit, it was recognized that it may be infeasible to access some of the wellheads with the grouting equipment. As a result, it was agreed that language would be added to the Final Work Plan to address how work at these locations will be performed to minimize disturbances.</p> <p>The following paragraphs have been modified as written below. The first paragraph is Section 3.3.4 paragraph 4 and the second one is Section 3.4.2 paragraph 2.</p> <p>New Section 3.3.4 Paragraph 4: "Plexus will attempt to bring all equipment and materials for the processes as close to the well as possible; however, in the instances where this may not be possible, due to the steepness of the terrain for example, other measures may be employed to gain access. Equipment such as all-terrain-vehicles (ATVs), skid steers, and other relevant equipment may be used to access the wellheads. At locations where grout mixing equipment is not able to access the wellhead, hoses will be used to pump the grout from the mixing location to the wellhead."</p> <p>New Section 3.4.2 paragraph 2:          "A tremie pipe will be lowered close to the bottom of the well and gradually raised as the slurry mixture is introduced into the casing. As discussed in Section 3.3.4, if the grout mixing equipment will be unable to access the wellhead the grout will be pumped to the wellhead through hoses. Any water displaced from the</p>

**Comment Resolution Table**

**Comments prepared by:** Ohio EPA (Kevin Palombo)

**Comments dated:** 2 April 2015

**Responses prepared by:** Craig Hebert

**Responses dated:** 6 May 2015

			well during the grouting process will be captured in a tank and pumped to a storage tank prior to final containerization (see Section 3.5). The well will be considered completely filled with slurry material when all of the existing water has been removed and the slurry has reached the ground surface. Once the grouting process has been completed, the slurry will be allowed to settle for at least a 24 hour period or overnight before proceeding with the final steps of the abandonment process. The well will be topped off to approximately three feet below ground surface (bgs) following any settling that occurs. Any unused slurry will be allowed to dry and will be disposed with the concrete demolition debris discussed in Section 3.4.3."
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**NATIONAL GUARD BUREAU**

111 SOUTH GEORGE MASON DRIVE  
ARLINGTON VA 22204-1373

April 22, 2015

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

Subject: Ravenna Army Ammunition Plant (RVAAP) Restoration Program  
Portage/Trumbull Counties, Army Contacts for E-Docs Submittals

Dear Mr. Beals:

In order to help facilitate the new E-Docs system being implemented and used by the Ohio EPA, the Army National Guard (ARNG) is sending this correspondence to provide direction on who E-Docs correspondence should be sent to for the RVAAP Restoration Program. Please send electronic correspondence to the following contacts:

Kathryn Tait [kathryn.s.tait.nfg@mail.mil](mailto:kathryn.s.tait.nfg@mail.mil)  
Kevin Sedlak [kevin.m.sedlak.ctr@mail.mil](mailto:kevin.m.sedlak.ctr@mail.mil)  
Mark Leeper [mark.s.leeper.civ@mail.mil](mailto:mark.s.leeper.civ@mail.mil)  
Greg Moore [gregory.f.moore@usace.army.mil](mailto:gregory.f.moore@usace.army.mil)  
Gail Harris [gail.harris@vistasciences.com](mailto:gail.harris@vistasciences.com)  
Rebecca Haney [rebecca.haney@vistasciences.com](mailto:rebecca.haney@vistasciences.com)  
Al Brillinger [allan.brillinger@vistasciences.com](mailto:allan.brillinger@vistasciences.com)

Please send one (1) hardcopy of the correspondence to the following contact:

Mark Leeper, P.G., MBA  
Army National Guard Directorate  
Environmental Programs Division  
ARNG- ILE-CR  
111 South George Mason Drive  
Arlington, VA 22204

Please contact the undersigned at (703) 607-7955 or [mark.s.leeper.civ@mail.mil](mailto:mark.s.leeper.civ@mail.mil) with any questions or concerns.

Sincerely,

A handwritten signature in black ink, appearing to read "Mark Leeper", is positioned below the "Sincerely," text.

Mark Leeper  
RVAAP Restoration Program Manager  
Army National Guard Directorate

Subject: Army Contacts for E-Docs Submittals

ec: Justin Burke, Ohio EPA, DERR-CO  
Kevin Sedlak, ARNG, Camp Ravenna  
Katie Tait, OHARNG Camp Ravenna  
Greg Moore, USACE Louisville  
Gail Harris, Vista Sciences



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

April 2, 2015

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  
267000859207

**Subject:** Ravenna Army Ammunition Plant, Portage/Trumbull Counties,  
Comments on the Draft Work Plan for Interim Removal Action Historical  
Well Abandonment Activities Former Ravenna Army Ammunition Plant,  
Ravenna, Ohio, Dated January 2015, Ohio EPA ID # 267-000859-207

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 Interim Removal Action Work Plan (IRAWP) for Historical Well Abandonment Activities" Former Ravenna Army Plant Portage and Trumbull Counties, Ohio. This document was received at Ohio EPA's Northeast District Office (NEDO) on January 30, 2015, and is dated January 2015. The document was prepared for the U.S. Army Corps of Engineers (USACE), Louisville District, by Plexus Scientific Corporation, under contract number W912QR-12-D-0010.

Ohio EPA understands that the abandonment of the wells will be conducted according to the methods described in the State of Ohio Technical Guidance for Sealing Unused Wells (ODNR, 1996). Based on the review of the Draft IRAWP, Ohio EPA has the following comments:

1. Page 1-1, Section 1.1, sentence 1, states that "...this IRAWP outlines the methods and procedures for the abandonment of historical water production wells located within or downgradient of known Areas of Concern (AOCs) or Munitions Response Sites (MRSs) or within potentially impacted groundwater plumes..." Are these wells currently impacted by site activities? It is understood that this project does not include options for sampling these historical wells, but Ohio EPA requests that a detailed log based on surface elevation, total depth, estimate of bedrock surface from historical data, and current static water level, be prepared.

This data would be useful data for interpretations during facility wide ground water program activities. It would be a loss of an opportunity not use the information these wells provide.

2. Page 1-1, Section 1.1, sentence 2, states, "The activities described...include the process for abandonment of 25 of 44 verified production wells..." What was the reasoning to select only 25 of 44 wells? Will the remaining 19 wells be abandoned under a different contract? The fact that they remain will continue to allow potential conduits for contaminants to reach deep parts of aquifers across the base.
3. Table 3-3. The Title of the Table does not match the Title on the Table of Contents. Please correct the discrepancy.
4. Table 5-1 was not included in the submittal. Please provide Table 5-1.
5. Page 3-4, Section 3.4, paragraph 3 states that the depth to ground water and total depth will be recorded. The abandonment of the 25 of 44 production wells identified on the property provides an opportunity to collect information that will assist in the overall facility-wide ground water evaluation. All data can be useful and should be recorded and included in the Interim Removal Action Report. If a copy of the original well log for the wells being abandoned is available, please provide a copy in the Report. Data such as the well depth, diameter, static water level, debris in the well, odors, floating hydrocarbons is all very useful to the facility wide evaluation and should be included for each well.
6. Page 3-5, Section 3.4.2., Paragraph 4 is unclear. The paragraph needs to clarify "casings exposed at the surface" and "buried casings were exposed". Is this paragraph discussing a time after the slurry was added? Why is bagged gravel being added to make up for lost volume instead of additional slurry?
7. Page 3-5, paragraph 2, sentence 1 and page 3-8, section 3.4.4, paragraph 1, sentence 2. Please remove the period after the acronym OHARNG.
8. Page 3-5, Section 3.4.2, paragraph 2, sentence 4. This sentence states, "...the slurry will be allowed to settle before proceeding with the final steps of the abandonment process". A time limit was not presented in the report that defines the time the slurry will be allowed to settle. Ohio EPA wants to be assured that the slurry is allowed to settle or sufficiently "harden" enough to accept the final material, at least overnight.
9. Page 3-6, Section 3.4.3.1: Sections describing the handling of waste water and solid waste do not mention the size of the containers to be used for storage. Please provide this information.
10. Figures 2-1 and 2-2 show the potentiometric surface maps of both unconsolidated and bedrock aquifers. These maps are noted to be from 2011. Several more recent maps have been prepared that would be more accurate, particularly the

MR. MARK LEEPER  
RAVENNA ARMY AMMUNITION PLANT  
April 2, 2015  
PAGE 3

bedrock surface interpretations which have changed since 2011. It is advised that a more recent map be consulted to assure or verify the wells that are chosen to be abandoned are in fact downgradient of areas of concern.

Please include Ohio EPA's unique project number (267-000859-207) that can be found in the subject line of this letter, with all return communications regarding this activity. If you have any questions concerning this correspondence, or wish to request a meeting to discuss, please do not hesitate to contact me at (330) 963-1292.

Sincerely,



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

KMP/nvr

cc: Katie Tait, OHARNG RTLS  
Kevin Sedlak, ARNG  
Gregory F. Moore, USACE  
Rebecca Haney/Gail Harris, VISTA Sciences Corp.

ec: Rodney Beals, Ohio EPA NEDO DERR  
Justin Burke, Ohio EPA, CO DERR





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

March 31, 2015

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

**RE: US ARMY RAVENNA AMMUNITION PLT RVAAP  
REMEDICATION RESPONSE  
PROJECT RECORDS  
REMEDIAL RESPONSE  
TRUMBULL COUNTY  
267000859059**

**SUBJECT: EXTENSION REQUEST FOR REMEDIAL INVESTIGATION REPORTS AT  
MULTIPLE AREAS OF CONCERN (AOCS) UNDER THE PBA08 CONTRACT  
FOR THE RAVENNA ARMY AMMUNITION PLANT PORTAGE/TRUMBULL  
COUNTIES, PROJECT ID # 267-000859-059**

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 "Ravenna Army Ammunition Plant (RVAAP) Restoration Program, Portage/Trumbull Counties, Ohio, Extension Request for Remedial Investigation Reports at Multiple Areas of Concern (AOCs) Under the PAA08 Contract" letter, dated March 26, 2015. The Army is requesting an extension of 180 days after a new contract award for the resubmittal/submittal of Remedial Investigation (RI) reports for the following IRP sites:

- RVAAP-06 C Block Quarry;
- RVAAP-12 Load Line 12;
- RVAAP-19 Landfill North of Winklepeck Burning Grounds;
- RVAAP-29 Upper and Lower Cobbs Ponds;
- RVAAP-33 Load Line 6;
- RVAAP-38 NACA Test Area;
- RVAAP-40 Load Line 7;
- RVAAP-41 Load Line 8;
- RVAAP-42 Load Line 9;
- RVAAP-44 Load Line 11;
- RVAAP-45 Wet Storage Area;
- RVAAP-46 Building F-15 and F-16;
- RVAAP-50 Atlas Scrap Yard; and
- RVAAP-67 Facility-Wide Sewers.



MR. MARK LEEPER  
RAVENNA ARMY AMMUNITION PLANT  
MARCH 31, 2015  
PAGE 2

The extension request is acceptable to Ohio EPA. If you have any questions, please call me at (330) 963-1207.

Sincerely,



Vicki Deppisch  
Division of Environmental Response and Revitalization

VD/nvr

cc: Gail Harris/Rebecca Haney, Vista Sciences  
Greg Moore, USACE Louisville

ec: Justin Burke, Ohio EPA, CO, DERR  
Brian Tucker/Carrie Rasik, Ohio EPA, CO, DERR  
Rod Beals, Ohio EPA, NEDO, DERR  
Vanessa Steigerwald, Ohio EPA, NEDO, DERR  
Ed D'Amato, Ohio EPA, NEDO, DERR  
Sue Watkins, Ohio EPA, NEDO, DERR  
Andrew Kocher, Ohio EPA, NEDO, DERR  
Katie Tait, OHARNG, Camp Ravenna  
Kevin Sedlak, ARNG, Camp Ravenna  
Nat Peters, USACE Louisville



## NATIONAL GUARD BUREAU

111 SOUTH GEORGE MASON DRIVE  
ARLINGTON VA 22204-1373

March 26, 2015

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, Ohio, Extension Request for Remedial Investigation Reports at Multiple Areas of Concern (AOCs) Under the PBA08 Contract

Dear Ms. Deppisch:

Based on discussions during the Ohio Environmental Protection Agency (Ohio EPA) schedule call on 19 March 2015 regarding the end of the PBA08 contract with Leidos, the Army is submitting an extension request for completion of Remedial Investigation reports for multiple AOCs under this contract. The Army is requesting an extension of 180 days after a new contract award for the resubmittal of Remedial Investigation reports for the following sites:

RVAAP-06 C Block Quarry; RVAAP-12 Load Line 12; RVAAP-19 Landfill North of Winklepeck Burning Grounds; RVAAP-29 Upper and Lower Cobbs Ponds; RVAAP-33 Load Line 6; RVAAP-38 NACA Test Area; RVAAP-40 Load Line 7; RVAAP-41 Load Line 8; RVAAP-42 Load Line 9; RVAAP-44 Load Line 11; RVAAP-45 Wet Storage Area; RVAAP-46 Building F-15 and F-16; RVAAP-50 Atlas Scrap Yard; and RVAAP-67 Facility-wide Sewers.

Please review this request for extension and let the Army know if it is acceptable. Please contact the undersigned at (703) 607-7995 or [mark.s.leeper.civ@mail.mil](mailto:mark.s.leeper.civ@mail.mil) if there are issues or concerns with this request.

Sincerely,

Mark S. Leeper, P.G., MBA  
RVAAP Restoration Program Manager  
Army National Guard Directorate

cc: Rod Beals, Ohio EPA, DERR-NEDO  
Justin Burke, Ohio EPA, CO  
Kevin Sedlak, ARNG, Camp Ravenna  
Katie Tait, OHARNG, Camp Ravenna  
Nat Peters, USACE Louisville  
Greg Moore, USACE Louisville  
Pat Ryan, Leidos-REIMS  
Gail Harris, Vista Sciences Corporation



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

February 6, 2015

Mr. Mark Leeper  
Army National Guard Directorate  
ARNGD-ILE Clean Up  
111 South George Mason Drive  
Arlington, VA 22204

**Re: US Army Ravenna Ammunition Plt RVAAP  
Remediation Response  
Project Records  
Remedial Response  
Portage County  
267000859**

**Subject: Ravenna Army Ammunition Plant Portage/Trumbull Counties,  
Acknowledgement Letter, Final Community Relations Plan for the  
RVAAP Restoration Program, Dated February 4, 2015, Ohio EPA ID #  
267-000859-059, Site-Wide IRP Activities**

Dear Mr. Leeper:

The Ohio Environmental Protection Agency (Ohio EPA), Division of Environmental Response and Revitalization (DERR), received the "Updated Final Community Relations Plan, RVAAP Restoration Program, Portage and Trumbull Counties, Ohio," on February 4, 2015. The Document was submitted by Vista Sciences Corporation on behalf of the US Army Corp of Engineers (USACE) - Louisville District, under contract No. W912QR-12-C--0031. It is dated February 4, 2015.

Ohio EPA conducted a review of this updated document and concurs with the document, as amended.

If you have questions or concerns, please contact me at (330) 963-1218.

Sincerely,

Rod Beals, Manager  
Division of Environmental Response and Revitalization

KP/nvr

cc: Katie Tait, OHARNG RTLS  
Kevin Sedlak, ARNG

Rebecca Haney/Gail Harris, Vista Sciences Corp.  
Gregory F. Moore, USACE

ec: Justin Burke, CO, DERR

Kevin Palombo, NEDO, DERR

