# Ohio Environmental Protection Agency (Ohio EPA) And Ravenna Army Ammunition Plant (RVAAP) 2021 Correspondences

Ohio EPA 8/9/2021
Entered Directors Journal

Ohio Environmental Protection Agency

**Mike DeWine**, Governor
**Jon Husted**, Lt. Governor
**Laurie A. Stevenson**, Director

August 9, 2021

Mr. Timothy M. Morgan Environmental Supervisor
Ohio Army National Guard
Camp James A. Garfield Joint Military Training Center
1438 State Route 534 SW
Newton Falls, Ohio 44444

RE: Ramsdell Quarry Landfill
Director's Authorization
Approval
Municipal Solid Waste Landfills
Portage County
MSWL020352

**Subject: Ramsdell Quarry Landfill, Portage County**
**End of Post-Closure Care Period**

Dear Mr. Morgan:

The Ramsdell Quarry Landfill (Facility) is located on Ohio Army National Guard (OHARNG) – Camp James A. Garfield Joint Military Training Center (CJAGJMTC) located at 1438 State Route 534 SW, Newton Falls, Portage County, Ohio. The closure of the 10-acre, captive, municipal solid waste (MSW) landfill was certified on July 3, 1990.

On February 23, 2021, the following report was submitted to Ohio Environmental Protection Agency (Ohio EPA): "Post-Closure Certification, Ohio National Guard, Camp James A. Garfield Joint Military Training, Ramsdell Quarry Landfill, Portage County, Ohio." The Facility has been in post-closure care (PCC) for 30 years as of July 3, 2020. The report certifies that the post-closure activities, in accordance with OAC 3745-27-14, have been completed. The Facility performed quarterly inspections during the entire PCC period. The Facility was exempt from the explosive gas monitoring requirements due to its captive status.

Groundwater monitoring, investigation and remedial requirements were conducted in accordance with OAC 3745-27-10 for approximately fourteen (14) years of the PCC period. Director's Final Findings and Orders (DFFO), dated June 10, 2004, established a Facility-Wide Ground Water Monitoring Program (FWGWMP) which combined CERCLA, RCRA and OAC 3745-27-10 requirements. The FWGWMP provides a comparative assessment of the hydrogeological conditions and groundwater quality for the entire FWGWMP network. The five (5), Ramsdell Quarry Landfill groundwater monitoring wells included in this network, must remain in place in accordance with the DFFOs.

Ohio EPA staff have reviewed the available documents and concluded that the PCC requirements have been met and current site conditions do not pose a risk to human health or safety or the environment. Therefore, I acknowledge that the PCC obligations, as required by OAC 3745-27-14 for the Ramsdell Quarry Landfill, have been completed and authorize the discontinuance of the PCC period. The Facility is still required to comply with the groundwater monitoring, investigation and remedial requirements of the June 10, 2004 DFFO.

Please be advised that OAC Rule 3745-513 is still applicable to this Facility. OAC Rule 3745- 513-02(C) states:

"Chapter 3745-513 of the Administrative Code activities" or "chapter 513 activities" means engaging in filling, grading, excavating, building, drilling, or mining on land where a solid waste facility or hazardous waste facility was operated."

While OHARNG – CJAGJMTC is no longer obligated to conduct post-closure activities at the Facility pursuant to the solid waste regulations, the Facility should recognize that Ohio Revised Code (ORC) Chapter 6111 prohibits causing pollution to waters of the state. Therefore, Ohio EPA recommends that OHARNG – CJAGJMTC continue to undertake reasonable measures to prevent impacts from the Facility, such as periodic inspections and maintenance of the landfill cap and any surface water control features on the property.

You are hereby notified that this action of the Director of Environmental Protection (Director) is final and may be appealed to the Environmental Review Appeals Commission pursuant to ORC Section 3745.04. The appeal must be in writing and set forth the action complained of and the grounds upon which the appeal is based. The appeal must be filed with the Commission within thirty (30) days after notice of the Director's action. The appeal must be accompanied by a filing fee of $70.00 made payable to "Treasurer, State of Ohio." The Commission, in its discretion, may reduce the fee if by affidavit it is demonstrated that payment of the full amount of the fee would cause extreme hardship. Notice of the filing of the appeal shall be filed with the Director within three (3) days of filing with the Commission. Ohio EPA requests that a copy of the appeal be served upon the Ohio Attorney General's Office, Environmental Enforcement Section. An appeal may be filed with the Environmental Review Appeals Commission at the following address:

Environmental Review Appeals Commission
30 East Broad Street, 4th Floor
Columbus, Ohio 43215

If you have any questions concerning this letter, please contact Jerry Parker of Ohio EPA, Northeast District Office at 330-963-1186.

Sincerely,

Laurie A. Stevenson
Director

JP/ams

ec: Tim M. Morgan, Ohio Army National Guard, timothy.m.morgan.nfg@mail.mil
Jarnal Singh, Ohio EPA, NEDO, DMWM
Jeremy Carroll, Ohio EPA, Central Office, DMWM
Bob Princic, Ohio EPA, NEDO, DMWM
Mary Helen Smith, Portage County H.D., mhsmith@portagehealth.net
John Zampino, Partners Environmental, jzampino@partnersenv.com

PORTAGE COUNTY HEALTH DISTRICT

**Portage County Combined General Health District**
705 Oakwood Street, 2nd Floor
Ravenna, Ohio 44266
www.portagehealth.net

ACCREDITED HEALTH DEPARTMENT · PHAB Advancing public health performance · PUBLIC HEALTH ACCREDITATION BOARD

Portage County Health District 330-296-9919
Fax 330-297-3597
Portage County WIC 330-297-9422
Columbiana County WIC 330-424-7293

*Joseph Diorio, MPH, MS, RS, Health Commissioner*

June 24, 2021

Brad Kline
Environmental Specialist 2
Ohio Army National Guard
Camp James A. Garfield Joint Military Training Center
1438 State Route 534 SW
Newton Falls, OH 44444

RE: Camp James Garfield Joint Military Training Center
Ramsdell Quarry Landfill Facility
2021 1st Quarter Comprehensive Inspection
1438 State Route 534 SW, Newton Falls, Ohio 44444
Portage County, Ohio

Dear Mr. Kline

On June 21, 2020, a comprehensive inspection was conducted at the closed Ramsdell Quarry Landfill Facility located at the Camp James A. Garfield Military Training Center as referenced above. Those present included:

- Portage County Health District: Andy Bull MPH, RS; Justin Rechichar MPH, RS and
- Camp JAG: Brad Kline, Environmental Specialist 2.

No violations, issues or concerns were identified during the inspection. The site is well monitored and maintained.

Enclosed please find the closed municipal solid waste (MSW) inspection checklist. Should you have any questions or concerns, please feel free to contact me at the letterhead address, by phone at (330) 296-9919 ext. 122, or by email at abull@portagehealth.net

Respectfully,

Andy Bull MPH, REHS
Registered Environmental Health Specialist

Enclosure
CC: File

Ohio Environmental Protection Agency

# Closed MSW Landfill Inspection Checklist

| | |
|---|---|
| Facility Name: Ramsdell Quarry Landfill | |
| Address: Camp James A Garfield Joint Military Training Center, 1438 State Route 534 SW, Newton Falls, Ohio 44444 | |
| Date: June 21, 2021 | Time: 10 AM Weather: Sunny |
| Inspection Representatives | |
| Facility: Brad Kline, Ohio Army National Guard Environmental Spec 2 | |
| Health District: Andy Bull | |
| Ohio EPA: | |
| Other | |

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

*Comments:*

1. The facility has no leachate management system, surface water management system, or explosive gas extraction and monitoring system. Groundwater monitoring consists of nine wells in place at or around the facility due to CERCLA requirements. Groundwater monitoring is completed in accordance with June 10, 2004 Director's Findings and Orders as part of a facility-wide (JAG) groundwater monitoring program under CERCLA.

- Closed landfill facility is well maintained.
- Post-closure care activities are conducted in accordance with the requirements set forth in OAC 3745-27-14. No issues or concerns were found during the site inspection.

| Andy Bull, MPH, RS | | June 24, 2021 |
|---|---|---|
| Print Name of Inspector Completing Form | Signature | Date |

*Updated: 2/2016*

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

23 June 2021

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

RE: Second Quarter 2021 Ramsdell Quarry Landfill Quarterly Inspection, OAC Rule 3745-27-14(A)(4) – Post-closure Care of Sanitary Landfills, Camp James A. Garfield, Portage and Trumbull Counties, Ohio

Dear Mr. Parker,

On behalf of the Ohio Army National Guard (OHARNG), a Post-Closure Quarterly Inspection of the subject landfill was conducted on June 21, 2021 by Mr. Allan Brillinger from Chenega Tri-Services, LLC (see attached "Closed MSW Landfill Inspection Checklist"). A similar inspection was conducted concurrently by representatives from the Portage County Combined General Health District (PCCGHD), a copy of which will be submitted to the Ohio EPA by the PCCGHD.

The attached Closed MSW Landfill Inspection Checklist indicates that the subject Landfill is in compliance with applicable regulations contained in OAC Rules 3745-27-14(A)(1 through 7). The annual post-closure report for 2020 was submitted on March 18, 2021.

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

Sincerely,

Timothy M. Morgan
State Environmental Supervisor

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

Attachment: Closed MSW Landfill Inspection Checklist for Ramsdell Quarry Landfill

Ohio Environmental Protection Agency

# Closed MSW Landfill Inspection Checklist

| | |
|---|---|
| Facility Name | Ramsdell Quarry Landfill |
| Address | Camp James A. Garfield, 1438 S.R. 534, SW, Newton Falls, OH 44444 |
| Date | June 21, 2021 |
| Time | 10:45 AM |
| Inspection Representatives | Allan Brillinger (Chenega Tri-Services, LLC) |
| Facility | Brad Kline (OHARNG) |
| Health District | Justin Rechichar and Andy Bull (PCHD) |
| Ohio EPA | |
| Other | |

| Inspection Type | | Reason for Inspection | |
|---|---|---|---|
| ☑ | Comprehensive | ☐ Required | ☑ Other |
| ☐ | Focused | ☐ Re-Inspection | Post-Closure Quarterly Inspection |

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

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

*Comments:* Weather during the inspection on June 21, 2021 was partly cloudy, humid and 72 degrees F.
- In reference to OAC Rule 3745-27-14(A)(1), the facility has no leachate and surface water management systems, and no explosive gas extraction and monitoring systems.
- In reference to OAC Rule 3745-27-14(A)(1), twelve groundwater monitoring wells are in place at or around the facility due to CERCLA requirements. Groundwater monitoring is done in accordance with the 10 June 2004 Director's Final Findings and Orders as part of the Facility-Wide Groundwater Monitoring Program regulated under CERCLA.
- Annual mowing at the landfill was completed on September 15, 2020 and is planned for mid-September 2021.
- In reference to OAC Rule 3745-27-14(A)(6), the 2020 annual post-closure report was submitted on March 18, 2021.
- Overall condition of the landfill is very good, no issues noted.

| Allan B. Brillinger | Allan B Brillinger | June 21, 2021 |
|---|---|---|
| Print Name of Inspector Completing Form | Signature | Date |

*Updated: 2/2016*

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

24 March 2021

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

RE: First Quarter 2021 Ramsdell Quarry Landfill Quarterly Inspection, OAC Rule 3745-27-14(A)(4) – Post-closure Care of Sanitary Landfills, Camp James A. Garfield, Portage and Trumbull Counties, Ohio

Dear Mr. Parker,

On behalf of the Ohio Army National Guard (OHARNG), a Post-Closure Quarterly Inspection of the subject landfill was conducted on March 22, 2021 by Mr. Allan Brillinger from Chenega Tri-Services, LLC (see attached "Closed MSW Landfill Inspection Checklist"). A similar inspection was conducted concurrently by a representative from the Portage County Combined General Health District (PCCGHD), a copy of which will be submitted to the Ohio EPA by the PCCGHD.

The attached Closed MSW Landfill Inspection Checklist indicates that the subject Landfill is in compliance with applicable regulations contained in OAC Rules 3745-27-14(A)(1 through 7). The annual post-closure report for 2020 was submitted on March 18, 2021.

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

Sincerely,

Timothy M. Morgan
State Environmental Supervisor

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

Attachment: Closed MSW Landfill Inspection Checklist for Ramsdell Quarry Landfill

Ohio Environmental Protection Agency

# Closed MSW Landfill Inspection Checklist

| | |
|---|---|
| Facility Name | Ramsdell Quarry Landfill |
| Address | Camp James A. Garfield, 1438 S.R. 534, SW, Newton Falls, OH 44444 |
| Date | March 22, 2021 |
| Time | 10:00 AM |
| Inspection Representatives | Allan Brillinger (Chenega Tri-Services, LLC) |
| Facility | Brad Kline (OHARNG) |
| Health District | Andy Bull (PCHD) |
| Ohio EPA | |
| Other | |

| Inspection Type | Reason for Inspection | | |
|---|---|---|---|
| ☑ Comprehensive | ☐ Required | ☑ Other | |
| ☐ Focused | ☐ Re-Inspection | Post-Closure Quarterly Inspection | |

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

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

*Comments:* Weather during inspection on March 22, 2021 was sunny and 50 degrees F.
- In reference to OAC Rule 3745-27-14(A)(1), the facility has no leachate and surface water management systems, and no explosive gas extraction and monitoring systems.
- In reference to OAC Rule 3745-27-14(A)(1), twelve groundwater monitoring wells are in place at or around the facility due to CERCLA requirements. Groundwater monitoring is done in accordance with the 10 June 2004 Director's Final Findings and Orders as part of the Facility-Wide Groundwater Monitoring Program regulated under CERCLA.
- Annual mowing at the landfill was completed on September 15, 2020.
- In reference to OAC Rule 3745-27-14(A)(6), the 2020 annual post-closure report was submitted on March 18, 2021.
- Overall condition of the landfill is very good, no issues noted.

| Allan B. Brillinger | Allan B Brillinger | March 22, 2021 |
|---|---|---|
| Print Name of Inspector Completing Form | Signature | Date |

*Updated: 2/2016*

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

October 19, 2021

Ohio Environmental Protection Agency
DERR-NEDO
Attn: Mr. Edward D'Amato
2110 East Aurora Road
Twinsburg, OH 44087-1924

Subject: Former Ravenna Army Ammunition Plant (RVAAP) Restoration Program
Final Record of Decision, RVAAP-03 Open Demolition Area #1,
Portage/Trumbull Counties, Contract Number W912QR-12-D-0002, Delivery Order 0003, Ohio EPA ID # 267-000859-187

Dear Mr. D'Amato:

An electronic version of the Final, fully signed Record of Decision for RVAAP-03 Open Demolition Area #1 at the former Ravenna Army Ammunition Plant (RVAAP) will be uploaded for your records to the Ohio EPA LiquidFile site. A hard copy and CD will be sent when they are able to be received by the Ohio EPA. This version includes required signature under section E Authorizing Signature on page 16 of the document.

Please contact the undersigned at (614) 336-2053 or kevin.m.sedlak.ctr@mail.mil if there are issues or concerns with this submission.

Sincerely,

SEDLAK.KEVIN.MICHAEL.1254440171

Digitally signed by SEDLAK.KEVIN.MICHAEL.1254440171
Date: 2021.10.19 13:37:04 -04'00'

Kevin Sedlak
RVAAP Restoration Program Manager
Army National Guard Directorate

cc: Tom Schneider, Ohio EPA (cover letter via email only)
Bob Princic, Ohio EPA (cover letter via email only)
Natalie Oryshkewych, Ohio EPA (cover letter via email only)
Megan Oravec, Ohio EPA (cover letter via email only)
Mark Leeper, ARNG (one [1] electronic copy)
Katie Tait, OHARNG (one [1] electronic copy)
Kevin Mieczkowski, USACE Louisville (one [1] hard copy)
Steve Kvaal, USACE – Louisville (cover letter via email only)
Susan Oliver, Management Solutions, LLC (cover letter via email only)
Jennifer Tierney, Vista Sciences Corp. (one [1] electronic copy, one [1] hard copy)

Ohio Environmental Protection Agency

**Mike DeWine**, Governor
**Jon Husted**, Lt. Governor
**Laurie A. Stevenson**, Director

May 21, 2021

**TRANSMITTED ELECTRONICALLY**

Mr. Kevin M. Sedlak
Army National Guard
Installations & Environment
Cleanup Branch IPA Designation
1438 State Route 534 SW
Newton Falls, OH 44444

RE: US Army Ravenna Ammunition Plt RVAAP
Remediation Response
Project Records
Remedial Response
Portage County
ID # 267000859021

**Subject: Final Record of Decision for RVAAP-03 Open Demolition Area #1 Dated April 20, 2021**

Dear Mr. Sedlak:

The Ohio Environmental Protection Agency (Ohio EPA), Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR) has received and reviewed the "Final Record of Decision for RVAAP-03 Open Demolition Area #1 dated April 20, 2021." It was prepared by Parsons.

Ohio EPA has no comments on the Final Record of Decision (Final ROD). Based on the information contained in the Final ROD document, other investigation documents and reports, and Ohio EPA's oversight participation during the investigation, Ohio EPA concurs with the Final ROD for RVAAP-03 Open Demolition Area #1 recommending no further action.

As a precautionary response to COVID-19, Ohio EPA is currently operating with most staff working remotely. During this time, we will not be issuing hard-copy mail. This letter is an official response from Ohio EPA that will be maintained as a public record.

RECEIVED
MAY 21 2021

If you have any questions concerning this letter, please contact Edward D'Amato at (330) 963-1170, or via email at ed.damato@epa.ohio.gov.

Sincerely,

*Melisa Witherspoon*

Melisa Witherspoon
Chief
Division of Environmental Response and Revitalization

MW/sc

ec: Katie Tait, OHARNG RTLS
Nat Peters, USACE
Steven Kvaal, USACE
Mark Leeper, ARNG
Rebecca Shreffler, Chenega
Natalie Oryshkewych, Ohio EPA, NEDO, DERR
Megan Oravec, Ohio EPA, NEDO, DERR
Bob Princic, Ohio EPA, NEDO, DERR
Tom Schneider, Ohio EPA, SWDO, DERR
William Damschroder, Ohio EPA, Legal

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

April 19, 2021

Ohio Environmental Protection Agency
DERR-NEDO
Attn: Edward J. D'Amato
2110 East Aurora Road
Twinsburg, OH 44087-1924

Subject: Former Ravenna Army Ammunition Plant (RVAAP) Restoration Program
Final Record of Decision, RVAAP-03 Open Demolition Area #1,
Portage/Trumbull Counties, Contract Number W912QR-12-D-0002, Delivery Order 0003, Ohio EPA ID # 267-000859-187

Dear Mr. D'Amato:

An electronic version of the Final Record of Decision for RVAAP-03 Open Demolition Area #1 at the former Ravenna Army Ammunition Plant (RVAAP) will be uploaded for your review to the Ohio EPA LiquidFile site. A hard copy and CD will be sent when they are able to be received by the Ohio EPA. This document selects a "no further action" response for soil, surface water, and sediment at RVAAP-03. The distribution to other team members is shown below.

This report was prepared by Parsons in support of the RVAAP cleanup program. Please contact the undersigned at (614) 336-6000 or kevin.m.sedlak.ctr@mail.mil if there are issues or concerns with this submission.

Sincerely,

SEDLAK.KEVIN.MICHAEL.1254440171
Digitally signed by SEDLAK.KEVIN.MICHAEL.1254440171
Date: 2021.04.20 10:07:57 -04'00'

Kevin M. Sedlak
RVAAP Restoration Program Manager

Attachment

cc: Tom Schneider, Ohio EPA, SWDO (email transmittal letter only)
Natalie Oryshkewych, Ohio EPA, DERR-NEDO (email transmittal letter only)
Bob Princic, Ohio EPA, DERR-NEDO (email transmittal letter only)
Megan Oravec, Ohio EPA, DERR-NEDO (email transmittal letter only)
Mark Leeper, ARNG (one [1] electronic copy)
Katie Tait, OHARNG (one [1] electronic copy)
Kevin Mieczkowski, USACE Louisville (one [1] electronic copy, one [1] hard copy)
Jennifer Tierney, Vista Sciences (two [2] electronic copies, two [2] hard copies)
Steven Kvaal, USACE Louisville (email transmittal letter only)
Pat Ryan, Leidos (email transmittal letter only)
Ed Heyse, Parsons (one [1] electronic copy)

Ohio Environmental Protection Agency

**Mike DeWine**, Governor
**Jon Husted**, Lt. Governor
**Laurie A. Stevenson**, Director

April 16, 2021

**Transmitted Electronically**

Kevin M. Sedlak
Army National Guard
Installations & Environment Cleanup
Branch IPA Designation
1438 State Route 534 SW
Newton Falls, OH 44444

**Re:** **US Army Ravenna Ammunition Plt RVAAP**
**Remediation Response**
**Correspondence**
**Remedial Response**
**Portage County**
**267000859187**

**Subject:** **Review of Draft Record of Decision for RVAAP-03 Open Demolition Area #1, After Action Report**

Dear Mr. Sedlak:

The Ohio Environmental Protection Agency (Ohio EPA) Northeast District Office (NEDO) Division of Environmental Response and Revitalization (DERR) has reviewed the Draft Record of Decision for RVAAP-03 Open Demolition Area #1 dated April 1, 2021. The document was prepared by Parsons.

Ohio EPA has no comments. Please submit the document in final form.

**As a precautionary response to COVID-19, Ohio EPA is currently operating with most staff working remotely. During this time, we will not be issuing hard-copy mail. This letter is an official response from Ohio EPA that will be maintained as a public record.**

If you have any questions or concerns, please do not hesitate to contact me at (330) 963-1170 or ed.damato@epa.ohio.gov.

Sincerely,
Edward J D'Amato

Edward D'Amato
Site Coordinator
Division of Environmental Response and Revitalization

ED/cs

ec: Nat Peters, USACE
Katie Tait, OHARNG RTLS
Steve Kvaal, USACE
Rebecca Shreffler, Chenega
Mark Leeper, ARNG
Natalie Oryshkewych, Ohio EPA, NEDO DERR
Megan Oravec, Ohio EPA, NEDO DERR
Bob Princic, Ohio EPA, NEDO DERR
Tom Schneider, Ohio EPA, SWDO DERR

RECEIVED
APR 19 2021

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

April 1, 2021

Ohio Environmental Protection Agency
DERR-NEDO
Attn: Edward J. D'Amato
2110 East Aurora Road
Twinsburg, OH 44087-1924

Subject: Former Ravenna Army Ammunition Plant (RVAAP) Restoration Program
Draft Record of Decision, RVAAP-03 Open Demolition Area #1,
Portage/Trumbull Counties, Contract Number W912QR-12-D-0002, Delivery Order 0003, Ohio EPA ID # 267-000859-021

Dear Mr. D'Amato:

An electronic version of the Draft Record of Decision for RVAAP-03 Open Demolition Area #1 at the former Ravenna Army Ammunition Plant (RVAAP) will be uploaded for your review to the Ohio EPA LiquidFile site. A hard copy and CD will be sent when they are able to be received by the Ohio EPA. This document selects a "no further action" response for soil, surface water, and sediment at RVAAP-03. The distribution to other team members is shown below.

This report was prepared by Parsons in support of the RVAAP cleanup program. Please contact the undersigned at (614) 336-6000 or kevin.m.sedlak.ctr@mail.mil if there are issues or concerns with this submission.

Sincerely,

SEDLAK.KEVIN.MICHAEL.1254440171
Digitally signed by SEDLAK.KEVIN.MICHAEL.1254440171
Date: 2021.04.01 13:05:00 -04'00'

Kevin M. Sedlak
RVAAP Restoration Program Manager

Attachment

cc: Tom Schneider, Ohio EPA, SWDO (email transmittal letter only)
Natalie Oryshkewych, Ohio EPA, DERR-NEDO (email transmittal letter only)
Bob Princic, Ohio EPA, DERR-NEDO (email transmittal letter only)
Megan Oravec, Ohio EPA, DERR-NEDO (email transmittal letter only)
Mark Leeper, ARNG (one [1] electronic copy)
Katie Tait, OHARNG (one [1] electronic copy)
Kevin Mieczkowski, USACE Louisville (one [1] electronic copy, one [1] hard copy)
Jennifer Tierney, Vista Sciences (one [1] electronic copy)
Steven Kvaal, USACE Louisville (email transmittal letter only)
Pat Ryan, Leidos (email transmittal letter only)
Ed Heyse, Parsons (one [1] electronic copy)

PARSONS

401 Diamond Drive, NW | Huntsville, Alabama 35806
P: +1 256.837.5200 | F: +1 256.217.2525 | www.parsons.com

17 January 2021

United States Army Corps of Engineers, Louisville District
ATTN: Mr. Kevin Mieczkowski
600 Dr. Martin Luther King, Jr. Place
Room 708
Louisville, Kentucky 40202
(502) 315-6324

Subject: Preliminary Draft Record of Decision
RVAAP-03 Open Demolition Area #1
Former Ravenna Army Ammunition Plant
Portage and Trumbull Counties, Ohio
Contract No.W912QR-12-D-0002, Delivery Order 0003

Dear Mr. Mieczkowski,

Parsons has prepared the Preliminary Draft Record of Decision (ROD) for RVAAP-03 Open Demolition Area #1 in accordance with the Performance Work Statement. Enclosed for your approval are 2 hard copies and 1 CD of the Preliminary Draft ROD for RVAAP-03. This document recommends No Further Action for soil, surface water, and sediment at RVAAP-03. The distribution to other team members is shown below.

If you have any questions or comments, please contact me at (303) 563-9452 or email ed.heyse@parsons.com.

Sincerely,

PARSONS GOVERNMENT SERVICES INC.

Edward Heyse, PhD, PE
Project Manager

C: Kevin Sedlak, ARNG, CJAG (one [1] electronic copy)
Katie Tait, OHARNG, CJAG (one [1] electronic copy)
Jennifer Tierney, Vista Science Corp. (one [1] electronic copy)
Pat Ryan, Leidos-REIMS (Email Transmittal Letter Only)
Mark Leeper, ARNG (one [1] electronic copy)
Steven Kvaal, USACE – Louisville (Email Transmittal Letter Only)

Ohio Environmental Protection Agency

**Mike DeWine**, Governor
**Jon Husted**, Lt. Governor
**Laurie A. Stevenson**, Director

August 12, 2021

**TRANSMITTED ELECTRONICALLY**

Mr. Kevin M. Sedlak
Restoration Program Manager
ARNG-ILE Clean up
Camp James A. Garfield JTC
1438 State Route 534
Newton Falls, OH 44444

RE: US Army Ravenna Ammunition Plt RVAAP
Remediation Response
Project Records
Remedial Response
Portage County
ID # 267000859238

**Subject: Review of the Record of Meeting from the Technical Project Planning (TPP) Meeting #1 for the Remedial Investigation at Open Demolition Area 2 (ODA2), Dated July 15, 2021**

Dear Mr. Sedlak:

The Ohio Environmental Protection Agency (Ohio EPA), Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR) acknowledges the receipt of the "Record of Meeting from the Technical Project Planning (TPP) Meeting #1 for the Remedial Investigation at Open Demolition Area 2 (ODA2)" dated July 15, 2021. The document was prepared for the Army National Guard in support of the Environmental Program Support Services project at the former Ravenna Army Ammunition Plant.

Ohio EPA has no comments and accepts the record of the meeting.

This letter is an official response from Ohio EPA that will be maintained as a public record. If you have any questions concerning this letter, please contact me at (330) 963-1235.

Sincerely,

Nicholas Roope
Site Coordinator
Division of Environmental Response and Revitalization

NCR/sc

ec: Rebecca Shreffler, Chenega
Bob Princic, Ohio EPA, NEDO, DERR
Natalie Oryshkewych, Ohio EPA, NEDO, DERR
Thomas Schneider, Ohio EPA, SWDO, DERR
Katie Tait, OHARNG RTLS, CJAG
Steve Kvaal, USACE Louisville
Nathaniel Peters, USACE Louisville

RECEIVED
AUG 12 2021

Ohio Environmental Protection Agency

**Mike DeWine**, Governor
**Jon Husted**, Lt. Governor
**Laurie A. Stevenson**, Director

August 5, 2021

**TRANSMITTED ELECTRONICALLY**

Mr. Kevin M. Sedlak
Restoration Program Manager
ARNG-ILE Clean up
Camp James A. Garfield JTC
1438 State Route 534
Newton Falls, OH 44444

RE: US Army Ravenna Ammunition Plt RVAAP
Remediation Response
Project Records
Remedial Response
Portage County
ID # 267000859238

**Subject:** **Review of the Memorandum for Record, Summary of Findings, Magnetometer-Assisted Survey of Sand Creek conducted on 18-21 May 2021 as related to the Time Critical Removal Action for Open Demolition Area #2 at Camp James A. Garfield Joint Military Training Center, Newton Falls, OH**

Dear Mr. Sedlak:

The Ohio Environmental Protection Agency (Ohio EPA), Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR) acknowledges the receipt of the "Memorandum for Record, Summary of Findings, Magnetometer-Assisted Survey of Sand Creek conducted on 18-21 May 2021 as related to the Time Critical Removal Action for Open Demolition Area #2 at Camp James A. Garfield Joint Military Training Center, Newton Falls, OH" dated July 7, 2021. The document was prepared by U. S. Army Corps of Engineers – Baltimore District and reviewed by Ohio EPA.

Ohio EPA has no comments and concurs with the conclusions of the report. There is no evidence that would support munitions and explosives of concern, material potentially presenting an explosive hazard, or munitions debris are migrating beyond the Open Demolition Area #2 munitions response site boundary at this time. Ohio EPA will continue to review future magnetometer-assisted surveys of Sand Creek to verify the conclusions of this memorandum remain valid.

This letter is an official response from Ohio EPA that will be maintained as a public record.

RECEIVED
AUG 06 2021

If you have any questions concerning this letter, please contact me at (330) 963-1235.

Sincerely,

Nicholas Roope
Site Coordinator
Division of Environmental Response and Revitalization

NCR/sc

ec: Rebecca Shreffler, Chenega
Bob Princic, Ohio EPA, NEDO, DERR
Natalie Oryshkewych, Ohio EPA, NEDO, DERR
Thomas Schneider, Ohio EPA, SWDO, DERR
Katie Tait, OHARNG RTLS, CJAG
Steve Kvaal, USACE Louisville
Nathaniel Peters, USACE Louisville

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

July 15, 2021

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

Subject: Ravenna Army Ammunition Plant Restoration Program, Open Demolition Area (OSA2), Record of Meeting, Technical Project Planning Meeting #1, Portage/Trumbull Counties, Ohio

Dear Mr. Roope:

The Record of Meeting from the Technical Project Planning (TPP) Meeting #1 for the Remedial Investigation at Open Demolition Area 2 (ODA2) is being submitted to you electronically.

One electronic copy is being submitted at this time and a hard copy can be provided when your office can receive them in the future, if requested. This record was prepared for the Army National Guard in support of the Environmental Program Support Services project at the former Ravenna Army Ammunition Plant.

Please contact the undersigned at (614) 336-2053 or kevin.m.sedlak.ctr@mail.mil if there are issues or concerns with this submission.

Sincerely,

SEDLAK.KEVIN.MICHAEL.1254440171
Digitally signed by SEDLAK.KEVIN.MICHAEL.1254440171
Date: 2021.07.16 09:45:58 -04'00'

Kevin Sedlak
RVAAP Restoration Program Manager
Army National Guard Directorate

cc: Tom Schneider, Ohio EPA (cover letter via email only)
Bob Princic, Ohio EPA (cover letter via email only)
Liam McEvoy, Ohio EPA (cover letter via email only)
Kevin Palombo, Ohio EPA (cover letter via email only)
Carrie Rasik, Ohio EPA (cover letter via email only)
Mark Leeper, ARNG (one [1] electronic copy)
Katie Tait, OHARNG (one [1] electronic copy)
Angela Schmidt, USACE – Louisville (one [1] electronic copy)
Steve Kvaal, USACE – Louisville (one [1] electronic copy)
Nicole Walworth, USACE – Baltimore (one [1] electronic copy)
Travis McCoun, USACE – Baltimore (one [1] electronic copy)

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

May 5, 2021

Ohio Environmental Protection Agency
DERR-NEDO
Attn: Mr. Ed D'Amato
2110 East Aurora Road
Twinsburg, OH 44087-1924

Subject: Notification of Field Work, Ravenna Army Ammunition Plant (RVAAP) Restoration Program, Portage/Trumbull Counties, Quarterly Sampling for CC RVAAP-69 Building 1048 Fire Station, Ohio EPA ID # 267-000859-214

Dear Mr. D'Amato:

In accordance with the Director's Final Findings and Orders, Section XIII, #28, for the RVAAP Restoration Program, the Army National Guard (ARNG) is providing notification of field activities at Camp James A. Garfield / former RVAAP 15 days prior to the scheduled start date. Parsons will be conducting quarterly groundwater sampling of five wells at CC RVAAP-69 Building 1048 Fire Station during the week of 24 May 2021 (anticipate two days of sampling, 25 and 26 May 2021).

For additional information on the field activities, please refer to the *Final Work Plan Additional Sampling for CC RVAAP-69 Building 1048 Fire Station, CC RVAAP-70 East Classification Yard, and CC RVAAP-74 Building 1034-Motor Pool Hydraulic Lift at the former Ravenna Army Ammunition Plant (RVAAP)* submitted to Ohio EPA on 30 November 2017 and approved on 27 December 2017, and the *Second Update and Progress Report on Remedial Investigation at CC RVAAP-69 Building 1048 Fire Station, Ravenna Army Ammunition Plan Restoration Program*, dated 10 June 2019.

Please contact the undersigned at (614) 336-6000 Ex 2053 or kevin.m.sedlak.ctr@mail.mil if there are issues or concerns with this submission.

Sincerely,

SEDLAK.KEVIN.MICHAEL.1254440171 Digitally signed by SEDLAK.KEVIN.MICHAEL.1254440171 Date: 2021.05.05 09:39:10 -04'00'

Kevin Sedlak
RVAAP Restoration Program Manager

cc: Bob Princic, Ohio EPA, DERR-NEDO
Tom Schneider, Ohio EPA, SWDO
Natalie Oryshkewych, Ohio EPA, DERR-NEDO
Megan Oravec, Ohio EPA, DERR-NEDO
Katie Tait, OHARNG
Steven Kvaal, USACE Louisville
Kevin Mieczkowski, USACE Louisville
Jennifer Tierney, Vista Sciences
Edward Heyse, Parsons

Ohio Environmental Protection Agency

**Mike DeWine**, Governor
**Jon Husted**, Lt. Governor
**Laurie A. Stevenson**, Director

December 16, 2021

**TRANSMITTED ELECTRONICALLY**

Mr. Kevin M. Sedlak
Army National Guard
Installations & Environment
Cleanup Branch IPA Designation
1438 State Route 534 SW
Newton Falls, OH 44444

RE: US Army Ravenna Ammunition Plt RVAAP
Remediation Response
Project Records
Remedial Response
Portage County
ID # 267000859113

**Subject: Comments for Draft Record of Decision for Soil, Sediment and Surface Water at RVAAP-06 C-Block Quarry at the Former Ravenna Army Ammunition Plant, Portage and Trumbull Counties, Ohio, Contract No. W912QR-21-D-0016, October 27, 2021**

Dear Mr. Sedlak:

The Ohio Environmental Protection Agency (Ohio EPA), Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR) has received and reviewed the "Draft Record of Decision for Soil, Sediment and Surface Water at RVAAP-06 C-Block Quarry at the Former Ravenna Army Ammunition Plant, Portage and Trumbull Counties, Ohio," Contract No. W912QR-21-D-0016, dated October 27, 2021. It was prepared by Leidos.

Please forward the final version of the Record of Decision (ROD) to Ohio EPA for review after you have addressed the comments below.

**Comment 1: Industrial Receptor Exposure**

Page 18, Section I.2. states, "Surficial asbestos containing material (ACM) will be removed and digging restrictions will be implemented to prevent Industrial Receptor exposure to ACM." However, no mention of hexavalent chromium is made in this sentence. This section needs to clarify that digging restrictions will also be implemented to prevent exposure to the hexavalent chromium which is not being removed will remain in soils approximately one foot in depth.

RECEIVED
DEC 16 2021

**Comment 2: ACM Removal**

Page 18, Section I.2.2. describes the removal of ACM but does not mention to what level it will be removed. Is this just visual? Is there an estimated size removal? Will any verification sampling be completed? This information needs to be included in this section for clarity.

**Comment 3: Typographical**

Page 6, paragraph 2, first sentence, line 200. The second word "states," should read "stakes."

This letter is an official response from Ohio EPA that will be maintained as a public record.

This "Draft Record of Decision for Soil, Sediment and Surface Water at RVAAP-06 C-Block Quarry at the Former Ravenna Army Ammunition Plant, Portage and Trumbull Counties, Ohio" was reviewed by personnel from Ohio EPA. Additional information is necessary to approve the document. If you have questions or would like to set up a meeting to discuss these comments, you may contact me via email at kevin.palombo@epa.ohio.gov.

Sincerely,

Kevin M. Palombo

Kevin M. Palombo
Site Coordinator
Division of Environmental Response and Revitalization

KP/sc

ec: Katie Tait, OHARNG RTLS
Nat Peters, USACE Louisville
Steven Kvaal, USACE Louisville
Rebecca Shreffler, Chenega
Natalie Oryshkewych, Ohio EPA, NEDO, DERR
Megan Oravec, Ohio EPA, NEDO, DERR
Bob Princic, Ohio EPA, NEDO, DERR
Tom Schneider, Ohio EPA, SWDO, DERR
William Damschroder, Ohio EPA, CO, Legal

Ohio Environmental Protection Agency

**Mike DeWine**, Governor
**Jon Husted**, Lt. Governor
**Laurie A. Stevenson**, Director

March 23, 2021

**TRANSMITTED ELECTRONICALLY**

Mr. Kevin M. Sedlak
Army National Guard
Installations & Environment
Cleanup Branch IPA Designation
1438 State Route 534 SW
Newton Falls, OH 44444

RE: US Army Ravenna Ammunition Plt RVAAP
Remediation Response
Project Records
Remedial Response
Portage County
ID # 267000859261

**Subject: Draft Record of Decision for Building 1034 Motor Pool Hydraulic Lift**

Dear Mr. Sedlak:

The Ohio Environmental Protection Agency (Ohio EPA), Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR) has received and reviewed the Draft Record of Decision for Building 1034 Motor Pool Hydraulic Lift," dated March 08, 2021.

Ohio EPA has no comments but has a recommendation:

1. Section E.1.3, Lines 366-367 states: "An inactive groundwater supply well is located approximately 240 feet west-northwest of the [Area of Concern]." Ohio EPA recommends abandoning this well. Please note this recommendation is not a comment that requires response.

Please submit the document in final form.

As a precautionary response to COVID-19, Ohio EPA is currently operating with most staff working remotely. During this time, we will not be issuing hard-copy mail. This letter is an official response from Ohio EPA that will be maintained as a public record.

RECEIVED
MAR 23 2021

If you have any questions concerning this letter, please contact Edward D'Amato at (330) 963-1170, or via email at ed.damato@epa.ohio.gov.

Sincerely,

Edward J D'Amato

Edward D'Amato
Site Coordinator
Division of Environmental Response and Revitalization

ED/sc

ec: Katie Tait, OHARNG RTLS
Nat Peters, USACE
Steven Kvaal, USACE
Rebecca Shreffler, Chenega
Natalie Oryshkewych, Ohio EPA, NEDO, DERR
Megan Oravec, Ohio EPA, NEDO, DERR
Bob Princic, Ohio EPA, NEDO, DERR
Tom Schneider, Ohio EPA, SWDO, DERR
William Damschroder, Ohio EPA, Legal

Ohio Environmental Protection Agency

**Mike DeWine**, Governor
**Jon Husted**, Lt. Governor
**Laurie A. Stevenson**, Director

May 11, 2021

**TRANSMITTED ELECTRONICALLY**

Mr. Kevin Sedlak
Restoration Program Manager
ARNG-ILE Clean Up
Camp James A Garfield JTC
1438 State Route 534 SW
Newton Falls, OH 44444

RE: US Army Ammunition Plt RVAAP
Remediation Response
Project Records
Remedial Response
Portage County
ID#267000859137

**Subject: Approval of the "Final Non Time-Critical Removal Action Work Plan for RVAAP-34 Sand Creek Disposal Road Landfill"**

Dear Mr. Sedlak:

The Ohio Environmental Protection Agency (Ohio EPA) has received the "Final Non Time-Critical Removal Action Work Plan for RVAAP-34 Sand Creek Disposal Road Landfill" at the Former Ravenna Army Ammunition Plant, Portage and Trumbull Counties, Ohio dated April 8, 2021. This document was received via email at Ohio EPA's Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR) on April 9, 2021. The document was prepared for the U.S Army Corps of Engineers on behalf of the Army National Guard Directorate by Leidos.

The final 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.

As a precautionary response to COVID-19, Ohio EPA is currently operating with most staff working remotely. During this time, we will not be issuing hard-copy mail. This letter is an official response from Ohio EPA that will be maintained as a public record. If you have any questions, please contact me at kevin.palombo@epa.ohio.gov, or call me at (330) 963-1292.

Sincerely,

RECEIVED
MAY 11 2021

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

KP/ams

ec: Rebecca Shreffler, Chenega
Bob Princic, Ohio EPA, NEDO, DERR
Natalie Oryshkewych, Ohio EPA, NEDO, DERR
Thomas Schneider, Ohio EPA, SWDO, DERR
Carrie Rasik, Ohio EPA, Central Office, DERR
Liam McEvoy, Ohio EPA, NEDO, DERR
Katie Tait, OHARNG RTLS, CJAG
Steven Kvaal, USACE Louisville
Nathaniel Peters, USACE Louisville

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

April 8, 2021

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

Subject: Ravenna Army Ammunition Plant (RVAAP) Restoration Program, Portage/Trumbull Counties, Response to Comments on Draft Non Time-Critical Removal Action Work Plan for RVAAP-34 Sand Creek Disposal Road Landfill
(Ohio EPA Work Flow Activity #267000859137)

Dear Mr. Palombo:

Enclosed for Ohio EPA files is 1 electronic copy (sent via the liquid file site) of the *Final Non Time-Critical Removal Action Work Plan for RVAAP-34 Sand Creek Disposal Road Landfill*. This document was prepared for the Army in support of the RVAAP Restoration Program. This document is being submitted following revisions made to the Sampling and Analysis Plan (Table 2-1 of the QAPP) in response to Ohio EPA comments dated April 6, 2021.

Please contact the undersigned at 614-336-6000 Ext 2053 or kevin.m.sedlak.ctr@mail.mil if there are issues or concerns with this submission.

Sincerely,

SEDLAK.KEVIN.MICHAEL.1254440171
Digitally signed by SEDLAK.KEVIN.MICHAEL.1254440171
Date: 2021.04.08 13:43:58 -04'00'

Kevin M. Sedlak
RVAAP Restoration Program Manager Army
National Guard Directorate

cc: Mark Leeper, ARNG
Bob Princic, Ohio EPA, NEDO, DERR
Tom Schneider, Ohio EPA, SWDO, DERR
Katie Tait, OHARNG, Camp James A. Garfield
Nathaniel Peters, USACE Louisville
Steve Kvaal, USACE Louisville
Rebecca Shreffler, Chenega
Pat Ryan, Leidos – REIMS
Carrie Rasik, Ohio EPA, CO, DERR
Natalie Oryshkewych, Ohio EPA NEDO, DERR Liam McEvoy, Ohio EPA, NEDO, DERR

Ohio Environmental Protection Agency

**Mike DeWine**, Governor
**Jon Husted**, Lt. Governor
**Laurie A. Stevenson**, Director

April 6, 2021

**TRANSMITTED ELECTRONICALLY**

Mr. Kevin Sedlak
Restoration Program Manager
ARNG-ILE Clean Up
Camp James A. Garfield JTC
1438 State Route 534 SW
Newton Falls, OH 44444

RE: US Army Ammunition Plt RVAAP
Remediation Response
Project Records
Remedial Response
Portage County
ID # 267000859137

**Subject: Concurrence with Response to Ohio EPA Comments on the "Draft Non Time Critical Removal Action Work Plan for RVAAP-34 Sand Creek Disposal Road Landfill" Based on Conference call of March 24, 2021**

Dear Mr. Sedlak:

The Ohio Environmental Protection Agency (Ohio EPA) has received and reviewed the response to Ohio EPA comments sent to you in our letter dated February 19, 2021 on the "Draft Non Time Critical Removal Action (NTCRA) Work Plan for RVAAP-34 Sand Creek Disposal Road Landfill" at the Former Ravenna Army Ammunition Plant, Portage and Trumbull Counties, Ohio (Camp Garfield). Your response was received via email at Ohio EPA's Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR) on March 18, 2021. The response was prepared for the United States Army Corps of Engineers on behalf of the National Guard Bureau by Endpoint Consulting, Incorporated and Alaniz Associates Corporation under Contract Number W912QR-17-C-0045.

The remaining comment to be resolved was Ohio EPA Comment 5 related to Waste Profile Sampling. Although Ohio EPA still did not completely concur with your response in your letter to us dated March 17, 2021, the call we had with the Army and their consultant on March 24, 2021, and the incorporation of the action item below, serve to resolve the comment.

**Waste Profiling**

The March 17, 2021 response to comments and our telephone call on March 24, 2021 answered much of this comment. Ohio EPA noted during this telephone call that there was a typo in the Quality Assurance Project Plan, Table 2-1 regarding waste characterization. This table noted 50 vs 250 cubic yard was the waste sampling frequency.

RECEIVED
APR 04 2021

**ACTION ITEM:** A page change should be adequate to address this edit. Please include on the revised Table 2-1 page the information that Endpoint discussed during our call that it had obtained from the landfill receiving the waste, affirming this sampling frequency meets the landfill's requirements.

As a precautionary response to COVID-19, Ohio EPA is currently operating with most staff working remotely. During this time, we will not be issuing hard-copy mail. This letter is an official response from Ohio EPA that will be maintained as a public record.

The response to Ohio EPA comments on the "Draft Non Time Critical Removal Action Work Plan for RVAAP-34 Sand Creek Disposal Road Landfill" was reviewed by personnel from Ohio EPA. Based on the agreements made in your response to Ohio EPA comments, and the conference call of March 24, 2021, the final document can be prepared. If you have questions or would like to set up a meeting to discuss, you can contact me by email at kevin.palombo@epa.ohio.gov, or at (330) 963-1292.

Sincerely,

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

KP/sc

ec: Rebecca Shreffler, Chenega Tri-Services
Katie Tait, OHARNG RTLS
Bob Princic, Ohio EPA, NEDO, DERR
Natalie Oryshkewych, Ohio EPA, NEDO, DERR
Liam McEvoy, Ohio EPA, NEDO, DERR
Thomas Schneider, Ohio EPA, SWDO, DERR
Carrie Rasik, Ohio EPA, CO, DERR
Steven Kvaal, USACE Louisville
Nat Peters, USACE Louisville
Mark Leeper, ARNG, Arlington

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

March 17, 2021

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

Subject: Ravenna Army Ammunition Plant (RVAAP) Restoration Program, Portage/Trumbull Counties, Response to Comments on Draft Non Time-Critical Removal Action Work Plan for RVAAP-34 Sand Creek Disposal Road Landfill (Ohio EPA Work Flow Activity #267000859137)

Dear Mr. Palombo:

The Army National Guard (ARNG) has reviewed comments provided for the Response to Comments letter dated January 29, 2021 for the *Draft Non Time-Critical Removal Action Work Plan for RVAAP-34 Sand Creek Disposal Road Landfill* (Work Plan) by the Ohio Environmental Protection Agency (Ohio EPA) in a letter dated February 19, 2021.

The responses on the attached comment resolution table reflect Ohio EPA comments received on February 19, 2021 regarding the Work Plan. The Ohio EPA confirmed that previous comments provided by the Ohio EPA regarding the Work Plan were adequately addressed in the letter dated February 19, 2021

Please contact the undersigned at 614-336-6000 Ext 2053 or kevin.m.sedlak.ctr@mail.mil if there are issues or concerns with this submission.

Sincerely,

SEDLAK.KEVIN.MICHAEL.1254440171 Digitally signed by SEDLAK.KEVIN.MICHAEL.1254440171 Date: 2021.03.17 06:46:32 -04'00'

Kevin M. Sedlak
RVAAP Restoration Program Manager
Army National Guard Directorate

cc: Mark Leeper, ARNG
Bob Princic, Ohio EPA, NEDO, DERR
Tom Schneider, Ohio EPA, SWDO, DERR
Katie Tait, OHARNG, Camp James A. Garfield
Nathaniel Peters, USACE Louisville
Steve Kvaal, USACE Louisville
Rebecca Shreffler, Chenega
Pat Ryan, Leidos – REIMS
Carrie Rasik, Ohio EPA, CO, DERR
Natalie Oryshkewych, Ohio EPA NEDO, DERR
Liam McEvoy, Ohio EPA, NEDO, DERR

**Comment Resolution Table**

**Installation**: Camp James A. Garfield/Former RVAAP
**Document**: Draft Non Time-Critical Removal Action Work Plan for Sand Creek Disposal Road Landfill (RVAAP-34).
**Reviewer(s)**: Kevin Palombo, Environmental Specialist, Ohio EPA
**Date**: March 17, 2021

| Cmt. No. | Page or Sheet | Comment and Recommendation | Response |
|---|---|---|---|
| Ohio EPA 5 | Section 6.1.1 Waste Profile Sampling | The response states, "Prior to receipt of this comment, and at the request of the Ohio EPA, the ARNG modified the procedure for waste profile sampling outlined in the project Sampling and Analysis Plan and Quality Assurance Project Plan. In response to this comment, and to coincide with Ohio EPA approved changes for the Load Line 9 Remedial Design, Sampling and Analysis Plan (e.g., waste profile samples will consist of an 8-point composite sample, rather than ISM)".<br><br>After talking to the LL9 SAP review team, a final LL9 SAP document has yet to be approved by Ohio EPA, and the LL9 Ohio EPA team did not have comments on the waste sampling section of the SAP. Section 3.6: Sample Design, subsection Category 3 of the draft SAP describes the waste profile sampling as one in-situ soil ISM with a minimum of 30 aliquots to the depth of excavation and one discrete sample collected at the center of the area at a depth of half the excavation depth. Therefore, modifying the procedure from ISM/discrete to eight-point composite at Sand Creek should not occur prior to the LL9 SAP being approved. If the waste profile sampling procedures in the Draft LL9 SAP keeps with the ISM and discrete procedure, conduct ISM and discrete at both areas SCss-062M-0001-SO and SCsb-037M as described by the SAP and provide identification and rationale for the number of aliquots for ISM at each area. The SAP states a minimum number of 30 aliquots, but the aliquot number should not be static for each area. Rather, the aliquot number should be based on the proposed volume of excavation (e.g., a larger volume of waste would generally have more aliquots than a smaller volume of waste). | Approval of the waste profile sampling procedure change from ISM/discrete to an 8-point composite sample was provided by the Ohio EPA in the Response to Comments letter for the SAP document dated December 28, 2020. A follow-up clarification comment regarding waste profiling was provided by the Ohio EPA in a letter dated March 2, 2021, pertaining to whether 8-point composite sampling will be used across all AOCs where waste profile sampling is required. In the Load Line 9 SAP and QAPP Response to Comments letter dated March 16, 2021, Endpoint provided confirmation that this sampling method shall be used for all AOCs covered under the SAP, including the Sand Creek AOC.<br><br>The SAP had been previously updated to state the following: “Waste profile sampling of impacted soil will consist of one 8-point composite sample per every 250 cubic yards of metals impacted soil (in-situ) to be excavated in each AOC prior to beginning excavation activities.”<br><br>The SAP also provides sampling procedures for 8-point composite sampling as it pertains to waste profile samples in Section 4.2.2.3. Additionally, the waste characterization methodology and analysis has been confirmed to meet and exceed all of the waste facility’s Federal (e.g, RCRA) and State permit requirements. |

Ohio Environmental Protection Agency

**Mike DeWine**, Governor
**Jon Husted**, Lt. Governor
**Laurie A. Stevenson**, Director

February 19, 2021

**TRANSMITTED ELECTRONICALLY**

Mr. Kevin Sedlak
Restoration Program Manager
ARNG-ILE Clean Up
Camp James A Garfield JTC
1438 State Route 534 SW
Newton Falls, OH 44444

RE: US Army Ammunition Plt RVAAP
Remediation Response
Project Records
Remedial Response
Portage County
ID # 267000859137

**Subject: Response to Ohio EPA Comments on the "Draft Non Time Critical Removal Action Work Plan for RVAAP-34 Sand Creek Disposal Road Landfill" dated January 29, 2021**

Dear Mr. Sedlak:

The Ohio Environmental Protection Agency (Ohio EPA) has received and reviewed the Response to Ohio EPA comments sent to you in our letter dated January 8, 2021 on the "Draft Non Time Critical Removal Action (NTCRA) Work Plan for RVAAP-34 Sand Creek Disposal Road Landfill" at the Former Ravenna Army Ammunition Plant, Portage and Trumbull Counties, Ohio (CJAG). Your response was received via email at Ohio EPA's Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR) on February 2, 2021. The response was prepared for the United States Army Corps of Engineers on behalf of the National Guard Bureau by Endpoint Consulting, Incorporated and Alaniz Associates Corporation under Contract Number W912QR-17-C-0045.

The selected remedial alternative for soil at the Sand Creek Disposal Road Landfill RVAAP-34, as recommended in the Engineering Evaluation/Cost Analysis (EE/CA), is Alternative 2, Excavation with Off-Site Disposal for Soil with Arsenic and Ex-Situ Thermal Treatment for Soil with polycyclic aromatic hydrocarbons (PAHs) to Attain Unrestricted (Residential) Land Use. The scope of this activity includes the excavation and off-site disposal of soil at sample locations SCss-062M-0001-SO and SCsb-037M-0001-SO/ SCsb-037M-0002-SO and ex-situ thermal treatment of soil excavated at sample locations SCss-060M-0001-SO and SCsb-049M-0001-SO. To this end, this NTCRA work plan details requirements and procedures necessary to implement the selected remedial action alternative, including a plan to excavate and dispose of arsenic-impacted soil above RVAAP background levels and excavation and thermal treatment of PAH-impacted soil exceeding residential Regional Screening Levels (RSLs), allowing for unrestricted (i.e., residential) reuse of the area of concern (AOC).

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The following provides Ohio EPA's comments and the Army's response. One of the comments, Comment 5, will require further response and concurrence.

## COMMENTS

**Comment 1: Section 1.0: Introduction, Figure 1.4, Estimated Extent of Soil Remediation**

The identification labels for areas SCsb-037M and SCsb-049M are illegible.

**Comment 1 Action Item:** Revise the map and modify area identifying labels.

**Response to Comment:** Figure 1.4 has been revised so that the referenced labels are legible. A copy of the revised figure was also attached. **The response addresses the comment.**

**Comment 2: Section 5.2.2, page 23 Ex-Situ Thermal Treatment of PAHs in Soil Using the Vapor Energy Generator (VEG) Technology, VEG Thermal Treatment Process**

A description of the thermal treatment process is described in this section, but the volume or thickness of the soil in the treatment chamber is not provided. The section also explains that the temperature in the chamber reaches 500 to 700 degrees Fahrenheit. It is unclear if the soil temperature is specifically monitored or just the temperature within the chamber.

**Comment 2 Action Item:** Clarify the what the volume (and thickness) of the soil is within the chamber and specifically if the temperature of the middle of the soil volume is monitored.

**Response to Comment:** The following sentences in the second paragraph under "VEG Thermal Treatment Process" in Section 5.2.2. have been revised to read: "The steam created through the VEG's vapor generator is in turn placed into contact with the impacted soil within a fully enclosed and sealed treatment chamber. Depth of soil within the treatment chamber is approximately 2.5 feet. Soil temperatures will be measured after the soil is discharged from the treatment chamber by inserting thermocouples in the soil, or using a hand-held infrared thermometer, demonstrating that soil has reached target treatment temperatures." **The response addresses the comment.**

**Comment 3: Section 6.1.1: Waste Profile Sampling**

The section describes how sampling will take place to characterize the waste profile in proposed arsenic-impacted excavation areas prior to removal of soils. This will be based on one soil boring in each area. The section does not provide the lead time anticipated for this sampling.

**Comment 3 Action Item:** Provide the anticipated lead time for this sampling event prior to excavation.

**Response to Comment:** Waste profile samples will be collected from all AOCs and submitted to the laboratory at the same time prior to commencing remedial activities/excavation at any one AOC within CJAG. Samples will be collected at a minimum of 1 week prior to excavation.

In response to the comment, and to coincide with Ohio EPA approved changes for the Load Line 9 Remedial Design, Sampling and Analysis Plan (e.g., waste profile samples will consist of an eight-point composite sample, rather than incremental sampling methodology (ISM)), the following sentences in Section 6.1.1. have been revised to: "Prior to excavating arsenic-impacted soil at the Sand Creek AOC, one in-situ waste profile sample will be collected from within the limits of each excavation containing soils slated for disposal." "Collecting profile samples from all AOCs involving soil disposal prior to soil excavation at each respective AOC will allow adequate time to receive profile sample results…" "One 8-point composite in-situ soil sample (with aliquots collected from the 0-1 ft bgs range) will be collected within the boundaries of the excavation around SCss062M and SCss-037 at the beginning of all remedial activities at CJAG or a minimum of 1-week prior to excavation." **The response addresses the comment.**

**Comment 4: Section 6.2.2: Deep Excavation Confirmation Sampling**

One discrete confirmation soil sample from each wall of the deep excavation areas is proposed at a depth of half of the excavation. At the arsenic excavation area for SCsb-037M-0001-SO/SCsb-037M-0002-SO, remedial investigation samples were collected at two depth intervals: one to five feet below ground surface (bgs) at SCsb-037-M-0001-SO and five to nine feet bgs at SCsb-037M-0002-SO. Each of these depth intervals reported arsenic detections above a soil clean-up goal. Therefore, the deep excavation wall confirmation discrete sampling at this area should, at a minimum, have two depth locations at each wall, one in the one to five-foot interval and one at the five to nine-foot interval, to confirm arsenic concentrations remaining, if any, are below clean-up goals.

**Comment 4 Action Item:** Revise the depth proposed for the wall confirmation discrete soil sampling at remedial area SCsb-037M-0001-SO/SCsb-037M-0002-SO.

**Response to Comment:** Eight sidewall samples will be collected, one from the one to five-foot interval and one from the five to nine-foot interval. The text in section 6.2.2 has been revised, and the following note has been added to Table 6-2, "For discrete samples collected from sidewalls at SCsb-037M and SCsb-049M, the identifier "T" will denote a sidewall sample collected from 1-5 ft bgs and "B" will denote collection from 5-9 ft bgs." **The response addresses the comment.**

**Comment 5: Section 6.6.1: Waste Profile Sampling**

The report states, "[p]rior to excavating arsenic-impacted soil at the Sand Creek AOC, two in-situ waste profile samples will be collected from within the limits of each excavation." For the shallow soil excavation at SCss-062M-0001-SO, an ISM sample from the zero to one-foot depth will be collected to profile the 71 cubic yards estimated for excavation. For the deep soil excavation at SCsb-037M, a discrete sample from the middle depth of the excavation (i.e., five feet) will be collected from the center of the excavation area of approximately 13 cubic yards. It is unclear how one ISM sample will be appropriate to characterize 71 cubic yards of soil at SCss-062M-0001-SO, and how one discrete sample will be appropriate for waste profile sampling of 13 cubic yards of soil at SCsb-037M. U.S. EPA Guidance SW-846: Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, Chapter 9: Sampling Plan discusses how chemical information needs to be sufficiently precise to be considered reliable, and that "sampling precision is most commonly achieved by taking an appropriate number of samples from the population." The guidance points to the use of Formula 8 in Table 9-1 for a means of estimating an appropriate sampling effort, and that increasing the number or size of samples taken from a population increases sampling precision.

**Comment 5 Action Item:** Provide rationale for the appropriateness of collecting the proposed waste profile samples or increase the number of waste profiling samples.

**Response to Comment:** The response states, "Prior to receipt of this comment, and at the request of the Ohio EPA, the ARNG modified the procedure for waste profile sampling outlined in the project Sampling and Analysis Plan and Quality Assurance Project Plan. In response to this comment, and to coincide with Ohio EPA approved changes for the Load Line 9 Remedial Design, Sampling and Analysis Plan (e.g., waste profile samples will consist of an 8-point composite sample, rather than ISM)".

After talking to the LL9 SAP review team, a final LL9 SAP document has yet to be approved by Ohio EPA, and the LL9 Ohio EPA team did not have comments on the waste sampling section of the SAP. Section 3.6: Sample Design, subsection Category 3 of the draft SAP describes the waste profile sampling as one in-situ soil ISM with a minimum of 30 aliquots to the depth of excavation and one discrete sample collected at the center of the area at a depth of half the excavation depth. Therefore, modifying the procedure from ISM/discrete to eight-point composite at Sand Creek should not occur prior to the LL9 SAP being approved. If the waste profile sampling procedures in the Draft LL9 SAP keeps with the ISM and discrete procedure, conduct ISM and discrete at both areas SCss-062M-0001-SO and SCsb-037M as described by the SAP and provide identification and rationale for the number of aliquots for ISM at each area. The SAP states a minimum number of 30 aliquots, but the aliquot number should not be static for each area. Rather, the aliquot number should be based on the proposed volume of excavation (e.g., a larger volume of waste would generally have more aliquots than a smaller volume of waste).

Also, once approved, please provide the final LL9 RD SAP as an appendix to the Sand Creek NTCR for reference.

**Comment 6: Table 3-1. Summary of Soil COCs, Cleanup Goals, and Remediation - Volumes, Arsenic Clean-Up Goal**

Footnote 1 to the table states, "Cleanup goal for arsenic based on a background 15.5 to 18.8 mg/kg and compared to 20.1 mg/kg 95% [Upper Confidence Limit] UCL." The report does not state if the original background data sets for the surface soil and subsurface soil were used to calculate the 95% UCL, or if it was the two final background values that were used to calculate the proposed 95% UCL background value. If it were the latter option, two values are not statistically appropriate to develop a 95% UCL, and the U.S. EPA 95% UCL software would give error messages. Additionally, the U.S. Army Corp of Engineers (USACE) developed separate arsenic background values to be used for the surface soil and subsurface soil, as reported in their March 2010 document "Final Facility-Wide Human Health Cleanup Goals for the Ravenna Army Ammunition Plant (RVAAP), Ravenna, Ohio" as prepared by SAIC. The Ravenna site-specific surface soil background value for arsenic is 15.4 mg/kg, and the Ravenna site-specific subsurface soil background value for arsenic is 19.8 mg/kg. These values are the background values to use for arsenic clean-up goals for the surface and subsurface excavations as previously developed by USACE and agreed upon by Ohio EPA.

**Comment 6 Action Item:** Revised footnote 1 for Table 3-1 to state the soil clean-up goals for arsenic are the surface soil background value for arsenic of 15.4 mg/kg and the subsurface soil background value for arsenic of 19.8 mg/kg.

**Response to Comment:** The footnote was revised per the action: Footnote 1 for Table 3-1 has been revised to, "Cleanup goal for arsenic based on a background surface soil value of 15.4 and subsurface value of 19.8 mg/kg." **The response addresses the comment.**

The response to Ohio EPA comments on the "Draft Non Time Critical Removal Action Work Plan for RVAAP-34 Sand Creek Disposal Road Landfill" was reviewed by personnel from Ohio EPA. Additional information is necessary to approve the response to Comment 5.

As a precautionary response to COVID-19, Ohio EPA is currently operating with most staff working remotely. During this time, we will not be issuing hard-copy mail. This letter is an official response from Ohio EPA that will be maintained as a public record.

If you have questions or would like to set up a meeting to discuss, you can contact me via email at kevin.palombo@epa.ohio.gov, or at (330) 963-1292.

Sincerely,

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

KP/sc

ec: Katie Tait, OHARNG RTLS
Steven Kvaal, USACE Louisville
Nat Peters, USACE Louisville
Mark Leeper, ARNG
Rebecca Shreffler, Chenega Tri-Services
Bob Princic, Ohio EPA, NEDO, DERR
Natalie Oryshkewych, Ohio EPA, NEDO,
DERR Liam McEvoy, Ohio EPA, NEDO, DERR
Thomas Schneider, Ohio EPA, SWDO, DERR
Carrie Rasik, Ohio EPA, CO, DERR

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

January 29, 2021

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

Subject: Ravenna Army Ammunition Plant (RVAAP) Restoration Program, Portage/Trumbull Counties, Draft Non Time-Critical Removal Action Work Plan for RVAAP-34 Sand Creek Disposal Road Landfill (Ohio EPA Work Flow Activity #267000859137)

Dear Mr. Palombo:

The Army National Guard (ARNG) has reviewed comments provided by the Ohio Environmental Protection Agency (Ohio EPA) for the *Draft Non Time-Critical Removal Action (NTCRA) Work Plan for RVAAP-34 Sand Creek Disposal Road Landfill* dated October 16, 2020.

The responses on the attached comment resolution table reflect ARNG responses to Ohio EPA comments received on January 8, 2021 regarding the subject NTCRA Work Plan.

Please contact the undersigned at 614-336-6000 Ext 2053 or kevin.m.sedlak.ctr@mail.mil if there are issues or concerns with this submission.

Sincerely,

SEDLAK.KEVIN.MICHAEL.1254440171

Digitally signed by SEDLAK.KEVIN.MICHAEL.1254440171
Date: 2021.02.01 06:47:23 -05'00'

Kevin M. Sedlak
RVAAP Restoration Program Manager
Army National Guard Directorate

cc: Mark Leeper, ARNG
Bob Princic, Ohio EPA, NEDO, DERR
Tom Schneider, Ohio EPA, SWDO, DERR
Katie Tait, OHARNG, Camp James A. Garfield
Nathaniel Peters, USACE Louisville
Steve Kvaal, USACE Louisville
Rebecca Shreffler, Chenega
Pat Ryan, Leidos – REIMS
Carrie Rasik, Ohio EPA, CO, DERR
Natalie Oryshkewych, Ohio EPA NEDO, DERR
Liam McEvoy, Ohio EPA, NEDO, DERR

**Comment Resolution Table**

**Installation**: Camp James A. Garfield/Former RVAAP
**Document**: Draft Non Time-Critical Removal Action Work Plan for Sand Creek Disposal Road Landfill (RVAAP-34).
**Reviewer(s)**: Kevin Palombo, Environmental Specialist, Ohio EPA
**Date**: January 29, 2021

| Cmt. No. | Page or Sheet | Comment and Recommendation | Response |
|---|---|---|---|
| Ohio EPA 1 | Figure 1.4 | The identification labels for areas SCsb-037M, and SCsb-049M are illegible.<br><br>Action Item: Revise the map and modify area identifying labels. | Figure 1.4 has been revised so that the referenced labels are legible. See attached copy of the revised figure. |
| Ohio EPA 2 | Section 5.2.2, Page 23 | A description of the thermal treatment process is described in this section, but the volume or thickness of the soil in the treatment chamber is not provided. The section also explains that the temperature in the chamber reaches 500-700 degrees Fahrenheit. It is unclear if the soil temperature is specifically monitored or just the temperature within the chamber.<br><br>Action Item: Clarify the what the volume (and thickness) of the soil is within the chamber and specifically if the temperature of the middle of the soil volume is monitored. | The following sentences in the second paragraph under "VEG Thermal Treatment Process" in Section 5.2.2. have been revised to read:<br><br>"The steam created through the VEG's vapor generator is in turn placed into contact with the impacted soil within a fully enclosed and sealed treatment chamber. Depth of soil within the treatment chamber is approximately 2.5 feet."<br><br>"Soil temperatures will be measured after the soil is discharged from the treatment chamber by inserting thermocouples in the soil, or using a hand-held infrared thermometer, demonstrating that soil has reached target treatment temperatures." |

**Comment Resolution Table**

**Installation**: Camp James A. Garfield/Former RVAAP
**Document**: Draft Non Time-Critical Removal Action Work Plan for Sand Creek Disposal Road Landfill (RVAAP-34).
**Reviewer(s)**: Kevin Palombo, Environmental Specialist, Ohio EPA
**Date**: January 29, 2021

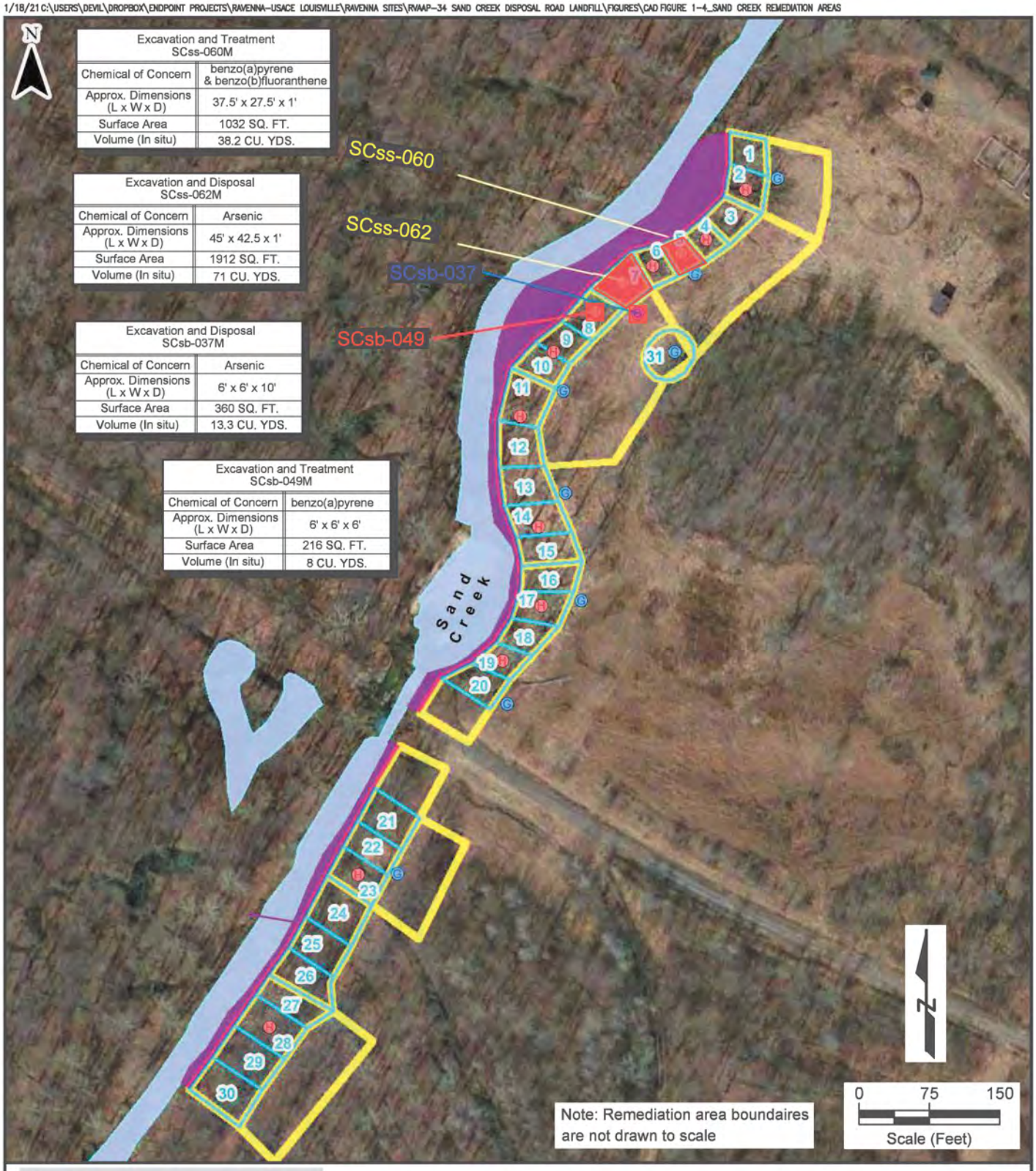
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| Ohio EPA 3 | Section 6.1.1 Waste Profile Sampling | The section describes how sampling will take place to characterize the waste profile in proposed arsenic -impacted excavation areas prior to removal of soils. This will be based on one soil boring in each area. The section does not provide the lead time anticipated for this sampling.<br><br>Action Item: Provide the anticipated lead time for this sampling event prior to excavation. | Waste profile samples will be collected from all AOCs and submitted to the laboratory at the same time prior to commencing remedial activities/excavation at any one AOC within CJAG. Samples will be collected at a minimum of 1 week prior to excavation.<br><br>In response to the comment, and to coincide with Ohio EPA approved changes for the Load Line 9 Remedial Design, Sampling and Analysis Plan (e.g., waste profile samples will consist of an 8-point composite sample, rather than ISM), the following sentences in Section 6.1.1. have been revised to:<br><br>"Prior to excavating arsenic-impacted soil at the Sand Creek AOC, one in-situ waste profile sample will be collected from within the limits of each excavation containing soils slated for disposal."<br><br>"Collecting profile samples from all AOCs involving soil disposal prior to soil excavation at each respective AOC will allow adequate time to receive profile sample results…"<br><br>"One 8-point composite in-situ soil sample (with aliquots collected from the 0-1 ft bgs range) will be collected within the boundaries of the excavation around SCss-062M and SCss-037 at the beginning of all remedial activities at CJAG or a minimum of 1-week prior to excavation." |
| Ohio EPA 4 | Section 6.6.1 Waste Profile Sampling | The report states, "[p]rior to excavating arsenic-impacted soil at the Sand Creek AOC, two in situ waste profile samples will be collected from within the limits of each excavation." For the shallow soil excavation at SCss-062M-0001-SO, an incremental sampling methodology (ISM) sample from the zero to one-foot depth will be collected to profile the 71 cubic yards estimated for excavation. For the deep soil excavation at SCsb-037M, a discrete sample from the middle depth of the excavation (i.e., five feet) will be collected from the center of the excavation area of approximately 13 cubic yards. It is unclear | The sample quantity was selected to comply with the waste facility RCRA permit requirements.<br><br>Prior to receipt of this comment, and at the request of the Ohio EPA, the ARNG modified the procedure for waste profile sampling outlined in the project Sampling and Analysis Plan and Quality Assurance Project Plan.<br><br>In response to this comment, and to coincide with Ohio EPA approved changes for the Load Line 9 Remedial Design, Sampling and Analysis Plan (e.g., waste profile samples will consist of an 8-point composite sample, rather than ISM), the following sentence in Section 6.1.1. have been revised to:<br><br>"One 8-point composite in-situ soil sample (with aliquots collected from the 0-1 ft |

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| | | how one ISM sample will be appropriate to characterize 71 cubic yards of soil at SCss-062M-0001-SO, and how one discrete sample will be appropriate for waste profile sampling of 13 cubic yards of soil at SCsb-037M. U.S. EPA Guidance SW-846: Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, Chapter 9: Sampling Plan discusses how chemical information needs to be sufficiently precise to be considered reliable, and that "sampling precision is most commonly achieved by taking an appropriate number of samples from the population." The guidance points to the use of Formula 8 in Table 9-1 for a means of estimating an appropriate sampling effort, and that increasing the number or size of samples taken from a population increases sampling precision.<br><br>Action Item: Provide rationale for the appropriateness of collecting the proposed waste profile samples or increase the number of waste profiling samples. | bgs range) will be collected within the boundaries of the excavation around SCss-062M and SCss-037 at the beginning of all remedial activities at CJAG or a minimum of 1-week prior to excavation. Specifically, one 8-point composite soil sample with aliquots collected from the 0-1 ft bgs range will be collected from the excavation surrounding SCss-062M and one 8-point composite soil sample with aliquots collected from approximately 5 ft bgs (i.e., half the total depth of the excavation) will be collected from the excavation surrounding SCss-037." |
| Ohio EPA 5 | Section 6.2.2 Deep Excavation Confirmation Sampling | One discrete confirmation soil sample from each wall of the deep excavation areas is proposed at a depth of half of the excavation. At the arsenic excavation area for SCsb-037M0001-SO/SCsb-037M-0002-SO, remedial investigation samples were collected at two depth intervals: one to five feet below ground surface at SCsb-037-M-0001-SO and five to nine feet below ground surface at SCsb-037M-0002-SO. Each of these depth intervals reported arsenic detections above a soil clean-up goal. Therefore, the deep excavation wall confirmation discrete sampling at this area | The text in Section 6.2.2. has been revised to state, "… confirmation sampling at these locations will consist of collecting discrete sidewall samples at two depth intervals: from 1 to 5 feet bgs and from 5 to 9 feet bgs (i.e., two discrete samples collected per sidewall). Sample nomenclature and locations are shown on Table 6-2." and "Based on the aforementioned anticipated dimensions and sampling intervals, a minimum of 8 sidewall and 1 bottom samples (total of 9 discrete samples) are proposed for each excavation."<br><br>Additionally, the following note has been added to Table 6-2, "For discrete samples collected from sidewalls at SCsb-037M and SCsb-049M, the identifier "T" will denote a sidewall sample collected from 1-5 ft bgs and "B" will denote collection from 5-9 ft bgs." |

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| | | should, at a minimum, have two depth locations at each wall, one in the one to five-foot interval and one at the five to nine-foot interval, to confirm arsenic concentrations remaining, if any, are below clean-up goals.<br><br>Action Item: Revise the depth proposed for the wall confirmation discrete soil sampling at remedial area SCsb-037M-0001-SO/SCsb-037M-0002-SO. | |
| Ohio EPA 6 | Table 3-1.<br><br>Summary of Soil COCs, Cleanup Goals, and Remediation Volumes, Arsenic Cleanup Goal | Footnote 1 to the table states, "Cleanup goal for arsenic based on a background 15.5 to 18.8 mg/kg and compared to 20.1 mg/kg 95%UCL [Upper Confidence Limit]". The report does not state if the original background data sets for the surface soil and subsurface soil were used to calculate the 95% UCL, or if it was the two final background values that were used to calculate the proposed 95% UCL background value. If it were the latter option, two values are not statistically appropriate to develop a 95% UCL, and the U.S. EPA 95% UCL software would give error messages. Additionally, the USACE developed separate arsenic background values to be used for the surface soil and subsurface soil, as reported in their March 2010 document "Final Facility-Wide Human Health Cleanup Goals for the Ravenna Army Ammunition Plant (RVAAP), Ravenna, Ohio" as prepared by SAIC. The Ravenna site-specific surface soil background value for arsenic is 15.4 mg/kg, and the Ravenna site-specific subsurface soil background value for arsenic is 19.8 mg/kg. These values are the background values to use for arsenic clean-up goals for the surface and | Footnote 1 for Table 3-1 has been revised to, “Cleanup goal for arsenic based on a background surface soil value of 15.4 and subsurface value of 19.8 mg/kg.” |

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| | | subsurface excavations as previously developed by USAGE and agreed upon by Ohio EPA.<br><br>Action Item: Revise footnote 1 for Table 3-1 to state the soil clean-up goals for arsenic are the surface soil background value for arsenic of 15.4 mg/kg and the subsurface soil background value for arsenic of 19.8 mg/kg. | |

1/18/21 C:\USERS\DEVIL\DROPBOX\ENDPOINT PROJECTS\RAVENNA-USACE LOUISVILLE\RAVENNA SITES\RVAAP-34 SAND CREEK DISPOSAL ROAD LANDFILL\FIGURES\CAD FIGURE 1-4_SAND CREEK REMEDIATION AREAS




**Legend**

- Geoprobe Sample Location (9)
- Hand-Auger Sample Location (13)
- Incremental Sample Sediment Area (2)
- Incremental Sample Soil Area (18)
- Sand Creek Dump-Limits & Sample Grids (16)
- Area Requiring Remediation

US Army Corps of Engineers Louisville District

Endpoint. Strategy. Science. Sustainability.

Figure 1-4

Estimated Extent of Soil Remediation

RVAAP-34 Sand Creek Disposal Road Landfill
Former RVAAP/Camp James A. Garfield

Basemap Source: USACE, 2019. Engineering Evaluation/Cost Analysis: RVAAP-34 Sand Creek Disposal Road Landfill. January

Ohio Environmental Protection Agency

**Mike DeWine**, Governor
**Jon Husted**, Lt. Governor
**Laurie A. Stevenson**, Director

January 8, 2021

**TRANSMITTED ELECTRONICALLY**

Mr. Kevin Sedlak
Restoration Program
Manager ARNG-ILE Clean Up
Camp James A Garfield JTC
1438 State Route 534 SW
Newton Falls, OH 44444

RE: US Army Ammunition Plt
RVAAP Remediation Response
Project Records
Remedial Response
Portage County
ID # 267000859137

**Subject: Ohio EPA Comments on the "Draft Non Time Critical Removal Action Work Plan for RVAAP-34 Sand Creek Disposal Road Landfill" dated October 16, 2020**

Dear Mr. Sedlak:

The Ohio Environmental Protection Agency (Ohio EPA) has received and reviewed the "Draft Non Time Critical Removal Action (NTCRA) Work Plan for RVAAP-34 Sand Creek Disposal Road Landfill" at the Former Ravenna Army Ammunition Plant, Portage and Trumbull Counties, Ohio (Camp Garfield). This document was received via email at Ohio EPA's Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR) on October 19, 2020. The report was prepared for the United States Army Corps of Engineers (USACE) on behalf of the National Guard Bureau by Endpoint Consulting, Incorporated and Alaniz Associates Corporation under Contract Number W912QR-17-C-0045. Comments on the document based on Ohio EPA review are provided below. Please provide responses to the comments in accordance with the Directors Findings and Orders. Additional information is necessary to approve the document.

**DRAFT NTCRA WORK PLAN FOR RVAAP-34 SAND CREEK DISPOSAL ROAD LANDFILL**

The selected remedial alternative for soil at the Sand Creek Disposal Road Landfill RVAAP-34, as recommended in the Engineering Evaluation/Cost Analysis (EE/CA), is Alternative 2, Excavation with Off-Site Disposal for Soil with Arsenic and Ex-Situ Thermal Treatment for Soil with polycyclic aromatic hydrocarbons (PAHs) to Attain Unrestricted (Residential) Land Use.

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The scope of this activity includes the excavation and off-site disposal of soil at sample locations SCss-062M-0001-SO and SCsb-037M-0001-SO/SCsb-037M-0002-SO and ex-situ thermal treatment of soil excavated at sample locations SCss-060M-0001-SO and SCsb-049M-0001-SO. To this end, this NTCRA work plan details requirements and procedures necessary to implement the selected remedial action alternative, including a plan to excavate and dispose of arsenic-impacted soil above RVAAP background levels and excavation and thermal treatment of PAH-impacted soil exceeding residential Regional Screening Levels (RSLs), allowing for unrestricted (i.e., residential) reuse of the area of concern (AOC).

## COMMENTS

### Comment 1: Section 1.0: Introduction, Figure 1.4, Estimated Extent of Soil Remediation

The identification labels for areas SCsb-037M, and SCsb-049M are illegible.

> **Action Item:** Revise the map and modify area identifying labels.

### Comment 2: Section 5.2.2, page 23 Ex-Situ Thermal Treatment of PAHs in Soil Using the Vapor Energy Generator (VEG) Technology, VEG Thermal Treatment Process

A description of the thermal treatment process is described in this section, but the volume or thickness of the soil in the treatment chamber is not provided. The section also explains that the temperature in the chamber reaches 500-700 degrees Fahrenheit. It is unclear if the soil temperature is specifically monitored or just the temperature within the chamber.

> **Action Item:** Clarify the what the volume (and thickness) of the soil is within the chamber and specifically if the temperature of the middle of the soil volume is monitored.

### Comment 3: Section 6.1.1: Waste Profile Sampling

The section describes how sampling will take place to characterize the waste profile in proposed arsenic -impacted excavation areas prior to removal of soils. This will be based on one soil boring in each area. The section does not provide the lead time anticipated for this sampling.

> **Action Item:** Provide the anticipated lead time for this sampling event prior to excavation.

### Comment 4: Section 6.6.1: Waste Profile Sampling

The report states, "[p]rior to excavating arsenic-impacted soil at the Sand Creek AOC, two in-situ waste profile samples will be collected from within the limits of each excavation." For the shallow soil excavation at SCss-062M-0001-SO, an incremental sampling methodology (ISM) sample from the zero to one-foot depth will be collected to profile the 71 cubic yards estimated for excavation. For the deep soil excavation at SCsb-037M, a discrete sample from the middle

depth of the excavation (i.e., five feet) will be collected from the center of the excavation area of approximately 13 cubic yards. It is unclear how one ISM sample will be appropriate to characterize 71 cubic yards of soil at SCss-062M-0001-SO, and how one discrete sample will be appropriate for waste profile sampling of 13 cubic yards of soil at SCsb-037M. U.S. EPA Guidance SW-846: Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, Chapter 9: Sampling Plan discusses how chemical information needs to be sufficiently precise to be considered reliable, and that "sampling precision is most commonly achieved by taking an appropriate number of samples from the population." The guidance points to the use of Formula 8 in Table 9-1 for a means of estimating an appropriate sampling effort, and that increasing the number or size of samples taken from a population increases sampling precision.

> **Action Item:** Provide rationale for the appropriateness of collecting the proposed waste profile samples or increase the number of waste profiling samples.

**Comment 5: Section 6.2.2: Deep Excavation Confirmation Sampling**

One discrete confirmation soil sample from each wall of the deep excavation areas is proposed at a depth of half of the excavation. At the arsenic excavation area for SCsb-037M-0001-SO/SCsb-037M-0002-SO, remedial investigation samples were collected at two depth intervals: one to five feet below ground surface at SCsb-037-M-0001-SO and five to nine feet below ground surface at SCsb-037M-0002-SO. Each of these depth intervals reported arsenic detections above a soil clean-up goal. Therefore, the deep excavation wall confirmation discrete sampling at this area should, at a minimum, have two depth locations at each wall, one in the one to five-foot interval and one at the five to nine-foot interval, to confirm arsenic concentrations remaining, if any, are below clean-up goals.

> **Action Item:** Revise the depth proposed for the wall confirmation discrete soil sampling at remedial area SCsb-037M-0001-SO/SCsb-037M-0002-SO.

**Comment 6: Table 3-1. Summary of Soil COCs, Cleanup Goals, and Remediation - Volumes, Arsenic Clean-Up Goal**

Footnote 1 to the table states, "Cleanup goal for arsenic based on a background 15.5 to 18.8 mg/kg and compared to 20.1 mg/kg 95%UCL [Upper Confidence Limit]". The report does not state if the original background data sets for the surface soil and subsurface soil were used to calculate the 95% UCL, or if it was the two final background values that were used to calculate the proposed 95% UCL background value. If it were the latter option, two values are not statistically appropriate to develop a 95% UCL, and the U.S. EPA 95% UCL software would give error messages. Additionally, the USACE developed separate arsenic background values to be used for the surface soil and subsurface soil, as reported in their March 2010 document "Final Facility-Wide Human Health Cleanup Goals for the Ravenna Army Ammunition Plant (RVAAP), Ravenna, Ohio" as prepared by SAIC. The Ravenna site-specific surface soil background value for arsenic is 15.4 mg/kg, and the Ravenna site-specific subsurface soil background value for arsenic is 19.8 mg/kg. These values are the background

values to use for arsenic clean-up goals for the surface and subsurface excavations as previously developed by USACE and agreed upon by Ohio EPA.

> **Action Item:** Revise footnote 1 for Table 3-1 to state the soil clean-up goals for arsenic are the surface soil background value for arsenic of 15.4 mg/kg and the subsurface soil background value for arsenic of 19.8 mg/kg.

As a precautionary response to COVID-19, Ohio EPA is currently operating with most staff working remotely. During this time, we will not be issuing hard-copy mail. This letter is an official response from Ohio EPA that will be maintained as a public record.

This "Draft Non Time Critical Removal Action Work Plan for RVAAP-34 Sand Creek Disposal Road Landfill" was reviewed by personnel from Ohio EPA. If you have questions or would like to set up a meeting to discuss these comments, you can contact me via email at kevin.palombo@epa.ohio.gov, or at (330) 963-1292.

Sincerely,

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

KP/sc

ec: Katie Tait, OHARNG RTLS
Steven Kvaal, USACE Louisville
Nat Peters, USACE Louisville
Rebecca Shreffler, Chenega Tri-Services
Bob Princic, Ohio EPA, NEDO, DERR
Natalie Oryshkewych, Ohio EPA NEDO, DERR
Liam McEvoy, Ohio EPA, NEDO, DERR
Thomas Schneider, Ohio EPA, SWDO, DERR
Carrie Rasik, Ohio EPA, CO, DERR

Ohio Environmental Protection Agency

**Mike DeWine**, Governor
**Jon Husted**, Lt. Governor
**Laurie A. Stevenson**, Director

March 26, 2021

**TRANSMITTED ELECTRONICALLY**

Mr. Kevin M. Sedlak
Army National Guard
Installations & Environment
Cleanup Branch IPA Designation
1438 State Route 534 SW259
Newton Falls, OH 44444

RE: US Army Ravenna Ammunition Plt RVAAP
Remediation Response
Project Records
Remedial Response
Portage County
ID # 267000859259

**Subject: Final Remedial Design for Soil, Sediment and Surface Water at RVAAP-38 NACA Test Area Dated March 19, 2021**

Dear Mr. Sedlak:

The Ohio Environmental Protection Agency (Ohio EPA), Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR) has received and reviewed the document titled "Final Remedial Design for Soil, Sediment and Surface Water RVAAP-38 NACA Test Area." This document was prepared for the U.S. Army Corps of Engineers Louisville District, by Endpoint Consulting, Inc., 5 South Linden St., Suite 2, South San Francisco, CA 94080 and Alaniz Associates Corp., 21334 East Cloverton St., Covina, CA 91724.

Ohio EPA approves the document.

The Alaniz-Endpoint Team is contracted to conduct remediation work at a total of five areas of concern (AOCs). Ohio EPA is working with you on revisions to the sampling and analysis plan (SAP), which is contained in the Final RD for Load Line 9. Once revisions are made to the Endpoint 2020 SAP, it will apply to the RVAAP-38 NACA Test Area AOC and the other four AOCs.

As a precautionary response to COVID-19, Ohio EPA is currently operating with most staff working remotely. During this time, we will not be issuing hard-copy mail. This letter is an official response from Ohio EPA that will be maintained as a public record.

RECEIVED
MAR 29 2021

If you have any questions concerning this letter, please contact Edward D'Amato at (330) 963-1170, or via email at ed.damato@epa.ohio.gov.

Sincerely,

Edward J D'Amato

Edward D'Amato
Site Coordinator
Division of Environmental Response and Revitalization

ED/sc

ec: Katie Tait, OHARNG RTLS
Nat Peters, USACE
Steven Kvaal, USACE
Rebecca Shreffler, Chenega
Mark Leeper, ARNG
Natalie Oryshkewych, Ohio EPA, NEDO, DERR
Megan Oravec, Ohio EPA, NEDO, DERR
Bob Princic, Ohio EPA, NEDO, DERR
Susan Netzly-Watkins, Ohio EPA, DERR, NEDO
Tom Schneider, Ohio EPA, SWDO, DERR

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

March 19, 2021

Ohio Environmental Protection Agency
DERR-NEDO
Attn: Ed D'Amato
2110 East Aurora Road
Twinsburg, OH 44087-1924

Subject: Ravenna Army Ammunition Plant (RVAAP) Restoration Program, Portage/Trumbull Counties, Final Remedial Design for RVAAP-38 NACA Test Area (Ohio EPA Work Flow Activity #267000859098)

Dear Mr. D'Amato:

Enclosed for Ohio EPA's files is 1 electronic copy (sent via the liquid file site) of the *Final Remedial Design for Soil, Sediment and Surface Water at RVAAP-38 NACA Test Area*. This document was prepared for the Army in support of the RVAAP Restoration Program.

Please contact the undersigned at 614-336-6000 Ex 2053 or kevin.m.sedlak.ctr.mail.mil if there are issues or concerns with this submission.

Sincerely,

SEDLAK.KEVIN.MICHAEL.1254440171

Digitally signed by SEDLAK.KEVIN.MICHAEL.1254440171
Date: 2021.03.19 09:07:00 -04'00'

Kevin Sedlak
RVAAP Restoration Program Manager
Army National Guard Directorate

cc: Bob Princic, Ohio EPA, NEDO, DERR
Tom Schneider, Ohio EPA, SWDO, DERR
Mark Leeper, ARNG
Katie Tait, OHARNG, Camp James A. Garfield
Craig Coombs, USACE Louisville
Nathaniel Peters, USACE Louisville
Steve Kvaal, USACE Louisville
Rebecca Shreffler, Chenega
Jennifer Tierney, Vista Sciences Corporation
Pat Ryan, Leidos – REIMS

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

December 8, 2020

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

Subject: Ravenna Army Ammunition Plant (RVAAP) Restoration Program, Portage/Trumbull Counties, Response to Comments on Draft Remedial Design for RVAAP-42 Load Line 9, SAP and QAPP (Ohio EPA Work Flow Activity #267000859264)

Dear Ms. Netzly-Watkins:

In a letter dated November 3, 2020, the Army responded to review comments provided by Ohio EPA on the *Draft Remedial Design for Soil, Sediment and Surface Water at RVAAP-42 Load Line 9*. The Ohio EPA comment letter was dated October 9, 2020.

On November 10, 2020, the Army received emailed questions regarding our November 3 response. The questions pertained to the Sampling and Analysis Plan (SAP) that was attached to the Load Line 9 Remedial Design (RD) prepared by Endpoint. The SAP is intended to capture the generic sampling and analysis procedures that will be common to all areas of concern (AOCs) being remedied by the Vapor Energy Generator (VEG) process, and it will be considered an attachment to all of those RDs.

On November 17,2020, I provided the email shown in Attachment 1 to this letter as a response to your emailed questions.

On November 19, 2020, during our monthly call to update the schedule, the Ohio EPA indicated that you had concerns with our responses dated November 17. I think the question Brian Tucker had was "why did you go back to RPD instead of RSD?" The Army team was a bit confused because we weren't expecting the question and were not sure exactly what he was asking about. This letter is an attempt to clarify the situation and capture the email correspondence for the Administrative Record.

The Army understands that the Ohio EPA is trying to ensure that requirements for the SAP for the ex-situ thermal treatment by the VEG process, to be conducted by Endpoint, are consistent with requirements that have been placed on the ex-situ thermal treatment being conducted at Load Lines 1 – 4 & 12 by CH2M. It should be noted that the RD for Load Lines 1 – 4 & 12 has been approved and treatment has started at those AOCs. The Army believes that RD was revised such that we are doing what was asked of us. We are doing field triplicates for ISMs at the agreed upon frequency and when there are triplicates, the comparison calculation will be RSD. Also, for every batch of samples that has field replicates, there will be laboratory sub-sampling replicates. These replicates may not be on the same primary sample, but they will be from the same batch of samples. This is detailed in CH2M's QAPP. If a Contaminant of Concern is an explosive constituent, the laboratory method calls for the subsampling replicates to be triplicates. As with field triplicates, for laboratory triplicates the comparison calculation will be RSD. For all other

Contaminants of Concern, the laboratory subsampling replicates will be duplicates, consistent with the applicable laboratory methods. For duplicates, the comparison calculation is RPD. Calculating an RSD with less than three samples does not really work.

Regarding the SAP prepared by Endpoint for the Load Line 9 Remedial Design, the AOCs scheduled to be remedied by the VEG process do not have explosives as Contaminants of Concern. Consequently, there are no references to laboratory subsampling triplicates in the document. Since the laboratory replicates will be duplicates, the comparison calculation will be RPD.

This is consistent with what was approved for Load Lines 1 - 4 & 12. There will be field triplicates at the agreed upon frequency and again the comparison calculation will be RSD.

Finally, it has been agreed that if any sample replicate (field or laboratory) fails to meet the cleanup criteria, the whole sample will be considered to have failed. This fact seems to render the comparison calculation moot, whether it is RSD or RPD.

In conclusion, the Army stands by our previously submitted written responses. We would also suggest that any disagreement about a technical detail in the Endpoint SAP need not delay your review of subsequent Remedial Designs for the VEG process, because the details of how the samples are going to be collected, processed, and analyzed are contained in the SAP. Each RD contains details that are unique to that AOC.

Please contact the undersigned at 614-336-6000 Ext 2053 or kevin.m.sedlak.ctr@mail.mil if there are issues or concerns with this submission.

Sincerely,

SEDLAK.KEVIN.MICHAEL.1254440171 Digitally signed by SEDLAK.KEVIN.MICHAEL.1254440171 Date: 2020.12.08 16:20:07 -05'00'

Kevin M. Sedlak
RVAAP Restoration Program Manager
Army National Guard Directorate

cc: Bob Princic, Ohio EPA, NEDO, DERR Tom Schneider, Ohio EPA, SWDO
Tim Christman, Ohio EPA, NEDO, DERR
Natalie Oryshkewych, Ohio EPA, NEDO, DERR Brian Tucker, Ohio EPA
Kelly Kanoza, Akron Regional Air Quality Management District
Katie Tait, OHARNG, Camp James A. Garfield
Steven Kvaal, USACE Louisville
Nathaniel Peters, USACE Louisville Rebecca Shreffler, Chenega
Jennifer Tierney, Vista Sciences Corporation
Pat Ryan, Leidos – REIMS
Mark Leeper, ARNG

Attachment 1

From: Sedlak, Kevin M CTR NG OHARNG (USA)
<kevin.m.sedlak.ctr@mail.mil>
Sent: Tuesday, November 17, 2020 6:50 AM
To: Susan.Netzly-Watkins@epa.ohio.gov; Bob.Princic@epa.ohio.gov; Brian.Tucker@epa.ohio.gov; Ed.Damato@epa.ohio.gov;
(Thomas.Schneider@epa.ohio.gov) <Thomas.Schneider@epa.ohio.gov>
Cc: Peters, Nathaniel II CIV USARMY CELRL (USA) <Nathaniel.Peters.II@usace.army.mil>; Tait, Kathryn S NFG NG OHARNG (USA) <kathryn.s.tait.nfg@mail.mil>; Leeper, Mark S CIV NG NGB (USA) <mark.s.leeper.civ@mail.mil>; Kvaal, Steven LRL <Steven.Kvaal@usace.army.mil>
Subject: Responses to Ohio EPA Comments Received on November 10, 2020

ALCON: Below are the response to the comments sent by email on November 10, 2020. Please let me know if the responses are acceptable or if you would like to set up a call to further discuss the responses. Thank you.

CMT NO 1: You indicated that Table 4-1 would be revised. However, Attachment 1: QAPP Table 4-1 still states you will be applying the RPD for laboratory. We were wondering if this was perhaps a typo, or do you have other rational for keeping the RPD and why?

Thank you for the review and comment. This is not a typo.
The QAPP, including Table 4-1, was updated to incorporate feedback provided by Ohio EPA on Load Lines 1-4 and 12. Inclusion of RPD for laboratory duplicates was based on the following taken from Load Line 1-4 and 12 QAPP, Worksheet 11, Table 11-1, Step 5:

"ISM samples collected for confirmation will include 30 to 50 aliquots per sample, incorporating duplicate and triplicate sample collection for one per 10 ISM samples along with one laboratory duplicate to verify the subsampling precision. Analytical testing will be for COCs associated with each respective excavation area (see Table 2-1 of the RD Work Plan and Worksheet #18 of this QAPP). An RSD of less than or equal to 30 to 35% as a goal (RSD less than or equal to 35%) will be incorporated into the ISM field primary, duplicate and triplicate data evaluations. An RSD/RPD of less than or equal to 20% will be the goal for ISM laboratory subsample replicates (triplicates for explosives, duplicates for PAHs and PCBs; one per laboratory batch of up to 20 samples for each analytical group)." The scope of the SAP/QAPP prepared by Endpoint does not include explosives, therefore only laboratory duplicates are proposed. Per the Load Line 1-4 and 12 QAPP, Worksheet 37 (Page 66 of the QAPP), under Precision: "For ISM laboratory subsample replicates a control limit RSD/RPD of 20 percent will be used. For ISM field triplicate results, the precision is measured using the RSD and the control limit for that will be less than or equal to 30 to 35 percent as a goal (RSD less than or equal to 35 percent)."
No change is recommended.

CMT NO 2: You note you will be submitting lab data to Ohio EPA for a 48 hour review of the DQOs outlined in the QAPP. Please update us on the progress you are making. The holidays and deer hunting season is quickly moving upon us and our staff may be unavailable on some of the upcoming days. We are happy to discuss with you further. We have time this Friday or next week, Wednesday - Friday. Construction and sampling under this QAPP scope is planned for mid-2021. Confirmation sample data generated during construction and sampling in 2021 will be submitted to Ohio EPA for 48 hour review to confirm the CUGs/RSLs and DQOs are met in order to keep field work moving. We will coordinate with the Ohio EPA as field work gets closer.

NOTE: NEW EMAIL ADDRESS kevin.m.sedlak.ctr@mail.mil Kevin Sedlak, PG, MS Restoration

Project Manager IPA Designation Camp James A. Garfield JTC
1438 State Route 534 SW
Newton Falls, OH 44444
ARNG-IES-D Clean Up
Office Phone 614-336-6000 Ex 2053
e-mail to:kevin.m.sedlak.ctr@mail.mil
***Please note, any communication generated through this correspondence does not coincide with any contract modifications, specifications, clarifications, or corrections unless a formal document is attached designating the like.***

Ohio Environmental Protection Agency

**Mike DeWine**, Governor
**Jon Husted**, Lt. Governor
**Laurie A. Stevenson**, Director

May 17, 2021

**TRANSMITTED ELECTRONICALLY**

Mr. Kevin Sedlak
Army National Guard
Installation and Environment
Clean-up Branch
IPA Designation
1438 State Route 534 SW
Newton Falls, OH 44444

RE: US Army Ravenna Ammunition Plt RVAAP
Remediation Response
Project Records
Remedial Response
Portage County
ID # 267000859264

**Subject: Receipt and Review of the Final Remedial Design for RVAAP-42 Load Line 9, Dated May 5, 2021**

Dear Mr. Sedlak:

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 Design for RVAAP-42 Load Line 9." This document, received by Ohio EPA's NEDO on May 5, 2021, was prepared for the U.S. Army Corps of Engineers (USACE) Louisville District, and by Endpoint Consulting, Inc., 5 South Linden Street, Suite 2, South San Francisco, CA 94080, and Alaniz Associates Corp., 21334 East Colverton St., Covina, CA 91724.

Ohio EPA has no further comments, and we concur with the May 5, 2021 Final Remedial Design for RVAAP-42 Load Line 9.

As a precautionary response to COVID-19, Ohio EPA is currently operating with most staff working remotely. During this time, we will not be issuing hard-copy mail. This letter is an official response from Ohio EPA that will be maintained as a public record.

RECEIVED
MAY 17 2021

If you have any questions or concerns, please do not hesitate to contact me at (330) 963-1201, or via email at Susan.Netzly-Watkins@epa.ohio.gov.

Sincerely,

Sue Netzly-Watkins

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

SNW/sc

ec: Katie Tait, OHARNG RTLS
Nat Peters, USACE
Steven Kvaal, USACE
Rebecca Shreffler, Chenega
Mark Leeper, ARNG
Natalie Oryshkewych, Ohio EPA, NEDO, DERR
Bob Princic, Ohio EPA, NEDO, DERR
Tom Schneider, Ohio EPA, SWDO, DERR
Brian Tucker, Ohio EPA, DERR, CO
Kelly Kanoza, Akron Regional Air Quality Management District

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

May 5, 2021

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

Subject: Ravenna Army Ammunition Plant (RVAAP) Restoration Program, Portage/Trumbull Counties, Final Remedial Design for RVAAP-42 Load Line 9 (Ohio EPA Work Flow Activity #267000859120)

Dear Ms. Netzly-Watkins:

Enclosed for Ohio EPA files is 1 electronic copy (sent via the liquid file site) of the *Final Remedial Design for Soil, Sediment and Surface Water at RVAAP-42 Load Line 9*. This document was prepared for the Army in support of the RVAAP Restoration Program. This document includes the revised Table 4-1 of the QAPP as presented in the January 13, 2021 RTCs and in response to Ohio EPA comments dated May 4, 2021.

Please contact the undersigned at 614-336-6000 Ex 2053 or kevin.m.sedlak.ctr@mail.mil if there are issues or concerns with this submission.

Sincerely,

SEDLAK.KEVIN.MICHAEL.1254440171
Digitally signed by SEDLAK.KEVIN.MICHAEL.1254440171
Date: 2021.05.05 11:18:28 -04'00'

Kevin Sedlak
RVAAP Restoration Program Manager
Army National Guard Directorate

cc: Bob Princic, Ohio EPA, NEDO, DERR
Tom Schneider, Ohio EPA, SWDO
Tim Christman, Ohio EPA, NEDO, DERR
Natalie Oryshkewych, Ohio EPA, NEDO, DERR
Kevin Palombo, Ohio EPA, DERR
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Steven Kvaal, USACE Louisville
Nathaniel Peters, USACE Louisville
Rebecca Shreffler, Chenega
Jennifer Tierney, Vista Sciences Corporation
Pat Ryan, Leidos – REIMS

Ohio Environmental Protection Agency

**Mike DeWine**, Governor
**Jon Husted**, Lt. Governor
**Laurie A. Stevenson**, Director

May 4, 2021

**TRANSMITTED ELECTRONICALLY**

Mr. Kevin Sedlak
Army National Guard
Installation and Environment
Clean-up Branch
IPA Designation
1438 State Route 534 SW
Newton Falls, OH 44444

RE: US Army Ravenna Ammunition Plt RVAAP
Remediation Response
Project Records
Remedial Response
Portage County
ID # 267000859264

**Subject: Receipt and Review of the Final Remedial Design for RVAAP-42 Load Line 9, Dated March 17, 2021**

Dear Mr. Sedlak:

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 Design for RVAAP-42 Load Line 9." This document, received by Ohio EPA's NEDO on April 9, 2021, was prepared for the U.S. Army Corps of Engineers (USACE) Louisville District, and by Endpoint Consulting, Inc., 5 South Linden Street, Suite 2, South San Francisco, CA 94080, and Alaniz Associates Corp., 21334 East Colverton St., Covina, CA 91724.

**Comment 1:** In the January 13, 2021 Response to Comments (RTC) you had agreed to making changes to Table 4-1 in the quality assurance project plan (QAPP). The revised table was not in the March 17, 2021 Final RD QAPP.

> **ACTION ITEM**: Please replace QAPP Table 4-1 in the March 17, 2021 Final Remedial Design with the QAPP Table 4-1 included in the January 13, 2021 RTC.

Once the above comment has been addressed, Ohio EPA concurs with the Final Remedial Design for RVAAP-42 Load Line 9.

As a precautionary response to COVID-19, Ohio EPA is currently operating with most staff working remotely. During this time, we will not be issuing hard-copy mail. This letter is an official response from Ohio EPA that will be maintained as a public record.

RECEIVED
MAY 04 2021

If you have any questions or concerns, please do not hesitate to contact me at (330) 963-1201, or via email at Susan.Netzly-Watkins@epa.ohio.gov.

Sincerely,

Sue Netzly-Watkins

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

SNW/sc

ec: Katie Tait, OHARNG RTLS
Nat Peters, USACE
Steve Kvaal, USACE
Rebecca Shreffler, Chenega
Natalie Oryshkewych, Ohio EPA, NEDO, DERR
Bob Princic, Ohio EPA, NEDO, DERR
Tom Schneider, Ohio EPA, SWDO, DERR
Brian Tucker, Ohio EPA, CO, DERR
Kelly Kanoza, Akron Regional Air Quality Management District

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

April 8, 2021

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

Subject: Ravenna Army Ammunition Plant (RVAAP) Restoration Program, Portage/Trumbull Counties, Final Remedial Design for RVAAP-42 Load Line 9 (Ohio EPA Work Flow Activity #267000859264)

Dear Ms. Netzly-Watkins:

Enclosed for Ohio EPA files is 1 electronic copy (sent via the liquid file site) of the *Final Remedial Design for Soil, Sediment and Surface Water at RVAAP-42 Load Line 9*. This document was prepared for the Army in support of the RVAAP Restoration Program. This document includes revisions made to Table 2-1 of the QAPP in response to Ohio EPA comments dated April 1, 2021.

Please contact the undersigned at 614-336-6000 Ex 2053 or kevin.m.sedlak.civ@mail.mil if there are issues or concerns with this submission.

Sincerely,

SEDLAK.KEVIN.MICHAEL.1254440171 Digitally signed by SEDLAK.KEVIN.MICHAEL.1254440171 Date: 2021.04.08 13:40:01 -04'00'

Kevin Sedlak
RVAAP Restoration Program Manager
Army National Guard Directorate

cc: Bob Princic, Ohio EPA, NEDO, DERR
Tom Schneider, Ohio EPA, SWDO
Tim Christman, Ohio EPA, NEDO, DERR
Natalie Oryshkewych, Ohio EPA, NEDO, DERR
Kevin Palombo, Ohio EPA, DERR
Brian Tucker, Ohio EPA
Kelly Kanoza, Akron Regional Air Quality Management District
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Steven Kvaal, USACE Louisville
Nathaniel Peters, USACE Louisville
Rebecca Shreffler, Chenega
Jennifer Tierney, Vista Sciences Corporation
Pat Ryan, Leidos – REIMS

Ohio Environmental Protection Agency

**Mike DeWine**, Governor
**Jon Husted**, Lt. Governor
**Laurie A. Stevenson**, Director

April 1, 2021

**TRANSMITTED ELECTRONICALLY**

Mr. Kevin Sedlak
Army National Guard
Installation and Environment
Clean-up Branch
IPA Designation
1438 State Route 534 SW
Newton Falls, OH 44444

RE: US Army Ravenna Ammunition Plt RVAAP
Remediation Response
Project Records
Remedial Response
Portage County
ID # 267000859120

**Subject: Receipt and Review of the Response to Comments Draft Remedial Design Work Plan for RVAAP Load Line 9 (RVAAP-42), Dated March 16, 2021**

The Ohio Environmental Protection Agency (Ohio EPA), Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR) has received and reviewed the March 13, 2021 "Response to Comments on Draft Remedial Design for RVAAP-42 Load Line 9, SAP and QAPP." The Response to Comments (RTC) was received on March 19, 2021.

The Draft Remedial Design (RD) for RVAAP-42 Load Line 9 (LL9) includes a sampling and analysis plan (SAP) that covers five Areas of Concern (AOCs), in Appendix I in the Draft RD for RVAAP-42 Load Line 9. The SAP is dated May 15, 2020. The five AOCs included in the SAP are as follows: LL 9, Depot Area, Sand Creek, NACA and Wet Storage Area.

**Comment 1: Quality Assurance Plan (QAPP) and Incremental Sampling Methodology (ISM).**

The RTC noted that the Final LL 9 QAPP was revised to include the Hawaii technical guidance manual (TGM) for using ISM to characterize decision units. The Final LL 9 RD was submitted on March 19, 2021. The March RTC addressed our February 2021 ISM comments, and the final LL 9 RD includes references and excerpts from the Hawaii TGM.

**Comment 2: Waste profiling**

The March 2021 RTC and our telephone call on March 24, 2021 answered much of this comment. Ohio EPA noted during this telephone call that there was a typo in the QAPP, Table 2-1 regarding waste characterization. This table noted 50 vs. 250 cubic yards was the waste sampling frequency.

RECEIVED
APR 6 1 2021

**ACTION ITEM:** A page change should be adequate to address this edit. Please include on the revised Table 2-1 page the information that Endpoint discussed during our call that it had obtained from the landfill receiving the waste, affirming this sampling frequency meets the landfill's requirements.

As a precautionary response to COVID-19, Ohio EPA is currently operating with most staff working remotely. During this time, we will not be issuing hard-copy mail. This letter is an official response from Ohio EPA that will be maintained as a public record.

Ohio EPA requests the comment above be addressed as noted in the Action Item. If you have any questions or concerns, please do not hesitate to contact me at (330) 963-1235.

Sincerely,

*Sue Netzly-Watkins*

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

SNW/sc

ec: Nat Peters, USACE
Steve Kvaal, USACE
Katie Tait, OHARNG RTLS
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Natalie Oryshkewych, Ohio EPA, NEDO, DERR
Bob Princic, Ohio EPA, NEDO, DERR
Tom Schneider, Ohio EPA, SWDO, DERR
Brian Tucker, Ohio EPA, DERR, CO
Carrie Rasik, Ohio EPA, DERR, CO

**NATIONAL GUARD BUREAU**
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ARLINGTON VA 22204-1373

March 17, 2021

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

Subject: Ravenna Army Ammunition Plant (RVAAP) Restoration Program, Portage/Trumbull Counties, Final Remedial Design for RVAAP-42 Load Line 9 (Ohio EPA Work Flow Activity #267000859264)

Dear Ms. Netzly-Watkins:

Enclosed for Ohio EPA files is 1 electronic copy (sent via the liquid file site) of the *Final Remedial Design for Soil, Sediment and Surface Water at RVAAP-42 Load Line 9*. This document was prepared for the Army in support of the RVAAP Restoration Program.

Please contact the undersigned at 614-336-6000 Ex 2053 or kevin.m.sedlak.civ@mail.mil if there are issues or concerns with this submission.

Sincerely,

SEDLAK.KEVIN.MICHAEL.1254440171 Digitally signed by SEDLAK.KEVIN.MICHAEL.1254440171 Date: 2021.03.17 06:53:12 -04'00'

Kevin Sedlak
RVAAP Restoration Program Manager
Army National Guard Directorate

cc: Bob Princic, Ohio EPA, NEDO, DERR
Tom Schneider, Ohio EPA, SWDO
Tim Christman, Ohio EPA, NEDO, DERR
Natalie Oryshkewych, Ohio EPA, NEDO, DERR
Kevin Palombo, Ohio EPA, DERR
Brian Tucker, Ohio EPA
Kelly Kanoza, Akron Regional Air Quality Management District
Mark Leeper, ARNG
Katie Tait, OHARNG, Camp James A. Garfield
Steven Kvaal, USACE Louisville
Nathaniel Peters, USACE Louisville
Rebecca Shreffler, Chenega
Jennifer Tierney, Vista Sciences Corporation
Pat Ryan, Leidos – REIMS

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

March 16, 2021

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

Subject: Ravenna Army Ammunition Plant (RVAAP) Restoration Program, Portage/Trumbull Counties, Response to Comments on Draft Remedial Design for RVAAP-42 Load Line 9, SAP and QAPP (Ohio EPA Work Flow Activity #267000859264)

Dear Ms. Netzly-Watkins:

The Army National Guard (ARNG) has reviewed comments provided for the Response to Comments letter dated March 2, 2021 for the Draft Remedial Design for RVAAP-42 Load Line 9, Sampling and Analysis Plan (SAP) and Quality Assurance Project Plan (QAPP) by the Ohio Environmental Protection Agency (Ohio EPA) in a letter dated January 11, 2021.

The responses on the attached comment resolution table reflect Ohio EPA comments received on January 11, 2021 regarding the SAP/QAPP. The Ohio EPA confirmed that previous comments provided by the Ohio EPA regarding the SAP/QAPP were adequately addressed in letters dated October 9, 2020 and December 28, 2020.

ARNG confirmed with Bob Princic (Ohio EPA) that the Final Remedial Design for RVAAP-42 Load Line 9, SAP and QAPP will be submitted concurrent with the submittal of this letter. This document will be submitted separately.

Please contact the undersigned at 614-336-6000 Ext 2053 or kevin.m.sedlak.ctr@mail.mil if there are issues or concerns with this submission.

Sincerely,

SEDLAK.KEVIN.MICHAEL.1254440171 Digitally signed by SEDLAK.KEVIN.MICHAEL.1254440171 Date: 2021.03.17 06:52:18 -04'00'

Kevin M. Sedlak
RVAAP Restoration Program Manager
Army National Guard Directorate

cc: Bob Princic, Ohio EPA, NEDO, DERR
Tom Schneider, Ohio EPA, SWDO
Tim Christman, Ohio EPA, NEDO, DERR
Natalie Oryshkewych, Ohio EPA, NEDO, DERR
Kevin Palombo, Ohio EPA, DERR
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Kelly Kanoza, Akron Regional Air Quality Management District
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Steven Kvaal, USACE Louisville
Nathaniel Peters, USACE Louisville
Rebecca Shreffler, Chenega
Jennifer Tierney, Vista Sciences Corporation
Pat Ryan, Leidos – REIMS

**Comment Resolution Table**

**Installation**: Camp James A. Garfield/Former RVAAP
**Document**: Draft Remedial Design Work Plan for RVAAP Load Line 9 (RVAAP-42), Dated August 19, 2020
**Reviewer(s)**: Sue Netzly-Watkins (SNW), Site Coordinator, Ohio EPA (330-963-1235 or Susan.Netzly-Watkins@epa.ohio.gov);
Comments received March 2, 2021
**Date**: March 15, 2021

| Cmt. No. | Page or Sheet | Comment and Recommendation | Response |
|---|---|---|---|
| Ohio EPA 1.1 | QAPP/ SAP | The relative standard deviation (RSD) and evaluation approach for replicates Ohio EPA concurs with the general approach being applied for the LL 1-4 and 12 RD; a mix of qualitative (including the narratives and photographs) and quantitative approaches (e.g., RSD goal of 35% and use of 95% Upper Confidence Limit (UCL) when appropriate) for evaluating triplicate ISM results with elevated RSD values and the decision of needing, or not, additional soil removals to meet cleanup goals (CUGs). | We concur with the comment. This change was already incorporated into the SAP/QAPP following a previous response to Ohio EPA comments, per the letter dated January 13, 2021. No change will be made to the SAP/QAPP. |
| Ohio EPA 1.2 | QAPP/ SAP | The SAP for LL9 should require metals be included in the initial triplicate samples for new projects to ensure that all teams and laboratories can meet RSD goals for ISM samples. These results would also aide in clarifying the uncertainty for the thermal destruction of explosives by all parties. Once it is demonstrated that the field team and laboratory are producing ISM results that reflect reliable data to verify that the remedy goal was met, future ISM confirmation samples do not need to include the additional metal analysis for triplicate samples. | We concur with the comment. This project does not contain any explosive Chemicals of Concern (COCs).<br><br>The following change was made to the notes on the SAP Table 4-1:<br><br>"For excavation confirmation samples collected using ISM, the first three ISM samples at the first excavation performed under this SAP will be collected in triplicate and analyzed for SVOCs and Metals." |

**Comment Resolution Table**

**Installation**: Camp James A. Garfield/Former RVAAP
**Document**: Draft Remedial Design Work Plan for RVAAP Load Line 9 (RVAAP-42), Dated August 19, 2020
**Reviewer(s)**: Sue Netzly-Watkins (SNW), Site Coordinator, Ohio EPA (330-963-1235 or Susan.Netzly-Watkins@epa.ohio.gov);
Comments received March 2, 2021
**Date**: March 15, 2021

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|---|---|---|---|
| Ohio EPA 1.3 | QAPP/ SAP | Triplicate ISM samples provide additional information not so by single ISM results to make decisions on data use, including the use of maximum values or 95% UCL values of the data set for meeting cleanup goals (i.e., less than or equal to the appropriate CUGs). However, with single ISM sample results and the known high RSD for explosives, one cannot determine if a value is on the high or low end of the range (e.g., two orders of magnitude have been demonstrated), and at a minimum, the reported value is likely 25% lower than the true mean value. Given this "consistent" loss of contaminant during sample preparation, please provide a discussion on why the CUGs for TNT and RDX for single ISM results should not be reduced to compensate for these low biased results.<br><br>In addition, single ISM results that are near an explosive CUG (e.g., < 25%), should be evaluated and likely considered a failure of meeting an appropriate CUG for explosives. | We concur with the comment. This project does not contain any explosive COCs. No change will be made to the SAP/QAPP. |

**Comment Resolution Table**

**Installation**: Camp James A. Garfield/Former RVAAP
**Document**: Draft Remedial Design Work Plan for RVAAP Load Line 9 (RVAAP-42), Dated August 19, 2020
**Reviewer(s)**: Sue Netzly-Watkins (SNW), Site Coordinator, Ohio EPA (330-963-1235 or Susan.Netzly-Watkins@epa.ohio.gov);
Comments received March 2, 2021
**Date**: March 15, 2021

| | | | |
|---|---|---|---|
| Ohio EPA 2 | QAPP/ SAP | Generally, when composite sampling is conducted to profile waste, as a data quality check the composite value is multiplied by the number of individual samples collected to make the composite; if that value is over a risk value each individual composite is analyzed to determine if any of those are above a risk value. If it is determined via the composite sampling the waste is hazardous waste and LDR sample is needed, please confirm if the stated waste profiling change is being made across the board for all five AOCs under the SAP included in the LL9 RD. If so, please revise the SAP accordingly and provide the details on how the composite sampling will be conducted. | The waste profiling procedure will be utilized for all five AOCs under this SAP.<br><br>Per Section 3.6 of the SAP, as amended following the response to comments (November 3, 2020) approved by Ohio EPA (December 28, 2021), all composite samples will be analyzed for Land Disposal Restriction criteria (e.g., TCLP).<br><br>For your reference, the following text was previously amended in Section 3.6 of the SAP:<br><br>"Category 3: Waste profile sampling of impacted soil will consist of one 8-point composite sample per every 250 cubic yards of metals impacted soil (in-situ) to be excavated in each AOC prior to beginning excavation activities. The samples will be collected within the anticipated excavation area at depths ranging between ground surface and the anticipated total depth of the excavation. Collecting waste profile samples prior to soil excavation will allow adequate time to receive sample results, ensuring waste disposal is not delayed and that impacted soil/waste are handled by the appropriate transporter (DRMO if hazardous) and disposed at the appropriate disposal facility.<br><br>Waste profile soil samples under this category will be subjected to TCLP analysis for metals, herbicides, pesticides, semi-volatile organic compounds (SVOCs), volatile organic compounds (VOCs), as well as total sulfide/cyanide, polychlorinated biphenyls (PCBs), flashpoint and pH. Analysis will be done using the methods provided in Table 3-1, plus any additional analyses as required by the disposal facility. The results of the waste profile analysis will be used to determine which of the facilities the soil will be disposed, based on the landfill permit requirements. Soil will be disposed at Waste Management American Landfill for non-hazardous and US Ecology of Ohio or US Ecology Michigan Disposal Inc for hazardous." |

Ohio Environmental Protection Agency

**Mike DeWine**, Governor
**Jon Husted**, Lt. Governor
**Laurie A. Stevenson**, Director

March 2, 2021

**TRANSMITTED ELECTRONICALLY**

Mr. Kevin Sedlak
Army National Guard
Installation and Environment
Clean-up Branch
IPA Designation
1438 State Route 534 SW
Newton Falls, OH 44444

RE: US Army Ravenna Ammunition Plt RVAAP
Remediation Response
Project Records
Remedial Response
Portage County
ID # 267000859120

**Subject: Receipt and Review of the Response to Comments, Draft Remedial Design Work Plan for RVAAP Load Line 9 (RVAAP-42), Dated January 13, 2021**

The Ohio Environmental Protection Agency (Ohio EPA), Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR) has received and reviewed the January 13, 2021 "Response to Comments on Draft Remedial Design for RVAAP-42 Load Line 9, SAP and QAPP."

The Draft Remedial Design (RD) for RVAAP-42 Load Line 9 (LL9) includes a sampling and analysis plan (SAP) that covers five Areas of Concern (AOCs), in Appendix I in the Draft RD for RVAAP-42 LL9. The SAP is dated May 15, 2020.

The five AOCs included in the SAP are as follows: LL9, Depot Area, Sand Creek, NACA and Wet Storage Area.

**Comment 1: Quality Assurance Project Plan (QAPP) and Incremental Sampling Methodology (ISM) Sampling**

The January 11, 2021 response to comments (RTC) confirms the LL9 QAPP will be revised to include the Hawaii Technical Guidance Manual (TGM) for using ISM to characterize decision units. Like the RD for LL 1-4 and 12, the Draft LL9 RD is using ISM sampling to verify when a remediation area has met the remediation goals.

During the implementation of the RD for LL 1-4 and 12, that together with the Army and its contractor we have adjusted and improved the initial ISM process through change orders. Below we have noted several key matters that have been addressed through our discussions on the LL 1-4 and 12 RD that should apply to the SAP for the AOCs being addressed through the LL9 SAP.

Received
2 MAR 2021

1) The relative standard deviation (RSD) and evaluation approach for replicates

Ohio EPA concurs with the general approach being applied for the LL 1-4 and 12 RD; a mix of qualitative (including the narratives and photographs) and quantitative approaches (e.g., RSD goal of 35% and use of 95% Upper Confidence Limit (UCL) when appropriate) for evaluating triplicate ISM results with elevated RSD values and the decision of needing, or not, additional soil removals to meet cleanup goals (CUGs).

2) Including metal analysis for future explosive ISM samples

The January 12, 2021 email from Sue Netzly-Watkins with the subject of LL 1-4 and 12 RD requested the Army to consider adding metal analysis to triplicate ISM samples for explosives. This was based on the general concern of explosive ISM sample results not meeting RSD goals and the recent understanding by all parties of the thermal sensitivity of explosives (e.g., TNT, RDX).

The SAP for LL9 should require metals be included in the initial triplicate samples for new projects to ensure that all teams and laboratories can meet RSD goals for ISM samples. These results would also aide in clarifying the uncertainty for the thermal destruction of explosives by all parties. Once it is demonstrated that the field team and laboratory are producing ISM results that reflect reliable data to verify that the remedy goal was met, future ISM confirmation samples do not need to include the additional metal analysis for triplicate samples.

3) Low Recovery and Low Bias for Explosives

Recently, during our January 7, 2021 call to discuss the failure of meeting the 35% RSD goal for TNT and RDX, Ohio EPA was informed that the reason was the thermal instability of explosives during the grinding procedure for ISM soil samples. The grinding procedure produces heat and destroys a percentage of the explosives. Recovery of spiked soil was noted as low as 11% in Excavation Report No. 8 when soil samples were compared to similar but ground up samples. This reduction in explosive concentrations is inconsistent and thus increases the RSD values for triplicate samples to much above the goal of the project. Ohio EPA was also informed that even though the loss of explosives during sample preparation was inconsistent, it was generally near a 25% reduction of the true average concentration of explosives.

Triplicate ISM samples provide additional information not so by single ISM results to make decisions on data use, including the use of maximum values or 95% UCL values of the data set for meeting cleanup goals (i.e., less than or equal to the appropriate CUGs). However, with single ISM sample results and the known high RSD for explosives, one cannot determine if a value is on the high or low end of the range (e.g., two orders of magnitude have been demonstrated), and at a minimum, the reported value is likely 25% lower than the true mean value. Given this "consistent" loss of contaminant during sample preparation, please provide a discussion on why the CUGs for TNT and RDX for single ISM results should not be reduced to compensate for these low biased results.

In addition, single ISM results that are near an explosive CUG (e.g., < 25%), should be evaluated and likely considered a failure of meeting an appropriate CUG for explosives.

This has not been an issue thus far for LL 1-4 and 12 as failures to meet, or confirmation of expected results, have been reasonably clear. However, future results should be evaluated and the approach added to the final report and draft LL9 Remedial Action work plan.

**Comment 2: Waste profiling**

The May 15, 2020 SAP notes that waste profile sampling will also include discrete sampling in addition to ISM sampling. We had a discussion with other Ohio EPA staff regarding the Sand Creek RD.

The Sand Creek review team expressed concern that an appropriate number of samples were not being collected from the population without an adequate explanation for the proposed waste characterization strategy. The Army's response to the comment was "Prior to receipt of this comment, and at the request of the Ohio EPA, the ARNG modified the procedure for waste profile sampling outlined in the project Sampling and Analysis Plan and Quality Assurance Project Plan. In response to this comment, and to coincide with Ohio EPA approved changes for the Load Line 9 Remedial Design, Sampling and Analysis Plan (e.g., waste profile samples will consist of an 8-point composite sample, rather than ISM)."

> **ACTION ITEM:** Generally, when composite sampling is conducted to profile waste, as a data quality check the composite value is multiplied by the number of individual samples collected to make the composite; if that value is over a risk value each individual composite is analyzed to determine if any of those are above a risk value. If it is determined via the composite sampling the waste is hazardous waste and LDR sample is needed, please confirm if the stated waste profiling change is being made across the board for all five AOCs under the SAP included in the LL9 RD. If so, please revise the SAP accordingly and provide the details on how the composite sampling will be conducted.

As a precautionary response to COVID-19, Ohio EPA is currently operating with most staff working remotely. During this time, we will not be issuing hard-copy mail. This letter is an official response from Ohio EPA that will be maintained as a public record.

Ohio EPA requests the comments above be addressed prior to submitting the final version of the document. If you have any questions or concerns, please do not hesitate to contact me at (330) 963-1235.

Sincerely,

Sue Netzly-Watkins

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

SNW/sc

ec: Katie Tait, OHARNG RTLS
Nat Peters, USACE
Steve Kvaal, USACE
Rebecca Shreffler, Chenega
Natalie Oryshkewych, Ohio EPA, NEDO, DERR
Bob Princic, Ohio EPA, NEDO, DERR
Tom Schneider, Ohio EPA, SWDO, DERR
Brian Tuckerman, Ohio EPA, CO, DERR
Carrie Rasik, Ohio EPA, CO, DERR

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

January 13, 2021

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

Subject: Ravenna Army Ammunition Plant (RVAAP) Restoration Program, Portage/Trumbull Counties, Response to Comments on Draft Remedial Design for RVAAP-42 Load Line 9, SAP and QAPP (Ohio EPA Work Flow Activity #267000859264)

Dear Ms. Netzly-Watkins:

The Army National Guard (ARNG) has reviewed comments provided for the Response to Comments letter dated December 8, 2020 for the Draft Remedial Design for RVAAP-42 Load Line 9, Sampling and Analysis Plan (SAP) and Quality Assurance Project Plan (QAPP) by the Ohio Environmental Protection Agency (Ohio EPA) in a letter dated December 28, 2020.

The responses on the attached comment resolution table reflect Ohio EPA comments received on December 28, 2020 regarding the SAP/QAPP. The Ohio EPA confirmed that previous comments provided by the Ohio EPA regarding the SAP/QAPP were adequately addressed in a letter dated October 9, 2020.

Please contact the undersigned at 614-336-6000 Ext 2053 or kevin.m.sedlak.ctr@mail.mil if there are issues or concerns with this submission.

Sincerely,

SEDLAK.KEVIN.MICHAEL.1254440171

Digitally signed by SEDLAK.KEVIN.MICHAEL.1254440171
Date: 2021.01.13 08:52:55 -05'00'

Kevin M. Sedlak
RVAAP Restoration Program Manager
Army National Guard Directorate

cc: Bob Princic, Ohio EPA, NEDO, DERR
Tom Schneider, Ohio EPA, SWDO
Tim Christman, Ohio EPA, NEDO, DERR
Natalie Oryshkewych, Ohio EPA, NEDO, DERR
Brian Tucker, Ohio EPA
Kelly Kanoza, Akron Regional Air Quality Management District
Katie Tait, OHARNG, Camp James A. Garfield
Steven Kvaal, USACE Louisville
Nathaniel Peters, USACE Louisville
Rebecca Shreffler, Chenega
Jennifer Tierney, Vista Sciences Corporation
Pat Ryan, Leidos – REIMS

**Comment Resolution Table**

**Installation**: Camp James A. Garfield/Former RVAAP
**Document**: Draft Remedial Design Work Plan for RVAAP Load Line 9 (RVAAP-42), Dated August 19, 2020
**Reviewer(s)**: Sue Netzly-Watkins (SNW), Site Coordinator, Ohio EPA (330-963-1235 or Susan.Netzly-Watkins@epa.ohio.gov);
Comments received December 28, 2020
**Date**: January 11, 2021

| Cmt. No. | Page or Sheet | Comment and Recommendation | Response |
|---|---|---|---|
| Ohio EPA 1 | QAPP Section 4 | When the RSD reflects good precision (RSD<35%) then the decision unit (DU) can be assumed to demonstrate the cleanup standards were met, assuming the concentrations are below the cleanup number.<br><br>In the Hawaii technical guidance manual (TGM) for the use of multi increment samples to characterize DUs, Section 4.2.7.1 notes that triplicate samples should be collected to evaluate the precision of field sampling methods used. Section 4.2.7.2 notes triplicate samples should be collected to evaluate the precision of the lab subsampling methods used.<br><br>In the December 8 RVAAP-42 Load Line 9 SAP and quality assurance project plan (QAPP) letter to Ohio EPA, you noted that triplicates will not be collected when the chemicals of concern (COCs) are not explosives. It is not clear why triplicates are not being done for other COCs. | The requested change has been made to reflect field and laboratory triplicates will be analyzed.<br><br>The following was added to the QAPP for field and laboratory verification:<br><br>"4.5 Initial Data Review<br><br>For excavation confirmation samples collected using the Incremental Sampling Methodology (ISM), the first three ISM samples at the first excavation performed under this QAPP will be collected in triplicate. The triplicates will be analyzed along with laboratory subsample triplicates. The results of the initial ISM field triplicate samples and associated laboratory subsample triplicates will be submitted to Ohio EPA for a 48-hour review of the following DQOs:<br><br>For the field and laboratory triplicates, an RSD of less than or equal to 30 to 35% as a goal (RSD less than or equal to 35%) will be incorporated into sample data evaluations. If this DQO is not met for the ISM field triplicate samples, then Ohio EPA will work with the Army to determine whether there are concerns with the data quality, using Table 1 of the Ohio EPA Field Standard Operating Procedure (FSOP) as a guide (see Attachment 1). If the laboratory triplicate DQO is not met, a J-flag will be applied to the associated data. If there are concerns with the data quality, then the Army, Ohio EPA and Endpoint will work together to determine the path forward, following the guidance below excerpted from the Hawai'i Department of Health Technical Guidance Manual Section 4.2.7.3 "Evaluation of Data Representativeness, Table 4-2 Recommended Adjustment of Multi Increment Data for Decision Making Based on RSD of Replicate Samples", http://hawaiidoh.org/tgm-pdfs/TGM.pdf (HDOH, 2016):<br><br>Good Precision (RSD <35%)<br><br>• Compare unadjusted ISM sample data directly to cleanup goal for decision |

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| | | | making (for RVAAP, the maximum field replicate value will be used to compare to the cleanup goal);<br><br>• Data can be used for confirmation purposes without the need for additional sampling, if cleanup goals are met.<br><br>Moderate Precision (RSD >35% but <50%)<br><br>• Review and discuss field sampling methods and laboratory processing and analysis methods and discuss potential sources of error (e.g., improper increment collection methods, inadequate number or mass of increments, unrepresentative laboratory subsampling methods, etc.);<br><br>• Compare unadjusted ISM sample data directly to cleanup goal for decision making (for RVAAP, the maximum field replicate value will be used to compare to the cleanup goal);<br><br>• Additional confirmation sampling recommended following remediation of decision units (DUs) that exceed cleanup goals, including use of smaller DUs and/or a larger number of increments and collection of additional replicate samples.<br><br>Poor Precision (RSD >50% but <100%)<br><br>• Review and discuss field sampling methods and laboratory processing and discuss potential sources of error in report;<br><br>• If the large majority of total error is attributable to laboratory subsampling and analysis error, request laboratory to subsample and analyze the batch of DU samples again using correct techniques, and include additional subsampling replicates;<br><br>• Compare the 95% UCL (Chebyshev method) for replicate data to 150% of the cleanup goal for decision making; |

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| | | | • Estimate a 95% UCL for DUs where replicates were not collected based on the 95% UCL and mean calculated for the replicate data; Compare results to 150% of the cleanup goal;<br><br>• Provide additional, multiple lines of evidence for acceptance (or rejection) of the data for decision making purposes including knowledge of the site history and the anticipated potential for contamination above cleanup goal, the adequacy of the methods used to collect, process and analyze samples, and the approximation of the data to cleanup goal;<br><br>• Additional confirmation sampling recommended following remediation of DUs that exceed cleanup goal, including use of smaller DUs and/or a larger number of increments and collection of additional replicate samples.<br><br>Very Poor Precision (RSD >100%)<br><br>• If the large majority of total error is attributable to laboratory subsampling and analysis error, request laboratory to subsample and analyze the batch of DU samples again using correct techniques, and include additional subsampling replicates;<br><br>• Review and discuss field sampling methods and laboratory processing and analysis methods and discuss potential sources of error in report;<br><br>• Consider re-sampling of DU(s) most suspect for contamination using a larger number of increments and/or smaller DUs;<br><br>• If one or more of the replicate samples exceeds the cleanup goal then remediation of the DU should be considered, even if the mean concentration is well below the cleanup goal. Remediation of associated DUs where replicate samples were not collected should also be considered;<br><br>• If all replicate samples are below the cleanup goal, then compare the 95% UCL (Chebyshev method) for replicate data to the unadjusted cleanup goal for decision making; |

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| | | | • If all replicate samples are below the cleanup goal, estimate a 95% UCL for DUs where replicates were not collected based on the 95% UCL and mean calculated for the replicate data and compare results to unadjusted cleanup goal;<br><br>• Provide additional, multiple lines of evidence for acceptance (or rejection) of the data for decision making purposes including knowledge of the site history and the anticipated potential for contamination above cleanup goal, the adequacy of the methods used to collect, process and analyze samples and the approximation of the data to cleanup goal;<br><br>• Additional confirmation sampling recommended following remediation of DUs that exceed cleanup goal, including use of smaller DUs and/or a larger number of increments.<br><br>Following review of the triplicate data for the initial three confirmation samples, additional field triplicates will be taken at 10% of the project ISM sample locations. Laboratory triplicates will be taken at the same frequency as field triplicates, but not necessarily at the same sample location.<br><br>If field triplicate samples are being collected for a particular DU, the aliquots will be collected from completely independent systematic random locations in the grid (i.e., aliquots for the field triplicate samples will not be collected around a single grid point used for the parent sample since this may not adequately test small-scale variability within the DU) (HDOH, 2016)."<br><br>If replicate data for ISM samples that exceed cleanup goals are not available for an individual DU, then the 95% UCL value will be estimated based on replicate data collected for a similar DU at the site by multiplying the contaminant concentration reported for that DU by the ratio of the 95% UCL and the mean for the replicate data set."<br><br>Table 4-1 was updated in the QAPP to reflect these changes and has been provided as an attachment to this comment resolution table. |

**Comment Resolution Table**

**Installation**: Camp James A. Garfield/Former RVAAP
**Document**: Draft Remedial Design Work Plan for RVAAP Load Line 9 (RVAAP-42), Dated August 19, 2020
**Reviewer(s)**: Sue Netzly-Watkins (SNW), Site Coordinator, Ohio EPA (330-963-1235 or Susan.Netzly-Watkins@epa.ohio.gov);
Comments received December 28, 2020
**Date**: January 11, 2021

| | | | |
|---|---|---|---|
| Ohio EPA 2 | QAPP Section 4 | The need for replicate data and calculation of a 95% UCL should be evaluated as part of the systematic planning process described in Section 3. A 95% UCL should ideally be calculated based on replicate sample data specific to the DU in question. If replicate data are not available for a DU, then the 95% UCL value should be estimated based on replicate data collected for a similar DU at the site. This is done by multiplying the contaminant concentration reported for that DU by the ratio of the 95% UCL and the mean for the replicate data set. Please contact Ohio EPA if this approach is desired for a specific set of data. | As discussed in the previous response, the Chebyshev method for calculating the 95% UCL will be used when the variance between replicate samples is high (e.g., poor precision >50%).<br><br>If replicate data for ISM samples that exceed cleanup goals are not available for an individual DU, then the 95% UCL value will be estimated based on replicate data collected for a similar DU at the site by multiplying the contaminant concentration reported for that DU by the ratio of the 95% UCL and the mean for the replicate data set.<br><br>We would like approval from Ohio EPA to proceed with this approach on all DUs where no replicates will be collected. |
| Ohio EPA 2 | SAP Table 4-1 | | Added the following note to Table 4-1 of the SAP:<br><br>"For excavation confirmation samples collected using ISM, the first three ISM samples at the first excavation performed under this SAP will be collected in triplicate. The triplicates will be analyzed along with laboratory subsample triplicates. The results of the initial ISM field triplicate samples and associated laboratory subsample triplicates will be submitted to Ohio EPA for a 48-hour review of the DQOs outlined in the QAPP. Following review of the field and laboratory triplicate data for the first three confirmation samples, additional field triplicates will be taken at 10% of the project ISM sample locations. Laboratory triplicates will be taken at the same frequency as field triplicates, but not necessarily at the same sample location." |

**Attachment 1**
QAPP Table 4-1

**Table 4-1. Data Quality Objectives Summary for Soil Sampling**
*Former RVAAP Site, Portage and Trumbull Counties, OH*

| USEPA Analytical Method | Sample Type | Field & Laboratory Precision (RSD) | Accuracy (Laboratory) | Completeness |
|---|---|---|---|---|
| 8270D | ISM and Composite | <35%RSD | 45-134% | 90% |
| 60 I0C | ISM and Composite | <35%RSD | 81-112% | 90% |
| 7471B | ISM and Composite | <35%RSD | 82-119% | 90% |
| 1311 | ISM and Composite | <35%RSD | 82-119% | 80% |

Ohio Environmental Protection Agency

**Mike DeWine**, Governor
**Jon Husted**, Lt. Governor
**Laurie A. Stevenson**, Director

August 2, 2021

**TRANSMITTED ELECTRONICALLY**

Mr. Kevin Sedlak
Army National Guard
Installation and Environment
Clean-up Branch
IPA Designation
1438 State Route 534 SW
Newton Falls, OH 44444

RE: US Army Ravenna Ammunition Plt RVAAP
Remediation Response
Project Records
Remedial Response
Portage County
ID # 267000859127

**Subject: Remedial Design Field Change Request for RVAAP-45 Wet Storage Area Dated July 20, 2021**

Dear Mr. Sedlak:

The Ohio Environmental Protection Agency (Ohio EPA), Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR) received the July 20, 2021, field change request for the remedial activities at RVAAP-45 Wet Storage Area. Impacted soils will be removed from a 0.02-acre non-jurisdictional Category 1 wetland on the Wet Storage Area of Concern. Backfill materials will not be placed in this area during site restoration as had originally been planned in the remedial design document. Instead, the area will be seeded with a wetland seed mix.

Ohio EPA concurs with this request.

This letter is an official response from Ohio EPA that will be maintained as a public record. If you have any questions or concerns, please do not hesitate to contact me at (330) 963-1201 or via email at susan.netzly-watkins@epa.ohio.gov

Sincerely,

Sue Netzly-Watkins

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

SNW/sc

ec: Nat Peters, USACE
Steve Kvaal, USACE
Katie Tait, OHARNG RTLS
Rebecca Shreffler, Chenega
Natalie Oryshkewych, Ohio EPA, NEDO, DERR
Bob Princic, Ohio EPA, NEDO, DERR
Tom Schneider, Ohio EPA, SWDO, DERR

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Ohio Environmental Protection Agency

**Mike DeWine**, Governor
**Jon Husted**, Lt. Governor
**Laurie A. Stevenson**, Director

April 13, 2021

**TRANSMITTED ELECTRONICALLY**

Mr. Kevin Sedlak
Army National Guard
Installation and Environment
Clean-up Branch IPA Designation
1438 State Route 534 SW
Newton Falls, OH 44444

RE: US Army Ravenna Ammunition Plt RVAAP
Remediation Response
Project Records
Remedial Response
Portage County
ID # 267000859127

**Subject: Receipt and Review of the Final Remedial Design for RVAAP-45 Wet Storage Area, Dated March 19, 2021**

Dear Mr. Sedlak:

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 Design for RVAAP-45 Wet Storage Area. This document, received by Ohio EPA's NEDO on March 19, 2021 was prepared for the U.S. Army Corps of Engineers Louisville District, and by Endpoint Consulting, Inc., 5 South Linden Street, Suite 2, South San Francisco, CA 94080, and Alaniz Associates Corp., 21334 East Colverton St., Covina, CA 91724.

Ohio EPA has no further comments, and concurs with the Final Remedial Design Work Plan for RVAAP-45 Wet Storage Area.

As a precautionary response to COVID-19, Ohio EPA is currently operating with most staff working remotely. During this time, we will not be issuing hard-copy mail. This letter is an official response from Ohio EPA that will be maintained as a public record.

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If you have any questions or concerns, please do not hesitate to contact me at (330) 963-1201, or via email at Susan.Netzly-Watkins@epa.ohio.gov.

Sincerely,

Sue Netzly-Watkins

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

SNW/sc

ec: Nat Peters, USACE
Steve Kvaal, USACE
Katie Tait, OHARNG RTLS
Sarah Meyers, CH2M
Rebecca Shreffler, Chenega
Natalie Oryshkewych, Ohio EPA, NEDO, DERR
Bob Princic, Ohio EPA, NEDO, DERR
Tom Schneider, Ohio EPA, SWDO, DERR
Brian Tucker, Ohio EPA, DERR, CO
Kelly Kanoza, Akron Regional Air Quality Management District

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

March 19, 2021

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

Subject: Ravenna Army Ammunition Plant (RVAAP) Restoration Program, Portage/Trumbull Counties, Final Remedial Design for RVAAP-45 Wet Storage Area
(Ohio EPA Work Flow Activity #267000859127)

Dear Ms. Netzly-Watkins:

Enclosed for Ohio EPA's files is 1 electronic copy (sent via the liquid file site) of the *Final Remedial Design for Soil, Sediment and Surface Water at RVAAP-45 Wet Storage Area*. This document was prepared for the Army in support of the RVAAP Restoration Program.

Please contact the undersigned at 614-336-6000 Ex 2053 or kevin.m.sedlak.ctr.@mail.mil if there are issues or concerns with this submission.

Sincerely,

SEDLAK.KEVIN.MICHAEL.1254440171 Digitally signed by SEDLAK.KEVIN.MICHAEL.1254440171 Date: 2021.03.19 09:09:11 -04'00'

Kevin Sedlak
RVAAP Restoration Program Manager
Army National Guard Directorate

cc: Bob Princic, Ohio EPA, NEDO, DERR
Tom Schneider, Ohio EPA, SWDO, DERR
Mark Leeper, ARNG
Katie Tait, OHARNG, Camp James A. Garfield
Craig Coombs, USACE Louisville
Nathaniel Peters, USACE Louisville
Steve Kvaal, USACE Louisville
Rebecca Shreffler, Chenega
Jennifer Tierney, Vista Sciences Corporation
Pat Ryan, Leidos – REIMS

Ohio Environmental Protection Agency

**Mike DeWine**, Governor
**Jon Husted**, Lt. Governor
**Laurie A. Stevenson**, Director

November 5, 2021

**TRANSMITTED ELECTRONICALLY**

Mr. Kevin M. Sedlak
Army National Guard
Installations & Environment
Cleanup Branch IPA Designation
1438 State Route 534 SW
Newton Falls, OH 44444

RE: US Army Ravenna Ammunition Plt RVAAP
Remediation Response
Project Records
Remedial Response
Portage County
ID # 267000859110

**Subject: Draft Record of Decision for Soil, Sediment, and Surface Water at RVAAP-50 Atlas Scrap Yard, October 7, 2021**

Dear Mr. Sedlak:

The Ohio Environmental Protection Agency (Ohio EPA), Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR) has received and reviewed the "Draft Record of Decision for Soil, Sediment, and Surface Water at RVAAP-50 Atlas Scrap Yard," dated October 7, 2021. It was prepared by Leidos.

Ohio EPA has the following comments:

1. **Page 5, Lines 180-181:** The selected remedy for the Former Storage Area (FSA) is not protective of all receptors. It is only protective for the Industrial Receptor and National Guard Trainee.

   **Action Item:** Please revise the text.

2. **Page 20, line 801-803:** These lines state: *Soil will be transferred to a mixing area, where the stabilization agent will be added to the soil. The soil and stabilizing agent will be mixed in this area until a homogeneous mixture is achieved.*

   More information is needed on the soil that will be removed from the Former Incinerator Area (FIA) and transferred to a mixing area for treatment. Please describe the treatment process, including whether the treatment will occur in a container or tank, treatment administration, stabilization agent, etc. If the soil, when excavated from the FIA, is characterized as a hazardous waste, and then transferred to a mixing area for treatment, these activities will constitute generation of a hazardous waste and



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placement. As such, RVAAP should re-evaluate the list of Applicable or Relevant and Appropriate Requirements (ARARs) regarding these activities as they pertain to the Ohio's hazardous waste laws and rules.

More information regarding the concepts identified above are discussed in the following U.S. EPA RCRA Online interpretative information:

- https://rcrapublic.epa.gov/files/11954.pdf
- https://rcrapublic.epa.gov/files/14283.pdf

**Action Item:** Please include the additional information in the revised document.

This letter is an official response from Ohio EPA that will be maintained as a public record.

If you have any questions concerning this letter, please contact me at (330) 963-1170, or via email at ed.damato@epa.ohio.gov.

Sincerely,

Edward J D'Amato

Edward D'Amato
Site Coordinator
Division of Environmental Response and Revitalization

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ec: Katie Tait, OHARNG RTLS
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Frank Zingales, Ohio EPA, NEDO, DERR
Tom Schneider, Ohio EPA, SWDO, DERR
William Damschroder, Ohio EPA, CO, Legal

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

October 7, 2021

Ohio Environmental Protection Agency
DERR-NEDO
Attn: Edward D'Amato, Site Coordinator
2110 East Aurora Road
Twinsburg, OH 44087-1924

Subject: Ravenna Army Ammunition Plant (RVAAP) Restoration Program, Portage/Trumbull Counties, RVAAP-50 Atlas Scrap Yard, Draft Record of Decision (Work Activity No. 267000859110)

Dear Mr. D'Amato:

An electronic version of the *Draft Record of Decision for Soil, Sediment, and Surface Water at RVAAP-50 Atlas Scrap Yard* will be sent using the Ohio EPA LiquidFile system. A hard copy and CD will be sent if requested when they are able to be received by Ohio EPA.

This document was prepared for the Army National Guard in support of the RVAAP Restoration Program. Please contact the undersigned at 614-336-6000, ext 2053 or kevin.m.sedlak.ctr@mail.mil if there are issues or concerns with this submission.

Sincerely,

**FOR** Kevin M. Sedlak
RVAAP Restoration Program Manager
Army National Guard Directorate

cc: Natalie Oryshkewych, Ohio EPA, NEDO
Bob Princic, Ohio EPA, NEDO
Tom Schneider, Ohio EPA, SWDO
Megan Oravec, Ohio EPA, NEDO
Mark Leeper, ARNG
Katie Tait, OHARNG, Camp James A. Garfield
Steve Kvaal, USACE Louisville
Nathaniel Peters, II, USACE Louisville
Jed Thomas, Leidos
Jennifer Tierney, Vista Sciences Corporation

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Date: 2021.10.07 09:05:40 -04'00'

Ohio Environmental Protection Agency

**Mike DeWine**, Governor
**Jon Husted**, Lt. Governor
**Laurie A. Stevenson**, Director

December 10, 2021

**TRANSMITTED ELECTRONICALLY**

Mr. Kevin Sedlak
Restoration Program Manager
ARNG-ILE Clean Up
Camp James A Garfield JTC
1438 State Route 534 SW
Newton Falls, OH 44444

RE: US Army Ammunition Plt RVAAP
Remediation Response
Project Records
Remedial Response
Portage County
ID # 267000859036

**Subject: Ohio EPA Reply to the "Response to Ohio EPA Comments on the Draft Facility-wide Groundwater Monitoring Program Plan RVAAP-66 Facility-wide Groundwater Remedial Investigation Report" Dated July 31, 2020**

Dear Mr. Sedlak:

The Ohio Environmental Protection Agency (Ohio EPA) has received and reviewed the "Response to Ohio EPA Comments on the Draft Facility-wide Groundwater Monitoring Program (FWGWMP) Plan RVAAP-66 Facility-wide Groundwater Remedial Investigation Report" for the Former Ravenna Army Ammunition Plant, Portage and Trumbull Counties, Ohio (Camp Garfield). This document was received by Ohio EPA's Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR) via email on October 5, 2021. The response was prepared for the United States Army Corps of Engineers (USACE) on behalf of the National Guard Bureau by Leidos under Contract Number W912QR-16-D-0003. This letter serves as Ohio EPA's response to the unresolved comments as presented by the Army in the October 5, 2021, letter.

## GENERAL REPORT COMMENTS

***Ohio EPA Report Section Comment 4:*** *Section 4.7, page 4-4. Monitoring wells were analyzed for perchlorate in 2008 and then stopped. Perchlorates were used in propellants. Please summarize the rationale for sampling for this compound and then for ending that analysis after one year.*

**Army Response:** Clarification. Section 4.7 merely summarizes (at a high level) important activities conducted under the FWGWMP in 2008. One activity conducted in 2008 was "Between the July and October 2008 sampling event, 131 wells were analyzed for perchlorate (EQM 2009a and 2009b)", thus it was discussed in the summary of 2008 sampling.

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Over 180 perchlorate samples were collected and analyzed after 2008. For example, as stated in Section 4.17.3, perchlorate was analyzed as part of the full-suite analysis for the Sand Creek Disposal Road Landfill wells installed in 2018.

> **May 12, 2021, Ohio EPA Comment:** Ohio EPA does not believe the response adequately answers the question. Please provide the historical rationale for the sampling and why it was not continued.
>
> **October 5, 2021, Army Reply:** Army Response (Revised): Clarification. As indicated in the response, the analysis for perchlorates under the FWGWMP did not stop. Over 180 perchlorate samples were collected and analyzed after 2008. For example, as stated in Section 4.17.3, perchlorate was analyzed as part of the full-suite analysis for the Sand Creek Disposal Road Landfill wells installed in 2018.
>
> In the 2007 Annual Report (dated March 24, 2008) stated in Section 1.6 Changes to the FWGWMP for 2008 that "A perchlorate analysis addendum to the FWGWMP Plan was implemented for the October 2007 monitoring event that will be reported in the 2008 Annual Report." The Report for the October 2007 Sampling Event (dated April 28, 2008) provided a Perchlorate Analysis Addendum in Appendix A. This Perchlorate Analysis Addendum did not present the rationale for perchlorate analysis, rather only presented the sampling methodology.
>
> ***Current Ohio EPA Response: Ohio EPA finds this response adequate but would like to discuss Perchlorate during a Comment Resolution Meeting.***
>
> ***Please be prepared to summarize the perchlorate evaluation in ground water and at what Areas of Concern (AOCs) perchlorate exceeded screening levels.***

***Ohio EPA Report Section Comment 6:*** *Section 5.1, page 5-2, second bullet. Regarding the separate [Remedial Investigations] RIs that are being conducted at RVAAP-04, RVAAP-69, and RVAAP-74, a statement needs to be made that clearly states that RIs are being conducted separately at these three AOCs due to schedules that did not coincide with preparation of this FWGW RI and therefore the results and conclusions will be handled separately. It is Ohio EPA's request that these final RIs become appendices to this FWGW RI.*

**Army Response:** Clarification and agree. The rationale for which RVAAP-004-R-01, CC RVAAP-69, and CC RVAAP-74 are not part of the Facility-wide Groundwater RI extends beyond schedule. For example, groundwater at RVAAP-004-R-01 Open Demolition Area #2 is being evaluated as part of a site-specific comprehensive RI that includes other media such as soil, sediment, and surface water. It is the position of the Army that it is less important to provide this rationale, provided that there is clarity that site-specific RIs for these sites are underway. Text provided in Sections 1.2 (Scope), 1.3 (Report Organization), 5.1 (Data Assembly), and 9.0 (Conclusions) have been modified similar to below:

"Three additional separate groundwater investigations at CJAG are not included in this FWGW RI, as groundwater is being addressed during comprehensive site-specific investigations. These areas of concern (AOCs) include RVAAP-004-R-01 Open Demolition Area #2 [Munitions Response Site] MRS (which is inclusive of RVAAP-04 Open Demolition Area #2), CC-RVAAP-69 Building 1048 Fire Station, and CC RVAAP-74 Building 1034 Motor Pool."

In addition, it is the Army's position that the final RIs for RVAAP-004-R-01, CC RVAAP-69, and CC RVAAP-74 do not become appendices to this Facility-wide Groundwater RI Report. As noted above, the report clearly states that these sites are not within the scope, and there is an administrative record available for future reviewers to find groundwater-specific conclusions associated with these sites.

> **May 12, 2021, Ohio EPA Comment:** Ohio EPA wonders then why the Facility-Wide Groundwater Remedial investigation is titled as it is. It is not a Facility-Wide Remedial Investigation when it does not include several major AOCs. The Introduction to this RI should clearly list those AOCs where RIs are conducted separately.
>
> **October 5, 2021, Army Response (Revised):** Comment noted. As presented in the original response to this comment, subsections to the Introduction (Section 1.2 Scope and Section 1.3 Report Organization) have been modified to specify the AOCs where RIs are being conducted separately.
>
> "Three additional separate groundwater investigations at CJAG are not included in this FWGW RI, as groundwater is being addressed during comprehensive site-specific investigations. These areas of concern (AOCs) include RVAAP-004-R-01 Open Demolition Area #2 MRS (which is inclusive of RVAAP-04 Open Demolition Area #2), CC-RVAAP-69 Building 1048 Fire Station, and CC RVAAP-74 Building 1034 Motor Pool."
>
> ***Current Ohio EPA Response: Ohio EPA finds this response adequate but would like to discuss during a Comment Resolution Meeting. We would like to discuss the Army's reasoning for not including these RIs as appendices to the Facility wide Groundwater Remedial Investigation Report.***

***Ohio EPA Report Section Comment 10:*** *Section 9.0, page 9-2, last paragraph states, "The Army will continue with three additional investigations at CJAG at…" The statement needs to clearly state that RIs are being conducted separately at these three AOCs due to schedules that did not coincide with preparation of this FWGW RI and therefore the results and conclusions will be handled separately. It is Ohio EPA's request that these final RIs become appendices to this FWGW RI.*

**Army Response:** Please see response to Report Section Comment 6.

**May 12, 2021, Ohio EPA Comment:** Ohio EPA wonders then why the Facility-Wide Groundwater Remedial investigation is titled as it is. It is not a Facility-Wide Remedial Investigation when it does not include several major AOCs. The Introduction to this RI should clearly list those AOCs where RIs are conducted separately.

**October 5, 2021, Army Response:** Please see response to Report Section Comment 6.

***Current Ohio EPA Response: Ohio EPA finds this response adequate but would like to discuss during a Comment Resolution Meeting.***

***Ohio EPA Report Section Comment 11:*** *Appendix A, Section A.1.3.5, page 7, paragraph 3. The Route 80 Tank Farm. Please describe the number and size of tanks that were located in this area. When were they removed? It does not appear ground water was evaluated in this area. Based on information provided in this RI, Ohio EPA believes ground water [monitoring wells] MWs are necessary in the area to eliminate our concern over this potential contaminant pathway.*

**Army Response:** Clarification and agree. Soil screening for migration to groundwater was conducted for all [site-related contaminants] SRCs within CC RVAAP-79 including the Route 80 Tank Farm, concluding no impact to groundwater. This information combined with the well documented site history, investigations, and removal actions documented in the Final Remedial Investigation for CC RVAAP-79 DLA Ore Storage Sites (Parsons 2020) provides adequate support to eliminate the need for monitoring wells. Additionally, FWGmw-014 is located approximately 250 ft to the southwest and is screened in unconsolidated sediments from 8.25 to 18.25 ft [below ground surface] bgs doesn't exceed the site related screening criteria. Available site information summarized in final investigation reports for the DLA Storage Area, pertinent to the Route 80 Tank Farm, will be summarized in revised text as follows in paragraph 2 and 3 of Section A.1.3.5:

"This sub-area was used to store strategic material in 18 [aboveground storage tanks] ASTs including asbestos, cobalt, monazite sand, nickel cathodes, rutile sand, talc, and zircon sand ore (SpecPro, 2003). Several decontamination and survey efforts were conducted between the mid1970s and 2001. Details relative to closure of these storage units are documented in the Final Report for the Assessment of Potential Contamination at the DLA Outdoor Storage Areas, Ravenna Army Ammunition Plant, Ravenna, Ohio (SpecPro, 2003). The historical ASTs are no longer present in this sub-area, with the last tank (Tank #1306 that was approximately 85-ft in diameter, 25-ft tall) removed in March 2007 (SpecPro 2007). North-south trending rail lines used to traverse the sub-area but have been removed. Several thousand cubic yards of asbestos and monazite contaminated soil were removed from the AST area and all subsequent activities summarized in the Final RI (Parsons 2020x)."

"The Final Remedial Investigation for CC RVAAP-79 DLA Ore Storage Sites (Parsons 2020x) included a summary of the nature and extent of contamination, contaminant fate and transport, [a] [human health risk assessment] HHRA, and an [environmental risk assessment]

ERA. SRC concentrations in soil were screened to identify those contaminant migration chemicals of potential concern (CMCOPCs) with the potential to leach to and migrate in groundwater. Conclusions of the soil screening analysis are that all of the identified SRCs at this AOC in soil were eliminated as current risks to groundwater. No CMCOPCs (and, therefore, no contaminant migration [chemicals of concern] COCs) were identified at CC RVAAP-79 DLA Ore Storage Sites.

**May 12, 2021, Ohio EPA Comment:** Ohio EPA is not confident that one well 250 feet away, likely side gradient from 18 ASTs storing an estimated 1,300 cubic yards each and where several thousand cubic yards of contaminated soil were removed, is adequate to determine if ground water has or has not been impacted. Please include general soil types and their estimated permeabilities in the area as part of the discussion above.

**October 5, 2021, Army Response (Revised):** Agree. The soil types and estimated hydraulic conductivity used in the contaminant fate and transport modeling has been added to the text, as presented below.

Soil screening for migration to groundwater was conducted for all SRCs within CC RVAAP-79 including the Route 80 Tank Farm, concluding no impact to groundwater. This information combined with the well documented site history, investigations, and removal actions documented in the Final Remedial Investigation for CC RVAAP-79 DLA Ore Storage Sites (Parsons 2020) provides adequate support to eliminate the need for monitoring wells. Additionally, FWGmw-014 is located approximately 250 ft to the southwest and is screened in unconsolidated sediments from 8.25 to 18.25 ft bgs doesn't exceed the site related screening criteria. Available site information summarized in final investigation reports for the DLA Storage Area, pertinent to the Route 80 Tank Farm, will be summarized in revised text as follows in paragraph 2 and 3 of Section A.1.3.5:

"This sub-area was used to store strategic material in 18 ASTs including asbestos, cobalt, monazite sand, nickel cathodes, rutile sand, talc, and zircon sand ore (SpecPro, 2003). Several decontamination and survey efforts were conducted between the mid-1970s and 2001. Details relative to closure of these storage units are documented in the Final Report for the Assessment of Potential Contamination at the DLA Outdoor Storage Areas, Ravenna Army Ammunition Plant, Ravenna, Ohio (SpecPro, 2003). The historical ASTs are no longer present in this sub-area, with the last tank (Tank #1306 that was approximately 85-ft in diameter, 25-ft tall) removed in March 2007 (SpecPro 2007). North-south trending rail lines used to traverse the sub-area but have been removed. Several thousand cubic yards of asbestos and monazite contaminated soil were removed from the AST area and all subsequent activities summarized in the Final RI (Parsons 2020x)."

"The Final Remedial Investigation for CC RVAAP-79 DLA Ore Storage Sites (Parsons 2020x) included a summary of the nature and extent of contamination, contaminant fate and transport, an HHRA, and an ERA. SRC concentrations in soil were screened to identify those contaminant migration chemicals of potential concern (CMCOPCs) with the potential to leach to and migrate in groundwater. The native soil at the Route 80 Tank Farm was mapped by the United States Department of Agriculture (USDA) as Wadsworth silt loam (0 to 2 percent slopes). Boring logs from the area indicate clayey black organic material at the surface in some areas. Soil below that is generally brown to gray clay and silty clay, which are assumed to be Lavery Till glacial deposits or fill material from site construction. The potential to leach to and migrate in groundwater was assessed using a hydraulic conductivity of 0.0033 ft/year. Conclusions of the soil screening analysis are that all of the identified SRCs at this AOC in soil were eliminated as current risks to groundwater. ~~No CMCOPCs (and, therefore, no contaminant migration COCs) were identified at CC RVAAP-79 DLA Ore Storage Sites.~~

The following reference has been added to Appendix A:

SpecPro (SpecPro, Inc.) 2007. Project Completion Report for the DLA Storage Area Reclamation – Route 80 Tank Farm and East Ore Yard Culvert Replacement. November 2007.

***Current Ohio EPA Response: Ohio EPA finds this response adequate but would like to discuss during a Comment Resolution Meeting.***

***Ohio EPA Report Section Comment 21:*** *Appendix B, Section B.1.3.4, page 5. The description of CC-RVAAP-71 Barn Number 5 Petroleum Release states that soil samples were collected from this site of a pipeline release that occurred in 1964. The section also states that no further action is required. No ground water evaluation was ever conducted at this AOC located near the [Ohio Army National Guard] OHARNG downgradient property line. Without additional information, Ohio EPA believes MWs are warranted in this area. The wells would not only allow for the ground water pathway to be evaluated; they would also serve to protect the Army from potential liability.*

**Army Response:** Comment noted. As stated in the Site Inspection and Remedial Investigation Work Plan (ECC 2012), "ECC will evaluate the soils, and if based on the data, it appears groundwater may be impacted, then a recommendation will be included in the report that groundwater will need to be assessed by the Army under its base-wide groundwater program". After evaluation of subsurface soil and deep soil borings at the CC RVAAP-71 Barn No. 5 Petroleum Release, the Final Site Inspection Report (ECC 2015) stated that [No Further Action] NFA was warranted. In addition, no water was encountered at CC RVAAP-71 during drilling activities at any of the soil boring locations which indicates that the groundwater is likely deeper than 13 ft bgs in the vicinity of the AOC. Accordingly, it is concluded as part of the FWGWMP that additional investigation of groundwater at this site is not warranted.

**May 12, 2021, Ohio EPA Comment:** Based on the information provided, ground water has not been evaluated in this Area of Concern (AOC). Can you provide information on the estimated release volume? Was any clean up or repair of the pipeline conducted? How close is the nearest private well downgradient? Ohio EPA believes that based on the information provided, ground water should be evaluated in this AOC.

**October 5, 2021, Army Response (Revised):** Clarification and agree. Regarding CC RVAAP-71 Barn No. 5 Petroleum Release, the SI Report stated that "No documented evidence of impact from former and/or current military operations at this AOC was found during the [Historical Records Review] HRR. Further, no documented evidence of military munitions or operations involving [hazardous, toxic and radioactive waste] HTRW was found. No presence of ASTs or [underground storage tanks] USTs was discovered during the HRR. No documented evidence was discovered during the HRR of historical practices involving containerized hazardous, toxic and radioactive waste at CC RVAAP-71."

A drawing dated 1943, showed the 12.5-ft pipeline easement of the SOHIO pipeline from which gasoline was released. Figure 2-3 of the Historical Records Review Report for CC-RVAAP-71 Barn No. 5 Petroleum Release and CC-RVAAP-83 Former Buildings 1031 and 1039 (ECC 2012) depicts the pipeline easement.

The incident of the historic gasoline release at CC RVAAP-71 has been documented in a letter prepared by C.F. Craver, former RVAAP Security Manager (Security Chief) to H.M. Krengel, Ravenna Arsenal, Inc. General Manager and dated May 13, 1964. The 1964 pipeline break caused a consequent release of an estimated 20 barrels (840 gallons) of gasoline. Based on the 1964 letter, excavation was completed in order to repair the pipeline on the same day as the reported release. The pipeline depth is unknown.

Based on the site inspection conducted on November 3, 2011, there is no visual evidence of a gasoline release, such as staining, residue, odor, or stressed vegetation evident at the site area. In 2013, fourteen soil borings were advanced to 7 ft bgs and one soil boring was advanced to 13 ft bgs. There were no BUSTR exceedances of gasoline-constituents related with the 1964 gasoline release reported in any of the subsurface soil samples collected at CC RVAAP71 Barn No. 5 Petroleum Release.

Estimated groundwater flow in the Unconsolidated aquifer in this area is to the south. Groundwater was not encountered during advancement of any borings, indicating that groundwater is likely deeper than 13 ft bgs at the site.

Although there is no documented evidence of impact from former and/or current military operations at this site, the Army is proposing to install a temporary well in the Unconsolidated aquifer, south of the location of the pipeline, for a one-time sample of [volatile organic compounds] VOCs, [semi-volatile organic compounds] SVOCs, lead,

and [total petroleum hydrocarbon] TPH [diesel range organics/gasoline range organics] DRO/GRO.




***Current Ohio EPA Comment: Ohio EPA finds this response adequate but would like to discuss during a Comment Resolution Meeting.***

## GROUP SPECIFIC COMMENTS

***Ohio EPA Group Comment 1:*** *Group A - Western Sites and C Block Quarry.*

*While five MWs were located around the RVAAP-06 C Block Quarry Area, two MWs were located around the CC RVAAP-76 Depot Area, one MW was located around the CC RVAAP-79 DLA Ore Storage Sites – Route 80 Tank Farm, one MW was located around the CC RVAAP-73 Facility-wide Coal Storage – North Line Road Coal Tipple, and no wells were shown around the RVAAP-46 Buildings F-15 and F-16, RVAAP-046-R-01 Building #F-15 and F-16 MRS, and CC RVAAP-73 Facility-wide Coal Storage – Building U-16 1050 Boiler House. Please confirm that sites with limited numbers of wells have been adequately delineated and discuss/demonstrate how sites with no wells have been thoroughly investigated and warrant no further action. While this rationale may have been previously covered in the RI Work Plan or [Feasibility Study] FS reports, reiteration of this rationale within this final Remedial Investigation Report would provide clarification for future reviewers.*

**Army Response:** Clarification. Appendix A, Section A.1.3 provides a detailed summary of every AOC, MRS, and [Compliance Restoration Site] CRS within Group A and is supported by conclusions from the most recent approved available documents for each site. Some sites, including RVAAP-46, RVAAP-046-R-01, and CC RVAAP-73, were determined not to have soil or sediment contamination that would adversely impact groundwater. Subsequent group-specific evaluation of groundwater in Sections A.2 to A.4 supports the Army's conclusion that the nature and extent of contamination has been defined, and the HHRA and ERA did not identify a risk requiring an action for Group A.

**May 12, 2021, Ohio EPA Comment:** Ohio EPA finds this response adequate and acceptable, and considers this comment resolved with the additional recommendation to include this type of clarification text within the Main Text, Section 9.0 Conclusions and Recommendations portion of the document, within Table 9.1, and also within the X.6 Conclusions and Recommendations portions of each Group appendix (for clarity to assist future reading of the document). The text could be further clarified by adding explanation of the low number/no well issues, such as "Some sites with limited wells or no wells were determined not to have soil or sediment contamination that would adversely impact ground water, thus fewer or no wells were needed for some sites." Ohio EPA is not concurring with abandonment of specified wells at this time, since it is understood that the Army's intention is to abandon wells at a later date, upon discussion and receipt of Ohio EPA's concurrence of the facility-wide ground water AOC path forward, as this document is not a well abandonment plan.

**October 5, 2021, Army Response (Revised):** Agree. The third paragraph of Section 9.0 has been revised as follows:

"Due to the size and structure of the FWGW AOC, CJAG was divided into 15 groups of monitoring wells and potential contaminant source areas. Some potential contaminant source areas with limited wells or no wells were determined not to have soil or sediment contamination that would adversely impact ground water, thus fewer or no wells were installed at the specific potential contaminant source area. The individual appendices present group-specific [conceptual side models] CSMs, data gap assessment, nature and extent of contamination, HHRA, ERA, contaminant fate and transport (if necessary), and conclusions and recommendations."

In addition, Section X.1.3 Potential Contaminant Source Areas has been revised as follows in each Appendix:

"Fifty-three AOCs, 17 MRSs, and 14 Compliance Restoration Sites (CRSs) that represent the potential contaminant source areas are located within the former Ravenna Army Ammunition Plant (RVAAP). Some potential contaminant source areas with limited wells or no wells were determined not to have soil or sediment contamination that would adversely impact ground water, thus fewer or no wells were installed at the specific potential contaminant source area. The following subsections

provide a description and investigative findings for the potential contaminant source areas within Group A."

***Current Ohio EPA Comment: Ohio EPA finds this response adequate and acceptable, and considers this comment resolved, as long as the Army is satisfied that the revised text does not also have to be in other portions of the document such as within Table 9.1, and also within the Sections X.6 Conclusions and Recommendations portions of each Group appendix (for clarity to assist future reading of the document).***

***Ohio EPA Group Comment 2:*** *Group B - NACA Test Area.*

*While 13 MWs were located around the RVAAP-38 National Advisory Committee for Aeronautics (NACA) Test Area, six MWs were located around the RVAAP-28 Suspected Mustard Agent Burial Site (SMABS) – South, one MW (along with three NACA wells) were located around the RVAAP-03 Open Demolition Area #1 (ODA1), one MW (a co-located NACA well) was located around the RVAAP-28 Suspected Mustard Agent Burial Site (SMABS) - North, and no wells were shown around the CC RVAAP-71 Barn No. 5 Petroleum Release. Please confirm that sites with limited numbers of wells have been adequately delineated and discuss/demonstrate how sites with no wells have been thoroughly investigated and warrant no further action. While this rationale may have been previously covered in the RI Work Plan or FS reports, reiteration of this rationale within this final Remedial Investigation Report would provide clarification for future reviewers.*

**Army Response:** Clarification. Appendix B, Section B.1.3 provides a detailed summary of every AOC, MRS, and CRS within Group B and is supported by conclusions from the most recent approved available documents for each site. Subsequent group-specific evaluation of groundwater in Sections B.2 to B.4 supports the Army's conclusion that the nature and extent of contamination has been defined, and the HHRA and ERA did not identify a risk requiring an action for Group B.

**May 12, 2021, Ohio EPA Comment:** Ohio EPA finds this response adequate and acceptable, and considers this comment resolved with the additional recommendation to include this type of clarification text within the Main Text, Section 9.0 Conclusions and Recommendations portion of the document, within Table 9.1, and also within the X.6 Conclusions and Recommendations portions of each Group appendix (for clarity to assist future reading of the document). The text could be further clarified by adding explanation of the low number/no well issues such as "Some sites with limited wells or no wells were determined not to have soil or sediment contamination that would adversely impact ground water, thus fewer or no wells were needed for some sites." Ohio EPA is not concurring with abandonment of specified wells at this time, since it is understood that the Army's intention is to abandon wells at a later date, upon discussion and receipt of Ohio EPA's concurrence of the facility-wide ground water AOC path forward, as this document is not a well abandonment plan.

**October 5, 2021, Army Response (Revised):** Agree. See the revised response to Group Comment 1. Text portions of Section 9.0 and Sections X.1.3 were updated with revised text as recommended: "Some potential contaminant source areas with limited wells or no wells were determined not to have soil or sediment contamination that would adversely impact ground water, thus fewer or no wells were installed at the specific potential contaminant source area."

***Current Ohio EPA Comment: Ohio EPA finds this response adequate and acceptable, and considers this comment resolved, as long as the Army is satisfied that the revised text does not also have to be in other portions of the document such as within Table 9.1, and also within the Sections X.6 Conclusions and Recommendations portions of each Group appendix (for clarity to assist future reading of the document).***

***Ohio EPA Group Comment 3:*** *Group C - Fuze and Booster Load Lines.*

*RVAAP-39 Load Line 5, RVAAP-33 Load Line 6, RVAAP-40 Load Line 7, RVAAP-41 Load Line 8, RVAAP-44 Load Line 11, and CC RVAAP-68 Electric Substations – Substation No. 3 appear to have adequate delineation monitoring wells in their respective areas. However, one MW was located around the RVAAP-033-R-01 Firestone Test Facility MRS, one MW was located around the RVAAP-062-R-01 Water Works #4 Dump MRS, one MW was located around the CC RVAAP-68 Electric Substations – Substation No. 3, and no wells were shown around the CC RVAAP-75 George Road Sewage Treatment Plant Mercury Spill, CC RVAAP-77 Building 1037 Laundry Wastewater Sump, or CC RVAAP-83 Former Buildings 1031 and 1039. Please confirm that sites with limited numbers of wells have been adequately delineated and discuss/demonstrate how sites with no wells have been thoroughly investigated and warrant no further action. While this rationale may have been previously covered in the RI Work Plan or FS reports, reiteration of this rationale within this final Remedial Investigation Report would provide clarification for future reviewers.*

**Army Response:** Clarification. Appendix C, Section C.1.3 provides a detailed summary of every AOC, MRS, and CRS within Group C and is supported by conclusions from the most recent approved available documents for each site. Some sites, including RVAAP-33, RVAAP-39, RVAAP-40, RVAAP-41, RVAAP-42, RVAAP-43, RVAAP-44, CC RVAAP-68, CC RVAAP-74, CC RVAAP-77, and CC RVAAP-83, were determined not to have soil or sediment contamination that would adversely impact groundwater. Subsequent group-specific evaluation of groundwater in Sections C.2 to C.4 supports the Army's conclusion that the nature and extent of contamination has been defined, and the HHRA and ERA did not identify a risk requiring an action for Group C. This conclusion excludes CC RVAAP-69 Building 1048 Fire Station and CC RVAAP-74 Building 1034 Motor Pool.

**May 12, 2021, Ohio EPA Comment:** Ohio EPA finds this response adequate and acceptable, and considers this comment resolved with the additional recommendation to include this type of clarification text within the Main Text, Section 9.0 Conclusions and Recommendations portion of the document, within Table 9.1, and also within the

X.6 Conclusions and Recommendations portions of each Group appendix (for clarity to assist future reading of the document). The text could be further clarified by adding explanation of the low number/no well issues such as "Some sites with limited wells or no wells were determined not to have soil or sediment contamination that would adversely impact ground water, thus fewer or no wells were needed for some sites." Ohio EPA is not concurring with abandonment of specified wells at this time, since it is understood that the Army's intention is to abandon wells at a later date, upon discussion and receipt of Ohio EPA's concurrence of the facility-wide ground water AOC path forward, as this document is not a well abandonment plan.

**October 5, 2021, Army Response (Revised):** Agree. See the revised response to Group Comment 1. Text portions of Section 9.0 and Sections X.1.3 were updated with revised text as recommended: "Some potential contaminant source areas with limited wells or no wells were determined not to have soil or sediment contamination that would adversely impact ground water, thus fewer or no wells were installed at the specific potential contaminant source area."

**Current Ohio EPA Comment: Ohio EPA finds this response adequate and acceptable, and considers this comment resolved, as long as the Army is satisfied that the revised text does not also have to be in other portions of the document such as within Table 9.1, and also within the Sections X.6 Conclusions and Recommendations portions of each Group appendix (for clarity to assist future reading of the document).**

***Ohio EPA Group Comment 8:*** *Group E - Load Line 12.*

*Ohio EPA concurs with the recommendations for additional activities to be conducted to further evaluate Group E. The extent of contamination does not appear to have been defined, since the 2020 RI Report calls for additional horizontal and vertical delineation well(s). Unconsolidated Aquifer potentiometric flow directions indicate that horizontal delineation may be warranted to the east of LL12mw-185 and LL12mw-187.*

**Army Response:** Comment noted. It is the position of the Army that horizontal delineation is adequately defined for purposes of completing the RI phase of the [Comprehensive Environmental Response, Compensation, and Liability Act] CERCLA process. Further evaluation of nitrate and ammonia in the area of LL12mw-185 and LL12mw-187 will go forward in an FS. During the development and regulatory review of the FS, it will be determined if additional wells are needed to refine the conceptual site model and/or monitor contaminant migration.

**May 12, 2021, Ohio EPA Comment:** Ohio EPA finds this response adequate and acceptable, and considers this comment resolved with the additional comment that Ohio EPA is concurring with the horizontal and vertical delineation as recommended in the Draft RI Report as presented below:

From Appendix E, Page 98, lines 1456-1461:

1456 As the nature and extent of contamination has been defined, the HHRA identified risk at Load Line 12

1457 requiring additional actions. It is recommended that the area around LL12mw-185 and LLmw-187

1458 proceed to an FS for further evaluation to address the nitrate and ammonia contamination. In addition,

1459 the FS should specify the monitoring well network to refine horizontal and vertical contamination in

1460 this area, install new wells to support this evaluation (including evaluating and potentially replacing

1461 older wells), and abandon wells not needed for this evaluation.

**October 5, 2021, Army Response:** Comment noted. It is the position of the Army that horizontal delineation is adequately defined for purposes of completing the RI phase of the CERCLA process. Further evaluation of nitrate and ammonia in the area of LL12mw-185 and LL12mw-187 will go forward in an FS. During the development and regulatory review of the FS, it will be determined if additional wells are needed to refine the conceptual site model and/or monitor contaminant migration.

***Current Ohio EPA Comment: Ohio EPA finds this response adequate and acceptable, and considers this comment resolved pending scheduling and completion of the resolution meeting.***

***Ohio EPA Group Comment 10:*** *Group F - Atlas Scrap Yard and Load Line 4.*

*RVAAP-11 Load Line 4, RVAAP-50 Atlas Scrap Yard, and RVAAP-050-R-01 Atlas Scrap Yard MRS appear to have adequate delineation monitoring wells in their respective areas. However, no wells were shown around the RVAAP-48 Anchor Test Area, RVAAP-048-R-01 Anchor Test Area MRS, and CC RVAAP-79 DLA Ore Storage Sites – Building 841, Area 8 Inert Storage. Please confirm that sites with limited numbers of wells have been adequately delineated and discuss/demonstrate how sites with no wells have been thoroughly investigated and warrant no further action. While this rationale may have been previously covered in the RI Work Plan or FS reports, reiteration of this rationale within this final Remedial Investigation Report would provide clarification for future reviewers.*

**Army Response:** Appendix F, Section F.1.3 provides a detailed summary of every AOC, MRS, and CRS within Group F and is supported by conclusions from the most recent approved available documents for each site. Some sites, including RVAAP-11, RVAAP-50, and CC RVAAP-79, were determined not to have soil or sediment contamination that would adversely impact groundwater. Subsequent group-specific evaluation of groundwater in Sections F.2 to F.4 supports the Army's conclusion that the nature and extent of

contamination has been defined, and the HHRA and ERA did not identify a risk requiring an action for Group F.

**May 12, 2021, Ohio EPA Comment:** Ohio EPA finds this response adequate and acceptable, and considers this comment resolved with the additional recommendation to include this type of clarification text within the Main Text, Section 9.0 Conclusions and Recommendations portion of the document, within Table 9.1, and also within the X.6 Conclusions and Recommendations portions of each Group appendix (for clarity to assist future reading of the document). The text could be further clarified by adding explanation of the low number/no well issues such as "Some sites with limited wells or no wells were determined not to have soil or sediment contamination that would adversely impact ground water, thus fewer or no wells were needed for some sites." Ohio EPA is not concurring with abandonment of specified wells at this time, since it is understood that the Army's intention is to abandon wells at a later date, upon discussion and receipt of Ohio EPA's concurrence of the facility-wide ground water AOC path forward, as this document is not a well abandonment plan.

**October 5, 2021, Army Response (Revised):** See the revised response to Group Comment 1. Text portions of Section 9.0 and Sections X.1.3 were updated with revised text as recommended: "Some potential contaminant source areas with limited wells or no wells were determined not to have soil or sediment contamination that would adversely impact ground water, thus fewer or no wells were installed at the specific potential contaminant source area."

***Current Ohio EPA Comment: Ohio EPA finds this response adequate and acceptable, and considers this comment resolved, as long as the Army is satisfied that the revised text does not also have to be in other portions of the document such as within Table 9.1, and also within the Sections X.6 Conclusions and Recommendations portions of each Group appendix (for clarity to assist future reading of the document).***

***With regard to RVAAP -79, it is clear there is limited ground water information available to make decisions with regard to the arsenic contamination at this location. Soils and sediment are impacted yet the closest well appears to be one quarter to half a mile away. Ohio EPA would like to discuss this during the Comment Resolution meeting.***

***Ohio EPA Group Comment 15:*** *Group I - Ramsdell Quarry Landfill.*

*While 11 MWs were located in and around the RVAAP-01 Ramsdell Quarry Landfill (RQL) and RVAAP-001-R-02 RQL MRS Area 1 (North), only one MW was located within the RVAAP-001-R-01 RQL MRS Area 2 (South). Please confirm that sites with limited numbers of wells have been adequately delineated and discuss/demonstrate how sites with no wells have been thoroughly investigated and warrant no further action. While this rationale may*

*have been previously covered in the RI Work Plan or FS reports, reiteration of this rationale within this final Remedial Investigation Report would provide clarification for future reviewers.*

**Army Response:** Clarification. Appendix I, Section I.1.3 provides a detailed summary of the AOC (RQL) and MRSs (RQL MRS Area 1 North and RQL MRS Area 2 South) within Group I and is supported by conclusions from the most recent approved available documents for each site. Subsequent group-specific evaluation of groundwater in Sections I.2 to I.4 supports the Army's conclusion that the nature and extent of contamination has been defined, and the HHRA and ERA did not identify a risk requiring an action for Group I.

**May 12, 2021, Ohio EPA Comment:** Ohio EPA finds this response adequate and acceptable, and considers this comment resolved with the additional recommendation to include this type of clarification text within the Main Text, Section 9.0 Conclusions and Recommendations portion of the document, within Table 9.1, and also within the X.6 Conclusions and Recommendations portions of each Group appendix (for clarity to assist future reading of the document). The text could be further clarified by adding explanation of the low number/no well issues such as "Some sites with limited wells or no wells were determined not to have soil or sediment contamination that would adversely impact ground water, thus fewer or no wells were needed for some sites." Ohio EPA is not concurring with abandonment of specified wells at this time, since it is understood that the Army's intention is to abandon wells at a later date, upon discussion and receipt of Ohio EPA's concurrence of the facility-wide ground water AOC path forward, as this document is not a well abandonment plan.

Ohio EPA believes it is appropriate to defer some or all well abandonment activities until after concurrence has been reached regarding status of each AOC, until final remedies have been chosen and a long-term facility-wide ground water monitoring program is established. Continued ground water monitoring of some of these AOC wells may be required to comply with applicable Division of Materials and Waste Management (DMWM) rules and regulations. A ground water monitoring program that includes wells at downgradient property lines may also be beneficial.

**October 5, 2021, Army Response (Revised):** Regarding the recommendations provided in the first paragraph of the reply, please see the revised response to Group Comment 1. The Army concurs that well abandonment is not required at this time. OHARNG submitted the Final End of Post Closure Care Certification (EOPCC) for RQL to the Division of Materials and Waste Management (DMWM). According to a letter from the Director of the Ohio EPA, dated August 9, 2021, regarding the EOPCC and RQL, "the five RQL groundwater monitoring wells included the in FWGWMP network must remain in place in accordance with the [Director's Final Findings and Orders] DFFOs. The Facility is still required to comply with the groundwater monitoring, investigation, and remedial requirements of the June 10, 2004, DFFO." Therefore, any current and future groundwater sampling at RQL would be done to support the CERCLA process, and the need for groundwater monitoring downgradient of the property lines is assessed as part of the Facility-wide Groundwater Monitoring

Program (FWGWMP) and groundwater sampling is specified in the annual addendums.

***Current Ohio EPA Comment: Ohio EPA finds this response adequate and acceptable, and considers this comment resolved, as long as the Army is satisfied that the revised text does not also have to be in other portions of the document such as within Table 9.1, and also within the Sections X.6 Conclusions and Recommendations portions of each Group appendix (for clarity to assist future reading of the document). Ohio EPA concurs that well abandonment is not required at this time, and that the five RQL wells will fall under the CERCLA process and the FWGWMP.***

***Ohio EPA Group Comment 18:*** *Group L - Northern Sites.*

*Since five MWs were located within the Group L area to assess the CC RVAAP-73 Facility-wide Coal Storage – Sand Creek Coal Tipple, the CC RVAAP-79 DLA Ore Storage Sites – Area 2 Ammo Storage Area, and the CC RVAAP-80 Group 2 Propellant Can Top (an approximate 8,000-foot by 6,000-foot area), please confirm that sites with limited numbers of wells have been adequately delineated and discuss/demonstrate how sites with no wells have been thoroughly investigated and warrant no further action. While this rationale may have been previously covered in the RI Work Plan or FS reports, reiteration of this rationale within this final Remedial Investigation Report would provide clarification for future reviewers.*

**Army Response:** Clarification. Appendix L, Section L.1.3 provides a detailed summary of every AOC, MRS, and CRS within Group L and is supported by conclusions from the most recent approved available documents for each site. Some sites, including CC RVAAP-79, CC RVAAP-80, and CC RVAAP-73, were determined not to have soil or sediment contamination that would adversely impact groundwater. Subsequent group-specific evaluation of groundwater in Sections L.2 to L.4 supports the Army's conclusion that the nature and extent of contamination has been defined, and the HHRA and ERA did not identify a risk requiring an action for Group L.

**May 12, 2021, Ohio EPA Comment:** Ohio EPA finds this response adequate and acceptable, and considers this comment resolved with the additional recommendation to include this type of clarification text within the Main Text, Section 9.0 Conclusions and Recommendations portion of the document, within Table 9.1, and also within the X.6 Conclusions and Recommendations portions of each Group appendix (for clarity to assist future reading of the document). The text could be further clarified by adding explanation of the low number/no well issues such as "Some sites with limited wells or no wells were determined not to have soil or sediment contamination that would adversely impact ground water, thus fewer or no wells were needed for some sites." Ohio EPA is not concurring with abandonment of specified wells at this time, since it is understood that the Army's intention is to abandon wells at a later date, upon discussion and receipt of Ohio EPA's concurrence of the facility-wide ground water AOC path forward, as this document is not a well abandonment plan.

October 5, 2021, Army Response (revised): Agree. See the revised response to Group Comment 1. Text portions of Section 9.0 and Sections X.1.3 were updated with revised text as recommended: "Some potential contaminant source areas with limited wells or no wells were determined not to have soil or sediment contamination that would adversely impact ground water, thus fewer or no wells were installed at the specific potential contaminant source area."

***Current Ohio EPA Comment: Ohio EPA finds this response adequate and acceptable, and considers this comment resolved, as long as the Army is satisfied that the revised text does not also have to be in other portions of the document such as within Table 9.1, and also within the Sections X.6 Conclusions and Recommendations portions of each Group appendix (for clarity to assist future reading of the document).***

***Ohio EPA Group Comment 20:*** *Group N - Landfill North of Winklepeck Burning Grounds (LNWBG).*

*Since four MWs were located within the Group N area to assess the RVAAP-19 LNWBG and RVAAP-019-R-01 Landfill North of Winklepeck MRS (landfills with a total footprint of approximately 300 by 1,200-feet), and only one well (LNWmw-026) was installed within the footprint of one of the landfills (the other three wells were upgradient to the west), please confirm that the limited number of wells adequately delineate the sites and discuss/demonstrate how sites with no wells (no wells are installed on the RVAAP-19 LNWBG or downgradient of either landfill) have been thoroughly investigated and warrant no further action. While this rationale may have been previously covered in the RI Work Plan or FS reports, reiteration of this rationale within this final Remedial Investigation Report would provide clarification for future reviewers.*

**Army Response:** Clarification. It was determined that LNWBG was not used for landfilling operations. This was stated in the Record of Decision for Soil, Sediment, and Surface Water at RVAAP-19 Landfill North of Winklepeck Burning Grounds [Leidos 2020]). This conclusion was also summarized in Section N.1.3 of the Facility-Groundwater RI Report stating, "it is evident that LNWBG was predominantly used for burning wastes, as opposed to trench and fill-type operations of a landfill". In addition, Section N.1.3 states that it was concluded that there was no contamination in soil, sediment, and surface water at the LNWBG AOC requiring remediation, nor was there [munitions constituent] MC-related contamination requiring an action. Appendix N, Section N.1.3 provides a detailed summary of the AOC (LNWBG) and MRS (LNWBG MRS) within Group N and is supported by conclusions from the most recent approved available documents for each site. LNWBG was determined not to have soil or sediment contamination that would adversely impact groundwater. Subsequent group-specific evaluation of groundwater in Sections N.2 to N.4 supports the Army's conclusion that the nature and extent of contamination has been defined, and the HHRA and ERA did not identify a risk requiring an action for Group N.

**May 12, 2021, Ohio EPA Comment:** Ohio EPA finds this response adequate and acceptable, and considers this comment resolved with the additional recommendation to include this type of clarification text within the Main Text, Section 9.0 Conclusions and Recommendations portion of the document, within Table 9.1, and also within the X.6 Conclusions and Recommendations portions of each Group appendix (for clarity to assist future reading of the document). The text could be further clarified by adding explanation of the low number/no well issues such as "Some sites with limited wells or no wells were determined not to have soil or sediment contamination that would adversely impact ground water, thus fewer or no wells were needed for some sites." Ohio EPA is not concurring with abandonment of specified wells at this time, since it is understood that the Army's intention is to abandon wells at a later date, upon discussion and receipt of Ohio EPA's concurrence of the facility-wide ground water AOC path forward, as this document is not a well abandonment plan.

**October 5, 2021, Army Response (Revised):** Agree. See the revised response to Group Comment 1. Text portions of Section 9.0 and Sections X.1.3 were updated with revised text as recommended: "Some potential contaminant source areas with limited wells or no wells were determined not to have soil or sediment contamination that would adversely impact ground water, thus fewer or no wells were installed at the specific potential contaminant source area."

***Current Ohio EPA Comment: Ohio EPA finds this response adequate and acceptable, and considers this comment resolved, as long as the Army is satisfied that the revised text does not also have to be in other portions of the document such as within Table 9.1, and also within the Sections X.6 Conclusions and Recommendations portions of each Group appendix (for clarity to assist future reading of the document).***

***Ohio EPA Group Comment 21:*** *Group O - Upper and Lower Cobbs Ponds and the Central Burn Pits.*

*While nine MWs were located around the RVAAP-49 Central Burn Pits, six MWs were located around the RVAAP-29 Upper and Lower Cobbs Ponds, and three MWs were located around the RVAAP-034-R-01 Sand Creek Dump MRS, no wells were shown around the RVAAP-34 Sand Creek Disposal Road Landfill or the RVAAP-51 Dump Along Paris-Windham Road areas. Please confirm that the two sites with no wells have been adequately delineated and discuss/demonstrate how these sites with no wells have been thoroughly investigated and warrant no further action. While this rationale may have been previously covered in the RI Work Plan or FS reports, reiteration of this rationale within this final Remedial Investigation Report would provide clarification for future reviewers.*

**Army Response:** Clarification. Regarding RVAAP-34 Sand Creek Disposal Road Landfill, three wells were installed in 2018 and sampled for four-quarters for the full-suite analyses. This was done in response to data gaps identified and as presented in Table 1-3 of the RI Work Plan (TEC-Weston 2016). As stated in Section O.1.6.1 Data Gaps within this Facility-

wide Groundwater RI Report, "In October 2018, three permanent monitoring wells (SCLmw-001, SCLmw-002, and SCLmw-003) were installed at the Sand Creek Disposal Road Landfill. SCLmw-001 and SCLmw-002 were installed within the floodplain of Sand Creek, downgradient from the hillside where waste/debris was dumped. Subsequent to the well installation, four quarters of sampling for full suite analysis were conducted from November 2018 to August 2019." It is worth noting that the Sand Creek Dump MRS boundary and the Sand Creek Dump Disposal Road Landfill AOC boundary are nearly identical, and the sampling and analysis of these wells adequately characterized both the MRS and AOC. Regarding RVAAP-51 Dump Along Paris-Windham Road, the following has been added to the end of Section O.1.6.2 RI Goals and Objectives: "A review of the historical sampling record for monitoring well FWGmw-001 in proximity RVAAP-51 Dump Along Paris-Windham Road was performed in response to Ohio EPA comments on the RI Work Plan (TEC-Weston 2016). This review concluded that there were no detections of site related non-metals soil COPCs in groundwater. No investigation of groundwater associated with these CRS sites is planned for the RI.

> **May 12, 2021, Ohio EPA Comment:** Ohio EPA finds this response adequate and acceptable, and considers this comment resolved. Upon review of the Appendix O figures provided within the Draft RI Report, they do not provide site outlines on them, so locations of wells versus the site locations cannot be determined. Having both outlines of the Sand Creek Dump MRS boundary and the Sand Creek Dump Disposal Road Landfill AOC boundary on the same figure with the site delineated would be beneficial, and the site layer issue has already been noted and addressed under Report Section Comment 15. Ohio EPA is not concurring with abandonment of specified wells at this time, since it is understood that the Army's intention is to abandon wells at a later date, upon discussion and receipt of Ohio EPA's concurrence of the facility-wide ground water AOC path forward, as this document is not a well abandonment plan.
>
> **October 5, 2021, Army Response (Revised):** Clarification. Figure O.1-1 in the Draft RIR shows the outline of both the Sand Creek Dump MRS boundary and the Sand Creek Dump Disposal Road Landfill AOC boundary. The polygons for each are presented in the Legend. As noted in the Ohio EPA reply, the figures in Section O.2 have been revised to show the different sites within the group in response to Report Section Comment 15.
>
> ***Current Ohio EPA Comment: Ohio EPA finds this response adequate and acceptable, and considers this comment resolved.***

Ohio EPA reviewed the Army's response to Ohio EPA comments on the Draft Facility-wide Groundwater Monitoring Program Plan RVAAP-66 Facility-wide Groundwater Remedial Investigation Report. Additional information is necessary to approve the document. Based on discussion with the Army, a Comment Resolution meeting will be set up to discuss issues not yet resolved.

This letter is an official response from Ohio EPA that will be maintained as a public record.

If you have questions, you can reach me via email at kevin.palombo@epa.ohio.gov, or at (330) 963-1292.

Sincerely,

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

KP/sc

ec: Katie Tait, OHARNG RTLS
Rebecca Shreffler, Chenega Tri-Services
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Steven Kvaal, USACE Louisville
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**NATIONAL GUARD BUREAU**
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ARLINGTON VA 22204-1373

December 8, 2021

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

Subject: Notification of Field Work, Ravenna Army Ammunition Plant (RVAAP) Restoration Program, Portage/Trumbull Counties, RVAAP-66 Facility-wide Groundwater
(Work Activity No. 267-000-859-036)

Dear Mr. Palombo:

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

- 12/13/21-12/17/21: Mobilization, site set up, and facility-wide monitoring well gauging
- 12/27/21-01/7/22: Groundwater sampling per the 2021 Addendum.

In the event that the schedule above needs to change, the Army will provide an e-mail notification with revised dates. Please contact the undersigned at (614) 336-6000 (ext.2053) or kevin.m.sedlak.ctr@army.mil if there are issues or concerns with this submission.

Sincerely,

SEDLAK.KEVIN.MICHAEL.1254440171 Digitally signed by SEDLAK.KEVIN.MICHAEL.1254440171 Date: 2021.12.08 14:03:24 -05'00'

Mr. Kevin Sedlak
RVAAP Restoration Program Manager
Army National Guard Directorate

cc: Natalie Oryshkewych, Ohio EPA, DERR-NEDO
Bob Princic, Ohio EPA, DERR-NEDO
Liam McEvoy, Ohio EPA, DERR-NEDO
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December 7, 2021

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, Responses to Comments on the Draft RVAAP-66 Facility-wide Groundwater Semi-Annual Report for Spring 2021 Sampling Event (Work Activity No. 267-000-859-036)

Dear Mr. Palombo:

The Army appreciates your comments on the Draft Facility-wide Groundwater Monitoring Program Plan RVAAP-66 Facility-wide Groundwater Semi-Annual Report for Spring 2021 Sampling Event. Enclosed for your review are responses to your comments. Upon final resolution of the comments, the Army will provide a Final version of the report for Ohio EPA concurrence.

These comment responses were prepared for the Army National Guard in support of the RVAAP Restoration Program. Please contact the undersigned at 614-336-6000, ext 2053 or kevin.m.sedlak.ctr@army.mil if there are issues or concerns with this submission.

Sincerely,

SEDLAK.KEVIN.MICHAEL.1254440171
Digitally signed by SEDLAK.KEVIN.MICHAEL.1254440171
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Kevin M. Sedlak
RVAAP Restoration Program Manager
Army National Guard Directorate

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Jay Trumble, USACE Louisville
Vasu Peterson, Leidos
Jed Thomas, Leidos
Rebecca Shreffler, Chenega Tri-Services

Subject: Former Ravenna Army Ammunition Plant (RVAAP) Restoration Program, Portage/Trumbull Counties, RVAAP-66 Facility-wide Groundwater Semi-Annual Report for Spring 2021 Sampling Event (Work Activity No. 267-000-859-036)

**COMMENTS**

**Ohio EPA Comment 1: Data Summary Completeness:** Table 4-1 of the Draft FWGWMP Semi-Annual Report for Spring 2021 indicated that all 53 wells were analyzed for the proper analytical parameters in accordance with the Draft FWGWMP Addendum for 2021 (well-specific combinations of VOCs, SVOCs, PAHs, phenols, PCBs, perchlorate, explosives, phthalates, pesticides, cyanide, phosphorus, anions, pH, alkalinity, nitrate, ammonia, carbon tetrachloride and metals). Table 4-1 generally presented summaries of all the available well-specific data results, but (when compared to Appendix D.1 and Appendix D.3 tables) did not appear to list the calcium results of 130 mg/L from DET-004 (exceeding background concentration of 107 mg/L). Also, while HMX was detected in WBGmw-006 but was not shown on table Appendix D.3 (while it did not exceed the Tap water RSL 0.1 mg/L criteria, other explosives were listed on Appendix D.3 that also did not exceed screening criteria/did not have screening criteria). Numerous explosives concentrations were shown on the Appendix D.3 exceedance table when no screening level criteria have been identified for those compounds.

Please verify that all applicable results are summarized on Table 4-1 and included in Appendix D.1 and Appendix D.3 tables as appropriate. As a suggestion, it may be clearer to have an Appendix D.3 table that denotes all laboratory detections, and then presents just the exceedances in bold font, that way both detections and exceedances are clearly denoted and comparing two or three tables is not necessary.

> *Army Response*: Clarification and agree. Since calcium is considered an essential nutrient, the calcium result was not discussed. The following text has been added to Section 4.0: "Chemicals that are considered essential nutrients (e.g., calcium, chloride, iodine, iron, magnesium, potassium, phosphorus, and sodium) are an integral part of the human food supply and often are added to food as supplements. These essential nutrients are not discussed in Table 4-1 to streamline the narrative."
>
> Appendix D.3 has been revised to present "Spring 2021 Detected Concentrations". In this revised table, all detected concentrations are presented and sorted by well. A column is added to the right of the table that presents the following for each detection "Result Exceed Screening and Background Criteria (Y/N)?" This new column would be added instead of bolding the exceedances.

**Ohio EPA Comment 2: Well Redevelopment – Elevated Turbidity Results:** Section 6.0 Well Redevelopment of the Draft FWGWMP Semi-Annual Report for Spring 2021 indicated that 11 permanent monitoring wells (FBQmw-173, LL1mw-079, LL1mw-082, LL3mw-245, LL12mw-244, LL12mw-246, WBGmw-007, WBGmw-008, WBGmw-014, WBGmw-018, and WBGmw-019) were redeveloped following Section 3.5.2 of the approved Revised Final Remedial Investigation Work Plan (RIWP) produced by TEC-Weston dated December 21, 2016, and in accordance with Ohio EPA's Technical Guidance Manual for Ground Water Investigations – Chapter 8: Monitoring Well Development, Maintenance, and Redevelopment (Ohio EPA 2009). According to the Turbidity Value Table 6-1, five of these wells achieved post-redevelopment readings of <10 NTUs, while six of the wells exceeded 10 NTUs. During sampling of these 11 wells (one to two weeks later), 10 wells were found to have <10 NTUs, while only one exceeded 10 NTUs, with reading of 7,537.2 NTUs from well LL12mw-244.

Please explain any future plans using methods other than surging and pumping until dry (such as purging with a Waterra pump or equivalent) to further redevelop/improve well LL12mw-244, or other wells that may have similar turbidity issues in the future.

*Army Response*: Clarification. At this time, there are not specified different methods to redevelop/improve well LL12mw-244. This well will continue to be analyzed for COCs identified in the RI Report (nitrate and ammonia). While the Army took proactive measures to redevelop this well in Spring 2021, nitrate and ammonia are not influenced by elevated turbidity. The high turbidity associated with this well does not appear to create issues with the dataset and risk management decisions. Any future methods to develop this well (if different) or replacement of LL12mw-244 (or any other well) will be communicated to Ohio EPA.

**Ohio EPA Comment 3: Chemical Specific Screening Criteria:** Appendix D.2: Chemical Specific Screening Criteria does not contain screening criteria for cis-1,2-dichloroethene (CAS 156-59-2) or trans-1,2-dichloroethene (CAS 156-60-5). Both chemicals have MCL values available. Please explain why these two chemicals are not listed in Appendix D.2.

*Army Response*: Clarification. Cis-1,2-dichloroethene (CAS 156-59-2) and trans-1,2-dichloroethene (CAS 156-60-5) were not analyzed in Spring 2021; therefore, these chemicals are not listed in Appendix D.2. 1,2-Dichloroethene was analyzed, and the respective MCL (0.07 mg/L) is presented in Appendix D.2.

Ohio Environmental Protection Agency

**Mike DeWine**, Governor
**Jon Husted**, Lt. Governor
**Laurie A. Stevenson**, Director

November 19, 2021

**TRANSMITTED ELECTRONICALLY**

Mr. Kevin Sedlak
Restoration Program Manager
ARNG-ILE Clean Up
Camp James A Garfield JTC
1438 State Route 534 SW
Newton Falls, OH 44444

RE: US Army Ammunition Plt RVAAP
Remediation Response
Project Records
Remedial Response
Portage County
ID # 267000859036

**Subject: Ohio EPA Comments on the "Draft Facility-wide Groundwater Monitoring Program Plan RVAAP-66 Facility-wide Groundwater Semi-Annual Report for Spring 2021 Sampling Event" dated August 31, 2021**

Dear Mr. Sedlak:

The Ohio Environmental Protection Agency (Ohio EPA) has received and reviewed the **"Draft Facility-wide Groundwater Monitoring Program Plan RVAAP-66 Facility-wide Groundwater Semi-Annual Report for Spring 2021 Sampling Event"** (Draft FWGWMP Semi-Annual Report for Spring 2021) at the Former Ravenna Army Ammunition Plant, Portage and Trumbull Counties, Ohio (Camp Garfield). This document was received at Ohio EPA's Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR) on August 31, 2021. The report was prepared for the United States Army Corps of Engineers on behalf of the National Guard Bureau by Leidos under Contract Number W912QR-16-D-0003. Comments on the document based on Ohio EPA review are provided below. Please provide responses to the comments in accordance with the Director's Findings and Orders.

## DRAFT FWGWMP SEMI-ANNUAL REPORT FOR SPRING 2021

The Draft FWGWMP Semi-Annual Report for Spring 2021 summarizes ground water monitoring activities conducted during the Spring 2021 sampling event, and provides descriptions of field activities performed, presents field and analytical results, and evaluates chemical data collected per the approved ground water sampling scheme specified in the Draft FWGWMP Addendum for 2021 dated February 17, 2021.

According to the Draft FWGWMP Addendum for 2021, a total of 53 wells, including five Resource Conservation and Recovery Act (RCRA) wells, were slated for resampling in 2021.

47 wells (including RCRA wells) were sampled 2020 under the FWGWMP. Based on those results, nine of these wells were discontinued from sampling, while a new set of 15 wells (not sampled in 2020) were added to the list to achieve the total of 53 wells.

RECEIVED
NOV 19 2021

According to Section 3.1, Table 3-1, and Table 4-1 of the Draft FWGWMP Semi-Annual Report for Spring 2021, all 53 wells specified in the Draft FWGWMP Addendum for 2021 were sampled. Summary of findings is presented below:

- From April 26, 2021, through May 12, 2021 (Spring 2021 sampling event), a total of 53 of the facility's monitoring wells were sampled. This included sampling of the five semi-annual RCRA ground water wells.

- A review of Appendix B (Field Forms) included daily log sheets, well purge forms, chain of custody sheets, and calibration reports for field equipment.

- Section 3.2 (Page 3-2, line 156) documents the four previously approved field change requests submitted and applicable to the Spring 2021 sampling event, also included as Appendix A. No new field change requests were necessary for the Spring 2021 event. A total of four Ohio EPA approved field change request forms were included within Appendix C (LEIDOS_FWGW_001, LEIDOS_FWGW_004, and LEIDOS_FWGW_006 from 2018 and LEIDOS_FWGW_010 from 2019).

- Table 4-1 of the Draft FWGWMP Semi-Annual Report for Spring 2021 indicated that all 53 wells were analyzed for the proper analytical parameters in accordance with the Draft FWGWMP Addendum for 2021 (well-specific combinations of volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), polycyclic aromatic hydrocarbons (PAHs), phenols, polychlorinated biphenyls (PCBs), perchlorate, explosives, phthalates, pesticides, cyanide, phosphorus, anions, pH, alkalinity, nitrate, ammonia, carbon tetrachloride and metals). Other than in Table 4-1, no other additional summary or evaluation of the data findings were presented in this report; further evaluation of the Spring 2021 data is expected to be presented along with the Fall 2021 data in the Draft FWGWMP Annual Report for 2021. Table 4-1 generally presented summaries of all the available well-specific data results, but (when compared to Appendix D.1 and Appendix D.3 tables) did not appear to list the calcium results of 130 mg/L from DET-004 (exceeding background concentration of 107 mg/L). Also, while HMX was detected in WBGmw-006 but was not shown on table Appendix D.3 (while it did not exceed the Tap water RSL 0.1 mg/L criteria, other explosives were listed on Appendix D.3 that also did not exceed screening criteria/did not have screening criteria). Numerous explosives concentrations were shown on the Appendix D.3 exceedance table when no screening level criteria have been identified for those compounds.

- Appendix D.3 presents Spring 2021 results that exceeded screening criteria; it appears 22 wells were found to contain one or more exceedances of screening criteria.

- A review of Appendix F (Data Quality Assessment Report) showed the data quality review of the analytical reports indicated that 100% of the data was qualified as usable, with some data qualified as estimated and no data points were rejected. Overall, the data quality assessment reported that the data produced for the project can withstand

scientific scrutiny, are appropriate for its intended purpose, are technically defensible, and are of known and acceptable sensitivity, precision, and accuracy.

- Section 6.0 Well Redevelopment of the Draft FWGWMP Semi-Annual Report for Spring 2021 indicated that 11 permanent monitoring wells (FBQmw-173, LL1mw-079, LL1mw-082, LL3mw-245, LL12mw-244, LL12mw-246, WBGmw-007, WBGmw-008, WBGmw-014, WBGmw-018, and WBGmw-019) were redeveloped following Section 3.5.2 of the approved Revised Final Remedial Investigation Work Plan (RIWP) produced by TEC-Weston dated December 21, 2016, and in accordance with Ohio EPA's Technical Guidance Manual for Ground Water Investigations – Chapter 8: Monitoring Well Development, Maintenance, and Redevelopment (Ohio EPA 2009). According to the Turbidity Value Table 6-1, five of these wells achieved post-redevelopment readings of <10 Nephelometric Turbidity Units (NTUs), while six of the wells exceeded 10 NTUs. During sampling of these 11 wells (one to two weeks later), 10 wells were found to have <10 NTUs, while only one exceeded 10 NTUs, with reading of 7,537.2 NTUs from well LL12mw-244. Further discussion may be warranted to evaluate if additional potential well redevelopment activities using methods other than surging and pumping until dry (such as purging with a Waterra pump or equivalent) could help lower the elevated turbidity numbers in well LL12mw-244.

## COMMENTS

**1. Table 4-1 Data Summary Completeness:**

Table 4-1 of the Draft FWGWMP Semi-Annual Report for Spring 2021 indicated that all 53 wells were analyzed for the proper analytical parameters in accordance with the Draft FWGWMP Addendum for 2021 (well-specific combinations of VOCs, SVOCs, PAHs, phenols, PCBs, perchlorate, explosives, phthalates, pesticides, cyanide, phosphorus, anions, pH, alkalinity, nitrate, ammonia, carbon tetrachloride and metals). Table 4-1 generally presented summaries of all the available well-specific data results, but (when compared to Appendix D.1 and Appendix D.3 tables) did not appear to list the calcium results of 130 mg/L from DET-004 (exceeding background concentration of 107 mg/L). Also, while HMX was detected in WBGmw-006 but was not shown on table Appendix D.3 (while it did not exceed the Tap water RSL 0.1 mg/L criteria, other explosives were listed on Appendix D.3 that also did not exceed screening criteria/did not have screening criteria). Numerous explosives concentrations were shown on the Appendix D.3 exceedance table when no screening level criteria have been identified for those compounds.

Please verify that all applicable results are summarized on Table 4-1 and included in Appendix D.1 and Appendix D.3 tables as appropriate. As a suggestion, it may be clearer to have an Appendix D.3 table that denotes all laboratory detections, and then presents just the exceedances in **bold** font, that way both detections and exceedances are clearly denoted and comparing two or three tables is not necessary.

**2. Well Redevelopment – Elevated Turbidity Results:**

Section 6.0 Well Redevelopment of the Draft FWGWMP Semi-Annual Report for Spring 2021 indicated that 11 permanent monitoring wells (FBQmw-173, LL1mw-079, LL1mw-082, LL3mw-245, LL12mw-244, LL12mw-246, WBGmw-007, WBGmw-008, WBGmw-014, WBGmw-018, and WBGmw-019) were redeveloped following Section 3.5.2 of the approved Revised Final Remedial Investigation Work Plan (RIWP) produced by TEC-Weston dated December 21, 2016, and in accordance with Ohio EPA's Technical Guidance Manual for Ground Water Investigations – Chapter 8: Monitoring Well Development, Maintenance, and Redevelopment (Ohio EPA 2009). According to the Turbidity Value Table 6-1, five of these wells achieved post-redevelopment readings of <10 NTUs, while six of the wells exceeded 10 NTUs. During sampling of these 11 wells (one to two weeks later), 10 wells were found to have <10 NTUs, while only one exceeded 10 NTUs, with reading of 7,537.2 NTUs from well LL12mw-244.

Please explain any future plans using methods other than surging and pumping until dry (such as purging with a Waterra pump or equivalent) to further redevelop/improve well LL12mw-244, or other wells that may have similar turbidity issues in the future.

This letter is an official response from Ohio EPA that will be maintained as a public record.

This **"Draft Facility-wide Groundwater Monitoring Program Plan RVAAP-66 Facility-wide Groundwater Semi-Annual Report for Spring 2021 Sampling Event"** was reviewed by personnel from Ohio EPA. Additional information is necessary to approve the document. If you have questions or would like to set up a meeting to discuss these comments, you can contact me via email at kevin.palombo@epa.ohio.gov.

Sincerely,

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

KP/sc

ec: Katie Tait, OHARNG RTLS
Rebecca Shreffler, Chenega Tri-Services
Bob Princic, Ohio EPA, NEDO, DERR
Megan Oravec, Ohio EPA, NEDO, DERR
Natalie Oryshkewych, Ohio EPA, NEDO, DERR
Liam McEvoy, Ohio EPA, NEDO, DERR
Thomas Schneider, Ohio EPA, SWDO, DERR
Carrie Rasik, Ohio EPA, CO, DERR
Steven Kvaal, USACE Louisville
Nat Peters, USACE Louisville

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

September 24, 2021

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

Subject: Notification of Field Work, Ravenna Army Ammunition Plant (RVAAP) Restoration Program, Portage/Trumbull Counties, RVAAP-66 Facility-wide Groundwater
(Work Activity No. 267-000-859-036)

Dear Mr. Palombo:

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

- 10/12/21-10/15/21: Mobilization, site set up, and annual well gauging
- 10/18/21-10/29/21: Groundwater sampling per the 2021 Addendum.

In the event that the schedule above needs to change, the Army will provide an e-mail notification with revised dates. Please contact the undersigned at 614-336-6000, ext 2053 or kevin.m.sedlak.ctr@mail.mil if there are issues or concerns with this submission.

Sincerely,

SEDLAK.KEVIN.MICHAEL.1254440171 Digitally signed by SEDLAK.KEVIN.MICHAEL.1254440171 Date: 2021.09.24 09:50:38 -04'00'

Kevin M. Sedlak
RVAAP Restoration Program Manager
Army National Guard Directorate

cc: Natalie Oryshkewych, Ohio EPA, DERR-NEDO
Bob Princic, Ohio EPA, DERR-NEDO
Liam McEvoy, Ohio EPA, DERR-NEDO
Mark Leeper, ARNG
Katie Tait, OHARNG, Camp James A. Garfield
Steve Kvaal, USACE Louisville
Jay Trumble, USACE Louisville
Vasu Peterson, Leidos
Jed Thomas, Leidos
Rebecca Shreffler, Chenega

## Shreffler, Rebecca M

**From:** Tait, Kathryn S NFG NG OHARNG (USA) <kathryn.s.tait.nfg@mail.mil>
**Sent:** Wednesday, October 20, 2021 1:01 PM
**To:** Shreffler, Rebecca M
**Subject:** FW: [Non-DoD Source] Extension request-Facility-wide Groundwater 2021 Semi-Annual Report dated August 30, 2021 (UNCLASSIFIED)

CLASSIFICATION: UNCLASSIFIED

Please document as an extension request and approval as correspondence. Katie

---

**From:** Sedlak, Kevin M CTR NG OHARNG (USA) <kevin.m.sedlak.ctr@mail.mil>
**Sent:** Wednesday, October 20, 2021 12:24 PM
**To:** Kevin.Palombo@epa.ohio.gov
**Cc:** bob.princic@epa.ohio.gov; Thomas.Schneider@epa.ohio.gov; Tait, Kathryn S NFG NG OHARNG (USA) <kathryn.s.tait.nfg@mail.mil>; Leeper, Mark S CIV NG NGB (USA) <mark.s.leeper.civ@army.mil>; Atiur.Rahman@epa.ohio.gov; Trumble, James N III CIV USARMY CELRL (US) <Jay.N.Trumble@usace.army.mil>; Susan Oliver <soliver@managementsolutionsllc.com>
**Subject:** RE: [Non-DoD Source] Extension request-Facility-wide Groundwater 2021 Semi-Annual Report dated August 30, 2021 (UNCLASSIFIED)

CLASSIFICATION: UNCLASSIFIED

Mr. Palombo:

The extension requested to review the referenced report is acceptable by the Army. If you have any questions or comments please reach out to us. Thank you.

Kevin Sedlak, PG, MS
Restoration Program Manager
IPA Designation
CEMML Employee
Camp James A. Garfield JTC
1438 State Route 534 SW
Newton Falls, OH 44444
ARNG-IES-D Clean Up
Office Phone 614-336-6000 Ex 2053
e-mail to:kevin.m.sedlak.ctr@mail.mil
****Please note, any communication generated through this correspondence does not coincide with any contract modifications, specifications, clarifications, or corrections unless a formal document is attached designating the like.****

**From:** Kevin.Palombo@epa.ohio.gov <Kevin.Palombo@epa.ohio.gov>
**Sent:** Wednesday, October 20, 2021 11:23 AM
**To:** Sedlak, Kevin M CTR NG OHARNG (USA) <kevin.m.sedlak.ctr@mail.mil>
**Cc:** bob.princic@epa.ohio.gov; Thomas.Schneider@epa.ohio.gov; Tait, Kathryn S NFG NG OHARNG (USA) <kathryn.s.tait.nfg@mail.mil>; Leeper, Mark S CIV NG NGB (USA) <mark.s.leeper.civ@army.mil>; Atiur.Rahman@epa.ohio.gov
**Subject:** [Non-DoD Source] Extension request-Facility-wide Groundwater 2021 Semi-Annual Report dated August 30, 2021

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Mr. Sedlak:

Re. Draft Facility-wide Groundwater 2021 Semi-Annual Report dated August 30, 2021

Ohio EPA Is requesting an extension on the review of the referenced report with a due date of October 15, 2021, the document is still undergoing review by the review team. We are requesting an extension date of November 18, 2021.

Thanks
Kevin Palombo

Kevin M. Palombo | Site Coordinator
Ohio Environmental Protection Agency - Northeast District Office
Division of Environmental Response & Revitalization
2110 East Aurora Road
Twinsburg, OH 44087- 1924
T: (330) 963-1292
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**NATIONAL GUARD BUREAU**
111 SOUTH GEORGE MASON DRIVE
ARLINGTON VA 22204-1373

October 5, 2021

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, Responses to Comments on the Draft Remedial Investigation Report for RVAAP-66 Facility-wide Groundwater (Work Activity No. 267-000-859-036)

References: July 31, 2020, Draft Remedial Investigation Report for RVAAP-66 Facility-wide Groundwater submittal
November 6, 2020, Ohio EPA Comments on the "Draft Remedial Investigation Report for RVAAP-66 Facility-wide Groundwater
January 29, 2021, Army Responses to Comments on the Draft Remedial Investigation Report for RVAAP-66 Facility-wide Groundwater
May 12, 2021, Ohio EPA Reply to the to the "Response to Ohio EPA Comments on the Draft Facility-wide Groundwater Monitoring Program Plan RVAAP-66 Facility-wide Groundwater Remedial Investigation Report"

Dear Mr. Palombo:

The Army appreciates your reply to the "Response to Ohio EPA Comments on the Draft Facility-wide Groundwater Monitoring Program Plan RVAAP-66 Facility-wide Groundwater Remedial Investigation Report". Enclosed for your review are responses to unresolved comments. The Army anticipates a resolution meeting and will be contacting you to schedule the meeting. Upon resolution of these unresolved comments, the Army will provide a Final version of the report for Ohio EPA concurrence.

These comment responses were prepared for the Army National Guard in support of the RVAAP Restoration Program. Please contact the undersigned at 614-336-6000, ext. 2053 or kevin.m.sedlak.ctr@mail.mil if there are issues or concerns with this submission.

Sincerely,

TAIT.KATHRYN.SERENA.1289508275
Digitally signed by TAIT.KATHRYN.SERENA.1289508275
Date: 2021.10.05 13:22:31 -04'00'

**FOR** Kevin M. Sedlak
RVAAP Restoration Program Manager
Army National Guard Directorate

cc: Natalie Oryshkewych, Ohio EPA, NEDO, DERR
Bob Princic, Ohio EPA, NEDO, DERR

Subject: Former Ravenna Army Ammunition Plant (RVAAP) Restoration Program, Portage/Trumbull Counties, Remedial Investigation Report for RVAAP-66 Facility-Wide Groundwater (Work Activity No. 267-000-859-036)

Liam McEvoy, Ohio EPA, NEDO, DERR
Thomas Schneider, Ohio EPA, SWDO, DERR
Carrie Rasik, Ohio EPA, CO, DERR
Katie Tait, OHARNG, Camp James A. Garfield
Mark Leeper, ARNG
Steve Kvaal, USACE Louisville
Jay Trumble, USACE Louisville
Vasu Peterson, Leidos
Jed Thomas, Leidos
Rebecca Shreffler, Chenega Tri-Services

Subject: Former Ravenna Army Ammunition Plant (RVAAP) Restoration Program, Portage/Trumbull Counties, Remedial Investigation Report for RVAAP-66 Facility-Wide Groundwater (Work Activity No. 267-000-859-036)

**REPORT SECTION COMMENTS**

**Report Section Comment 4:** Section 4.7, page 4-4. Monitoring wells were analyzed for perchlorate in 2008 and then stopped. Perchlorates were used in propellants. Please summarize the rationale for sampling for this compound and then for ending that analysis after one year.

*Army Response*: Clarification. Section 4.7 merely summarizes (at a high level) important activities conducted under the FWGWMP in 2008. One activity conducted in 2008 was "Between the July and October 2008 sampling event, 131 wells were analyzed for perchlorate (EQM 2009a and 2009b)", thus it was discussed in the summary of 2008 sampling.

Over 180 perchlorate samples have been collected and analyzed since 2008. For example, as stated in Section 4.17.3, perchlorate was analyzed as part of the full-suite analysis for the Sand Creek Disposal Road Landfill wells installed in 2018.

**Ohio EPA Reply, dated 5/12/21:** Ohio EPA does not believe the response adequately answers the question. Please provide the historical rationale for the sampling and why it was not continued.

*Army Response (Revised)*: Clarification. As indicated in the response, the analysis for perchlorates under the FWGWMP did not stop. Over 180 perchlorate samples were collected and analyzed after 2008. For example, as stated in Section 4.17.3, perchlorate was analyzed as part of the full-suite analysis for the Sand Creek Disposal Road Landfill wells installed in 2018.

In the 2007 Annual Report (dated March 24, 2008) stated in Section 1.6 Changes to the FWGWMP for 2008 that "A perchlorate analysis addendum to the FWGWMP Plan was implemented for the October 2007 monitoring event that will be reported in the 2008 Annual Report." The Report for the October 2007 Sampling Event (dated April 28, 2008) provided a Perchlorate Analysis Addendum in Appendix A. This Perchlorate Analysis Addendum did not present the rationale for perchlorate analysis, rather only presented the sampling methodology.

---

**Report Section Comment 6:** Section 5.1, page 5-2, second bullet. Regarding the separate RIs that are being conducted at RVAAP-04, RVAAP-69, and RVAAP-74, a statement needs to be made that clearly states that RIs are being conducted separately at these three AOCs due to schedules that did not coincide with preparation of this FWGW RI and therefore the results and conclusions will be handled separately. It is Ohio EPA's request that these final RI's become appendices to this FWGW RI.

*Army Response*: Clarification and agree. The rationale for which RVAAP-004-R-01, CC RVAAP-69, and CC RVAAP-74 are not part of the Facility-wide Groundwater RI extends beyond schedule. For example, groundwater at RVAAP-004-R-01 Open Demolition Area #2 is being evaluated as part of a site-specific comprehensive RI that includes other media such as soil, sediment, and surface water. It is the position of the Army that it is less important to provide this rationale, provided that there is clarity that site-specific RIs for these sites are underway. Text provided in Sections 1.2 (Scope), 1.3 (Report Organization), 5.1 (Data Assembly), and 9.0 (Conclusions) have been modified similar to below:

> "Three additional separate groundwater investigations at CJAG are not included in this FWGW RI, as groundwater is being addressed during comprehensive site-specific investigations. These areas of concern (AOCs) include RVAAP-004-R-01 Open Demolition Area #2 MRS (which is inclusive of RVAAP-04 Open Demolition Area #2), CC-RVAAP-69 Building 1048 Fire Station, and CC RVAAP-74 Building 1034 Motor Pool."

In addition, it is the Army's position that the final RIs for RVAAP-004-R-01, CC RVAAP-69, and CC RVAAP-74 do not become appendices to this Facility-wide Groundwater RI Report. As noted above, the report clearly states that these sites are not within the scope, and there is an administrative record available for future reviewers to find groundwater-specific conclusions associated with these sites.

**Ohio EPA Reply, dated 5/12/21:** Ohio EPA wonders then why the Facility-Wide Groundwater Remedial investigation is titled as it is. It is not a Facility-Wide Remedial Investigation when it does not include several major AOCs. The Introduction to this RI should clearly list those AOCs where RIs are conducted separately.

*Army Response (Revised)*: Comment noted. As presented in the original response to this comment, subsections to the Introduction (Section 1.2 Scope and Section 1.3 Report Organization) have been modified to specify the AOCs where RIs are being conducted separately.

---

**Report Section Comment 10:** Section 9.0, page 9-2, last paragraph states, "The Army will continue with three additional investigations at CJAG at …" The statement needs to clearly state that RIs are being conducted separately at these three AOCs due to schedules that did not coincide with preparation of this FWGW RI and therefore the results and conclusions will be handled separately. It is Ohio EPA's request that these final RI's become appendices to this FWGW RI.

*Army Response*: Please see response to Report Section Comment 6.

**Ohio EPA Reply, dated 5/12/21:** Ohio EPA wonders then why the Facility-Wide Groundwater Remedial investigation is titled as it is. It is not a Facility-Wide Remedial Investigation when it does not include several major AOCs. The Introduction to this RI should clearly list those AOCs where RIs are conducted separately.

*Army Response (Revised)*: Comment noted. As presented in the original response to this comment, subsections to the Introduction (Section 1.2 Scope and Section 1.3 Report Organization) have been modified to specify the AOCs where RIs are being conducted separately.

---

**Report Section Comment 11:** Appendix A, Section A.1.3.5, page 7, paragraph 3. The Route 80 Tank Farm. Please describe the number and size of tanks that were located in this area. When were they removed? It does not appear ground water was evaluated in this area. Based on information provided in this RI, Ohio

EPA believes ground water MWs are necessary in the area to eliminate our concern over this potential contaminant pathway.

*Army Response*: Clarification and agree. Soil screening for migration to groundwater was conducted for all SRCs within CC RVAAP-79 including the Route 80 Tank Farm, concluding no impact to groundwater. This information combined with the well documented site history, investigations, and removal actions documented in the *Final Remedial Investigation for CC RVAAP-79 DLA Ore Storage Sites* (Parsons 2020) provides adequate support to eliminate the need for monitoring wells. Additionally, FWGmw-014 is located approximately 250 ft to the southwest and is screened in unconsolidated sediments from 8.25 to 18.25 ft bgs doesn't exceed the site related screening criteria. Available site information summarized in final investigation reports for the DLA Storage Area, pertinent to the Route 80 Tank Farm, will be summarized in revised text as follows in paragraph 2 and 3 of Section A.1.3.5:

> "This sub-area was used to store strategic material in 18 ASTs including asbestos, cobalt, monazite sand, nickel cathodes, rutile sand, talc, and zircon sand ore (SpecPro, 2003). Several decontamination and survey efforts were conducted between the mid1970s and 2001. Details relative to closure of these storage units are documented in the Final Report for the Assessment of Potential Contamination at the DLA Outdoor Storage Areas, Ravenna Army Ammunition Plant, Ravenna, Ohio (SpecPro, 2003). The historical ASTs are no longer present in this sub-area, with the last tank (Tank #1306 that was approximately 85-ft in diameter, 25-ft tall) removed in March 2007 (SpecPro 2007). North-south trending rail lines used to traverse the sub-area but have been removed. Several thousand cubic yards of asbestos and monazite contaminated soil were removed from the AST area and all subsequent activities summarized in the Final RI (Parsons 2020x)."
>
> "The *Final Remedial Investigation for CC RVAAP-79 DLA Ore Storage Sites* (Parsons 2020x) included a summary of the nature and extent of contamination, contaminant fate and transport, an HHRA, and an ERA. SRC concentrations in soil were screened to identify those contaminant migration chemicals of potential concern (CMCOPCs) with the potential to leach to and migrate in groundwater. The native soil at the Route 80 Tank Farm was mapped by the United States Department of Agriculture (USDA) as Wadsworth silt loam (0 to 2 percent slopes). Boring logs from the area indicate clayey black organic material at the surface in some areas. Soil below that is generally brown to gray clay and silty clay, which are assumed to be Lavery Till glacial deposits or fill material from site construction. The potential to leach to and migrate in groundwater was assessed using a hydraulic conductivity of 0.0033 ft/year. Conclusions of the soil screening analysis are that all of the identified SRCs at this AOC in soil were eliminated as current risks to groundwater. ~~No CMCOPCs (and, therefore, no contaminant migration COCs) were identified at CC RVAAP-79 DLA Ore Storage Sites.~~

The following reference has been added to Appendix A:

> SpecPro (SpecPro, Inc.) 2007. *Project Completion Report for the DLA Storage Area Reclamation – Route 80 Tank Farm and East Ore Yard Culvert Replacement*. November 2007.

**Ohio EPA Reply, dated 5/12/21:** Ohio EPA is not confident that one well 250 feet away, likely side gradient from 18 ASTs storing an estimated 1300 cubic yards each and where several thousand cubic yards of contaminated soil were removed, is adequate to determine if ground water has or has not been impacted. Please include general soil types and their estimated permeabilities in the area as part of the discussion above.

*Army Response (Revised)*: Agree. The soil types and estimated hydraulic conductivity used in the contaminant fate and transport modeling has been added to the text, as presented in green.

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**Report Section Comment 21:** Appendix B, Section B.1.3.4, page 5. The description of CC-RVAAP-71 Barn Number 5 Petroleum Release states that soil samples were collected from this site of a pipeline release that occurred in 1964. The section also states that no further action is required. No ground water evaluation was ever conducted at this AOC located near the OHARNG downgradient property line. Without additional information, Ohio EPA believes MWs are warranted in this area. The wells would not only allow for the ground water pathway to be evaluated; they would also serve to protect the Army from potential liability.

*Army Response*: Comment noted. As stated in the Site Inspection and Remedial Investigation Work Plan (ECC 2012), "ECC will evaluate the soils, and if based on the data, it appears groundwater may be impacted, then a recommendation will be included in the report that groundwater will need to be assessed by the Army under its base-wide groundwater program". After evaluation of subsurface soil and deep soil borings at the CC RVAAP-71 Barn No. 5 Petroleum Release, the Final Site Inspection Report (ECC 2015) stated that NFA was warranted. In addition, no water was encountered at CC RVAAP-71 during drilling activities at any of the soil boring locations which indicates that the groundwater is likely deeper than 13 ft bgs in the vicinity of the AOC. Accordingly, it is concluded as part of the FWGWMP that additional investigation of groundwater at this site is not warranted.

**Ohio EPA Reply, dated 5/12/21:** Based on the information provided, groundwater has not been evaluated in this Area of Concern (AOC). Can you provide information on the estimated release volume? Was any clean up or repair of the pipeline conducted? How close is the nearest private well downgradient? Ohio EPA believes that based on the information provided, groundwater should be evaluated in this AOC.

*Army Response (Revised)*: Clarification and agree. Regarding CC RVAAP-71 Barn No. 5 Petroleum Release, the SI Report stated that "No documented evidence of impact from former and/or current military operations at this AOC was found during the HRR. Further, no documented evidence of military munitions or operations involving HTRW was found. No presence of ASTs or USTs was discovered during the HRR. No documented evidence was discovered during the HRR of historical practices involving containerized hazardous, toxic and radioactive waste at CC RVAAP-71."

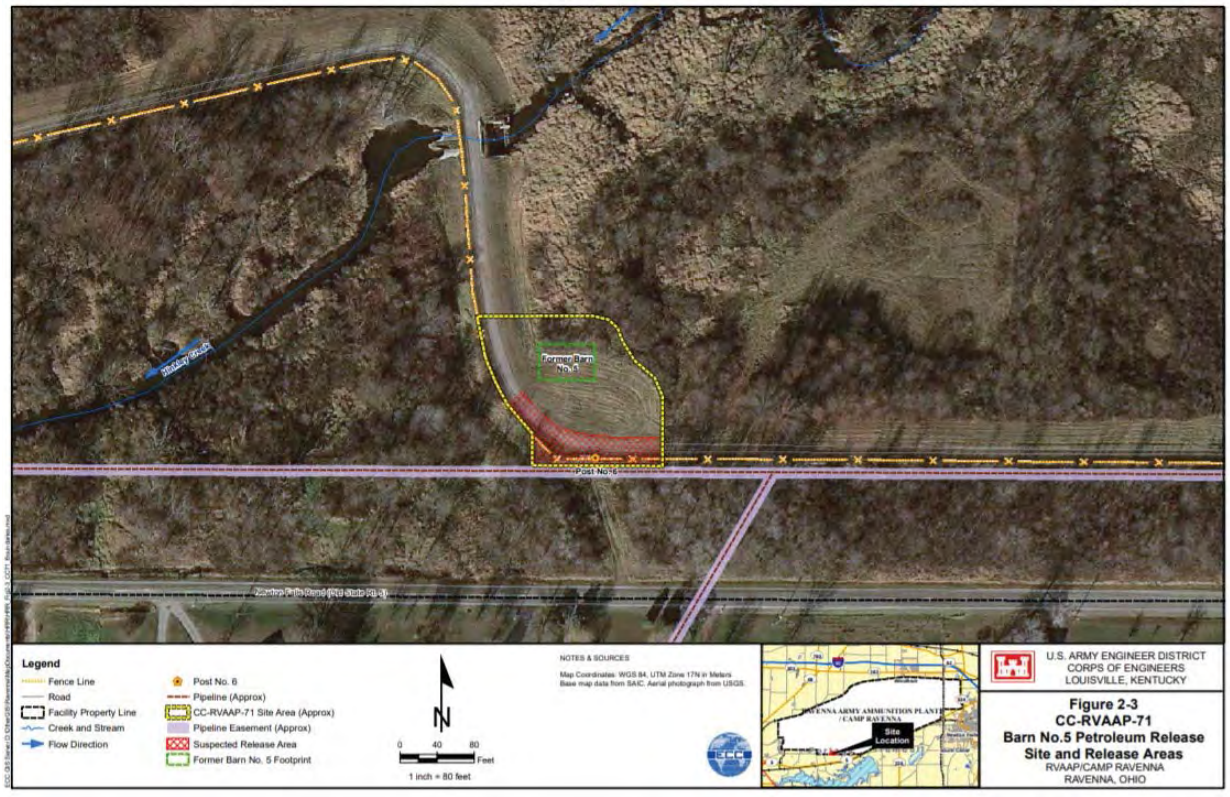
A drawing dated 1943, showed the 12.5-ft pipeline easement of the SOHIO pipeline from which gasoline was released. Figure 2-3 of the *Historical Records Review Report for CC-RVAAP-71 Barn No. 5 Petroleum Release and CC-RVAAP-83 Former Buildings 1031 and 1039* (ECC 2012) depicts the pipeline easement.

The incident of the historic gasoline release at CC RVAAP-71 has been documented in a letter prepared by C.F. Craver, former RVAAP Security Manager (Security Chief) to H.M. Krengel, Ravenna Arsenal, Inc.

General Manager and dated May 13, 1964. The 1964 pipeline break caused a consequent release of an estimated 20 barrels (840 gallons) of gasoline. Based on the 1964 letter, excavation was completed in order to repair the pipeline on the same day as the reported release. The pipeline depth is unknown.

Based on the site inspection conducted on November 3, 2011, there is no visual evidence of a gasoline release, such as staining, residue, odor, or stressed vegetation evident at the site area. In 2013, fourteen soil borings were advanced to 7 ft bgs and one soil boring was advanced to 13 ft bgs. There were no BUSTR exceedances of gasoline-constituents related with the 1964 gasoline release reported in any of the subsurface soil samples collected at CC RVAAP71 Barn No. 5 Petroleum Release.

Estimated groundwater flow in the Unconsolidated aquifer in this area is to the south. Groundwater was not encountered during advancement of any borings, indicating that groundwater is likely deeper than 13 ft bgs at the site. Although there is no documented evidence of impact from former and/or current military operations at this site, the Army is proposing to install a temporary well in the Unconsolidated aquifer, south of the location of the pipeline, for a one-time sample of VOCs, SVOCs, lead, and TPH DRO/GRO.



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**GROUP-SPECIFIC COMMENTS**

**Group Comment 1: *Group A - Western Sites and C Block Quarry* -** While five MWs were located around the RVAAP-06 C Block Quarry Area, two MWs were located around the CC RVAAP-76 Depot Area, one MW was located around the CC RVAAP-79 DLA Ore Storage Sites – Route 80 Tank Farm, one MW was located around the CC RVAAP-73 Facility-wide Coal Storage – North Line Road Coal Tipple, and no wells were shown around the RVAAP-46 Buildings F-15 and F-16, RVAAP-046-R-01 Building #F-15 and F-16 MRS, and CC RVAAP-73 Facility-wide Coal Storage – Building U-16 1050 Boiler House. Please confirm that sites with limited numbers of wells have been adequately delineated and discuss/demonstrate how sites with no wells have been thoroughly investigated and warrant no further action. While this rationale may have been previously covered in the RI Work Plan or FS reports, reiteration of this rationale within this RI Report would provide clarification for future reviewers.

*Army Response*: Clarification. Appendix A, Section A.1.3 provides a detailed summary of every AOC, MRS, and CRS within Group A and is supported by conclusions from the most recent *approved* available documents for each site. Some sites, including RVAAP-46, RVAAP-046-R-01, and CC RVAAP-73, were determined not to have soil or sediment contamination that would adversely impact groundwater. Subsequent group-specific evaluation of groundwater in Sections A.2 to A.4 supports the Army's conclusion that the nature and extent of contamination has been defined, and the HHRA and ERA did not identify a risk requiring an action for Group A.

**Ohio EPA Reply, dated 5/12/21:** Ohio EPA finds this response adequate and acceptable, and considers this comment resolved with the additional recommendation to include this type of clarification text within the Main Text, Section 9.0 Conclusions and Recommendations portion of the document, within Table 9.1, and also within the X.6 Conclusions and Recommendations portions of each Group appendix (for clarity to assist future reading of the document). The text could be further clarified by adding explanation of the low number/no well issues, such as "….Some sites with limited wells or no wells were determined not to have soil or sediment contamination that would adversely impact ground water, thus fewer or no wells were needed for some sites." Ohio EPA is not concurring with abandonment of specified wells at this time, since it is understood that the Army's intention is to abandon wells at a later date, upon discussion and receipt of Ohio EPA's concurrence of the facility-wide ground water AOC path forward, as this document is not a well abandonment plan.

*Army Response (Revised)*: Agree. The third paragraph of Section 9.0 has been revised as follows:

> "Due to the size and structure of the FWGW AOC, CJAG was divided into 15 groups of monitoring wells and potential contaminant source areas. Some potential contaminant source areas with limited wells or no wells were determined not to have soil or sediment contamination that would adversely impact ground water, thus fewer or no wells were installed at the specific potential contaminant source area. The individual appendices present group-specific CSMs, data gap assessment, nature and extent of contamination, HHRA, ERA, contaminant fate and transport (if necessary), and conclusions and recommendations."

In addition, Section X.1.3 Potential Contaminant Source Areas has been revised as follows in each Appendix:

> "Fifty-three AOCs, 17 MRSs, and 14 Compliance Restoration Sites (CRSs) that represent the potential contaminant source areas are located within the former Ravenna Army Ammunition Plant (RVAAP). Some potential contaminant source areas with limited wells or no wells were determined not to have soil or sediment contamination that would adversely impact ground water, thus fewer or no wells were installed at the specific potential contaminant source area. The following subsections provide a description and investigative findings for the potential contaminant source areas within Group A."

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**Group Comment 2**: ***Group B - NACA Test Area*** - While 13 MWs were located around the RVAAP-38 National Advisory Committee for Aeronautics (NACA) Test Area, six MWs were located around the RVAAP-28 Suspected Mustard Agent Burial Site (SMABS) - South, one MW (along with three NACA wells) were located around the RVAAP-03 Open Demolition Area #1 (ODA1), one MW (a co-located NACA well) was located around the RVAAP-28 Suspected Mustard Agent Burial Site (SMABS) - North, and no wells were shown around the CC RVAAP-71 Barn No. 5 Petroleum Release. Please confirm that sites with limited numbers of wells have been adequately delineated and discuss/demonstrate how sites with no wells have been thoroughly investigated and warrant no further action. While this rationale may have been previously covered in the RI Work Plan or FS reports, reiteration of this rationale within this RI Report would provide clarification for future reviewers.

*Army Response*: Clarification. Appendix B, Section B.1.3 provides a detailed summary of every AOC, MRS, and CRS within Group B and is supported by conclusions from the most recent approved available documents for each site. Subsequent group-specific evaluation of groundwater in Sections B.2 to B.4 supports the Army's conclusion that the nature and extent of contamination has been defined, and the HHRA and ERA did not identify a risk requiring an action for Group B.

**Ohio EPA Reply, dated 5/12/21:** Ohio EPA finds this response adequate and acceptable, and considers this comment resolved with the additional recommendation to include this type of clarification text within the Main Text, Section 9.0 Conclusions and Recommendations portion of the document, within Table 9.1, and also within the X.6 Conclusions and Recommendations portions of each Group appendix (for clarity to assist future reading of the document). The text could be further clarified by adding explanation of the low number/no well issues, such as "….Some sites with limited wells or no wells were determined not to have soil or sediment contamination that would adversely impact ground water, thus fewer or no wells were needed for some sites." Ohio EPA is not concurring with abandonment of specified wells at this time, since it is understood that the Army's intention is to abandon wells at a later date, upon discussion and receipt of Ohio EPA's concurrence of the facility-wide ground water AOC path forward, as this document is not a well abandonment plan.

*Army Response (Revised)*: Agree. See the revised response to Group Comment 1.

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**Group Comment 3: *Group C - Fuze and Booster Load Lines*** - RVAAP-39 Load Line 5, RVAAP-33 Load Line 6, RVAAP-40 Load Line 7, RVAAP-41 Load Line 8, RVAAP-44 Load Line 11, and CC RVAAP-68 Electric Substations – Substation No. 3 appear to have adequate delineation MWs in their respective areas. However, one MW was located around the RVAAP-033-R-01 Firestone Test Facility MRS, one MW was located around the RVAAP-062-R-01 Water Works #4 Dump MRS, one MW was located around the CC RVAAP-68 Electric Substations – Substation No. 3, and no wells were shown around the CC RVAAP-75 George Road Sewage Treatment Plant Mercury Spill, CC RVAAP-77 Building 1037 Laundry Waste Water Sump, or CC RVAAP-83 Former Buildings 1031 and 1039. Please confirm that sites with limited numbers of wells have been adequately delineated and discuss/demonstrate how sites with no wells have been thoroughly investigated and warrant no further action. While this rationale may have been previously covered in the RI Work Plan or FS reports, reiteration of this rationale within this RI Report would provide clarification for future reviewers.

*Army Response*: Clarification. Appendix C, Section C.1.3 provides a detailed summary of every AOC, MRS, and CRS within Group C and is supported by conclusions from the most recent approved available documents for each site. Some sites, including RVAAP-33, RVAAP-39, RVAAP-40, RVAAP-41, RVAAP-42, RVAAP-43, RVAAP-44, CC RVAAP-68, CC RVAAP-74, CC RVAAP-77, and CC RVAAP-83, were determined not to have soil or sediment contamination that would adversely impact groundwater. Subsequent group-specific evaluation of groundwater in Sections C.2 to C.4 supports the Army's conclusion that the nature and extent of contamination has been defined, and the HHRA and ERA did not identify a risk requiring an action for Group C. This conclusion excludes CC RVAAP-69 Building 1048 Fire Station and CC RVAAP-74 Building 1034 Motor Pool.

**Ohio EPA Reply, dated 5/12/21:** Ohio EPA finds this response adequate and acceptable, and considers this comment resolved with the additional recommendation to include this type of clarification text within the Main Text, Section 9.0 Conclusions and Recommendations portion of the document, within Table 9.1, and also within the X.6 Conclusions and Recommendations portions of each Group appendix (for clarity to assist future reading of the document). The text could be further clarified by adding explanation of the low number/no well issues, such as "….Some sites with limited wells or no wells were determined not to have soil or sediment contamination that would adversely impact ground water, thus fewer or no wells were needed for some sites." Ohio EPA is not concurring with abandonment of specified wells at this time, since it is understood that the Army's intention is to abandon wells at a later date, upon discussion and receipt of Ohio EPA's concurrence of the facility-wide ground water AOC path forward, as this document is not a well abandonment plan.

*Army Response (Revised)*: Agree. See the revised response to Group Comment 1.

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**Group Comment 8: *Group E - Load Line 12*** - Ohio EPA concurs with the recommendations for additional activities to be conducted to further evaluate Group E. The extent of contamination does not appear to have been defined, since the 2020 RI Report calls for additional horizontal and vertical delineation well(s). Unconsolidated Aquifer potentiometric flow directions indicate that horizontal delineation may be warranted to the east of LL12mw-185 and LL12mw-187.

*Army Response*: Comment noted. It is the position of the Army that horizontal delineation is adequately defined for purposes of completing the RI phase of the CERCLA process. Further evaluation of nitrate and ammonia in the area of LL12mw-185 and LL12mw-187 will go forward in an FS. During the development and regulatory review of the FS, it will be determined if additional wells are needed to refine the conceptual site model and/or monitor contaminant migration.

**Ohio EPA Reply, dated 5/12/21:** Ohio EPA finds this response adequate and acceptable, and considers this comment resolved with the additional comment that Ohio EPA is concurring with the horizontal and vertical delineation as recommended in the Draft RI Report as presented below:
From Appendix E, Page 98, lines 1456-1461:
"As the nature and extent of contamination has been defined, the HHRA identified risk at Load Line 12 requiring additional actions. It is recommended that the area around LL12mw-185 and LLmw-187 proceed to an FS for further evaluation to address the nitrate and ammonia contamination. In addition, the FS should specify the monitoring well network to refine horizontal and vertical contamination in this area, install new wells to support this evaluation (including evaluating and potentially replacing older wells), and abandon wells not needed for this evaluation."

*Army Response (Revised)*: Comment noted. A resolution meeting will be conducted to provide the approach for further evaluation of nitrate and ammonia in the area of LL12mw-185 and LL12mw-187.

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**Group Comment 10**: ***Group F - Atlas Scrap Yard and Load Line 4*** - RVAAP-11 Load Line 4, RVAAP-50 Atlas Scrap Yard, and RVAAP-050-R-01 Atlas Scrap Yard MRS appear to have adequate delineation MWs in their respective areas. However, no wells were shown around the RVAAP-48 Anchor Test Area, RVAAP-048-R-01 Anchor Test Area MRS, and CC RVAAP-79 DLA Ore Storage Sites – Building 841, Area 8 Inert Storage. Please confirm that sites with limited numbers of wells have been adequately delineated and discuss/demonstrate how sites with no wells have been thoroughly investigated and warrant no further action. While this rationale may have been previously covered in the RI Work Plan or FS reports, reiteration of this rationale within this RI Report would provide clarification for future reviewers.

*Army Response*: Appendix F, Section F.1.3 provides a detailed summary of every AOC, MRS, and CRS within Group F and is supported by conclusions from the most recent approved available documents for each site. Some sites, including RVAAP-11, RVAAP-50, and CC RVAAP-79, were determined not to have soil or sediment contamination that would adversely impact groundwater. Subsequent group-specific evaluation of groundwater in Sections F.2 to F.4 supports the Army's conclusion that the nature and extent of contamination has been defined, and the HHRA and ERA did not identify a risk requiring an action for Group F.

**Ohio EPA Reply, dated 5/12/21:** Ohio EPA finds this response adequate and acceptable, and considers this comment resolved with the additional recommendation to include this type of clarification text within the Main Text, Section 9.0 Conclusions and Recommendations portion of the document, within Table 9.1, and also within the X.6 Conclusions and Recommendations portions of each Group appendix (for clarity to assist future reading of the document). The text could be further clarified by adding explanation of the low number/no well issues, such as "….Some sites with limited wells or no wells were determined not to have

soil or sediment contamination that would adversely impact ground water, thus fewer or no wells were needed for some sites." Ohio EPA is not concurring with abandonment of specified wells at this time, since it is understood that the Army's intention is to abandon wells at a later date, upon discussion and receipt of Ohio EPA's concurrence of the facility-wide ground water AOC path forward, as this document is not a well abandonment plan.

*Army Response (Revised)*: Agree. See the revised response to Group Comment 1.

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**Group Comment 15**: ***Group I - Ramsdell Quarry Landfill*** - While 11 MWs were located in and around the RVAAP-01 Ramsdell Quarry Landfill (RQL) and RVAAP-001-R-02 RQL MRS Area 1 (North), only one MW was located within the RVAAP-001-R-01 RQL MRS Area 2 (South). Please confirm that sites with limited numbers of wells have been adequately delineated and discuss/demonstrate how sites with no wells have been thoroughly investigated and warrant no further action. While this rationale may have been previously covered in the RI Work Plan or FS reports, reiteration of this rationale within this RI Report would provide clarification for future reviewers.

*Army Response*: Clarification. Appendix I, Section I.1.3 provides a detailed summary of the AOC (RQL) and MRSs (RQL MRS Area 1 North and RQL MRS Area 2 South) within Group I and is supported by conclusions from the most recent approved available documents for each site. Subsequent group-specific evaluation of groundwater in Sections I.2 to I.4 supports the Army's conclusion that the nature and extent of contamination has been defined, and the HHRA and ERA did not identify a risk requiring an action for Group I.

**Ohio EPA Reply, dated 5/12/21:** Ohio EPA finds this response adequate and acceptable, and considers this comment resolved with the additional recommendation to include this type of clarification text within the Main Text, Section 9.0 Conclusions and Recommendations portion of the document, within Table 9.1, and also within the X.6 Conclusions and Recommendations portions of each Group appendix (for clarity to assist future reading of the document). The text could be further clarified by adding explanation of the low number/no well issues such as "….Some sites with limited wells or no wells were determined not to have soil or sediment contamination that would adversely impact ground water, thus fewer or no wells were needed for some sites." Ohio EPA is not concurring with abandonment of specified wells at this time, since it is understood that the Army's intention is to abandon wells at a later date, upon discussion and receipt of Ohio EPA's concurrence of the facility-wide ground water AOC path forward, as this document is not a well abandonment plan.

Ohio EPA believes it is appropriate to defer some or all well abandonment activities until after concurrence has been reached regarding status of each AOC, until final remedies have been chosen and a long-term facility-wide ground water monitoring program is established. Continued ground water monitoring of some of these AOC wells may be required to comply with applicable DMWM rules and regulations. A groundwater monitoring program that includes wells at downgradient property lines may also be beneficial.

*Army Response (Revised)*: Regarding the recommendations provided in the first paragraph of the reply, please see the revised response to Group Comment 1. The Army concurs that well abandonment is not required at this time. OHARNG submitted the Final End of Post Closure Care Certification (EOPCC) for

RQL to the Division of Materials and Waste Management (DMWM). According to a letter from the Director of the Ohio EPA, dated August 9, 2021, regarding the EOPCC and RQL, "the five RQL groundwater monitoring wells included the in FWGWMP network must remain in place in accordance with the DFFOs. The Facility is still required to comply with the groundwater monitoring, investigation, and remedial requirements of the June 10, 2004 DFFO." Therefore, any current and future groundwater sampling at RQL would be done to support the CERCLA process, and the need for groundwater monitoring downgradient of the property lines is assessed as part of the Facility-wide Groundwater Monitoring Program (FWGWMP) and groundwater sampling is specified in the annual addendums.

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**Group Comment 18: *Group L - Northern Sites* -** Since five MWs were located within the Group L area to assess the CC RVAAP-73 Facility-wide Coal Storage – Sand Creek Coal Tipple, the CC RVAAP-79 DLA Ore Storage Sites – Area 2 Ammo Storage Area, and the CC RVAAP-80 Group 2 Propellant Can Top (an approximate 8,000-foot by 6,000-foot area), please confirm that sites with limited numbers of wells have been adequately delineated and discuss/demonstrate how sites with no wells have been thoroughly investigated and warrant no further action. While this rationale may have been previously covered in the RI Work Plan or FS reports, reiteration of this rationale within this RI Report would provide clarification for future reviewers.

*Army Response*: Clarification. Appendix L, Section L.1.3 provides a detailed summary of every AOC, MRS, and CRS within Group L and is supported by conclusions from the most recent *approved* available documents for each site. Some sites, including CC RVAAP-79, CC RVAAP-80, and CC RVAAP-73, were determined not to have soil or sediment contamination that would adversely impact groundwater. Subsequent group-specific evaluation of groundwater in Sections L.2 to L.4 supports the Army's conclusion that the nature and extent of contamination has been defined, and the HHRA and ERA did not identify a risk requiring an action for Group L.

**Ohio EPA Reply, dated 5/12/21:** Ohio EPA finds this response adequate and acceptable, and considers this comment resolved with the additional recommendation to include this type of clarification text within the Main Text, Section 9.0 Conclusions and Recommendations portion of the document, within Table 9.1, and also within the X.6 Conclusions and Recommendations portions of each Group appendix (for clarity to assist future reading of the document). The text could be further clarified by adding explanation of the low number/no well issues, such as "….Some sites with limited wells or no wells were determined not to have soil or sediment contamination that would adversely impact ground water, thus fewer or no wells were needed for some sites." Ohio EPA is not concurring with abandonment of specified wells at this time, since it is understood that the Army's intention is to abandon wells at a later date, upon discussion and receipt of Ohio EPA's concurrence of the facility-wide ground water AOC path forward, as this document is not a well abandonment plan.

*Army Response (Revised)*: Agree. See the revised response to Group Comment 1.

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**Group Comment 20: *Group N - Landfill North of Winklepeck Burning Grounds -*** Since four MWs were located within the Group N area to assess the RVAAP-19 LNWBG and RVAAP-019-R-01 Landfill North of Winklepeck MRS (landfills with a total footprint of approximately 300 by 1,200 feet), and only one well (LNWmw-026) was installed within the footprint of one of the landfills (the other three wells were upgradient to the west), please confirm that the limited number of wells adequately delineate the sites and discuss/demonstrate how sites with no wells (no wells are installed on the RVAAP-19 LNWBG or downgradient of either landfill) have been thoroughly investigated and warrant no further action. While this rationale may have been previously covered in the RI Work Plan or FS reports, reiteration of this rationale within this RI Report would provide clarification for future reviewers.

*Army Response*: Clarification. It was determined that LNWBG was not used for landfilling operations. This was stated in the *Record of Decision for Soil, Sediment, and Surface Water at RVAAP-19 Landfill North of Winklepeck Burning Grounds* [Leidos 2020]). This conclusion was also summarized in Section N.1.3 of the Facility-Groundwater RI Report stating "it is evident that LNWBG was predominantly used for burning wastes, as opposed to trench and fill-type operations of a landfill". In addition, Section N.1.3 states that it was concluded that there was no contamination in soil, sediment, and surface water at the LNWBG AOC requiring remediation, nor was there MC-related contamination requiring an action.

Appendix N, Section N.1.3 provides a detailed summary of the AOC (LNWBG) and MRS (LNWBG MRS) within Group N and is supported by conclusions from the most recent approved available documents for each site. LNWBG was determined not to have soil or sediment contamination that would adversely impact groundwater. Subsequent group-specific evaluation of groundwater in Sections N.2 to N.4 supports the Army's conclusion that the nature and extent of contamination has been defined, and the HHRA and ERA did not identify a risk requiring an action for Group N.

**Ohio EPA Reply, dated 5/12/21:** Ohio EPA finds this response adequate and acceptable, and considers this comment resolved with the additional recommendation to include this type of clarification text within the Main Text, Section 9.0 Conclusions and Recommendations portion of the document, within Table 9.1, and also within the X.6 Conclusions and Recommendations portions of each Group appendix (for clarity to assist future reading of the document). The text could be further clarified by adding explanation of the low number/no well issues, such as "….Some sites with limited wells or no wells were determined not to have soil or sediment contamination that would adversely impact ground water, thus fewer or no wells were needed for some sites." Ohio EPA is not concurring with abandonment of specified wells at this time, since it is understood that the Army's intention is to abandon wells at a later date, upon discussion and receipt of Ohio EPA's concurrence of the facility-wide ground water AOC path forward, as this document is not a well abandonment plan.

*Army Response (Revised)*: Agree. See the revised response to Group Comment 1.

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**Group Comment 21: *Group O - Upper and Lower Cobbs Ponds and the Central Burn Pits*** - While nine MWs were located around the RVAAP-49 Central Burn Pits, six MWs were located around the RVAAP-29 Upper and Lower Cobbs Ponds, and three MWs were located around the RVAAP-034-R-01 Sand Creek Dump MRS, no wells were shown around the RVAAP-34 Sand Creek Disposal Road Landfill or the RVAAP-51 Dump Along Paris-Windham Road areas. Please confirm that the two sites with no wells have

been adequately delineated and discuss/demonstrate how these sites with no wells have been thoroughly investigated and warrant no further action. While this rationale may have been previously covered in the RI Work Plan or FS reports, reiteration of this rationale within this RI Report would provide clarification for future reviewers.

*Army Response*: Clarification. Regarding RVAAP-34 Sand Creek Disposal Road Landfill, three wells were installed in 2018 and sampled for four-quarters for the full-suite analyses. This was done in response to data gaps identified and as presented in Table 1-3 of the RI Work Plan (TEC-Weston 2016).

As stated in Section O.1.6.1 Data Gaps within this Facility-wide Groundwater RI Report, "In October 2018, three permanent monitoring wells (SCLmw-001, SCLmw-002, and SCLmw-003) were installed at the Sand Creek Disposal Road Landfill. SCLmw-001 and SCLmw-002 were installed within the floodplain of Sand Creek, downgradient from the hillside where waste/debris was dumped. Subsequent to the well installation, four quarters of sampling for full suite analysis were conducted from November 2018 to August 2019."

It is worth noting that the Sand Creek Dump MRS boundary and the Sand Creek Dump Disposal Road Landfill AOC boundary are nearly identical, and the sampling and analysis of these wells adequately characterized both the MRS and AOC.

Regarding RVAAP-51 Dump Along Paris-Windham Road, the following has been added to the end of Section O.1.6.2 RI Goals and Objectives:

> "A review of the historical sampling record for monitoring well FWGmw-001 in proximity RVAAP-51 Dump Along Paris-Windham Road was performed in response to Ohio EPA comments on the RI Work Plan (TEC-Weston 2016). This review concluded that there were no detections of site related non-metals soil COPCs in groundwater. No investigation of groundwater associated with these CRS sites is planned for the RI."

**Ohio EPA Reply, dated 5/12/21:** Ohio EPA finds this response adequate and acceptable, and considers this comment resolved. Upon review of the Appendix O figures provided within the Draft RI Report, they do not provide site outlines on them, so locations of wells versus the site locations cannot be determined. Having both outlines of the Sand Creek Dump MRS boundary and the Sand Creek Dump Disposal Road Landfill AOC boundary on the same figure with the site delineated would be beneficial, and the site layer issue has already been noted and addressed under Report Section Comment 15. Ohio EPA is not concurring with abandonment of specified wells at this time, since it is understood that the Army's intention is to abandon wells at a later date, upon discussion and receipt of Ohio EPA's concurrence of the facility-wide ground water AOC path forward, as this document is not a well abandonment plan.

*Army Response (Revised)*: Clarification. Figure O.1-1 in the Draft RIR shows the outline of both the Sand Creek Dump MRS boundary and the Sand Creek Dump Disposal Road Landfill AOC boundary. The polygons for each are presented in the Legend. As noted in the Ohio EPA reply, the figures in Section O.2 have been revised to show the different sites within the group in response to Report Section Comment 15.

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

August 30, 2021

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

Subject: Ravenna Army Ammunition Plant (RVAAP) Restoration Program, Portage/Trumbull Counties, Draft Facility-wide Groundwater 2021 Semi-Annual Report (Work Activity No. 267000859036)

Dear Mr. Palombo:

An electronic version of the *Draft Facility-wide Groundwater Monitoring Program Plan RVAAP-66 Facility-wide Groundwater Semi-Annual Report for Spring 2021 Sampling Event* will be sent using the Ohio EPA LiquidFile system. A hard copy and CD will be sent when they are able to be received by Ohio EPA. Due to file size, Appendix E containing the laboratory data packages are not included with the electronic version of this report. This appendix can be provided upon request as a separate electronic deliverable.

This report was prepared for the Army National Guard in support of the RVAAP Restoration Program. Please contact the undersigned at 614-336-6000, ext 2053 or kevin.m.sedlak.ctr@mail.mil if there are issues or concerns with this submission.

Sincerely,

SEDLAK.KEVIN.MICHAEL.1254440171 Digitally signed by SEDLAK.KEVIN.MICHAEL.1254440171 Date: 2021.09.02 09:52:21 -04'00'

Kevin M. Sedlak
RVAAP Restoration Program Manager
Army National Guard Directorate

cc: Natalie Oryshkewych, Ohio EPA, NEDO
Bob Princic, Ohio EPA, NEDO
Liam McEvoy, Ohio EPA, NEDO
Tom Schneider, Ohio EPA, SWDO
Carrie Rasik, Ohio EPA, CO
Mark Leeper, ARNG
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Jed Thomas, Leidos
Jennifer Tierney, Vista Sciences Corporation

Ohio Environmental Protection Agency

**Mike DeWine,** Governor
**Jon Husted,** Lt. Governor
**Laurie A. Stevenson,** Director

August 9, 2021

**TRANSMITTED ELECTRONICALLY**

Mr. Kevin M. Sedlak
Army National Guard
Installation and Environment
Clean-up Branch
IPA Designation
1438 State Route 534 SW
Newton Falls, OH 44444

RE: US Army Ammunition Plt RVAAP
Remediation Response
Project Records
Remedial Response
Portage County
ID # 267000859036

**Subject: Approval of the "Final Facility-wide Groundwater Program Plan, RVAAP-66 Facility-wide Groundwater Annual Report for 2020"**

Dear Mr. Sedlak:

The Ohio Environmental Protection Agency (Ohio EPA) has received the "Final Facility-wide Groundwater Program Plan, RVAAP-66 Facility-wide Groundwater Annual Report for 2020" at the Former Ravenna Army Ammunition Plant, Portage and Trumbull Counties, Ohio. This document was received via email at Ohio EPA's Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR) on July 21, 2021. The document was prepared for the U.S. Army Corps of Engineers on behalf of the Army National Guard Directorate by Leidos.

The final 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.

This letter is an official response from Ohio EPA that will be maintained as a public record.

RECEIVED
AUG 0 9 2021

If you have any questions, please contact me via email at kevin.palombo@epa.ohio.gov, or call me at (330) 963-1292.

Sincerely,

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

KP/sc

ec: Rebecca Shreffler, Chenega
Bob Princic, Ohio EPA, NEDO, DERR
Natalie Oryshkewych, Ohio EPA, NEDO, DERR
Liam McEvoy, Ohio EPA, NEDO, DERR
Thomas Schneider, Ohio EPA, SWDO, DERR
Carrie Rasik, Ohio EPA, CO, DERR
Katie Tait, OHARNG RTLS, CJAG
Craig Coombs, USACE Louisville
Nathaniel Peters, USACE Louisville

July 21, 2021

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

Subject: Ravenna Army Ammunition Plant (RVAAP) Restoration Program, Portage/Trumbull Counties, Final Facility-wide Groundwater 2020 Annual Report (Work Activity No. 267000859036)

Dear Mr. Palombo:

An electronic version of the *Final Facility-wide Groundwater Monitoring Program RVAAP-66 Facility-wide Groundwater Annual Report for 2020* has been sent using the Ohio EPA LiquidFile system. A hard copy and CD will be sent upon request by Ohio EPA. Due to file size, Appendices F.1 and F.2 containing the laboratory data packages are not included with the electronic version of this report. These appendices can be provided upon request as a separate electronic deliverable.

This report was prepared for the Army National Guard in support of the RVAAP Restoration Program. Please contact the undersigned at 614-336-6000, ext 2053 or kevin.m.sedlak.ctr@mail.mil if there are issues or concerns with this submission.

Sincerely,

SEDLAK.KEVIN.MICHAEL.1254440171 Digitally signed by SEDLAK.KEVIN.MICHAEL.1254440171 Date: 2021.07.21 07:15:57 -04'00'

Kevin M. Sedlak
RVAAP Restoration Program Manager
Army National Guard Directorate

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Jennifer Tierney, Vista Sciences Corporation

Ohio Environmental Protection Agency

**Mike DeWine**, Governor
**Jon Husted**, Lt. Governor
**Laurie A. Stevenson**, Director

July 12, 2021

**TRANSMITTED ELECTRONICALLY**

Mr. Kevin Sedlak
Restoration Program Manager
ARNG-ILE Clean Up
Camp James A Garfield JTC
1438 State Route 534 SW
Newton Falls, OH 44444

RE: US Army Ammunition Plt RVAAP
Remediation Response
Project Records
Remedial Response
Portage County
ID # 267000859036

**Subject: Response to Ohio EPA Comments on the "Draft Facility-wide Groundwater Monitoring Program Plan RVAAP-66 Annual Report for 2020" dated June 1, 2021**

Dear Mr. Sedlak:

The Ohio Environmental Protection Agency (Ohio EPA) has received and reviewed the "Response to Ohio EPA Comments on the Draft Facility-wide Groundwater Monitoring Program (FWGWMP) Plan RVAAP-66 Annual Report for 2020" at the Former Ravenna Army Ammunition Plant, Portage and Trumbull Counties, Ohio (Camp James A. Garfield). This document was received at Ohio EPA's Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR) via email on June 1, 2021.The response was prepared for the United States Army Corps of Engineers (USACE) on behalf of the National Guard Bureau by Leidos under Contract Number W912QR-16-D-0003.

Based on our review of the Army National Guard's Response to Ohio EPA comments provided in in your letter dated June 1, 2021, we find the responses generally acceptable, and the document can be finalized. Please be sure that all agreed to changes, additions and clarifications are provided in the final document.

This letter is an official response from Ohio EPA that will be maintained as a public record.

RECEIVED
JUL 12 2021

If you have questions, you can reach me via email at kevin.palombo@epa.ohio.gov or at (330) 963-1292.

Sincerely,

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

KP/sc

ec: Rebecca Shreffler, Chenega Tri-Services
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Ohio Environmental Protection Agency

**Mike DeWine**, Governor
**Jon Husted**, Lt. Governor
**Laurie A. Stevenson**, Director

July 9, 2021

**TRANSMITTED ELECTRONICALLY**

Mr. Kevin M. Sedlak
Army National Guard
Installation and Environment
Clean-up Branch
IPA Designation
1438 State Route 534 SW
Newton Falls, OH 44444

RE: US Army Ammunition Plt RVAAP
Remediation Response
Project Records
Remedial Response
Portage County
ID # 267000859036

**Subject: Approval of the "Final Facility-Wide Groundwater Monitoring Program Plan RVAAP-66 Facility-Wide Groundwater Addendum for 2021"**

Dear Mr. Sedlak:

The Ohio Environmental Protection Agency (Ohio EPA) has received the *Final Facility-Wide Groundwater Monitoring Program Plan RVAAP-66 Facility-Wide Groundwater Addendum for 2021* at the Former Ravenna Army Ammunition Plant, Portage and Trumbull Counties, Ohio, dated May 21, 2021. This document was received via email at Ohio EPA's Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR) on May 22, 2021. The document was prepared for the U.S. Army Corps of Engineers on behalf of the Army National Guard Directorate by Leidos.

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

This letter is an official response from Ohio EPA that will be maintained as a public record.

RECEIVED
JUL 07 2021

If you have any questions, please contact me by email at kevin.palombo@epa.ohio.gov, or call me at (330) 963-1292.

Sincerely,

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

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Thomas Schneider, Ohio EPA, SWDO, DERR
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Steve Kvaal, USACE Louisville
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**NATIONAL GUARD BUREAU**
111 SOUTH GEORGE MASON DRIVE
ARLINGTON VA 22204-1373

June 1, 2021

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, Responses to Comments on the Draft Facility-wide Groundwater Monitoring Annual Report for 2020 (Work Activity No. 267-000-859-036)

Dear Mr. Palombo:

The Army appreciates your time and comments on the Draft Facility-wide Groundwater Monitoring Annual Report for 2020. Enclosed for your review are responses to your comments. Upon resolution of these comments, the Army will provide a Final version of the report for Ohio EPA concurrence.

These comment responses were prepared for the Army National Guard in support of the RVAAP restoration program. Please contact the undersigned at 614-336-6000, ext 2053 or kevin.m.sedlak.ctr@mail.mil if there are issues or concerns with this submission.

Sincerely,

SEDLAK.KEVIN.MICHAEL.1254440171 Digitally signed by SEDLAK.KEVIN.MICHAEL.1254440171 Date: 2021.06.01 14:29:52 -04'00'

Kevin M. Sedlak
RVAAP Restoration Program Manager
Army National Guard Directorate

cc: Natalie Oryshkewych, Ohio EPA, NEDO
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Liam McEvoy, Ohio EPA, NEDO
Tom Schneider, Ohio EPA, SWDO
Carrie Rasik, Ohio EPA, CO
Mark Leeper, ARNG
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Steve Kvaal, USACE Louisville
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Vasu Peterson, Leidos
Jed Thomas, Leidos
Rebecca Shreffler, Chenega Tri-Services

Subject: Former Ravenna Army Ammunition Plant (RVAAP) Restoration Program, Portage/Trumbull Counties, Facility-Wide Groundwater Annual Report for 2020 (Work Activity No. 267-000-859-036)

**Comments**

**Ohio EPA Comment 1: Proposed Well Redevelopment Activities**

Section 4.3 Sedimentation and Turbidity indicated that eight (8) wells had turbidity readings in excess of 10 NTUs during 2020 sampling events. Some wells had been redeveloped during 2020, so only two (2) wells (LL1mw-081, LL2mw-267) were recommended for redevelopment in 2021.

Please clarify the planned methods for well redevelopment, or if these activities are described in other documents, please identify those reference documents (i.e., in the 2016 RIWP). Also please provide a timeframe for proposed well redevelopment activities (i.e., with Spring sampling or Fall sampling event) and clarify if these activities were added to the 2021 Addendum.

Army Response: As communicated with Ohio EPA, the Army redeveloped wells LL1mw-085, LL1mw-079, LL3mw-245, LL12mw-246, FBQmw-173, WBGmw-007, WBGmw-014, WBGmw-018, WBGmw-019, LL12mw-244, and WBGmw-008 prior to sampling in Spring 2021. These wells were recommended for sampling in the in the 2021 Addendum and were last sampled between 2011 and 2016. These wells were redeveloped in accordance with Section 3.5.2 of the RI Work Plan (TEC-Weston 2016), which also references the Facility-wide Sampling and Analysis Plan (SAIC 2011) and Chapters 8 and 10 of the Ohio EPA Technical Guidance Manual for Groundwater Investigations. A summary of the well redevelopment activities will be in the 2021 Annual Report.

Monitoring well LL1mw-081 was able to be stabilized at 2.46 NTU prior to sample collection in April 2021. The recommendation for redevelopment of this well will be reassessed after the Fall 2021 sampling event. Monitoring well LL2mw-267 is not planned for sampling in 2021, and consequently are not planned for redevelopment in 2021. If this well is sampled in the future, it is expected that this well will be redeveloped prior to sampling.

**Ohio EPA Comment 2: Statistical Data Evaluation**

Metals data results were compared to the findings presented in the 2019 Background Study for Metals, explosives were plotted on time series graphs, and pH readings were also plotted on time series graphs. While visibly recognizable best linear fit evaluations are useful, please explain if further statistical evaluation of these data (in future reports) will be used to more accurately determine decreasing, stable, or increasing trend lines in the data (utilizing Sanitas or some other acceptable form of statistical evaluation program). Statistical trend analyses would be recommended to help evaluate the ongoing FWGWMP and/or to help support future proposed well abandonment decisions.

Army Response: Comment noted. As indicated, the current graphs depict the necessary presentation regarding if a chemical concentration is increasing or decreasing over time. Further statistical evaluation of the groundwater data using programs like SAS® may be used once the list of COCs to go forward in a feasibility study is refined and concurred by the stakeholders.

**NATIONAL GUARD BUREAU**
111 SOUTH GEORGE MASON DRIVE
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May 21, 2021

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

Subject: Ravenna Army Ammunition Plant (RVAAP) Restoration Program, Portage/Trumbull Counties, Final Facility-wide Groundwater 2021 Addendum (Work Activity No. 267000859036)

Dear Mr. Palombo:

An electronic version of the *Final Facility-wide Groundwater Monitoring Program Plan RVAAP-66 Facility-wide Groundwater Addendum for 2021* will be sent using the Ohio EPA LiquidFile system. A hard copy and CD will be sent when they are able to be received by Ohio EPA.

This final addendum contains revisions specified in the Army's comment response letter dated 4/8/21. These revisions were approved by Ohio EPA, as noted in your response letter dated 5/5/21. As discussed on 5/6/21, monitoring well LL1mw-085 was unable to be sampled during the Spring 2021 sampling event. It was agreed to instead sample monitoring well LL1mw-082, which achieves the same objective of providing data to support the upcoming feasibility study. The change to sample LL1mw-082 is reflected in this final version of the addendum. The Army will take a separate action to assess the structural issues associated with LL1mw-085.

This addendum was prepared for the Army National Guard in support of the RVAAP Restoration Program. Please contact the undersigned at 614-336-6000, ext 2053 or kevin.m.sedlak.ctr@mail.mil if there are issues or concerns with this submission.

Sincerely,

SEDLAK.KEVIN.MICHAEL.1254440171 Digitally signed by SEDLAK.KEVIN.MICHAEL.1254440171 Date: 2021.05.14 10:52:15 -04'00'

Kevin M. Sedlak
RVAAP Restoration Program Manager
Army National Guard Directorate

cc: Natalie Oryshkewych, Ohio EPA, NEDO
Bob Princic, Ohio EPA, NEDO
Liam McEvoy, Ohio EPA, NEDO
Tom Schneider, Ohio EPA, SWDO
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Vasu Peterson, Leidos
Jed Thomas, Leidos
Jennifer Tierney, Vista Sciences Corporation

Ohio Environmental Protection Agency

**Mike DeWine**, Governor
**Jon Husted**, Lt. Governor
**Laurie A. Stevenson**, Director

May 12, 2021

**TRANSMITTED ELECTRONICALLY**

Mr. Kevin Sedlak
Restoration Program Manager
ARNG-ILE Clean Up
Camp James A Garfield JTC
1438 State Route 534 SW
Newton Falls, OH 44444

**RE: US Army Ammunition Plt RVAAP**
**Remediation Response**
**Project Records**
**Remedial Response**
**Portage County**
**ID # 267000859036**

**Subject: Ohio EPA Reply to the "Response to Ohio EPA Comments on the Draft Facility-wide Groundwater Monitoring Program Plan RVAAP-66 Facility-wide Groundwater Remedial Investigation Report" Dated July 31, 2020**

Dear Mr. Sedlak:

The Ohio Environmental Protection Agency (Ohio EPA) has received and reviewed the "Response to Ohio EPA Comments on the Draft Facility-wide Groundwater Monitoring Program (FWGWMP) Plan RVAAP-66 Facility-wide Groundwater Remedial Investigation Report" for the Former Ravenna Army Ammunition Plant, Portage and Trumbull Counties, Ohio (Camp Garfield). This document was received by Ohio EPA's Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR) via email on January 29, 2021. The response was prepared for the United States Army Corps of Engineers (USACE) on behalf of the National Guard Bureau by Leidos under Contract Number W912QR-16-D-0003. The initial Ohio EPA comments are presented below in italicized font, along with a summary of the USACE/Army responses from the January 2021 Draft Remedial Investigation (RI) Response to Comments (RTC) letter in regular font, followed by the latest Ohio EPA comments in bold font as applicable:

## GENERAL COMMENTS

***Ohio EPA General Comment 1:*** *In each of the nearly 70 or more Site Investigations (SIs) that have been conducted on the Camp James A. Garfield (CJAG) property, a statement is made that ground water will be evaluated in the Facility-wide Groundwater RI.*

*Action Item: This RI needs to provide a discussion regarding each Area of Concern (AOC) that the number, depth and location of the existing Monitoring Wells (MWs) are sufficient to evaluate the ground water pathway based on the specific hydrogeology and characteristics of specific contaminants of each area.*

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MAY 12 2021

**Army Response:** Clarification and agree. As conceptualized in the approved RI Work Plan (TEC-Weston 2016), the sites within the [Installation Restoration Program] IRP are aligned with specific groups. This RI Report provides group-specific appendices that summarize the history of each site (potential contaminant source area) within the group, including site history, conclusions of investigation for other media, available groundwater modeling, and whether source removals have been conducted. In addition, a summary of wells within the group and figures depicting the well locations are provided. The group-specific appendices provide a conclusion of whether the group (and inherently the sites within the group) has adequately defined nature and extent of contamination and if [chemicals of concern] COCs are requiring evaluation in a [Feasibility Study] FS.

For example, Section D.1 discusses the number of monitoring wells in the Unconsolidated aquifer and Homewood aquifer, and provides on Figure D.1-1 the location of these wells and the location of the area within this group that required a remedial action. To further enhance the write up, the following statement has been added to Section D.1.2 Group Aquifers, and will be done so for each Section X.1.2:

"Two aquifers were evaluated using a total of 12 monitoring wells in Group D. These aquifers and the potentiometric surfaces from the April 2019 well gauging event are summarized in the following subsections. The site-specific monitoring wells were generally placed in locations associated with potential source areas of contamination or to establish upgradient water quality conditions."

The evaluation of chemical concentrations associated with these wells and nature and extent of contamination are presented in Section D.2. If COCs are required for evaluation in an FS, the appendices identify the specific wells and sites that require this evaluation. For example, the recommendation to evaluate 2,4 DNT; 2 amino-4,6-DNT; 4-amino-2,6-DNT; and 2,4,6-TNT in Group D is further refined to the area of well FBQmw-174 at RVAAP-16 Fuze and Booster Quarry.

**Ohio EPA finds this response adequate and acceptable, and considers this comment resolved.**

***Ohio EPA General Comment 2:*** *The RI Report proposes to abandon the wells in multiple AOCs based on determination of "No Further Action".*

*Action Item: While the 2020 RI Report proposes to abandon the wells in multiple AOCs based on determination of "No Further Action", it may be appropriate to defer some or all well abandonment activities until after concurrence has been reached regarding status of each Area, until final remedies have been chosen and a long-termed Facility-Wide Ground Water monitoring system is established. Continued ground water monitoring of some of these AOC wells may be required to comply with applicable Division of Materials and Waste Management (DMWM) rules and regulations, specifically regarding wells located around regulated solid waste landfills located within several AOCs. Additionally, the potential of off-site migration*

*should be highlighted for applicable AOCs, and associated wells should be included within the long-term Facility-Wide Ground Water monitoring plan.*

***General Ohio EPA Well Abandonment Comment***

*Ohio EPA states that while the abandonment or retention of certain monitoring wells on the site is ultimately at the discretion of the USACE/Army, if future investigation activities necessitate subsurface investigation in areas where previous monitoring wells were abandoned, then installation of new monitoring wells in these historic locations will be the responsibility of the USACE/Army.*

*In accordance with Ohio Administrative Code (OAC) Rules 3745-9-03(B) and (C), a well that is damaged or deteriorated or is no longer being used or maintained shall either be repaired or sealed. Well sealing shall be performed in accordance with OAC Rule 3745-9-03(A). OAC Rule 3745-9-03 also establishes requirements for proper construction, sealing, repairing, and abandonment of monitoring wells in accordance with the requirements of the Ohio EPA Technical Guidance Manual for Hydrogeologic Investigations and Ground Water Monitoring (Ohio EPA TGM). After work is completed, the volunteer must submit well logs and required well abandonment forms to the Ohio Department of Natural Resources (ODNR). The sealing of all abandoned wells and boreholes that penetrate an aquifer must be properly documented in accordance with Section 1521.05(C) of the Ohio Revised Code (ORC). A well sealing report must be submitted to the ODNR, Division of Water Resources within 30 days of the sealing. Along with copies of well logs and abandonment forms, documentation of steps taken to abandon the wells should be included in a well abandonment report and submitted to Ohio EPA within 30 days after well sealing, as noted in Chapter 9, Section 2.3 of the Ohio EPA TGM.*

**Army Response:** Comment noted. Currently, it is the Army's intention to abandon wells upon receipt of Ohio EPA's concurrence of the facility-wide groundwater AOC path forward, as shall be documented in the record of decision.

> **Ohio EPA finds this response adequate and acceptable, and considers this comment resolved.**

**REPORT SECTION COMMENTS**

***Ohio EPA Report Section Comment 1:*** *Section 1.3, page 1-2, last bullet. To clarify the description and location of the "Groups", please refer the reader to Table 1-1 and/or Figure 5-1.*

**Army Response:** Clarification and agree. The purpose of the last bullet is to provide examples of how groupings were reconsidered. However, to point the reader to the list of groups and the associated contaminant source areas, paragraph leading into the bulleted list has been revised as follows:

"For this RI Report, monitoring wells were grouped into 15 groups. The list of groups and associated contaminant source areas are presented in Table 1-1. These 15 groups are similar…"

**Ohio EPA finds this response adequate and acceptable, and considers this comment resolved.**

***Ohio EPA Report Section Comment 2:*** *Section 3.1, page 3-1, paragraph 1. In the description of the facility location, please provide the total acreage the site encompasses, also what percentage of those are used by the Ohio Army National Guard (OHARNG) for military training.*

**Army Response:** Agree. The following text will be added to the end of the paragraph Section 3.1:

"The acreage of the facility is 21,683 acres. All of it is used for military training whether it is classified as operational range or a cantonment area."

**Ohio EPA finds this response adequate and acceptable, and considers this comment resolved.**

***Ohio EPA Report Section Comment 3:*** *Section 3.3, page 3-3, last paragraph. A very general description of the permeabilities of the various unconsolidated and bedrock deposits on the property is provided. For the reader to have a better understanding of the actual hydraulic conductivities measured at the facility, a table of the actual values should be provided from the various deposits that underlie the facility.*

**Army Response:** Agree. Information regarding the actual measurements and calculations for hydraulic conductivity, hydraulic gradient, and porosity at the facility has been added to Section 3.3, as follows:

"The majority of CJAG is composed of clay-rich glacial tills with low permeability and underlying bedrock formations with extremely variable, but relatively low, permeability. Typical yields from wells were reported in the 1982 study as penetrating the "Sharon Conglomerate" range from 5 to 200 gallons per minute (gpm); yields from the overlying unconsolidated deposits are usually considerably lower. In addition, the thickness and permeability of the bedrock water-bearing formations at CJAG vary considerably and have a strong effect on well yields, transmissivity, and hydraulic conductivity (Kammer 1982). Average porosity values (EQM 2012b) from previous Shelby tube samples and average hydraulic conductivity values derived from rising head/falling head tests conducted on CJAG groundwater monitoring wells have also been calculated for the formations present at CJAG. The hydraulic gradient, porosity, and hydraulic conductivity values are provided as Table 3-2.

**Ohio EPA finds this response adequate and acceptable, and considers this comment resolved.**

***Ohio EPA Report Section Comment 4:*** *Section 4.7, page 4-4. Monitoring wells were analyzed for perchlorate in 2008 and then stopped. Perchlorates were used in propellants. Please summarize the rationale for sampling for this compound and then for ending that analysis after one year.*

**Army Response:** Clarification. Section 4.7 merely summarizes (at a high level) important activities conducted under the FWGWMP in 2008. One activity conducted in 2008 was "Between the July and October 2008 sampling event, 131 wells were analyzed for perchlorate (EQM 2009a and 2009b)", thus it was discussed in the summary of 2008 sampling.

Over 180 perchlorate samples were collected and analyzed after 2008. For example, as stated in Section 4.17.3, perchlorate was analyzed as part of the full-suite analysis for the Sand Creek Disposal Road Landfill wells installed in 2018.

**Ohio EPA does not believe the response adequately answers the question. Please provide the historical rationale for the sampling and why it was not continued.**

***Ohio EPA Report Section Comment 5:*** *Table 4-1, page 4-13. A table of background ground water screening levels for metals is presented. Since there were two iterations of background sampling at CJAG, please put the date these were collected on the table.*

**Army Response:** Agree. The following footnote has been added to Table 4-1:
"Background concentrations are as specified in Table 4-5 of the "Background Study for Metals for RVAAP-66 Facility-wide Groundwater (Leidos 2019)."

**Ohio EPA finds this response adequate and acceptable, and considers this comment resolved.**

***Ohio EPA Report Section Comment 6:*** *Section 5.1, page 5-2, second bullet. Regarding the separate RIs that are being conducted at RVAAP-04, RVAAP-69, and RVAAP-74, a statement needs to be made that clearly states that RIs are being conducted separately at these three AOCs due to schedules that did not coincide with preparation of this FWGW RI and therefore the results and conclusions will be handled separately. It is Ohio EPA's request that these final RIs become appendices to this FWGW RI.*

**Army Response:** Clarification and agree. The rationale for which RVAAP-004-R-01, CC RVAAP-69, and CC RVAAP-74 are not part of the Facility-wide Groundwater RI extends beyond schedule. For example, groundwater at RVAAP-004-R-01 Open Demolition Area #2 is being evaluated as part of a site-specific comprehensive RI that includes other media such

as soil, sediment, and surface water. It is the position of the Army that it is less important to provide this rationale, provided that there is clarity that site-specific RIs for these sites are underway. Text provided in Sections 1.2 (Scope), 1.3 (Report Organization), 5.1 (Data Assembly), and 9.0 (Conclusions) have been modified similar to below:

"Three additional separate groundwater investigations at CJAG are not included in this FWGW RI, as groundwater is being addressed during comprehensive site-specific investigations. These areas of concern (AOCs) include RVAAP-004-R-01 Open Demolition Area #2 [Munitions Response Site] MRS (which is inclusive of RVAAP-04 Open Demolition Area #2), CC-RVAAP-69 Building 1048 Fire Station, and CC RVAAP-74 Building 1034 Motor Pool."

In addition, it is the Army's position that the final RIs for RVAAP-004-R-01, CC RVAAP-69, and CC RVAAP-74 do not become appendices to this Facility-wide Groundwater RI Report. As noted above, the report clearly states that these sites are not within the scope, and there is an administrative record available for future reviewers to find groundwater-specific conclusions associated with these sites.

**Ohio EPA wonders then why the Facility-Wide Groundwater Remedial investigation is titled as it is. It is not a Facility-Wide Remedial Investigation when it does not include several major AOCs. The Introduction to this RI should clearly list those AOCs where RIs are conducted separately.**

***Ohio EPA Report Section Comment 7:*** *Section 5.1, page 5-2, paragraph 3. This section states that data collected between 1998 and 2018 are available for this RI, and that the summary statistics were calculated using only the most recent two years. Please explain the rationale behind this decision and provide a brief explanation in this report*.

**Army Response:** Clarification. As stated in the second paragraph of Section 5.1, "While all of the data collected are considered in the nature and extent evaluation (e.g., to identify time trends), the most recent 2 years of data available for each chemical and each monitoring well are used to best represent current site conditions." No further text change is recommended.

**Ohio EPA finds this response adequate and acceptable.**

***Ohio EPA Report Section Comment 8:*** *Section 5.4, page 5-16. This section provides a brief discussion of the pH evaluation that took place at several areas of concern due to pH levels consistently being recorded below 6.0 but does not acknowledge the record of disposal of acidic wastes at these areas. Please provide some general statement that historic disposal of acidic wastes took place in these areas of concern.*

**Army Response:** Clarification. Section 5.4 is a generalized summary of how pH is evaluated within the group-specific appendices. The group-specific appendices then provide the detailed site history and pH evaluation. Stating that each of the four sites (C Block Quarry,

Fuze and Booster Quarry, Load Line 1, and Ramsdell Quarry Landfill) had a history of disposal of acidic wastes would be an inaccurate generalization. For example, there is not a recorded historic disposal of acidic wastes at Load Line 1. On the other hand, the following is stated for C Block Quarry "Liquid waste was dumped on the ground surface in the bottom of the abandoned unlined borrow pit. This liquid waste reportedly included annealing process liquids (chromic acid) from Building 802…"

Accordingly, it is the Army's position that the level of detail requested in this comment continue to reside in the group-specific appendices.

**Ohio EPA finds this response adequate and acceptable.**

***Ohio EPA Report Section Comment 9:*** *Section 9.0, page 9-2, paragraph 5 describes Figure 9.2 as a graphical depiction of explosives at Load Line 1 (Initial Source Plume). This figure does not detail whether the contaminants are in soil or ground water, though it is assumed it is ground water. Please make some notation on the map. Also, was the purpose of showing only the Load Line 1 area an example of maps to be presented for other AOCs? Please clarify in the document.*

**Army Response:** Clarification and agree. Only Load Line 1 had an inferred groundwater contaminant plume depicted in this RI Report, as that is the only contaminant area containing multiple co-located wells with recent data containing the same explosive contaminant requiring evaluation in an FS. As summarized in Section 9 and depicted in Figure 9-1, there are multiple other locations in which COCs require evaluation in an FS. To eliminate confusion about the purpose of Figure 9-2, it has been removed. The contaminant data for explosives at Load Line 1 is presented in graphics within Appendix H.

**Ohio EPA finds this response adequate and acceptable.**

***Ohio EPA Report Section Comment 10:*** *Section 9.0, page 9-2, last paragraph states, "The Army will continue with three additional investigations at CJAG at…" The statement needs to clearly state that RIs are being conducted separately at these three AOCs due to schedules that did not coincide with preparation of this FWGW RI and therefore the results and conclusions will be handled separately. It is Ohio EPA's request that these final RIs become appendices to this FWGW RI.*

**Army Response:** Please see response to Report Section Comment 6.

**Ohio EPA wonders then why the Facility-Wide Groundwater Remedial investigation is titled as it is. It is not a Facility-Wide Remedial Investigation when it does not include several major AOCs. The Introduction to this RI should clearly list those AOCs where RIs are conducted separately.**

***Ohio EPA Report Section Comment 11:*** *Appendix A, Section A.1.3.5, page 7, paragraph 3. The Route 80 Tank Farm. Please describe the number and size of tanks that were located in this area. When were they removed? It does not appear ground water was evaluated in this area. Based on information provided in this RI, Ohio EPA believes ground water MWs are necessary in the area to eliminate our concern over this potential contaminant pathway.*

**Army Response:** Clarification and agree. Soil screening for migration to groundwater was conducted for all [site-related contaminants] SRCs within CC RVAAP-79 including the Route 80 Tank Farm, concluding no impact to groundwater. This information combined with the well documented site history, investigations, and removal actions documented in the Final Remedial Investigation for CC RVAAP-79 DLA Ore Storage Sites (Parsons 2020) provides adequate support to eliminate the need for monitoring wells. Additionally, FWGmw-014 is located approximately 250 ft to the southwest and is screened in unconsolidated sediments from 8.25 to 18.25 ft [below ground surface] bgs doesn't exceed the site related screening criteria. Available site information summarized in final investigation reports for the DLA Storage Area, pertinent to the Route 80 Tank Farm, will be summarized in revised text as follows in paragraph 2 and 3 of Section A.1.3.5:

"This sub-area was used to store strategic material in 18 [aboveground storage tanks] ASTs including asbestos, cobalt, monazite sand, nickel cathodes, rutile sand, talc, and zircon sand ore (SpecPro, 2003). Several decontamination and survey efforts were conducted between the mid1970s and 2001. Details relative to closure of these storage units are documented in the Final Report for the Assessment of Potential Contamination at the DLA Outdoor Storage Areas, Ravenna Army Ammunition Plant, Ravenna, Ohio (SpecPro, 2003). The historical ASTs are no longer present in this sub-area, with the last tank (Tank #1306 that was approximately 85-ft in diameter, 25-ft tall) removed in March 2007 (SpecPro 2007). North-south trending rail lines used to traverse the sub-area but have been removed. Several thousand cubic yards of asbestos and monazite contaminated soil were removed from the AST area and all subsequent activities summarized in the Final RI (Parsons 2020x)."
"The Final Remedial Investigation for CC RVAAP-79 DLA Ore Storage Sites (Parsons 2020x) included a summary of the nature and extent of contamination, contaminant fate and transport, [a] [human health risk assessment] HHRA, and an [environmental risk assessment] ERA. SRC concentrations in soil were screened to identify those contaminant migration chemicals of potential concern (CMCOPCs) with the potential to leach to and migrate in groundwater. Conclusions of the soil screening analysis are that all of the identified SRCs at this AOC in soil were eliminated as current risks to groundwater. No CMCOPCs (and, therefore, no contaminant migration COCs) were identified at CC RVAAP-79 DLA Ore Storage Sites.

**Ohio EPA is not confident that one well 250 feet away, likely side gradient from 18 ASTs storing an estimated 1300 cubic yards each and where several thousand cubic yards of contaminated soil were removed, is adequate to determine if ground water has or has not been impacted. Please include general**

**soil types and their estimated permeabilities in the area as part of the discussion above.**

***Ohio EPA Report Section Comment 12:*** *Appendix A, Figure A.2-1. Please use a more contrasting color for the non-detects on this map.*

**Army Response:** Agree. Both Figures A.2-1 and A.2-6 have been revised such that a more contrasting color is used for the non-detects.

**Ohio EPA finds this response adequate and acceptable.**

***Ohio EPA Report Section Comment 13:*** *Appendix A, Figures. Does the shape and dimensions of the green outline that describes Group A, or any of the groups, indicate anything? A notation should be made in the legend.*

**Army Response: Clarification.** The outline depicting the shapes do not necessarily depict anything with the exception of the sites and wells that are encompassed in the group-specific evaluation.

**Ohio EPA finds this response adequate and acceptable**

***Ohio EPA Report Section Comment 14:*** *Appendix A, Figures. In the legend, there are numbers in parenthesis next to the Unconsolidated and Homewood well symbols as well as the "greater than" and "less than" screening level symbols. Please clarify in the legend on all the figures what the numbers indicate.*

**Army Response:** Agree. A note has been added to the legend stating: "The number in parenthesis in this legend represents the number of wells meeting the respective criteria".

**Ohio EPA finds this response adequate and acceptable.**

***Ohio EPA Report Section Comment 15:*** *Appendix A, Figures. After Figure A.1-1, all subsequent figures do not show the layer that locates and identifies individual sites within each group. Eliminating the specific site location label causes confusion. Please include the layer on all the Group Maps located in Appendices A through O.*

**Army Response:** Agree. The Section X.1 figures that show the potentiometric surfaces and Section X.2 figures that show chemical concentrations have been revised to show the different sites within each group. It is advised that the Figures X.1-2 to X.1-4 that show the unconsolidated deposits, soil classification, and geologic bedrock map on a facility-wide scale not have these callouts on the figure, as they are very dense with information as they are.

**Ohio EPA finds this response adequate and acceptable.**

***Ohio EPA Report Section Comment 16:*** *Appendix A, Section A.3.3.1, page 31. The first paragraph states, "No apparent 'core of the plume' is present in the Unconsolidated aquifer…" A clarification should be added that states "based on available monitoring well data."*

**Army Response:** Agree. All appendices have been reviewed, and text revised as follows where appropriate:

"Based on available data, no apparent "core of the plume is present…"

**Ohio EPA finds this response adequate and acceptable.**

***Ohio EPA Report Section Comment 17:*** *Appendix A, Section A.3.5.2, page 33, last paragraph. Please provide general range of hexavalent chromium concentrations identified in soils at C Block Quarry. Were any of the impacted soils removed? If hexavalent chromium was identified in three MWs during a 2005 ground water sampling event, it seems the statement "...the fate and transport concluded that hexavalent chromium would not be expected to reach the water table from the source area in 1000 years" should be removed or restated.*

**Army Response:** Agree. The third bullet in Section A.1.3.1 C Block Quarry has been revised as follows to present the range of hexavalent chromium concentration in soil.

• No human health chemicals of concern (COCs) requiring remediation were identified for the Industrial Receptor; however, the human health risk assessment (HHRA) identified hexavalent chromium as a surface and subsurface soil COC for the Resident Receptor and the National Guard Trainee Receptor. Of the nine surface and subsurface soil samples collected, five samples had detected concentrations of hexavalent chromium with a maximum concentration of 39 mg/kg. In addition, asbestos debris was identified in soil samples. Proposed remediation is discussed in Section A.1.4.

Upon review of the 2005 groundwater sampling results, the reported concentrations were the same as the laboratory detection limit. Although the contractor at the time may have not qualified these results as a non-detect, the laboratory qualified the results as B = detected at a concentration between the method detection limit and the reporting limit. For additional clarity, the third bullet in Section A.3.4.2 has been revised as follows:

"Hexavalent chromium was only detected during the January 2005 sampling event. These concentrations were reported at the laboratory detection limit of 0.01 mg/L and were possibly not actually detected by the laboratory. Hexavalent chromium was detected (0.01 mg/L) at a concentration greater than the tap water RSL (0.000035 mg/L) in filtered samples from CBLmw-001, CBLmw-002, and CBLmw003. Hexavalent chromium was not detected from unfiltered (total) samples collected from these three wells during the June 2018 sampling."

**Ohio EPA finds this response adequate and acceptable.**

***Ohio EPA Report Section Comment 18:*** *Appendix B, Figure B.2-1. Contaminant maps throughout the document need to identify the individual AOC locations.*

**Army Response:** Agree. The Section X.2 figures have been revised to show the different sites within each group.

**Ohio EPA finds this response adequate and acceptable.**

***Ohio EPA Report Section Comment 19:*** *Appendix B, Section B.1.2.1, page 2. The last sentence states "The screened elevation of NTA-mw-119 is approximately 65 to 95 feet deeper than other unconsolidated wells." Please explain the hydrologic reasoning for the deeper well and what do the water level comparisons with shallow wells indicate?*

**Army Response:** Agree. Section B.1.2.1 Unconsolidated Aquifer has been revised as follows:

"Twenty-one wells in Group B were screened in the Unconsolidated aquifer. This includes temporary well DA1tw-001, which was installed in October 2018, sampled in November 2018, and abandoned in June 2019. The screened interval in these wells ranged from 8 to 90 feet bgs within the Unconsolidated aquifer. Groundwater flow within the Unconsolidated aquifer in Group B is generally to the south toward the CJAG property boundary. This is depicted in Figure B.1-5. The screened elevation of NTAmw-119 is approximately 65 to 95 feet deeper than the other unconsolidated wells.

The screened interval for monitoring well NTAmw-119 is 90 to 100 ft bgs. This well was initially targeted to be installed as a bedrock well. However, during well installation in April 2012, Ohio EPA and the Army agreed to screen the well in the second water-bearing zone within the deep overburden at the site. Between the two water-bearing units identified during the well installation, there was a confining layer of dry, silty clay from 42.5 to 70 ft bgs followed by 16 feet of intermittent beds of sand and silty clay (EQM 2012a).

NTAmw-119 is nested with monitoring well NTAmw-109. NTAmw-109 has a screened interval of 8 to 18 ft bgs. The water levels in the two wells have been consistently similar. For example, in April 2019, the water level in NTAmw-109 was 11.43 ft [below top of casing] btoc. and the water level in NTAmw-119 was 12.18 ft btoc. The similarities in the water levels indicates that the groundwater in the wells are hydraulically connected."

**Ohio EPA finds this response adequate and acceptable.**

***Ohio EPA Report Section Comment 20:*** *Appendix B, Section B.1.3.1, page 3. Please describe the size of ODA-1 in this section.*

**Army Response:** Agree. The first paragraph in Section B.1.3.1 has been revised as follows: "ODA1 is approximately 6 acres in size and was used from 1941 to 1949 primarily for the thermal destruction of munitions, explosives, and associated materials through the operation of open burn/open demolition (OB/OD) practices."

**Ohio EPA finds this response adequate and acceptable**

***Ohio EPA Report Section Comment 21:*** *Appendix B, Section B.1.3.4, page 5. The description of CC-RVAAP-71 Barn Number 5 Petroleum Release states that soil samples were collected from this site of a pipeline release that occurred in 1964. The section also states that no further action is required. No ground water evaluation was ever conducted at this AOC located near the OHARNG downgradient property line. Without additional information, Ohio EPA believes MWs are warranted in this area. The wells would not only allow for the ground water pathway to be evaluated; they would also serve to protect the Army from potential liability.*

**Army Response:** Comment noted. As stated in the Site Inspection and Remedial Investigation Work Plan (ECC 2012), "ECC will evaluate the soils, and if based on the data, it appears groundwater may be impacted, then a recommendation will be included in the report that groundwater will need to be assessed by the Army under its base-wide groundwater program". After evaluation of subsurface soil and deep soil borings at the CC RVAAP-71 Barn No. 5 Petroleum Release, the Final Site Inspection Report (ECC 2015) stated that NFA was warranted. In addition, no water was encountered at CC RVAAP-71 during drilling activities at any of the soil boring locations which indicates that the groundwater is likely deeper than 13 ft bgs in the vicinity of the AOC. Accordingly, it is concluded as part of the FWGWMP that additional investigation of groundwater at this site is not warranted.

**Based on the information provided, groundwater has not been evaluated in this Area of Concern (AOC). Can you provide information on the estimated release volume? Was any clean up or repair of the pipeline conducted? How close is the nearest private well downgradient? Ohio EPA believes that based on the information provided, groundwater should be evaluated in this AOC.**

***Ohio EPA Report Section Comment 22:*** *Appendix C, page 92, last paragraph. The last sentence states, "The groundwater associated with Group C no longer requires analysis, and the MWs can be abandoned." Ohio EPA believes it is premature to begin the process of monitoring well abandonment until a long-term ground water monitoring system is developed. See General Comments.*

**Army Response:** Please see response to General Comment 2.

**Ohio EPA finds this response adequate and acceptable**

***Ohio EPA Report Section Comment 23:*** *Appendix C, Figure C.1-1. This figure shows the AOCs in Group C, it also shows the MWs in Group C. There seems to be several MWs missing, particularly near Building 1048. This map needs to provide some explanation to eliminate the confusion as to why some wells are missing.*

**Army Response:** Agree. The following note has been added to Figure C.1-1.
"Monitoring wells associated with CC RVAAP-69 Building 1048 Fire Station, and CC RVAAP-74 Building 1034 Motor Pool are not included on this figure, as site-specific RIs that include groundwater are being conducted for these sites."

**Ohio EPA finds this response adequate and acceptable**

***Ohio EPA Report Section Comment 24:*** *Appendix C. Please explain why there was no explosives/propellant concentration map prepared for Group C. For all the explosives handled in Group C Load Lines, does the Army have an opinion as to why it is not identified in ground water in significant concentration or locations? Does the Army have confidence in the number and placement of the MWs?*

**Army Response:** Clarification. Although difficult to speculate, it is not surprising that Group C did not result in explosives groundwater contamination. Unlike Load Lines 1-4 and 12 where soil contamination resulted in soil removal actions and residual concentrations of explosives in groundwater, there has been no evidence of comparable soil contamination within the Group C Load Lines.

As stated in Section C.2.1 Explosives and Propellants, "Explosives and propellants were not detected in groundwater samples at concentrations greater than the screening levels; therefore, explosives and propellants are not COPCs in Group C." Accordingly, there was no explosive/propellant concentration map prepared for Group C.

The HHRA process included a screening to identify COPCs within Group C. This screen is presented in Table C.3-1 and demonstrates that no explosives or propellants were identified as COPCs. In addition, the ERA concluded that explosives and propellants were not at concentrations harmful to ecological receptors.

The Army and Ohio EPA collaborated on the placement and sampling scheme associated with monitoring within Group C since the inception of the FWGWMP in 2004. Implementing this process, the Army has confidence in the number and placement of the monitoring wells and concludes that explosives and propellants are not of concern in Group C.

**Ohio EPA finds this response adequate and acceptable**

**Ohio EPA Report Section Comment 25:** Appendix C, Section C.3.3.2.1 and Graph C.2-1, Group C, Load Line 10, Carbon Tetrachloride. Carbon tetrachloride concentrations have recently increased above the Maximum Contaminant Level (MCL) clean-up value in recent years (December 2017, June 2018, and October 2018) in LL10mw-003. Because there are not eight consecutive monitoring events meeting the MCL and the recent increasing trend in MCL exceedances, carbon tetrachloride at Load Line 10 should be carried forward for evaluation in the Feasibility Study. Provide a discussion in Appendix C regarding the analysis for perchlorate in ground water. What was the rationale for the sampling? When did it occur, how many wells were sampled and why was it eliminated? This compound was detected in 27 of 32 samples analyzed.

**Army Response:** Clarification. Regarding carbon tetrachloride at LL10mw-003, please see response to Group Comment 5: Group C - Fuze and Booster Load Lines. Regarding perchlorates in Group C, ten wells in Load Line 11 were sampled and analyzed for perchlorates in 2000, and none of the groundwater samples had detectable concentrations of perchlorates. As noted in the 2009 Annual Report, "Performed perchlorate analysis per the modification approved by the Ohio EPA on August 6, 2007." Rationale for the modification was not provided in the 2009 Annual Report; however, 57 wells were sampled for perchlorates between 2008 and 2018, as perchlorates became a requirement of the RVAAP full suite analyses.

Of all the perchlorate samples collected from 2000 to 2018 from Group C wells, none had concentrations greater than the tapwater RSL of 0.0014 mg/L. The perchlorate data used in the COPC screen in Table C.3-1 of the RI Report indicates 27 of 32 samples were detected, however, none of the concentrations exceeded the tapwater RSL.

**Ohio EPA finds this response adequate and acceptable**

***Ohio EPA Report Section Comment 26:*** *Appendix D, Figure D.5-3. Please include a scale on this map. Also, this model shows migration off-property. Please provide more information on the map such as particle time- of-travel to reach property boundary.*

**Army Response:** Agree. A revised Figure D.5-3 is presented below to depict scale and time-of-travel to reach the property boundary.

**Ohio EPA finds this response adequate and acceptable**

**Ohio EPA Report Section Comment 27:** Appendix D, Section D.6, page 69, second paragraph, first bullet. Please list the six soil contaminants that have potential to leach from soil to groundwater.

**Army Response:** Agree. Text revised as presented below to revise Section D.6. In addition, these six chemicals are listed in Section D.1.3.1 (first bullet).

"Six soil contaminants (chromium; manganese; 2,4,6-TNT; RDX; and TCE) were identified by the modeling to have the potential to leach from soil to groundwater. None of these contaminants were predicted by the modeling results to migrate beyond the AOC boundary at concentrations greater than risk-based concentrations or drinking water MCLs (SAIC 2006)."

In addition, the following reference has been added to Appendix C, as this document provides the specific chemicals requested per the comment:
SAIC 2006. Feasibility Study for Fuze and Booster Quarry Landfill/Ponds (RVAAP-16). July 2006.

**Ohio EPA finds this response adequate and acceptable**

***Ohio EPA Report Section Comment 28:*** *Appendix M, Section M.1.3.1: RVAAP-05 Winklepeck Burning Grounds. The report states waste oil (hydraulic oil from machines and lubrication oil from vehicles) was burned in the northeastern corner of Winklepeck Burning Grounds until 1973. U.S. EPA's dioxin website states, "Combustion processes such as waste incineration (commercial or municipal) or burning fuels (like wood, coal or oil) form dioxins". The potential presence of or known absence of dioxins at Winklepeck Burning Grounds is not discussed in the report. Include as discussion as to whether dioxins are expected to be a chemical of potential concern in Winklepeck Burning Ground ground water.*

**Army Response:** Clarification. Dioxins have not been analyzed in any media as part of the RVAAP Restoration Program; however, based on review of historical information, waste oil including hydraulic oil from machines and lubrication oil from vehicles was stored and possibly burned in the northeastern corner of WBG. The Army proposes there is little evidence to support the presence of dioxins in groundwater at WBG for the reasons provided below:

**a)** Dioxins are produced through emissions and depositions of combustion processes and the manufacture of certain chlorinated organic chemicals. They are not readily formed in the emissions unless there is a predominant source of chlorine or chlorinated reactant in the material being burned. The predominant chlorinated source in hydraulic oil or waste oil would most likely be PCBs in transformer oil.

**b)** PCB sampling occurred across WBG in 29 soil, 4 sediment, and 122 groundwater samples. PCBs were not identified as a COC nor determined to be a potential contributor to groundwater contamination.

**c)** Dioxins are less soluble in water (e.g., TCDD is two orders of magnitude less soluble than PCB-1254) as well as less mobile (i.e., higher sorption) than PCBs (e.g., Koc for TCDD is 250,000 L/kg as compared to 130,000 L/kg for PCB-1254), therefore like PCBs, dioxins are not expected to be of potential groundwater concern at this site.

**Ohio EPA finds this response adequate and acceptable**

***Ohio EPA Group Comment 1:*** *Group A - Western Sites and C Block Quarry.*

*While five MWs were located around the RVAAP-06 C Block Quarry Area, two MWs were located around the CC RVAAP-76 Depot Area, one MW was located around the CC RVAAP-79 DLA Ore Storage Sites – Route 80 Tank Farm, one MW was located around the CC RVAAP-73 Facility-wide Coal Storage – North Line Road Coal Tipple, and no wells were shown around the RVAAP-46 Buildings F-15 and F-16, RVAAP-046-R-01 Building #F-15 and F-16 MRS, and CC RVAAP-73 Facility-wide Coal Storage – Building U-16 1050 Boiler House. Please confirm that sites with limited numbers of wells have been adequately delineated and discuss/demonstrate how sites with no wells have been thoroughly investigated and warrant no further action. While this rationale may have been previously covered in the RI Work Plan or FS reports, reiteration of this rationale within this final Remedial Investigation Report would provide clarification for future reviewers.*

**Army Response:** Clarification. Appendix A, Section A.1.3 provides a detailed summary of every AOC, MRS, and [Compliance Restoration Site] CRS within Group A and is supported by conclusions from the most recent approved available documents for each site. Some sites, including RVAAP-46, RVAAP-046-R-01, and CC RVAAP-73, were determined not to have soil or sediment contamination that would adversely impact groundwater. Subsequent group-specific evaluation of groundwater in Sections A.2 to A.4 supports the Army's conclusion that the nature and extent of contamination has been defined, and the HHRA and ERA did not identify a risk requiring an action for Group A.

**Ohio EPA finds this response adequate and acceptable, and considers this comment resolved with the additional recommendation to include this type of clarification text within the Main Text, Section 9.0 Conclusions and Recommendations portion of the document, within Table 9.1, and also within the X.6 Conclusions and Recommendations portions of each Group appendix (for clarity to assist future reading of the document).** The text could be further clarified by adding explanation of the low number/no well issues, such as "….Some sites with limited wells or no wells were determined not to have soil or sediment contamination that would adversely impact ground water, thus fewer or no wells were needed for some sites." Ohio EPA is not concurring with abandonment of specified wells at this time, since it is understood that the Army's intention is to abandon wells at a later date, upon discussion and receipt of Ohio EPA's concurrence of the facility-wide ground water AOC path forward, as this document is not a well abandonment plan.

***Ohio EPA Group Comment 2:*** *Group B - NACA Test Area.*

*While 13 MWs were located around the RVAAP-38 National Advisory Committee for Aeronautics (NACA) Test Area, six MWs were located around the RVAAP-28 Suspected Mustard Agent Burial Site (SMABS) – South, one MW (along with three NACA wells) were located around the RVAAP-03 Open Demolition Area #1 (ODA1), one MW (a co-located NACA well) was located around the RVAAP-28 Suspected Mustard Agent Burial Site (SMABS) - North, and no wells were shown around the CC RVAAP-71 Barn No. 5 Petroleum*

*Release. Please confirm that sites with limited numbers of wells have been adequately delineated and discuss/demonstrate how sites with no wells have been thoroughly investigated and warrant no further action. While this rationale may have been previously covered in the RI Work Plan or FS reports, reiteration of this rationale within this final Remedial Investigation Report would provide clarification for future reviewers.*

**Army Response:** Clarification. Appendix B, Section B.1.3 provides a detailed summary of every AOC, MRS, and CRS within Group B and is supported by conclusions from the most recent approved available documents for each site. Subsequent group-specific evaluation of groundwater in Sections B.2 to B.4 supports the Army's conclusion that the nature and extent of contamination has been defined, and the HHRA and ERA did not identify a risk requiring an action for Group B."

**Ohio EPA finds this response adequate and acceptable, and considers this comment resolved with the additional recommendation to include this type of clarification text within the Main Text, Section 9.0 Conclusions and Recommendations portion of the document, within Table 9.1, and also within the X.6 Conclusions and Recommendations portions of each Group appendix (for clarity to assist future reading of the document).** The text could be further clarified by adding explanation of the low number/no well issues such as "….Some sites with limited wells or no wells were determined not to have soil or sediment contamination that would adversely impact ground water, thus fewer or no wells were needed for some sites." Ohio EPA is not concurring with abandonment of specified wells at this time, since it is understood that the Army's intention is to abandon wells at a later date, upon discussion and receipt of Ohio EPA's concurrence of the facility-wide ground water AOC path forward, as this document is not a well abandonment plan.

***Ohio EPA Group Comment 3:*** *Group C - Fuze and Booster Load Lines.*

*RVAAP-39 Load Line 5, RVAAP-33 Load Line 6, RVAAP-40 Load Line 7, RVAAP-41 Load Line 8, RVAAP-44 Load Line 11, and CC RVAAP-68 Electric Substations – Substation No. 3 appear to have adequate delineation monitoring wells in their respective areas. However, one MW was located around the RVAAP-033-R-01 Firestone Test Facility MRS, one MW was located around the RVAAP-062-R-01 Water Works #4 Dump MRS, one MW was located around the CC RVAAP-68 Electric Substations – Substation No. 3, and no wells were shown around the CC RVAAP-75 George Road Sewage Treatment Plant Mercury Spill, CC RVAAP-77 Building 1037 Laundry Wastewater Sump, or CC RVAAP-83 Former Buildings 1031 and 1039. Please confirm that sites with limited numbers of wells have been adequately delineated and discuss/demonstrate how sites with no wells have been thoroughly investigated and warrant no further action. While this rationale may have been previously covered in the RI Work Plan or FS reports, reiteration of this rationale within this final Remedial Investigation Report would provide clarification for future reviewers.*

**Army Response:** Clarification. Appendix C, Section C.1.3 provides a detailed summary of every AOC, MRS, and CRS within Group C and is supported by conclusions from the most

recent approved available documents for each site. Some sites, including RVAAP-33, RVAAP-39, RVAAP-40, RVAAP-41, RVAAP-42, RVAAP-43, RVAAP-44, CC RVAAP-68, CC RVAAP-74, CC RVAAP-77, and CC RVAAP-83, were determined not to have soil or sediment contamination that would adversely impact groundwater. Subsequent group-specific evaluation of groundwater in Sections C.2 to C.4 supports the Army's conclusion that the nature and extent of contamination has been defined, and the HHRA and ERA did not identify a risk requiring an action for Group C. This conclusion excludes CC RVAAP-69 Building 1048 Fire Station and CC RVAAP-74 Building 1034 Motor Pool.

**Ohio EPA finds this response adequate and acceptable, and considers this comment resolved with the additional recommendation to include this type of clarification text within the Main Text, Section 9.0 Conclusions and Recommendations portion of the document, within Table 9.1, and also within the X.6 Conclusions and Recommendations portions of each Group appendix (for clarity to assist future reading of the document).** The text could be further clarified by adding explanation of the low number/no well issues such as "….Some sites with limited wells or no wells were determined not to have soil or sediment contamination that would adversely impact ground water, thus fewer or no wells were needed for some sites." Ohio EPA is not concurring with abandonment of specified wells at this time, since it is understood that the Army's intention is to abandon wells at a later date, upon discussion and receipt of Ohio EPA's concurrence of the facility-wide ground water AOC path forward, as this document is not a well abandonment plan.

***Ohio EPA Group Comment 4:*** *Group C - Fuze and Booster Load Lines.*

*RVAAP-43 Load Line 9 warrants horizontal delineation to the south of LL9mw-003, the centrally located well within the LL9 site. Homewood Aquifer potentiometric flow directions are radial outward from the LL9mw-003 location, and no wells are shown in this downgradient location.*

**Army Response:** Clarification. As demonstrated in Appendix C: Group C – Fuze and Booster Load Lines, there are no groundwater COCs requiring further analysis in an FS at Load Line 9, including at centrally-located well LL9mw-003. As there were no groundwater COCs identified requiring further analysis at Load Line 9, including the centrally located well LL9mw-003, there is no further groundwater delineation required at this area of concern. Soil treatment is planned for surface soil (0-1 ft bgs) in the southern portion of Load Line 9 to address human health risk associated with direct exposure to PAHs in soil. Regarding soil impacts to groundwater, the qualitative analysis associated with the groundwater modeling in the Record of Decision for Soil, Sediment, and Surface Water at RVAAP-42 Load Line 9 (Leidos 2019) concluded that "no CMCOCs were present in soil and sediment that may impact the groundwater beneath the source or at the downstream receptor location. No further action is required of soil and sediment at Load Line 9 for the protection of groundwater."

**Ohio EPA finds this response adequate and acceptable, and considers this comment resolved.**

***Ohio EPA Group Comment 5:*** *Group C - Fuze and Booster Load Lines.*

*RVAAP-43 Load Line 10 warrants horizontal delineation to the west of LL10mw-003, the well with historic carbon tetrachloride detections greater than the screening level of 5 ug/L, ranging from 6.7 ug/L to 8.1 ug/L. Unconsolidated Aquifer potentiometric flow directions are radial in the group area, and may flow west from this site and monitoring well. MODFLOW fate and transport analysis was provided for LL10, but shows LL10mw-003 flow calculated to the east. While this may be based on the ground water levels measured from April 2019 of 1111.47 feet for LL10mw-003 and 1111.38 for LL10mw-002 to the east, this ground water level appears virtually the same and may not be indicative of a gradient or flow between two wells located approximately 300 feet apart from each other in an area of radial flow. Additionally, while the last two sampling events indicated carbon tetrachloride levels below screening levels, preliminary visual indications of the graphed data results appear to have an upward trend in overall results from 2005 through 2020, so statistical trend analysis may help demonstrate if a trend is occurring. Additional sampling or ongoing monitoring activities may be warranted to further evaluate trends in carbon tetrachloride levels in LL10.*

**Army Response:** Clarification. The Draft RI Report cited the two sampling events in 2019 in which groundwater from LL10mw-003 had carbon tetrachloride concentrations below the screening level. This was provided in the Draft RI Report based on the availability of data at that time. In addition to these 2019 recent sampling events, groundwater from LL10mw-003 was analyzed for carbon tetrachloride in the spring and fall of 2020. Both concentrations were below the screening level. In summary, there have been two consecutive years in which of carbon tetrachloride samples were below the screening level. Carbon tetrachloride was included in the human health and ecological risk assessments. The HHRA notes that carbon tetrachloride was not detected in soil samples from Load Line 10. To further expand, none of the 22 soil or sediment samples had carbon tetrachloride detections. Both risk assessments concluded that carbon tetrachloride is not recommended to go forward. Please note that it is anticipated that the 2020 Addendum will continue to recommend analyzing carbon tetrachloride at well LL10mw-003.

**Ohio EPA finds this response adequate and acceptable, and considers this comment resolved.** The presentation of additional data for LL10mw-003 in encouraging, as this review only dealt with the information presented within the Draft RI Report and not this additional 2020 data. Trend analysis of this data is encouraged in the future for this well, and Ohio EPA concurs with the recommendation for continued sampling and analysis for carbon tetrachloride at well LL10mw-003.

***Ohio EPA Group Comment 6:*** *Group D - Fuze and Booster Quarry.*

*Figure D.2-1 (as well as other figures for this group) lists designated well aquifers in the notes section (Unconsolidated over Upper Sharon, over Homewood) in an order other than the correct lithologic sequence. It may be clearer to list applicable aquifers in the order in which*

*the strata appears, i.e., Unconsolidated, over Homewood, over Upper Sharon, etc. This comment may apply to other figures within the 2020 RI Report as well.*

**Army Response:** Agree. For the figures in which both the Homewood and Upper Sharon wells are depicted, the order of the "Designated Aquifer for Well" will be revised in order (top to bottom) as: Unconsolidated, Homewood, Upper Sharon.

**Ohio EPA finds this response adequate and acceptable, and considers this comment resolved.**

***Ohio EPA Group Comment 7:*** *Group D - Fuze and Booster Quarry.*

*Ohio EPA concurs with the recommendations for additional activities to be conducted to further evaluate the Group D area. The extent of contamination does not appear to have been defined, since the 2020 RI Report calls for additional delineation well(s). Homewood Aquifer potentiometric flow directions indicate that horizontal delineation may be warranted to the east of FBQmw-174 for Explosive Concentrations. Vertical delineation to the east was stated to be addressed by FWGmw-023 located in the Upper Sharon Aquifer, however that well is approximately 800 feet east of FBQmw-174. Additional vertical delineation may be warranted based on findings of future additional unconsolidated delineation activities to the east of FBQmw-174. Ohio EPA agrees that FBQmw-174 will require evaluation in an FS for potential remediation.*

**Army Response:** Comment noted. It is the position of the Army that horizontal delineation is adequately defined for purposes of completing the RI phase of the [Comprehensive Environmental Response, Compensation, and Liability Act] CERCLA process. Further evaluation of 2,4 DNT; 2 amino-4,6-DNT; 4-amino-2,6-DNT; and 2,4,6-TNT in the area of FBQmw-174 will go forward in an FS. During the development and regulatory review of the FS, it will be determined if additional wells are needed to refine conceptual site model and/or monitor contaminant migration.

**Ohio EPA finds this response adequate and acceptable, and considers this comment resolved.** Ohio EPA comment concurrence with additional activities was primarily referring to the proposed FS track, and the "2020 RI Report calls for additional delineation well(s)" comment was believed to be observation of that language somewhere within the Draft RI Report. The Ohio EPA reviewer was not able to locate where this "additional delineation well(s)" language came from, so it may be in error.

***Ohio EPA Group Comment 8:*** *Group E - Load Line 12.*

*Ohio EPA concurs with the recommendations for additional activities to be conducted to further evaluate Group E. The extent of contamination does not appear to have been defined, since the 2020 RI Report calls for additional horizontal and vertical delineation well(s).*

*Unconsolidated Aquifer potentiometric flow directions indicate that horizontal delineation may be warranted to the east of LL12mw-185 and LL12mw-187.*

**Army Response:** Comment noted. It is the position of the Army that horizontal delineation is adequately defined for purposes of completing the RI phase of the CERCLA process. Further evaluation of nitrate and ammonia in the area of LL12mw-185 and LL12mw-187 will go forward in an FS. During the development and regulatory review of the FS, it will be determined if additional wells are needed to refine the conceptual site model and/or monitor contaminant migration.

**Ohio EPA finds this response adequate and acceptable, and considers this comment resolved with the additional comment that Ohio EPA is concurring with the horizontal and vertical delineation as recommended in the Draft RI Report as presented below:**

> From Appendix E, Page 98, lines 1456-1461:
> 1456 As the nature and extent of contamination has been defined, the HHRA identified risk at Load Line 12
> 1457 requiring additional actions. It is recommended that the area around LL12mw-185 and LLmw-187
> 1458 proceed to an FS for further evaluation to address the nitrate and ammonia contamination. In addition,
> 1459 the FS should specify the monitoring well network to refine horizontal and vertical contamination in
> 1460 this area, install new wells to support this evaluation (including evaluating and potentially replacing
> 1461 older wells), and abandon wells not needed for this evaluation.

***Ohio EPA Group Comment 9:*** *Group F - Atlas Scrap Yard and Load Line 4.*

*The potentiometric flow lines on Figures F.1-5 and F.1-6 that are extrapolated on the western side of the figure (where well level data is not present) are shown to bisect actual topographic contour elevations and would indicate ground water is above surface grade. Future potentiometric maps should be checked and perhaps these extrapolated lines should be truncated so that overland flow is not indicated.*

**Army Response:** Agree. Figures F.1-5 and F.1-6 will be modified by truncating the extrapolated potentiometric contours to avoid depicting the potentiometric surface above the ground surface.

**Ohio EPA finds this response adequate and acceptable, and considers this comment resolved.**

***Ohio EPA Group Comment 10:*** *Group F - Atlas Scrap Yard and Load Line 4.*

*RVAAP-11 Load Line 4, RVAAP-50 Atlas Scrap Yard, and RVAAP-050-R-01 Atlas Scrap Yard MRS appear to have adequate delineation monitoring wells in their respective areas. However, no wells were shown around the RVAAP-48 Anchor Test Area, RVAAP-048-R-01 Anchor Test Area MRS, and CC RVAAP-79 DLA Ore Storage Sites – Building 841, Area 8 Inert Storage. Please confirm that sites with limited numbers of wells have been adequately delineated and discuss/demonstrate how sites with no wells have been thoroughly investigated and warrant no further action. While this rationale may have been previously covered in the RI Work Plan or FS reports, reiteration of this rationale within this final Remedial Investigation Report would provide clarification for future reviewers.*

**Army Response:** Appendix F, Section F.1.3 provides a detailed summary of every AOC, MRS, and CRS within Group F and is supported by conclusions from the most recent approved available documents for each site. Some sites, including RVAAP-11, RVAAP-50, and CC RVAAP-79, were determined not to have soil or sediment contamination that would adversely impact groundwater. Subsequent group-specific evaluation of groundwater in Sections F.2 to F.4 supports the Army's conclusion that the nature and extent of contamination has been defined, and the HHRA and ERA did not identify a risk requiring an action for Group F.

**Ohio EPA finds this response adequate and acceptable, and considers this comment resolved with the additional recommendation to include this type of clarification text within the Main Text, Section 9.0 Conclusions and Recommendations portion of the document, within Table 9.1, and also within the X.6 Conclusions and Recommendations portions of each Group appendix (for clarity to assist future reading of the document).** The text could be further clarified by adding explanation of the low number/no well issues such as "...Some sites with limited wells or no wells were determined not to have soil or sediment contamination that would adversely impact ground water, thus fewer or no wells were needed for some sites." Ohio EPA is not concurring with abandonment of specified wells at this time, since it is understood that the Army's intention is to abandon wells at a later date, upon discussion and receipt of Ohio EPA's concurrence of the facility-wide ground water AOC path forward, as this document is not a well abandonment plan.

***Ohio EPA Group Comment 11:*** *Group G - Load Line 3.*

*Ohio EPA concurs with the recommendations for additional activities to be conducted to further evaluate the Group G area. The extent of contamination does not appear to have been completely well defined, since explosives noted in wells central to LL3 are most closely defined horizontally to the west by well LL3mw-245 which is approximately 1,000 feet downgradient (Figure G.2-1). Upper Sharon Aquifer potentiometric flow directions indicate that horizontal delineation may be warranted to the west of LL3mw-241 and LL3mw-238. Ohio EPA also concurs with the recommendation to continue ground water monitoring for explosives.*

**Army Response:** Comment noted. It is the position of the Army that horizontal delineation is adequately defined for purposes of completing the RI phase of the CERCLA process. Further evaluation of 2,4,6- TNT; 2,6-DNT; 4-amino-2,6-DNT; and RDX in the Upper Sharon aquifer will go forward in an FS. During the development and regulatory review of the FS, it will be determined if additional wells are needed to refine the conceptual site model and/or monitor contaminant migration.

**Ohio EPA finds this response adequate and acceptable, and considers this comment resolved.** Ohio EPA comment concurrence with additional activities was primarily referring to the proposed FS track.

***Ohio EPA Group Comment 12:*** *Group G - Load Line 3.*

*The "Unconsolidated Aquifer" pink hatched lines and the "Group G" purple highlight make it difficult to see the fenced outline of LL3. Please use a more contrasting color.*

**Army Response:** Agree. The figures in Group G have been revised such that the purple highlight and pink hatched lines are more transparent, and the fenced outline has been made bolder.

**Ohio EPA finds this response adequate and acceptable, and considers this comment resolved.**

***Ohio EPA Group Comment 13:*** *Group G - Load Line 3.*

*The MODFLOW fate and transport analysis was provided for Group G LL3 (Figure G.5-3) but shows particle track simulation to the south and southeast, while the potentiometric map (Figure G.1-6) shows Upper Sharon Aquifer flow from LL3 heading in a westerly direction. Please explain the apparent discrepancy between these two maps.*

**Army Response:** USACE/Army response from the January 2021 Draft RI RTC Letter clarifies that the two figures were generated by different means, *i.e.*, one is a MODFLOW-USG model figure, and one is based on head of ground water elevations, and that mathematical calculations generated the apparent discrepancy between the two figures.

**Ohio EPA finds this response adequate and acceptable, and considers this comment resolved.** Ohio EPA recommends that modeling figures represent (as close as practical) real-world site conditions so as to make accurate predictions.

***Ohio EPA Group Comment 14:*** *Group H - Load Lines 1 and 2.*

*Ohio EPA concurs with the recommendations for additional activities to be conducted to further evaluate Group H. The extent of contamination does not appear to have been completely well defined, since explosives are still noted in Unconsolidated Aquifer wells*

*LL1mw-063 and LL1mw-089, and Upper Sharon Aquifer wells LL1mw-080, LL1mw-083, and LL1mw-084. Ohio EPA also concurs that future FS evaluation may involve remediation of these explosives plumes as well.*

**Army Response:** Comment noted. It is the position of the Army that horizontal delineation is adequately defined for purposes of completing the RI phase of the CERCLA process. As indicated in the Draft Facility-wide Groundwater RI Report, there was no contamination requiring potential remediation in the Unconsolidated aquifer. Further evaluation of the Upper Sharon aquifer wells (LL1mw-080, LL1mw-083, and LL1mw-084) will go forward in an FS. During the development and regulatory review of the FS, it will be determined if additional wells are needed to refine the conceptual site model and/or monitor contaminant migration of the Unconsolidated aquifer in this area is needed.

**Ohio EPA finds this response adequate and acceptable, and considers this comment resolved.** Ohio EPA comment concurrence with additional activities was primarily referring to the proposed FS track.

***Ohio EPA Group Comment 15:*** *Group I - Ramsdell Quarry Landfill.*

*While 11 MWs were located in and around the RVAAP-01 Ramsdell Quarry Landfill (RQL) and RVAAP-001-R-02 RQL MRS Area 1 (North), only one MW was located within the RVAAP-001-R-01 RQL MRS Area 2 (South). Please confirm that sites with limited numbers of wells have been adequately delineated and discuss/demonstrate how sites with no wells have been thoroughly investigated and warrant no further action. While this rationale may have been previously covered in the RI Work Plan or FS reports, reiteration of this rationale within this final Remedial Investigation Report would provide clarification for future reviewers.*

**Army Response:** Clarification. Appendix I, Section I.1.3 provides a detailed summary of the AOC (RQL) and MRSs (RQL MRS Area 1 North and RQL MRS Area 2 South) within Group I and is supported by conclusions from the most recent approved available documents for each site. Subsequent group-specific evaluation of groundwater in Sections I.2 to I.4 supports the Army's conclusion that the nature and extent of contamination has been defined, and the HHRA and ERA did not identify a risk requiring an action for Group I.

**Ohio EPA finds this response adequate and acceptable, and considers this comment resolved with the additional recommendation to include this type of clarification text within the Main Text, Section 9.0 Conclusions and Recommendations portion of the document, within Table 9.1, and also within the X.6 Conclusions and Recommendations portions of each Group appendix (for clarity to assist future reading of the document).** The text could be further clarified by adding explanation of the low number/no well issues such as "….Some sites with limited wells or no wells were determined not to have soil or sediment contamination that would adversely impact ground water, thus fewer or no wells were needed for some sites." Ohio EPA is not concurring with abandonment of specified wells at this time, since it is understood that the Army's intention is to abandon

wells at a later date, upon discussion and receipt of Ohio EPA's concurrence of the facility-wide ground water AOC path forward, as this document is not a well abandonment plan.

Ohio EPA believes it is appropriate to defer some or all well abandonment activities until after concurrence has been reached regarding status of each AOC, until final remedies have been chosen and a long-term facility-wide ground water monitoring program is established. Continued ground water monitoring of some of these AOC wells may be required to comply with applicable DMWM rules and regulations. A ground water monitoring program that includes wells at downgradient property lines may also be beneficial.

***Ohio EPA Group Comment 16:*** *Group J - Erie Burning Grounds.*

*Nine MWs were located within the RVAAP-02 EBG and RVAAP-002-R-01 EBG MRS areas, with eight installed within the Unconsolidated Aquifer and one installed in the Upper Sharon Aquifer. The ground water level for Upper Sharon Aquifer well EBGmw-131 is higher (940.61 feet) than surrounding Unconsolidated Aquifer wells ranging from 936.812 to 938.654 feet. Please explain this difference in head elevation to verify that this upward vertical gradient is correct.*

**Army Response:** Clarification. Groundwater level gauging and topographic surveying indicate that potentiometric surface of the Upper Sharon Aquifer is higher than the potentiometric surface observed in the overlying Unconsolidated Aquifer. The lithology encountered at EBGmw-131 includes fine grain (ML and CL) materials from approximately 27 ft bgs to 55 ft, at which point the borehole encountered weathered bedrock until approximately 56 ft. Below 56 ft the borehole encountered sandstone of the [sic] Upper Sharon Member. Based on the lithology encountered at this location and the observed potentiometric elevation, we infer that the Upper Sharon Member aquifer is confined or semi-confined. Therefore, the potentiometric surface indicates an upward gradient between the Upper Sharon aquifer and the overlying Unconsolidated Aquifer. The upward gradient is not necessarily indicative of upward flow, rather it indicates a confined or semi-confined aquifer with the potential for upward flow given a sufficiently permeable pathway.

**Ohio EPA finds this response adequate and acceptable, and considers this comment resolved.**

***Ohio EPA Group Comment 17:*** *Group K - Building 1200.*

*Since RDX was formerly used at the site and wastewater was drained via the on-site ditch into the Bldg. 1200 Settling Pond, please confirm that adequate sediment/surface water samples were taken to clear the ditch and pond area and confirm that no monitoring wells were deemed necessary around these water features.*

**Army Response:** Clarification. The available soil and sediment data associated with the Building 1200 AOC was re-reviewed. The following is a summary, and the Army's position is

that additional wells are not needed at the Building 1200 AOC: Ditch - There were five discrete sediment samples and two soil [incremental sampling method] ISM samples collected in the location of the ditch leading towards the Bldg. 1200 Settling Pond and analyzed for RDX. RDX was not detected in these samples. One surface water sample was collected from the ditch and had an RDX concentration of 42 ug/L, which was below the Resident Farmer Child [Facility-wide Cleanup Goal] FWCUG of 80.3 ug/L at TR 10-5. Building 1200 Settling Pond – There were three sediment samples and one soil boring collected within the Bldg. 1200 settling pond and analyzed for RDX. None of the RDX concentrations were detectable. One surface water sample was collected and had an RDX concentration of 2.8 ug/L, which was below the Resident Farmer Child FWCUG of 80.3 ug/L at TR 10-5. In general, as discussed in Section K.1 of the RI Report, the Building 1200 AOC attained CERCLA closure for Unrestricted (Residential) Land Use for soil, sediment, and surface water, as documented in the Record of Decision for Soil, Sediment, and Surface Water at RVAAP-13 Building 1200 (Leidos 2014) and upon completion of the remedial action as summarized in the Remedial Action Report for Soil, Sediment, and Surface Water at RVAAP-13 Building 1200 (Leidos 2015).

**Ohio EPA finds this response adequate and acceptable, and considers this comment resolved.**

***Ohio EPA Group Comment 18:*** *Group L - Northern Sites.*

*Since five MWs were located within the Group L area to assess the CC RVAAP-73 Facility-wide Coal Storage – Sand Creek Coal Tipple, the CC RVAAP-79 DLA Ore Storage Sites – Area 2 Ammo Storage Area, and the CC RVAAP-80 Group 2 Propellant Can Top (an approximate 8,000-foot by 6,000-foot area), please confirm that sites with limited numbers of wells have been adequately delineated and discuss/demonstrate how sites with no wells have been thoroughly investigated and warrant no further action. While this rationale may have been previously covered in the RI Work Plan or FS reports, reiteration of this rationale within this final Remedial Investigation Report would provide clarification for future reviewers.*

**Army Response:** Clarification. Appendix L, Section L.1.3 provides a detailed summary of every AOC, MRS, and CRS within Group L and is supported by conclusions from the most recent approved available documents for each site. Some sites, including CC RVAAP-79, CC RVAAP-80, and CC RVAAP-73, were determined not to have soil or sediment contamination that would adversely impact groundwater. Subsequent group-specific evaluation of groundwater in Sections L.2 to L.4 supports the Army's conclusion that the nature and extent of contamination has been defined, and the HHRA and ERA did not identify a risk requiring an action for Group L.

**Ohio EPA finds this response adequate and acceptable, and considers this comment resolved with the additional recommendation to include this type of clarification text within the Main Text, Section 9.0 Conclusions and Recommendations portion of the document, within Table 9.1, and also within the X.6 Conclusions and**

**Recommendations portions of each Group appendix (for clarity to assist future reading of the document).** The text could be further clarified by adding explanation of the low number/no well issues such as "….Some sites with limited wells or no wells were determined not to have soil or sediment contamination that would adversely impact ground water, thus fewer or no wells were needed for some sites." Ohio EPA is not concurring with abandonment of specified wells at this time, since it is understood that the Army's intention is to abandon wells at a later date, upon discussion and receipt of Ohio EPA's concurrence of the facility-wide ground water AOC path forward, as this document is not a well abandonment plan.

***Ohio EPA Group Comment 19:*** *Group M - Winklepeck Burning Grounds.*

*Ohio EPA concurs with the recommendations for additional activities to be conducted to further evaluate the Group M area. The extent of contamination surrounding Unconsolidated Aquifer wells WBGmw-006 and WBGmw-009 does not appear to have been completely defined, as WBGmw-006 does have a downgradient well approximately 600 feet to the east (WBGmw-017) but WBGmw-009 does not have any horizontal delineation wells around it. Ohio EPA concurs that WBGmw-006 and WBGmw-009 will require evaluation in an FS for potential remediation.*

**Army Response:** Comment noted. It is the position of the Army that horizontal delineation is adequately defined for purposes of completing the RI phase of the CERCLA process. As indicated in the Draft Facility-wide Groundwater RI Report, it is recommended that the areas associated with WBGmw-006 and WBGmw-009 go forward for further evaluation in an FS. During the development and regulatory review of the FS, it will be determined if additional wells are needed to refine the conceptual site model and/or monitor contaminant migration.

**Ohio EPA finds this response adequate and acceptable, and considers this comment resolved.** Ohio EPA comment concurrence with additional activities was primarily referring to the proposed FS track.

***Ohio EPA Group Comment 20:*** *Group N - Landfill North of Winklepeck Burning Grounds.*

*Since four MWs were located within the Group N area to assess the RVAAP-19 LNWBG and RVAAP-019-R-01 Landfill North of Winklepeck MRS (landfills with a total footprint of approximately 300 by 1,200-feet), and only one well (LNWmw-026) was installed within the footprint of one of the landfills (the other three wells were upgradient to the west), please confirm that the limited number of wells adequately delineate the sites and discuss/demonstrate how sites with no wells (no wells are installed on the RVAAP-19 LNWBG or downgradient of either landfill) have been thoroughly investigated and warrant no further action. While this rationale may have been previously covered in the RI Work Plan or FS reports, reiteration of this rationale within this final Remedial Investigation Report would provide clarification for future reviewers.*

**Army Response:** Clarification. It was determined that LNWBG was not used for landfilling operations. This was stated in the Record of Decision for Soil, Sediment, and Surface Water at RVAAP-19 Landfill North of Winklepeck Burning Grounds [Leidos 2020]). This conclusion was also summarized in Section N.1.3 of the Facility-Groundwater RI Report stating "it is evident that LNWBG was predominantly used for burning wastes, as opposed to trench and fill-type operations of a landfill". In addition, Section N.1.3 states that it was concluded that there was no contamination in soil, sediment, and surface water at the LNWBG AOC requiring remediation, nor was there MC-related contamination requiring an action. Appendix N, Section N.1.3 provides a detailed summary of the AOC (LNWBG) and MRS (LNWBG MRS) within Group N and is supported by conclusions from the most recent approved available documents for each site. LNWBG was determined not to have soil or sediment contamination that would adversely impact groundwater. Subsequent group-specific evaluation of groundwater in Sections N.2 to N.4 supports the Army's conclusion that the nature and extent of contamination has been defined, and the HHRA and ERA did not identify a risk requiring an action for Group N.

**Ohio EPA finds this response adequate and acceptable, and considers this comment resolved with the additional recommendation to include this type of clarification text within the Main Text, Section 9.0 Conclusions and Recommendations portion of the document, within Table 9.1, and also within the X.6 Conclusions and Recommendations portions of each Group appendix (for clarity to assist future reading of the document).** The text could be further clarified by adding explanation of the low number/no well issues such as "...Some sites with limited wells or no wells were determined not to have soil or sediment contamination that would adversely impact ground water, thus fewer or no wells were needed for some sites." Ohio EPA is not concurring with abandonment of specified wells at this time, since it is understood that the Army's intention is to abandon wells at a later date, upon discussion and receipt of Ohio EPA's concurrence of the facility-wide ground water AOC path forward, as this document is not a well abandonment plan.

***Ohio EPA Group Comment 21:*** *Group O - Upper and Lower Cobbs Ponds and the Central Burn Pits.*

*While nine MWs were located around the RVAAP-49 Central Burn Pits, six MWs were located around the RVAAP-29 Upper and Lower Cobbs Ponds, and three MWs were located around the RVAAP-034-R-01 Sand Creek Dump MRS, no wells were shown around the RVAAP-34 Sand Creek Disposal Road Landfill or the RVAAP-51 Dump Along Paris-Windham Road areas. Please confirm that the two sites with no wells have been adequately delineated and discuss/demonstrate how these sites with no wells have been thoroughly investigated and warrant no further action. While this rationale may have been previously covered in the RI Work Plan or FS reports, reiteration of this rationale within this final Remedial Investigation Report would provide clarification for future reviewers.*

**Army Response:** Clarification. Regarding RVAAP-34 Sand Creek Disposal Road Landfill, three wells were installed in 2018 and sampled for four-quarters for the full-suite analyses.

This was done in response to data gaps identified and as presented in Table 1-3 of the RI Work Plan (TEC-Weston 2016). As stated in Section O.1.6.1 Data Gaps within this Facility-wide Groundwater RI Report, "In October 2018, three permanent monitoring wells (SCLmw-001, SCLmw-002, and SCLmw-003) were installed at the Sand Creek Disposal Road Landfill. SCLmw-001 and SCLmw-002 were installed within the floodplain of Sand Creek, downgradient from the hillside where waste/debris was dumped. Subsequent to the well installation, four quarters of sampling for full suite analysis were conducted from November 2018 to August 2019." It is worth noting that the Sand Creek Dump MRS boundary and the Sand Creek Dump Disposal Road Landfill AOC boundary are nearly identical, and the sampling and analysis of these wells adequately characterized both the MRS and AOC. Regarding RVAAP-51 Dump Along Paris-Windham Road, the following has been added to the end of Section O.1.6.2 RI Goals and Objectives: "A review of the historical sampling record for monitoring well FWGmw-001 in proximity RVAAP-51 Dump Along Paris-Windham Road was performed in response to Ohio EPA comments on the RI Work Plan (TEC-Weston 2016). This review concluded that there were no detections of site related non-metals soil COPCs in groundwater. No investigation of groundwater associated with these CRS sites is planned for the RI.

> **Ohio EPA finds this response adequate and acceptable, and considers this comment resolved.** Upon review of the Appendix O figures provided within the Draft RI Report, they do not provide site outlines on them, so locations of wells versus the site locations cannot be determined. Having both outlines of the Sand Creek Dump MRS boundary and the Sand Creek Dump Disposal Road Landfill AOC boundary on the same figure with the site delineated would be beneficial, and the site layer issue has already been noted and addressed under Report Section Comment 15. Ohio EPA is not concurring with abandonment of specified wells at this time, since it is understood that the Army's intention is to abandon wells at a later date, upon discussion and receipt of Ohio EPA's concurrence of the facility-wide ground water AOC path forward, as this document is not a well abandonment plan.

As a precautionary response to COVID-19, Ohio EPA is currently operating with most staff working remotely. During this time, we will not be issuing hard-copy mail. This letter is an official response from Ohio EPA that will be maintained as a public record.

The Army's response to Ohio EPA comments on the Draft Facility-wide Groundwater Monitoring Program Plan RVAAP-66 Facility-wide Groundwater Remedial Investigation Report. Additional information is necessary to approve the document.

If you have questions or would like to set up a meeting to discuss Ohio EPA's reply, you can reach me via email at kevin.palombo@epa.ohio.gov, or at (330) 963-1292.

Sincerely,

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

KP/cs

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Ohio Environmental Protection Agency

**Mike DeWine**, Governor
**Jon Husted**, Lt. Governor
**Laurie A. Stevenson**, Director

May 12, 2021

**TRANSMITTED ELECTRONICALLY**

Mr. Kevin Sedlak
Restoration Program Manager
ARNG-ILE Clean Up
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1438 State Route 534 SW
Newton Falls, OH 44444

RE: US Army Ammunition Plt RVAAP
Remediation Response
Project Records
Remedial Response
Portage County
ID#267000859036

**Subject: Ohio EPA Comments on the "Draft Facility-wide Groundwater Monitoring Program Plan RVAAP-66 Facility-wide Groundwater Annual Report" dated February 5, 2021**

Dear Mr. Sedlak:

The Ohio Environmental Protection Agency (Ohio EPA) has received and reviewed the *Draft Facility-wide Groundwater Monitoring Program Plan RVAAP-66 Facility-wide Groundwater Annual Report for 2020* at the Former Ravenna Army Ammunition Plant, Portage and Trumbull Counties, Ohio (Camp Garfield). This document was received at Ohio EPA's Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR) via email on February 12, 2021. The report was prepared for the United States Army Corps of Engineers on behalf of the National Guard Bureau by Leidos under Contract Number W912QR-16-D-0003. 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.

## DRAFT FWGWMP ANNUAL REPORT FOR 2020

The Draft Facility-wide Groundwater Monitoring Program Plan Annual Report (FWGWMP) for 2020 summarizes ground water monitoring activities conducted during the 2020 annual reporting period to include:

- Changes to the FWGWMP that occurred in 2020 included submission of the Draft Remedial Investigation Report for RVAAP-66 Facility-wide Groundwater (Leidos



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2020b) to Ohio EPA in August 2020. Review of that document is provided under separate cover.

- The Background Study for Metals for RVAAP-66 Facility-wide Ground Water (Leidos 2019b) was completed in 2019 and approved by Ohio EPA on September 9, 2019. A total of 14 wells were installed in areas believed to not have been impacted by former RVAAP activities (seven wells were installed in unconsolidated materials, three wells were installed in shale bedrock, and three wells were installed in sandstone bedrock). Background calculations for metals concentration in the Unconsolidated, Homewood Sandstone, Upper Sharon, and Basal Sharon Conglomerate Aquifers are presented in Table 4-5 of the Background Study.

- Section 2.4 Groundwater Modelling: As presented within the 2016 Remedial Investigation Work Plan (TEC-Weston), a numerical ground water model was developed for the site and will be refined, calibrated, and verified during the RI process. This model will ultimately be used to evaluate contaminant fate and transport and present findings in future annual reports.

- Section 2.5 Assessment of Groundwater Remedial Action Effectiveness: While no ground water remedial actions have been conducted at the site, soil excavation source removals have been conducted to reduce soil leaching to ground water impacts, and the effectiveness of these removals will be evaluated following the completion of the FWGW RI and FS. This evaluation will help determine if remedial actions are needed for ground water.

- During 2020, no additional monitoring wells were installed at CJAG.

- During 2020, no monitoring wells were recorded as being abandoned at CJAG.

- Monitor well sampling events were conducted in the Spring (April through June) and Fall (September and October) of 2020.

- In accordance with the 2020 Addendum, between April 20 and April 30, 2020 (Spring sampling event) a total of 43 of the facility's monitoring wells were sampled. The remaining 4 wells (that were inaccessible) were sampled on June 11, 2020.

- In accordance with the 2020 Addendum, between September 28 and October 6, 2020 (Fall sampling event) a total of 47 of the facility's monitoring wells were sampled.

- Section 4.3 Sedimentation and Turbidity indicated that eight (8) wells had turbidity readings in excess of 10 NTUs during 2020 sampling events. Some wells had been redeveloped during 2020, so only two (2) wells (LL1mw-081, LL2mw-267) were recommended for redevelopment in 2021.

- Section 4.8 Investigation-Derived Waste (IDW) discusses preparation of characterization and disposal from 2019 and 2020 activities. Remaining 2019 IDW disposal activities were reported to consist of two (2), 55-gallon drums of liquid IDW from the Fall 2019 sampling event, and eight 55-gallons of liquid IDW from production well abandonments during 2019. An IDW Report containing waste profiles and waste manifests from the 2019 activities was included in the 2020 Annual Report as Appendix G 2020 FWGWMP IDW documentation. According to this IDW Report dated January 24, 2020, two (2), 55-gallon drums of liquid IDW and eight 55-gallons of liquid IDW from production well abandonments during 2019 (after acidification or neutralization as needed) were disposed of as non-hazardous/non-contaminated wastewater. Also, in Appendix G are 2020 IDW disposal activities summarized in the June 25, 2020 IDW Report documenting consisted of 15, 55-gallon drums of liquid IDW from Spring 2020 well sampling disposed of as non-hazardous waste on August 13, 2020 and the October IDW recommended characterization/disposal plan report recommending that the three (3), 55-gallon drums of liquid IDW from Fall 2020 well sampling be disposed of as non-hazardous waste.

- Production well abandonment activities in 2019 generated eight 55-gallon drums of liquid IDW. The Production Well Abandonment Report was provided under separate cover, dated April 16, 2020.

- Section 4.9 documents Field Change Requests submitted during field activities for the project. No new FCRs were necessary nor submitted during the 2020 sampling events. Copies of the previous signed and approved field change requests (LEIDOS-_FWGW_001, LEIDOS_FWGW_004, LEIDOS_FWGW_006, and LEIDOS-_FWGW_0010) were presented within Appendix H. LEIDOS_FWGW_009, which was submitted last year in the 2019 Annual Report, was not included in this 2020 version, and should be included for completeness in the Final 2020 Annual Report and subsequent versions.

- According to Section 5.0, ground water elevations were measured in 299 of the 300 RVAAP FWGW monitoring wells during 2020 sampling events. These water level measurements were used to prepare the potentiometric surface maps for the Unconsolidated, Homewood Sandstone, Upper Sharon Sandstone, and Basal Sharon Conglomerate Aquifers (Figures 5-1 through 5-4). Vertical gradients were also evaluated for flow between aquifers, and it was determined that Unconsolidated and Homewood aquifers appear hydraulically connected with little gradient difference. Unconsolidated and Upper Sharon Aquifers appear to have upward vertical gradient in one cluster of wells and downward vertical gradient in the remaining 6 clusters of wells. Unconsolidated and Basal Sharon Conglomerate Aquifers were found to have one cluster that is upward gradient and one cluster that is downward gradient, indicating some shale aquitards between the two aquifers. The Upper Sharon and Basal Sharon Conglomerate Aquifers were found to have three

well clusters with both minor upward and minor downward gradients, indicating they are hydraulically connected with little gradient difference.

- A comparison of potentiometric surface contours from 2019 to 2020 indicates that groundwater elevations were generally 0.5 to 1.4 feet higher than the previous year, flow directions of the various aquifers are generally similar from last year to this year.

## COMMENTS

1. **Proposed well redevelopment activities:**

   Section 4.3 Sedimentation and Turbidity indicated that eight (8) wells had turbidity readings in excess of 10 NTUs during 2020 sampling events. Some wells had been redeveloped during 2020, so only two (2) wells (LL1mw-081, LL2mw-267) were recommended for redevelopment in 2021.

   Please clarify the planned methods for well redevelopment, or if these activities are described in other documents, please identify those reference documents (i.e., in the 2016 RIWP). Also please provide a timeframe for proposed well redevelopment activities (i.e., with Spring sampling or Fall sampling event) and clarify if these activities were added to the 2021 Addendum.

2. **Statistical data evaluation:**

   Metals data results were compared to the findings presented in the *2019 Background Study for Metals,* explosives were plotted on time series graphs, and pH readings were also plotted on time series graphs. While visibly recognizable best linear fit evaluations are useful, please explain if further statistical evaluation of these data (in future reports) will be used to more accurately determine decreasing, stable, or increasing trend lines in the data (utilizing Sanitas or some other acceptable form of statistical evaluation program). Statistical trend analyses would be recommended to help evaluate the ongoing FWGWMP and/or to help support future proposed well abandonment decisions.

This *Draft Facility-wide Groundwater Monitoring Program Plan RVAAP-66 Facility-wide Groundwater Annual Report for 2020* was reviewed by personnel from Ohio EPA. Additional information is necessary to approve the document.

As a precautionary response to COVID-19, Ohio EPA is currently operating with most staff working remotely. During this time, we will not be issuing hard-copy mail. This letter is an official response from Ohio EPA that will be maintained as a public record.

If you have questions or would like to set up a meeting to discuss these comments, you may contact me at kevin.palombo@epa.ohio.gov or call me at (330) 963-1292.

Sincerely,

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

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ec: Kevin Sedlak, ARNG
Rebecca Shreffler, Chenega Tri-Services Shreffler
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Carrie Rasik, Ohio EPA, CO, DERR
Steven Kvaal, USACE Louisville
Nat Peters, USACE Louisville

Ohio Environmental Protection Agency

**Mike DeWine**, Governor
**Jon Husted**, Lt. Governor
**Laurie A. Stevenson**, Director

May 5, 2021

**TRANSMITTED ELECTRONICALLY**

Mr. Kevin Sedlak
Restoration Program Manager
ARNG-ILE Clean Up
Camp James A. Garfield JTC
1438 State Route 534 SW
Newton Falls, OH 44444

RE: US Army Ammunition Plt RVAAP
Remediation Response
Project Records
Remedial Response
Portage County
ID # 267000859036

**Subject: Response to Ohio EPA Comments on the "Draft Facility-wide Groundwater Monitoring Program Plan RVAAP-66 Facility-wide Groundwater Addendum for 2021" Dated April 8, 2021**

Dear Mr. Sedlak:

The Ohio Environmental Protection Agency (Ohio EPA) has received and reviewed the "Response to Ohio EPA Comments on the Draft Facility-wide Groundwater Monitoring Program (FWGWMP) Plan RVAAP-66, Facility-wide Groundwater Addendum for 2021" for the former Ravenna Army Ammunition Plant, Portage and Trumbull Counties, Ohio (Camp James A. Garfield). This document was received at Ohio EPA's Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR) via email on April 9, 2021.The response was prepared for the United States Army Corps of Engineers (USACE) on behalf of the National Guard Bureau by Leidos under Contract Number W912QR-16-D-0003.

Based on our review of the Army National Guard's Response to Ohio EPA comments provided in in your letter dated April 8, 2021, we find the responses generally acceptable, and the document can be finalized. Please be sure that all agreed to changes, additions and clarifications are provided in the final document.

As a precautionary response to COVID-19, Ohio EPA is currently operating with most staff working remotely. During this time, we will not be issuing hard-copy mail. This letter is an official response from Ohio EPA that will be maintained as a public record.

RECEIVED
MAY 05 2021

If you have questions, you can reach me via email at kevin.palombo@epa.ohio.gov, or at (330) 963-1292.

Sincerely,

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

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ec: Rebecca Shreffler, Chenega Tri-Services
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**NATIONAL GUARD BUREAU**
**111 SOUTH GEORGE MASON DRIVE**
**ARLINGTON VA 22204-1373**

April 8, 2021

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, Responses to Comments on the Groundwater Monitoring Addendum for 2021 (Work Activity No. 267-000-859-036)

Dear Mr. Palombo:

The Army appreciates your time and comments on the *Draft Facility-Wide Groundwater Monitoring Program Plan Addendum for 2021*. Enclosed for your review are responses to your comments. Upon resolution of these comments, the Army will provide a Final version of the addendum for Ohio EPA concurrence.

These comment responses were prepared for the Army National Guard in support of the RVAAP Restoration Program. Please contact the undersigned at 614-336-6000, ext 2053 or kevin.m.sedlak.ctr@mail.mil if there are issues or concerns with this submission.

Sincerely,

SEDLAK.KEVIN.MICHAEL.1254440171 Digitally signed by SEDLAK.KEVIN.MICHAEL.1254440171 Date: 2021.04.08 13:49:17 -04'00'

Kevin M. Sedlak
RVAAP Restoration Program Manager
Army National Guard Directorate

cc: Natalie Oryshkewych, Ohio EPA, NEDO, DERR
Bob Princic, Ohio EPA, NEDO, DERR
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Steve Kvaal, USACE Louisville
Jay Trumble, USACE Louisville
Vasu Peterson, Leidos
Jed Thomas, Leidos
Rebecca Shreffler, Chenega Tri-Services

Subject: Former Ravenna Army Ammunition Plant (RVAAP) Restoration Program, Portage/Trumbull Counties, Facility-Wide Groundwater Addendum for 2021 (Work Activity No. 267-000-859-036)

**GENERAL COMMENTS**

**Comment 1- Ramsdell Quarry Sample Discontinuation and Proposed Well Abandonments:**
Wells formerly identified as RCRA wells since 2005 (RVAAP-01 Ramsdell Quarry Landfill wells RQLmw-007, RQLmw-008, and RQLmw-009, and RVAAP-04 Open Demolition Area #2 wells DETmw-003 and DETmw-004) are currently being monitored under the CERCLA program and will no longer be referred to as RCRA wells. The Draft RI Report (Leidos 2020b) indicated that no further action is required for ground water at Ramsdell Quarry Landfill and the landfill is being closed; therefore, additional sampling of RQLmw-007, RQLmw-008, and RQLmw-009 is not recommended. The ground water at Open Demolition Area #2 is being evaluated under a separate RI; consequently, monitoring wells DETmw-003 and DETmw-004 will be sampled semi-annually under the FWGWMP in 2021.

Per previous November 6, 2020 Ohio EPA comment on the Draft 2020 RI Report, Ohio EPA believes it is premature to begin the process of monitoring well abandonment and that abandonment activities should be deferred until after concurrence has been reached regarding the status of each AOC, until final remedies have been chosen, and a long-term facility-wide ground water monitoring program is established. Continued ground water monitoring of some of these AOC wells may be required to comply with applicable Division of Materials and Waste Management (DMWM) rules and regulations.

Additionally, please clarify why sampling is to be discontinued at RQLmw-008, as polycyclic aromatic hydrocarbons (PAHs) benzo(a)anthracene and dibenz (a, h) anthracene were detected above their respective Regional Screening Levels (RSLs) (i.e., is it in conjunction with the landfill being closed or the AOC investigation being completed).

Army Response: Clarification. The Army concurs that well abandonment is not required at this time. This Draft 2021 Addendum does not include a recommendation to abandon the wells at Ramsdell Quarry Landfill (RQL). OHARNG submitted the Final End of Post Closure Care Certification (EOPCC) for RQL to the Division of Materials and Waste Management (DMWM). Any current and future sampling at RQL would be done to support the CERCLA process.

The *Draft Remedial Investigation Report for RVAAP-66 Facility-wide Groundwater* (Leidos 2020) concluded that no further action is required for groundwater at RQL. There were no comments in the 06 November 2020 Ohio EPA comment letter on the Draft RI Report that refuted this conclusion. Similar to numerous other wells within CJAG, sampling of the RQL wells is not needed to complete the RI phase of the CERCLA process. If the Final RI Report is resolved such that additional sampling at RQL is required, the need for additional sampling of the current wells will be re-evaluated. This approach is applicable to RQLmw-008, as the Draft RI Report did not identify PAHs at RQL as COCs requiring evaluation in an FS. Additional collection of groundwater for PAH analysis is not required to complete the CERCLA process.

**Comment 2 – Table 3-1 Discontinuation of Wells and Additional Wells:**
Table 3-1 indicates that sampling was recommended to be discontinued at nine wells for the 2021 FWGWMP sampling. However, of the 53 wells listed for sampling, it was not clear on this table which six wells were added (from the 2020 number of 47) for the 2021 sampling. Please provide clarification on which six wells were added to the 2021 FWGWMP sampling and why.

The Army should verify that the discontinuation of these nine wells meet the discontinuation criteria specified in the 2016 RIWP (i.e., whether that criteria is statistical trend analysis of historical results, certain number of non-detect results, etc.). Table 3-1 does indicate that for one well (LL2mw-267) explosives have not exceeded the screening levels for eight consecutive semi-annual sampling events, which may be adequate demonstration for discontinuation of sampling. Other wells slated for discontinuation do not have that level of specificity, please provide complete justification for discontinuing the remaining wells.

Army Response: Clarification and agree. Nine wells were indeed recommended for discontinuation of sampling, and ***fifteen wells*** that were not sampled in 2020 are recommended for sampling in 2021. The first paragraph in Section 3.1 will be revised as follows:

> "Forty-seven wells were sampled in 2020 under the FWGWMP. Nine wells sampled in 2020 are not recommended for sampling in 2021. This 2021 Addendum recommends that 53 wells be sampled in 2021, which includes an additional fifteen wells not sampled in 2020."

The newly added fifteen wells are identified in Table 3-1 by the "Not sampled in 2020" bullet in the cell summarizing the "2020 FWGWMP Sampling Recommendations". In addition, these rows will be highlighted in pink. For these specific wells, the rationale for sampling were provided in the "2021 FWGWMP Sampling Recommendations". As examples:

- WBGmw-006 was not sampled in 2020 and is recommended to be sampled in 2021 to "Monitor for explosives to support the FS".
- LL12mw-244 was not sampled in 2020 and is recommended to be sampled in 2021 to "Monitor for nitrate and ammonia to support the FS".

The RI Work Plan does not provide discontinuation criteria for the annual FWGWMP sampling. The purpose of the Addendums are to serve as the annual modification to the FWGWMP sampling scheme. The current FWGWMP Criteria 1 to 4 are presented in Section 1.2 of the 2021 Addendum. The discontinued wells no longer meet the criterion for continued sampling.

Table 3-1 includes 2020 sampling results, as well as a column that describes 2021 sampling recommendations. The sampling recommendation provides justification for wells discontinued based on sampling results or other changes (e.g., RCRA wells). To expand the rationale for discontinuing sampling at the wells below, the following bullet will be added to "2021 FWGWMP Sampling Recommendations" for wells RQL RCRA wells:

- OHARNG submitted the Final End of Post Closure Care Certification (EOPCC) for RQL to the Division of Materials and Waste Management (DMWM). Any current and future sampling at RQL would be done to support the CERCLA process. Additional sampling of this well in 2021 is not needed to support CERCLA.

The following bullet will be added to "2021 FWGWMP Sampling Recommendations" for FBQmw-168, -176, and -177:

- Explosive concentrations have not exceeded their screening levels during the FWGMWP sampling events (2003 to 2020).

**Comment 3 – Table 3-1 Reduction in Contaminant Analyses:**
Table 3-1 also indicates that a reduction in contaminant analyses would be conducted at numerous other wells on the table. Specifically, decreased analytical suites include the elimination of all metals analyses (with the exception of two wells from Open Demolition Area #2), presumably based on comparison of 2020 data results with background metals results as presented in the 2019 Background Study for Metals produced by Leidos (the use of calculated metals background levels resulted in fewer metals exceedances and thus fewer wells requiring additional metals analyses). Additionally, it was presented that the 2020 exceedances were limited to manganese and arsenic, which were not considered site related contaminants.

The Army should verify that the reduced sampling/analysis for the remaining FWGWMP wells for 2021 will not result in the necessity to modify the existing 2016 RIWP. If reduced sampling would change the 2016 RIWP, then a plan or schedule for such modification procedures should be contemplated and relayed to Ohio EPA for concurrence.

Ohio EPA DERR is in general concurrence with the proposed reduction in monitoring, but also recommends that the Army verify the reduction in well analyses for 2021 will not result in significant data gaps in the vertical or horizontal delineation directions around each affected AOC. Understandably, most of these wells proposed for discontinuation have had non-detects, but if additional delineation or confirmation is required at a later date, these wells may need to be resampled.

Army Response: Clarification. The Army verified that the reduced sampling/analysis for the remaining 2021 FWGWMP wells will not result in the necessity to modify the existing 2016 RIWP. The purpose of the Addendums are to serve as the annual modification to the FWGWMP sampling scheme; therefore, upon approval of this Addendum, modifications to the RI Work Plan will not be necessary.

The recommendations provided in the Draft 2021 Addendum supplement the conclusions provided in the Draft RI Report. If the comment resolution process of the RI Report identifies additional sampling and analysis to complete the RI phase of the CERCLA process, the need for additional sampling will be re-evaluated. The recommendations in the Draft 2021 Addendum also provide a sampling scheme to proactively acquire data for the upcoming feasibility study.

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

April 5, 2021

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

Subject: Notification of Field Work, Ravenna Army Ammunition Plant (RVAAP) Restoration Program, Portage/Trumbull Counties, RVAAP-66 Facility-wide Groundwater
(Work Activity No. 267-000-859-036)

Dear Mr. Palombo:

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

- 4/19/21-4/23/21: Mobilization, site set up, and well redevelopment
- 4/26/21-5/7/21: Groundwater sampling per the 2021 Addendum.

In the event that the schedule above needs to change, the Army will provide an e-mail notification with revised dates. Please contact the undersigned at 614-336-6000, ext 2053 or kevin.m.sedlak.ctr@mail.mil if there are issues or concerns with this submission.

Sincerely,

SEDLAK.KEVIN.MICHAEL.1254440171 Digitally signed by SEDLAK.KEVIN.MICHAEL.1254440171 Date: 2021.04.05 13:57:51 -04'00'

Kevin M. Sedlak
RVAAP Restoration Program Manager
Army National Guard Directorate

cc: Natalie Oryshkewych, Ohio EPA, DERR-NEDO
Bob Princic, Ohio EPA, DERR-NEDO
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Rebecca Shreffler, Chenega

Ohio Environmental Protection Agency

**Mike DeWine**, Governor
**Jon Husted**, Lt. Governor
**Laurie A. Stevenson**, Director

March 23, 2021

**TRANSMITTED ELECTRONICALLY**

Mr. Kevin M. Sedlak
Army National Guard
Installation and Environment
Clean-up Branch
IPA Designation
1438 State Route 534 SW
Newton Falls, OH 44444

RE: US Army Ammunition Plt RVAAP
Remediation Response
Project Records
Remedial Response
Portage County
ID # 267000859036

**Subject: Approval of the "RVAAP-66 Facility-Wide Groundwater Semi-Annual Report for Spring 2020 Sampling Event"**

Dear Mr. Sedlak:

The Ohio Environmental Protection Agency (Ohio EPA) has received the "RVAAP-66 Facility-Wide Groundwater Semi-Annual Report for Spring 2020 Sampling Event" at the Former Ravenna Army Ammunition Plant, Portage and Trumbull Counties, Ohio, dated March 10, 2021. This document was received via email at Ohio EPA's Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR) on March 10, 2021. The document was prepared for the U.S Army Corps of Engineers on behalf of the Army National Guard Directorate by Leidos.

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

As a precautionary response to COVID-19, Ohio EPA is currently operating with most staff working remotely. During this time, we will not be issuing hard-copy mail. This letter is an official response from Ohio EPA that will be maintained as a public record.

RECEIVED
MAR 23 2021

If you have any questions, please contact me by email at kevin.palombo@epa.ohio.gov, or call me at (330) 963-1292.

Sincerely,

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

KP/sc

ec: Katie Tait, OHARNG RTLS, CJAG
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**NATIONAL GUARD BUREAU**
111 SOUTH GEORGE MASON DRIVE
ARLINGTON VA 22204-1373

March 10, 2021

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

Subject: Ravenna Army Ammunition Plant (RVAAP) Restoration Program, Portage/Trumbull Counties, Final Facility-wide Groundwater 2020 Semi-Annual Report (Work Activity No. 267000859036)

Dear Mr. Palombo:

For your concurrence, an electronic version of the *Final Facility-wide Groundwater Monitoring Program RVAAP-66 Facility-wide Groundwater Semi-Annual Report for Spring 2020 Sampling Event* will be sent using the Ohio EPA liquid fileshare site. A hard copy and CD will be sent when they are able to be received by Ohio EPA. Due to file size, Appendix G containing the laboratory data packages are not included with the electronic version of this report. These appendices can be provided upon request as a separate electronic deliverable.

This report was prepared for the Army National Guard in support of the RVAAP Restoration Program. Please contact the undersigned at 614-336-6000, ext 2053 or kevin.m.sedlak.ctr@mail.mil if there are issues or concerns with this submission.

Sincerely,

SEDLAK.KEVIN.MICHAEL.1254440171 Digitally signed by SEDLAK.KEVIN.MICHAEL.1254440171 Date: 2021.03.10 06:53:43 -05'00'

Kevin M. Sedlak
RVAAP Restoration Program Manager
Army National Guard Directorate

cc: Natalie Oryshkewych, Ohio EPA, NEDO
Bob Princic, Ohio EPA, NEDO
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Tom Schneider, Ohio EPA, SWDO
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Vasu Peterson, Leidos
Jed Thomas, Leidos
Rebecca Shreffler, Chenega Tri-Services
Jennifer Tierney, Vista Sciences Corporation

Ohio Environmental Protection Agency

**Mike DeWine**, Governor
**Jon Husted**, Lt. Governor
**Laurie A. Stevenson**, Director

March 1, 2021

**TRANSMITTED ELECTRONICALLY**

Mr. Kevin Sedlak
Restoration Program Manager
ARNG-ILE Clean Up
Camp James A. Garfield JTC
1438 State Route 534 SW
Newton Falls, OH 44444

RE: US Army Ammunition Plt RVAAP
Remediation Response
Project Records
Remedial Response
Portage County
ID # 267000859036

**Subject: Response to Ohio EPA Comments on the "Draft Facility-wide Groundwater Monitoring Program Plan RVAAP-66 Facility-wide Groundwater Semi-Annual Report for Spring 2020 Sampling Event" dated January 11, 2021**

Dear Mr. Sedlak:

The Ohio Environmental Protection Agency (Ohio EPA) has received and reviewed the "Response to Ohio EPA Comments on the Draft Facility-wide Groundwater Monitoring Program (FWGWMP) Plan RVAAP-66 Facility-wide Groundwater Semi-Annual Report for Spring 2020 Sampling Event" at the Former Ravenna Army Ammunition Plant, Portage and Trumbull Counties, Ohio (Camp Garfield). This document was received at Ohio EPA's Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR) via email on January 11, 2021. The response was prepared for the United States Army Corps of Engineers (USACE) on behalf of the National Guard Bureau by Leidos under Contract Number W912QR-16-D-0003.

In order to document the communications between the Army and Ohio EPA, we refer the Army to correspondence that occurred via email on the following dates:

- September 17, 2020: The original document, "Draft Facility-wide Groundwater Monitoring Program Plan RVAAP-66 Facility-wide Groundwater Semi-Annual Report for Spring 2020 Sampling Event" was submitted to Ohio EPA.
- November 16, 2020: Ohio EPA provided comments to the Army National Guard.
- November 23, 2020: Army National Guard provided a response to Ohio EPA comments.

Received
1 MAR 2021

- December 28, 2020: Ohio EPA provided additional comments to the Army National Guard.

- January 11, 2021: Army National Guard provided a response to Ohio EPA comments.

Based on our review of the Army National Guard's Response to Ohio EPA comments on the "Draft Facility-wide Groundwater Monitoring Program (FWGWMP) Plan RVAAP-66 Facility-wide Groundwater Semi-Annual Report for Spring 2020 Sampling Event" provided in your letter dated January 11, 2021, we find the responses acceptable and the document can be finalized. Please be sure that all agreed-upon changes, additions and clarifications are included in the final document.

If you have questions, you can reach me via email at kevin.palombo@epa.ohio.gov, or at (330) 963-1292.

Sincerely,

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

KP/sc

ec: Rebecca Shreffler, Chenega Tri-Services
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Thomas Schneider, Ohio EPA, SWDO, DERR
Carrie Rasik, Ohio EPA, CO, DERR
Steven Kvaal, USACE Louisville
Nat Peters, USACE Louisville
Mark Leeper, ARNG

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

February 10, 2021

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

Subject: Ravenna Army Ammunition Plant (RVAAP) Restoration Program, Portage/Trumbull Counties, Draft Facility-wide Groundwater 2021 Addendum (Work Activity No. 267000859036)

Dear Mr. Palombo:

An electronic version of the *Draft Facility-wide Groundwater Monitoring Program Plan RVAAP-66 Facility-wide Groundwater Addendum for 2021* will be sent using the Ohio EPA LiquidFile system. A hard copy and CD will be sent when they are able to be received by Ohio EPA.

This addendum was prepared for the Army National Guard in support of the RVAAP Restoration Program. Please contact the undersigned at 614-336-6000, ext 2053 or kevin.m.sedlak.ctr@mail.mil if there are issues or concerns with this submission.

Sincerely,

SEDLAK.KEVIN.MICHAEL.1254440171 Digitally signed by SEDLAK.KEVIN.MICHAEL.1254440171 Date: 2021.02.10 13:07:06 -05'00'

Kevin M. Sedlak
RVAAP Restoration Program Manager
Army National Guard Directorate

cc: Natalie Oryshkewych, Ohio EPA, NEDO
Bob Princic, Ohio EPA, NEDO
Liam McEvoy, Ohio EPA, NEDO
Tom Schneider, Ohio EPA, SWDO
Carrie Rasik, Ohio EPA, CO
Mark Leeper, ARNG
Katie Tait, OHARNG, Camp James A. Garfield
Steve Kvaal, USACE Louisville
Jay Trumble, USACE Louisville
Vasu Peterson, Leidos
Jed Thomas, Leidos
Jennifer Tierney, Vista Sciences Corporation

**From:** Ed.Damato@epa.ohio.gov <Ed.Damato@epa.ohio.gov>
**Sent:** Friday, April 23, 2021 1:55 PM
**To:** Sedlak, Kevin M CTR NG OHARNG (USA) <kevin.m.sedlak.ctr@mail.mil>; Tait, Kathryn S NFG NG OHARNG (USA) <kathryn.s.tait.nfg@mail.mil>; Leeper, Mark S CIV NG NGB (USA) <mark.s.leeper.civ@mail.mil>; Kvaal, Steven LRL <Steven.Kvaal@usace.army.mil>; Peters, Nathaniel II LRL (Nathaniel.Peters.II@usace.army.mil) <Nathaniel.Peters.II@usace.army.mil>
**Cc:** megan.oravec@epa.ohio.gov; Thomas.Schneider@epa.ohio.gov; bob.princic@epa.ohio.gov; Susan.Netzly-Watkins@epa.ohio.gov
**Subject:** [Non-DoD Source] UPDATE: RVAAP-67 RACR Report/Load Lines 1-4 and 12 and Facility Wide Sewers at LL2

All active links contained in this email were disabled. Please verify the identity of the sender, and confirm the authenticity of all links contained within the message prior to copying and pasting the address to a Web browser.

---

Hello Everybody,

Just following up on our phone call from last Friday. Sue has looked through various previous documents, and we have an answer for you:

- We had asked if more data were available further down the channel that had been remediated in the EE/CA for FWS at LL2. This was to confirm the extent of contamination had been sufficiently delineated to show the EE/CA FWS CUGs were met.
    - Sue found additional information in the 2017 Final FS Addendum for LL 1-4 and 12. Final Feasibility Study Addendum for Soil, Sediment, and Surface Water at Load Lines 1, 2, 3, 4 and 12 (rvaap.org) < Caution-https://www.rvaap.org/docs/pub/F_FS_A_SSSW_LL1-

4_12_40_00/Final_FS%20Add._LL%201-4,%2012_062117.pdf >

- The hydrogeologic setting for LL2 is described in Section 2.2.1.3 in the Final FS. It states that the primary surface water conveyance at LL 2 drains to the south and ultimately discharges into Kelly's Pond. (See the attached 2017 FS Figure 2-4 and SAP Addendum Figure B-2)

- Sample LL2sd-633 was collected at a location near/at Kelly's Pond. According to Table 2-9 in the 2019 Final FS report (See attached 2017 FS Table 2-9) lead was below 400 mg/kg.

- We have located the information that addressed Sue's comment on the 2021 EE/CA Completion report findings for LL2 FWS project.

It is Ohio EPA's position that the downstream area we had questions about has been sufficiently delineated. A no further comments letter for the RVAAP 67/George Rd/LL-2 RACR report will be forthcoming.

Apologies for the confusion.

Regards,

*Edward D'Amato*
Ohio EPA
Division of Environmental Response and Revitalization
Northeast District Office
O: (330) 963-1170
F: (330) 487-0769

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CLASSIFICATION: UNCLASSIFIED

**Table 2-9. Summary of Human Health COC Concentrations in Soil and Sediment and Conclusions for Unrestricted (Residential) Land Use (continued)**

| Station | Sample Type | Residential RGO | | Metals | | | Explosives | | PAHs | | | | | PCBs | | Conclusion for Unrestricted Land Use |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 31 | 400 | 0.78 | 36 | 17 | 1.6 | 0.16 | 1.6 | 0.16 | 1.6 | 1.2 | 2.4 | |
| | | Date | Depth (ft) | Antimony | Lead | Thallium | TNT | 2,4-DNT | BaA | BaP | BbF | DA | IP | PCB-1254 | PCB-1260 | |
| *Kelly's Pond and Exit Drainage* | | | | | | | | | | | | | | | | |
| LL2sd-053 | D | 07/30/01 | 0 - 0.5 | -- | -- | -- | -- | -- | 0.15[a] | 0.18 | 0.25[a] | -- | 0.11[a] | -- | -- | Remediate |
| LL2sd-182 | D | 07/31/01 | 0 - 0.5 | -- | -- | -- | -- | -- | 0.6[a] | 0.55 | 0.71[a] | 0.082[a] | -- | -- | -- | NFA |
| Kelly's Pond | ISM | 06/23/03 | 0 - 0.3 | -- | -- | -- | -- | -- | 1.25[a] | 1.4 | 2.3 | 0.135[a] | 1.045[a] | -- | -- | Remediate |
| LL2SD-630 | D | 05/16/16 | 0 - 1 | -- | -- | -- | -- | -- | 0.228[a] | 0.216 | 0.311[a] | 0.0296[a] | -- | -- | -- | NFA |
| LL2SD-632 | D | 05/16/16 | 0 - 1 | -- | -- | -- | -- | -- | 0.471[a] | 0.463 | 0.675[a] | 0.0797[a] | -- | -- | -- | Remediate |
| LL2SD-633 | D | 05/16/16 | 0 - 1 | -- | -- | -- | -- | -- | 0.806[a] | 0.941 | 1.39[a] | 0.154[a] | 0.646[a] | -- | -- | Remediate |
| LL2SD-631 | D | 05/17/16 | 0 - 1 | -- | -- | -- | -- | -- | 16.4 | 23.6 | 41.2 | 4.55 | 19.1 | -- | -- | Remediate |

[a]Sample concentration is less than RGO; however, this chemical contributes to a sum of ratios greater than 1.

[b]Residential RGOs are the same for soil and sediment. This results in a very conservative assessment of sediment.

All units are mg/kg.

B(a)A = Benz(a)anthracene.

B(a)P = Benzo(a)pyrene.

B(b)F = Benzo(b)fluoranthene.

COC = Chemical of Concern.

D = Discrete soil sample.

DA = Dibenz(a,h)anthracene.

DNT = Dinitrotoluene.

ft = Feet.

IP = Indeno(1,2,3-cd)pyrene.

ISM = Incremental Sampling Methodology.

NFA = No further action or evaluation required for this COC.

PAH = Polycyclic Aromatic Hydrocarbon.

PCB = Polychlorinated Biphenyl.

RGO = Remedial Goal Option.

TNT = Trinitrotoluene.

-- = Chemical is not a COC in this sample.

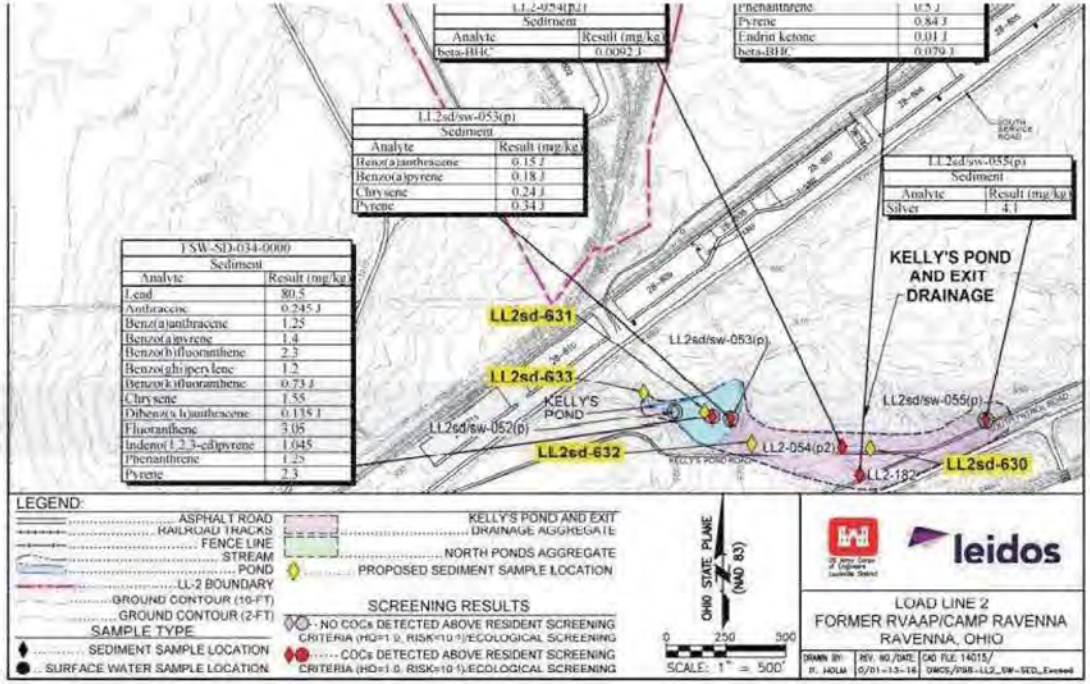



**Figure B-2. Screening Results and Proposed Sample Locations for Sediment at Load Line 2**

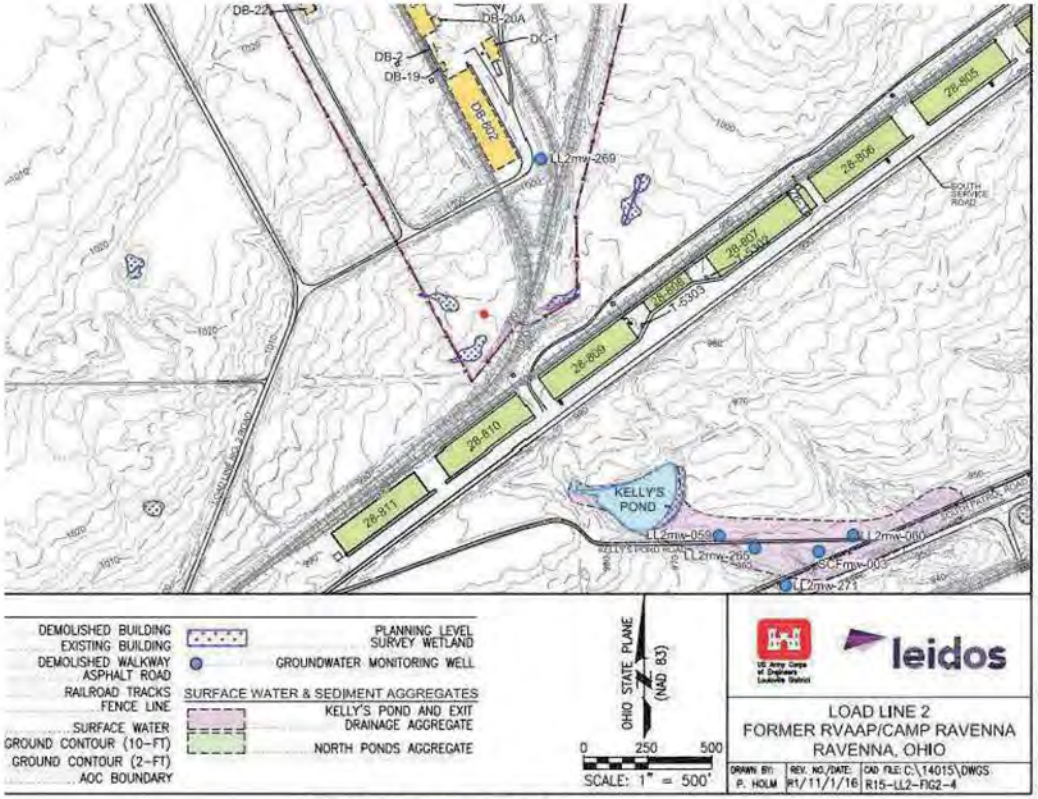



**Figure 2-4. Load Line 2 AOC Features**

Ohio Environmental Protection Agency

**Mike DeWine**, Governor
**Jon Husted**, Lt. Governor
**Laurie A. Stevenson**, Director

August 5, 2021

**TRANSMITTED ELECTRONICALLY**

Mr. Kevin M. Sedlak
Army National Guard
Installations & Environment
Cleanup Branch IPA Designation
1438 State Route 534 SW
Newton Falls, OH 44444

RE: US Army Ravenna Ammunition
Remediation Response
Correspondence
Remedial Response
Portage County
ID # 267000859214

**Subject: Ohio EPA's Review of Remedial Investigation for CC RVAAP-69 Building 1048 Fire Station**

Dear Mr. Sedlak:

The Ohio Environmental Protection Agency (Ohio EPA), Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR) has reviewed the May 4, 2021 Draft Remedial Investigation at CC RVAAP-69 Building 1048 Fire Station.

Ohio EPA has the following comments:

1. **Report Documentation Page Entry Question:**

   The Report Documentation Page within the Draft RI for CC RVAAP-69 Building 1048 Fire Station report has an entry within Box#15 Subject Terms as "Building 1034 Motor Pool Hydraulic Lift". While this is downgradient of the Building 1048 Fire Station, it is a different Area of Concern (AOC) than the Building 1048 Fire Station.

   **Action Item:** Please confirm this entry for Box #15 and correct/revise as needed.

2. **Well Abandonments:**

   According to Page 2-6, Lines 880-885: "An inactive groundwater supply well is located approximately 300 feet south-southeast of the AOC. The well was installed to a total depth of 97 feet bgs and cased to 57 feet bgs (water well log number 763132). The well was gauged on 4 June 2018; depth to water was 21.49 feet and depth to soft bottom was 84.75 feet. The well pump was inoperable, and the well is inactive. This drinking water well, along with all others, are scheduled for abandonment by the Ohio National Guard."

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AUG 0 5 2021

Ohio EPA anticipates that well abandonment activities will be conducted in accordance with the Ohio Administrative Code (OAC) rule 3745-9-10, the State of Ohio Regulations and Technical Guidance for Sealing Unused Water Wells and Boreholes - March 2015), and the Ohio EPA Technical Guidance Manual (TGM) for Hydrogeologic Investigations and Ground Water, Chapter 9 (Sealing Boreholes and Decommissioned Monitoring Wells), Section 2.1.2 – Revision 3, September 2016 (or more recent version).

Section 1521.05(C) of the Ohio Revised Code requires completed Water Well Sealing Report Forms (DNR 7810.12e) submitted to the Ohio Department of Natural Resources (ODNR) within 30 days after well sealing, as noted in Chapter 9, Section 2.3 of Ohio EPA's TGM. Also noted in Section 2.3, proper sealing of boreholes should be documented and reported to the Ohio EPA division regulating the site. Report information should include a copy of the ODNR Water Well Sealing Report Forms along with copies of well logs and documentation of steps taken to abandon the wells, and other information as described in Chapter 9, Section 2.3.1 of Ohio EPA's TGM.

**Action Item:** Please verify that this former drinking water well located near the Building 1034 Motor Pool Hydraulic Lift is scheduled for proper abandonment and provide timeline if known.

This letter is an official response from Ohio EPA that will be maintained as a public record. If you have any questions, please feel free to contact me at (330) 963-1170, or by email at ed.damato@epa.ohio.gov.

Sincerely,

Edward J D'Amato

Edward J. D'Amato
Site Coordinator
Division of Environmental Response and Revitalization

ED/sc

ec: Nat Peters, USACE
Steven Kvaal, USACE
Katie Tait, OHARNG RTLS
Rebecca Shreffler, Chenega
Mark Leeper, ARNG
Natalie Oryshkewych, Ohio EPA, NEDO, DERR
Megan Oravec, Ohio EPA, NEDO, DERR
Bob Princic, Ohio EPA, NEDO, DERR
Susan Netzly-Watkins, Ohio EPA, NEDO, DERR
Tom Schneider, Ohio EPA, SWDO, DERR
Brian Tucker, Ohio EPA, CO, DERR

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May 27, 2021

United States Army Corps of Engineers, Louisville District
ATTN: Mr. Kevin Mieczkowski
600 Dr. Martin Luther King, Jr. Place
Room 708
Louisville, Kentucky 40202
(502) 315-6324

Subject: Preliminary Draft Feasibility Study Report
CC RVAAP-69 Building 1048 Fire Station
Ravenna Army Ammunition Plant Restoration Program
Portage and Trumbull Counties, Ohio
Contract No.W912QR-12-D-0002, Delivery Order 0003

Dear Mr. Mieczkowski:

Parsons has prepared the Preliminary Draft Feasibility Study (FS) Report for CC RVAAP-69 Building 1048 Fire Station in accordance with the Performance Work Statement. Enclosed for your review and approval are 1 hard copy and 1 CD of the Preliminary Draft FS for CC RVAAP-69 Building 1048 Fire Station. This document recommends *In Situ* Thermal Desorption of Soil Source Area and Groundwater Plume Using High Temperature Treatment for Source Area and Lower Temperature for the Entire Footprint of the Plume to meet Unrestricted (Residential) Land Use. The distribution to other team members is shown below.

If you have any questions or comments, please contact me at (303) 563-9452 or email ed.heyse@parsons.com.

Sincerely,

PARSONS GOVERNMENT SERVICES INC.

Edward Heyse, PhD, PE
Project Manager

C: Kevin Sedlak, ARNG, (one [1] electronic copy)
Katie Tait, OHARNG, (one [1] electronic copy)
Mark Leeper, ARNG (one [1] electronic copy
Jennifer Tierney, Vista Science Corp. (one [1] electronic copy)
Angela Schmidt, USACE – Louisville (one [1] electronic copy)
Pat Ryan, Leidos-REIMS (Email Transmittal Letter Only)
Steve Kvaal, USACE – Louisville (Email Transmittal Letter Only)

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

May 05, 2021

Ohio Environmental Protection Agency
DERR-NEDO
Attn: Edward J. D'Amato
2110 East Aurora Road
Twinsburg, OH 44087-1924

Subject: Ravenna Army Ammunition Plant (RVAAP) Restoration Program
Draft Remedial Investigation for CC RVAAP-69 Building 1048 Fire Station
Portage/Trumbull Counties, Contract Number W912QR-12-D-0002, Delivery Order 0003, Ohio EPA ID # 267-000859-214

Dear Mr. D'Amato:

An electronic version of the Draft Remedial Investigation for CC RVAAP-69 Building 1048 Fire Station at the former Ravenna Army Ammunition Plant (RVAAP) will be uploaded for your review to the Ohio EPA LiquidFile Site. A hard copy and CD will be sent when they are able to be received by the Ohio EPA. This document recommends that CC RVAAP-69 Building 1048 Fire Station proceed to a Feasibility Study (FS).

This report was prepared by Parsons in support of the RVAAP cleanup program. Please contact the undersigned at (614) 336-6000 Ex 2053 or kevin.m.sedlak.ctr@mail.mil if there are issues or concerns with this submission.

Sincerely,

SEDLAK.KEVIN.MICHAEL.1254440171
Digitally signed by SEDLAK.KEVIN.MICHAEL.1254440171
Date: 2021.05.06 08:15:30 -04'00'

Kevin Sedlak
RVAAP Restoration Program Manager

Attachment

cc: Tom Schneider, Ohio EPA, DERR-SWDO (email transmittal letter only)
Bob Princic, Ohio EPA, DERR-NEDO (email transmittal letter only)
Natalie Oryshkewych, Ohio EPA, DERR-NEDO (email transmittal letter only)
Megan Oravec, Ohio EPA, DERR-NEDO (email transmittal letter only)
Katie Tait, OHARNG (one [1] electronic copy)
Mark Leeper, ARNG (one [1] electronic copy)
Kevin Mieczkowski, USACE Louisville (one [1] electronic copy, one [1] hard copy)
Steven Kvaal, USACE Louisville (email transmittal letter only)
Jennifer Tierney, Vista Sciences (one [1] electronic copy)
Patrick Ryan, Leidos (email transmittal letter only)
Ed Heyse, Parsons (one [1] electronic copy)

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

May 5, 2021

Ohio Environmental Protection Agency
DERR-NEDO
Attn: Mr. Ed D'Amato
2110 East Aurora Road
Twinsburg, OH 44087-1924

Subject: Notification of Field Work, Ravenna Army Ammunition Plant (RVAAP) Restoration Program, Portage/Trumbull Counties, Quarterly Sampling for CC RVAAP-69 Building 1048 Fire Station, Ohio EPA ID # 267-000859-214

Dear Mr. D'Amato:

In accordance with the Director's Final Findings and Orders, Section XIII, #28, for the RVAAP Restoration Program, the Army National Guard (ARNG) is providing notification of field activities at Camp James A. Garfield / former RVAAP 15 days prior to the scheduled start date. Parsons will be conducting quarterly groundwater sampling of five wells at CC RVAAP-69 Building 1048 Fire Station during the week of 24 May 2021 (anticipate two days of sampling, 25 and 26 May 2021).

For additional information on the field activities, please refer to the *Final Work Plan Additional Sampling for CC RVAAP-69 Building 1048 Fire Station, CC RVAAP-70 East Classification Yard, and CC RVAAP-74 Building 1034-Motor Pool Hydraulic Lift at the former Ravenna Army Ammunition Plant (RVAAP)* submitted to Ohio EPA on 30 November 2017 and approved on 27 December 2017, and the *Second Update and Progress Report on Remedial Investigation at CC RVAAP-69 Building 1048 Fire Station, Ravenna Army Ammunition Plan Restoration Program*, dated 10 June 2019.

Please contact the undersigned at (614) 336-6000 Ex 2053 or kevin.m.sedlak.ctr@mail.mil if there are issues or concerns with this submission.

Sincerely,

SEDLAK.KEVIN.MICHAEL.1254440171 Digitally signed by SEDLAK.KEVIN.MICHAEL.1254440171 Date: 2021.05.05 09:39:10 -04'00'

Kevin Sedlak
RVAAP Restoration Program Manager

cc: Bob Princic, Ohio EPA, DERR-NEDO
Tom Schneider, Ohio EPA, SWDO
Natalie Oryshkewych, Ohio EPA, DERR-NEDO
Megan Oravec, Ohio EPA, DERR-NEDO
Katie Tait, OHARNG
Steven Kvaal, USACE Louisville
Kevin Mieczkowski, USACE Louisville
Jennifer Tierney, Vista Sciences
Edward Heyse, Parsons

401 Diamond Drive, NW | Huntsville, Alabama 35806
Direct: +1 256.217.25730 / Office: +1 256.837.5200 / parsons.com

**February 26, 2021**

United States Army Corps of Engineers, Louisville District
ATTN: Mr. Kevin Mieczkowski
600 Dr. Martin Luther King, Jr. Place
Room 708
Louisville, Kentucky 40202
(502) 315-6324

Subject: Preliminary Draft Remedial Investigation Report
CC RVAAP-69 Building 1048 Fire Station
Ravenna Army Ammunition Plant Restoration Program
Portage and Trumbull Counties, Ohio
Contract No.W912QR-12-D-0002, Delivery Order 0003

Dear Mr. Mieczkowski,

Parsons has prepared the Preliminary Draft Remedial Investigation (RI) Report for CC RVAAP-69 Building 1048 Fire Station in accordance with the Performance Work Statement. Enclosed for your approval are 2 hard copies and 1 CD of the Preliminary Draft RI for CC RVAAP-69 Building 1048 Fire Station. This document recommends that CC RVAAP-69 Building 1048 Fire Station proceed to a Feasibility Study (FS). The distribution to other team members is shown below.

If you have any questions or comments, please contact me at (303) 563-9452 or email ed.heyse@parsons.com.

Sincerely,

PARSONS GOVERNMENT SERVICES INC.



Edward Heyse, PhD, PE
Project Manager

C: Kevin Sedlak, ARNG, (one [1] electronic copy)
Katie Tait, OHARNG, (one [1] electronic copy)
Mark Leeper, ARNG, (one [1] electronic copy)
Jennifer Tierney, Vista Science Corp. (one [1] electronic copy)
Angela Schmidt, USACE – Louisville (one [1] electronic copy)
Pat Ryan, Leidos-REIMS (Email Transmittal Letter Only)
Steven Kvaal, USACE – Louisville (Email Transmittal Letter Only)

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

February 18, 2021

Ohio Environmental Protection Agency
DERR-NEDO
Attn: Mr. Ed D'Amato
2110 East Aurora Road
Twinsburg, OH 44087-1924

Subject: Notification of Field Work, Ravenna Army Ammunition Plant (RVAAP) Restoration Program, Portage/Trumbull Counties, Quarterly Sampling for CC RVAAP-69 Building 1048 Fire Station, Ohio EPA ID # 267-000859-214

Dear Mr. D'Amato:

In accordance with the Director's Final Findings and Orders, Section XIII, #28, for the RVAAP Restoration Program, the Army National Guard (ARNG) is providing notification of field activities at Camp James A. Garfield / former RVAAP 15 days prior to the scheduled start date. Parsons will be conducting quarterly groundwater sampling of fourteen wells at CC RVAAP-69 Building 1048 Fire Station during the week of 8 March 2021 (anticipate four days of sampling, 8 March through 11 March 2021).

For additional information on the field activities, please refer to the *Final Work Plan Additional Sampling for CC RVAAP-69 Building 1048 Fire Station, CC RVAAP-70 East Classification Yard, and CC RVAAP-74 Building 1034-Motor Pool Hydraulic Lift at the former Ravenna Army Ammunition Plant (RVAAP)* submitted to Ohio EPA on 30 November 2017 and approved on 27 December 2017, and the *Second Update and Progress Report on Remedial Investigation at CC RVAAP-69 Building 1048 Fire Station, Ravenna Army Ammunition Plan Restoration Program*, dated 10 June 2019.

Please contact the undersigned at (614) 336-6000 Ex 2053 or kevin.m.sedlak.ctr@mail.mil if there are issues or concerns with this submission.

Sincerely,

SEDLAK.KEVIN.MICHAEL.1254440171 Digitally signed by SEDLAK.KEVIN.MICHAEL.125444017 1 Date: 2021.02.18 09:27:42 -05'00'

Kevin Sedlak
RVAAP Restoration Program Manager

cc: Bob Princic, Ohio EPA, DERR-NEDO
Tom Schneider, Ohio EPA, SWDO
Natalie Oryshkewych, Ohio EPA, DERR-NEDO
Megan Oravec, Ohio EPA, DERR-NEDO
Katie Tait, OHARNG, CJAG
Steven Kvaal, USACE Louisville
Kevin Mieczkowski, USACE Louisville
Jennifer Tierney, Vista Sciences
Edward Heyse, Parsons

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06 May 2021

United States Army Corps of Engineers, Louisville District
ATTN: Mr. Kevin Mieczkowski
600 Dr. Martin Luther King, Jr. Place
Room 708
Louisville, Kentucky 40202
(502) 315-6324

Subject: Final Action Memorandum
CC RVAAP-70 East Classification Yard
Ravenna Army Ammunition Plant Restoration Program
Portage and Trumbull Counties, Ohio
Contract No.W912QR-12-D-0002, Delivery Order 0003

Dear Mr. Mieczkowski,

Parsons has prepared the Final Action Memorandum for CC RVAAP-70 East Classification Yard in accordance with the Modification 08. Enclosed for your approval are one hard copy and one CD of the Final Action Memorandum for CC RVAAP-70. This Memorandum documents the decision to implement a non-time critical removal action (excavation and offsite disposal) for surface soil at DU03 Building 47-40 Round House Exterior. The distribution to other team members is shown below.

Parsons understands that the Action Memo is an internal Army document, and, therefore is prepared final for Army reviewers only.

If you have any questions or comments, please contact me at (303) 563-9452 or email ed.heyse@parsons.com.

Sincerely,

PARSONS GOVERNMENT SERVICES INC.

Edward Heyse, PhD, PE
Project Manager

C: Kevin Sedlak, ARNG, CJAG (one [1] electronic copy)
Mark Leeper, ARNG (one [1] electronic copy)
Katie Tait, OHARNG, CJAG (one [1] electronic copy)
Jennifer Tierney, Administrative Record Manager (one [1] electronic copy)
Pat Ryan, Leidos-REIMS (Email Transmittal Letter Only)
Steven Kvaal, USACE – Louisville (Email Transmittal Letter Only)

Ohio Environmental Protection Agency

**Mike DeWine**, Governor
**Jon Husted**, Lt. Governor
**Laurie A. Stevenson**, Director

February 11, 2021

**TRANSMITTED ELECTRONICALLY**

Mr. Kevin M. Sedlak
Army National Guard
Installations & Environment
Cleanup Branch
IPA Designation
1438 State Route 534 SW
Newton Falls, OH 44444

RE: US Army Ravenna Ammunition Plt RVAAP
Remediation Response
Project Records
Remedial Response
Portage County
ID # 267000859260

**Subject: Approval of Final Engineering Evaluation/Cost Analysis for CC RVAAP-70 East Classification Yard**

Dear Mr. Sedlak:

The Ohio Environmental Protection Agency (Ohio EPA), Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR) has received and reviewed the document titled, "Final Engineering Evaluation/Cost Analysis for CC RVAAP-70 East Classification Yard." The document was prepared for the U.S. Army Corps of Engineers Louisville District, by Parsons, 600 Dr. Martin Luther King Jr. Place, Louisville, Kentucky 40202-2267.

Ohio EPA approves the document.

As a precautionary response to COVID-19, Ohio EPA is currently operating with most staff working remotely. During this time, we will not be issuing hard-copy mail. This letter is an official response from Ohio EPA that will be maintained as a public record.

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FEB 11 2021

If you have any questions concerning this letter, please contact Edward D'Amato at (330) 963-1170, or via email at ed.damato@epa.ohio.gov.

Sincerely,

Edward J D'Amato

Edward D'Amato
Site Coordinator
Division of Environmental Response and Revitalization

ED/sc

ec: Katie Tait, OHARNG RTLS
Nat Peters, USACE
Steve Kvaal, USACE
Rebecca Shreffler, Chenega
Mark Leeper, ARNG
Tom Schneider, Ohio EPA, SWDO, DERR
Natalie Oryshkewych, Ohio EPA, NEDO, DERR
Bob Princic, Ohio EPA, NEDO, DERR
Megan Oravec, Ohio EPA, NEDO, DERR

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

January 28, 2021

Ohio Environmental Protection Agency
DERR-NEDO
Attn: Edward J. D'Amato
2110 East Aurora Road
Twinsburg, OH 44087-1924

Subject: Final Engineering Evaluation/Cost Analysis for CC RVAAP-70 East Classification Yard, Ravenna Army Ammunition Plant (RVAAP) Restoration Program, Portage/Trumbull Counties, Contract Number W912QR-12-D-0002, Delivery Order 0003, Ohio EPA ID # 267-000859-260

Dear Mr. D'Amato:

An electronic version of the Final Engineering Evaluation/Cost Analysis (EE/CA) for CC RVAAP-70 East Classification Yard at the former Ravenna Army Ammunition Plant (RVAAP) will be sent using the Ohio EPA LiquidFile system. A hard copy and CD will be sent when they are able to be received by Ohio EPA. This document presents the preferred alternative of excavation and off-site disposal for surface soil at CC RVAAP-70 East Classification Yard.

Please note that, as a result of Army legal review, the final EE/CA has two changes from the draft provided for your review on 15 December 2020. Also note that the preferred remedy and cleanup goals remain unchanged. The changes to the document are:

(1) The following sentence was added to the second paragraph of Section 1.0. "*As per NCP 300.415(b)(4)(i), where a planning period of at least six months exists before any on-site activities must be initiated, and the lead agency has determined that a removal action is appropriate, an EE/CA must be prepared.*"
(2) US Environmental Protection Agency Regional Screening Levels (RSLs) were removed from the Chemical-Specific ARAR table in Appendix A, and instead placed in a new Appendix A table entitled "Other Information To Be Considered." RSLs are not technically ARARs because they are not enforceable standards. RSLs however continue to be the basis for the cleanup goal.

Upon Ohio EPA acceptance of the Final EE/CA, the document will be released for 30-day public review.

This report was prepared by Parsons in support of the RVAAP cleanup program. Please contact the undersigned at (614) 336-6000 Ex 2053 or kevin.m.sedlak.ctr@mail.mil if there are issues or concerns with this submission.

Sincerely,

SEDLAK.KEVIN.MICHAEL.1254440171
Digitally signed by SEDLAK.KEVIN.MICHAEL.1254440171
Date: 2021.01.29 06:45:15 -05'00'

Kevin Sedlak
RVAAP Restoration Program Manager

Attachment

cc: Tom Schneider, Ohio EPA, DERR-SWDO (email transmittal letter only)
Bob Princic, Ohio EPA, DERR-NEDO (email transmittal letter only)
Natalie Oryshkewych, Ohio EPA, DERR-NEDO (email transmittal letter only)
Megan Oravec, Ohio EPA, DERR-NEDO (email transmittal letter only)
Katie Tait, OHARNG, CJAG (one [1] electronic copy)
Mark Leeper, ARNG (email transmittal letter only)
Steven Kvaal, USACE Louisville (email transmittal letter only)
Kevin Mieczkowski, USACE Louisville (one [1] electronic copy, two [2] hard copies)
Jennifer Tierney, Vista Sciences (two [2] electronic copies, two [2] hard copies)
Patrick Ryan, Leidos (email transmittal letter only)
Ed Heyse, Parsons (one [1] electronic copy)

Ohio Environmental Protection Agency

**Mike DeWine**, Governor
**Jon Husted**, Lt. Governor
**Laurie A. Stevenson**, Director

January 19, 2021

**TRANSMITTED ELECTRONICALLY**

Mr. Kevin M. Sedlak
Army National Guard
Installations & Environment
Cleanup Branch
IPA Designation
1438 State Route 534 SW
Newton Falls, OH 44444

RE: US Army Ravenna Ammunition Plt RVAAP
Remediation Response
Project Records
Remedial Response
Portage County
ID # 267000859260

**Subject: Response to Ohio EPA Comments, Draft Engineering Evaluation/Cost Analysis for CC RVAAP-70 East Classification Yard**

Dear Mr. Sedlak:

The Ohio Environmental Protection Agency (Ohio EPA), Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR) has received and reviewed the document titled, "Draft Engineering Evaluation/Cost Analysis for CC RVAAP-70 East Classification Yard." The document was prepared for the U.S. Army Corps of Engineers Louisville District, by Parsons, 600 Dr. Martin Luther King Jr. Place Louisville, Kentucky 40202-2267.

Ohio EPA has no comments. Please submit the document in final form.

As a precautionary response to COVID-19, Ohio EPA is currently operating with most staff working remotely. During this time, we will not be issuing hard-copy mail. This letter is an official response from Ohio EPA that will be maintained as a public record.

RECEIVED
JAN 19 2021

If you have any questions concerning this letter, please contact Edward D'Amato at (330) 963-1170, or via email at ed.damato@epa.ohio.gov.

Sincerely,

Edward J D'Amato

Edward D'Amato
Site Coordinator
Division of Environmental Response and Revitalization

ED/sc

ec: Katie Tait, OHARNG RTLS
Mark Leeper, ARNG
Nat Peters, USACE
Steve Kvaal, USACE
Rebecca Shreffler, Chenega
Natalie Oryshkewych, Ohio EPA, NEDO, DERR
Megan Oravec, Ohio EPA, NEDO, DERR
Bob Princic, Ohio EPA, NEDO, DERR
Tom Schneider, Ohio EPA, SWDO, DERR
Tim Christman, Ohio EPA, CO, DERR

Ohio Environmental Protection Agency

**Mike DeWine**, Governor
**Jon Husted**, Lt. Governor
**Laurie A. Stevenson**, Director

April 19, 2021

**TRANSMITTED ELECTRONICALLY**

Mr. Kevin M. Sedlak
Army National Guard
Installations & Environment
Cleanup Branch IPA Designation
1438 State Route 534 SW
Newton Falls, OH 44444

RE: US Army Ravenna Ammunition Plt RVAAP
Remediation Response
Project Records
Remedial Response
Portage County
ID # 267000859261

**Subject: Final Record of Decision for CC RVAAP-74 Building 1034 Motor Pool Hydraulic Lift**

Dear Mr. Sedlak:

The Ohio Environmental Protection Agency (Ohio EPA), Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR) has received and reviewed the "Final Record of Decision for CC RVAAP-74 Building 1034 Motor Pool Hydraulic Lift," dated March 25, 2021. It was prepared by Parsons.

Ohio EPA has no comments on the Final Record of Decision (Final ROD). Based on the information contained in the Final ROD document, other investigation documents and reports, and Ohio EPA's oversight participation during the investigation, Ohio EPA concurs with the Final ROD document for CC RVAAP-74 Building 1034 Motor Pool Hydraulic Lift recommending no further action.

As a precautionary response to COVID-19, Ohio EPA is currently operating with most staff working remotely. During this time, we will not be issuing hard-copy mail. This letter is an official response from Ohio EPA that will be maintained as a public record.

RECEIVED
APR 19 2021

If you have any questions concerning this letter, please contact Edward D'Amato at (330) 963-1170, or via email at ed.damato@epa.ohio.gov.

Sincerely,

*Melisa Witherspoon*

Melisa Witherspoon
Chief
Division of Environmental Response and Revitalization

MW/sc

ec: Nat Peters, USACE
Steven Kvaal, USACE
Katie Tait, OHARNG RTLS
Rebecca Shreffler, Chenega
Natalie Oryshkewych, Ohio EPA, NEDO, DERR
Megan Oravec, Ohio EPA, NEDO, DERR
Bob Princic, Ohio EPA, NEDO, DERR
Tom Schneider, Ohio EPA, SWDO, DERR
William Damschroder, Ohio EPA, CO, Legal

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

March 25, 2021

Ohio Environmental Protection Agency
DERR-NEDO
Attn: Edward J. D'Amato
2110 East Aurora Road
Twinsburg, OH 44087-1924

Subject: Former Ravenna Army Ammunition Plant (RVAAP) Restoration Program
Final Record of Decision, CC RVAAP-74 Building 1034 Motor Pool Hydraulic Lift, Portage/Trumbull Counties, Contract Number W912QR-12-D-0002, Delivery Order 0003, Ohio EPA ID # 267-000859-261

Dear Mr. D'Amato:

An electronic version of the Final Record of Decsion for CC RVAAP-74 Building 1034 Motor Pool Hydraulic Lift at the former Ravenna Army Ammunition Plant (RVAAP) will be uploaded for your review to the Ohio EPA LiquidFile site. A hard copy and CD will be sent when they are able to be received by the Ohio EPA. This document selects a "no further action" response for subsurface soil and groundwater at Building 1034 Motor Pool Hydraulic Lift. The distribution to other team members is shown below.

This report was prepared by Parsons in support of the RVAAP cleanup program. Please contact the undersigned at (614) 336-6000 or kevin.m.sedlak.ctr@mail.mil if there are issues or concerns with this submission.

Sincerely,

SEDLAK.KEVIN.MICHAEL.1254440171
Digitally signed by SEDLAK.KEVIN.MICHAEL.1254440171
Date: 2021.03.25 13:03:49 -04'00'

Kevin M. Sedlak
RVAAP Restoration Program Manager

Attachment

cc: Tom Schneider, Ohio EPA, SWDO (email transmittal letter only)
Natalie Oryshkewych, Ohio EPA, DERR-NEDO (email transmittal letter only)
Bob Princic, Ohio EPA, DERR-NEDO (email transmittal letter only)
Megan Oravec, Ohio EPA, DERR-NEDO (email transmittal letter only)
Mark Leeper, ARNG (one [1] electronic copy)
Katie Tait, OHARNG (one [1] electronic copy)
Kevin Mieczkowski, USACE Louisville (one [1] electronic copy, two [2] hard copies)
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Pat Ryan, Leidos (email transmittal letter only)
Ed Heyse, Parsons (one [1] electronic copy)

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

March 9, 2021

Ohio Environmental Protection Agency
DERR-NEDO
Attn: Edward J. D'Amato
2110 East Aurora Road
Twinsburg, OH 44087-1924

Subject: Former Ravenna Army Ammunition Plant (RVAAP) Restoration Program
Draft Record of Decision, CC RVAAP-74 Building 1034 Motor Pool Hydraulic Lift, Portage/Trumbull Counties, Contract Number W912QR-12-D-0002, Delivery Order 0003, Ohio EPA ID # 267-000859-261

Dear Mr. D'Amato:

An electronic version of the Draft Record of Decision for CC RVAAP-74 Building 1034 Motor Pool Hydraulic Lift at the former Ravenna Army Ammunition Plant (RVAAP) will be uploaded for your review to the Ohio EPA LiquidFile site. A hard copy and CD will be sent when they are able to be received by the Ohio EPA. This document selects a "no further action" response for subsurface soil and groundwater at Building 1034 Motor Pool Hydraulic Lift. The distribution to other team members is shown below.

This report was prepared by Parsons in support of the RVAAP cleanup program. Please contact the undersigned at (614) 336-6000 or kevin.m.sedlak.ctr@mail.mil if there are issues or concerns with this submission.

Sincerely,

SEDLAK.KEVIN.MICHAEL.1254440171
Digitally signed by SEDLAK.KEVIN.MICHAEL.1254440171
Date: 2021.03.09 14:05:00 -05'00'

Kevin M. Sedlak
RVAAP Restoration Program Manager

Attachment

cc: Tom Schneider, Ohio EPA, SWDO (email transmittal letter only)
Natalie Oryshkewych, Ohio EPA, DERR-NEDO (email transmittal letter only)
Bob Princic, Ohio EPA, DERR-NEDO (email transmittal letter only)
Megan Oravec, Ohio EPA, DERR-NEDO (email transmittal letter only)
Mark Leeper, ARNG (one [1] electronic copy)
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Steven Kvaal, USACE Louisville (email transmittal letter only)
Pat Ryan, Leidos (email transmittal letter only)
Ed Heyse, Parsons (one [1] electronic copy)

Ohio Environmental Protection Agency

**Mike DeWine**, Governor
**Jon Husted**, Lt. Governor
**Laurie A. Stevenson**, Director

December 22, 2020

**TRANSMITTED ELECTRONICALLY**

Mr. Kevin M. Sedlak
Army National Guard
Installations & Environment
Cleanup Branch
IPA Designation
1438 State Route 534 SW
Newton Falls, OH 44444

RE: US Army Ravenna Ammunition Plt RVAAP
Remediation Response
Project Records
Remedial Response
Portage County
ID # 267000859243

**Subject: Draft Remedial Design for Soil, Sediment and Surface Water at CC RVAAP-76 Depot Area Dated October 29, 2020**

Dear Mr. Sedlak:

The Ohio Environmental Protection Agency (Ohio EPA), Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR) has received and reviewed the document titled, "Draft Remedial Design for CC RVAAP-76 Depot Area." This document was prepared for the U.S. Army Corps of Engineers Louisville District, by Endpoint Consulting, Inc., 5 South Linden St., Suite 2, South San Francisco, CA 94080 and Alaniz Associates Corp., 21334 East Cloverton St., Covina, CA 91724.

Ohio EPA has the following comment regarding the draft Remedial Design for CC RVAAP-76 Depot Area:

1. The print on page 92 (as numbered by the .pdf document) gives the soil volumes for removal and replacement. The excavation area for U-4 is given as 432 square feet. That value should be closer to 17,400 square feet to be consistent with a removal volume of 645 cubic yards. In addition, the clean fill replacement volumes are equal to the in-situ removal volumes. Given that the replacement fill is to be compacted, the clean fill volume could be greater that the removed volume by as much as 20%.

Please correct the document accordingly.

Ohio EPA continues to work with you on revisions to the Endpoint 2020 Sampling and Analysis Plan (SAP).

RECEIVED
DEC 23 2020

The Alaniz-Endpoint Team is contracted to conduct remediation work at a total of five areas of concern (AOCs). Ohio EPA has reviewed and commented on the remedial design (RD) for AOC Load Line 9 (LL9) and Wet Storage Area. We have also received the draft RDs for the NACA Test Area and Sand Creek Disposal Road Landfill.

In Ohio EPA's October 9, 2020 "Response to Comments of the Draft Remedial Design Work Plan for RVAAP Load Line 9," Ohio EPA commented on the Endpoint 2020 SAP, specifically Appendix I, regarding quality assurance and quality control. Ohio EPA commented, "Specifically, the relative percent difference (RPD) should not be used and removed from the document. The relative standard deviation (RSD) of 30-35% should replace the RPD as the criteria for DQO objectives."

Ohio EPA is working with you on revising the SAP. Once revisions are made to the Endpoint 2020 SAP, the Endpoint 2020 SAP, as revised applies to the other Alaniz-Endpoint contracted remediation work noted above.

As a precautionary response to COVID-19, Ohio EPA is currently operating with most staff working remotely. During this time, we will not be issuing hard-copy mail. This letter is an official response from Ohio EPA that will be maintained as a public record.

If you have any questions concerning this letter, please contact Edward D'Amato at (330) 963-1170, or via email at ed.damato@epa.ohio.gov.

Sincerely,

Edward D'Amato
Site Coordinator
Division of Environmental Response and Revitalization

ED/sc

ec: Katie Tait, OHARNG RTLS
Mark Leeper, ARNG
Nat Peters, USACE
Steve Kvaal, USACE
Rebecca Shreffler, Chenega
Natalie Oryshkewych, Ohio EPA, NEDO, DERR
Megan Oravec, Ohio EPA, NEDO, DERR
Bob Princic, Ohio EPA, NEDO, DERR
Susan Netzly-Watkins, Ohio EPA, NEDO, DERR
Tom Schneider, Ohio EPA, SWDO, DERR

Ohio Environmental Protection Agency

**Mike DeWine**, Governor
**Jon Husted**, Lt. Governor
**Laurie A. Stevenson**, Director

March 26, 2021

**TRANSMITTED ELECTRONICALLY**

Mr. Kevin M. Sedlak
Army National Guard
Installations & Environment
Cleanup Branch IPA Designation
1438 State Route 534 SW
Newton Falls, OH 44444

RE: US Army Ravenna Ammunition Plt RVAAP
Remediation Response
Project Records
Remedial Response
Portage County
ID # 267000859243

**Subject: No Further Comments, Final Remedial Design for Soil, Sediment and Surface Water at CC RVAAP-76 Depot Area, Dated March 19, 2021**

Dear Mr. Sedlak:

The Ohio Environmental Protection Agency (Ohio EPA), Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR) has received and reviewed the document titled "Final Remedial Design for Soil, Sediment and Surface Water CC RVAAP-76 Depot Area." This document was prepared for the U.S. Army Corps of Engineers Louisville District, by Endpoint Consulting, Inc., 5 South Linden St., Suite 2, South San Francisco, CA 94080 and Alaniz Associates Corp., 21334 East Cloverton St., Covina, CA 91724.

Ohio EPA approves the document.

The Alaniz-Endpoint Team is contracted to conduct remediation work at a total of five areas of concern (AOCs). Ohio EPA is working with you on revising the sampling and analysis plan (SAP), which is contained in the Final RD for Load Line 9. Once revisions are made to the Endpoint 2020 SAP, it will apply to the RVAAP-76 Depot Area AOC and the other four AOCs.

As a precautionary response to COVID-19, Ohio EPA is currently operating with most staff working remotely. During this time, we will not be issuing hard-copy mail. This letter is an official response from Ohio EPA that will be maintained as a public record.

RECEIVED
MAR 2 6 2021

If you have any questions concerning this letter, please contact Edward D'Amato at (330) 963-1170, or via email at ed.damato@epa.ohio.gov.

Sincerely,

Edward J D'Amato

Edward D'Amato
Site Coordinator
Division of Environmental Response and Revitalization

ED/sc

ec: Katie Tait, OHARNG RTLS
Nat Peters, USACE
Steve Kvaal, USACE
Rebecca Shreffler, Chenega
Mark Leeper, ARNG
Natalie Oryshkewych, Ohio EPA, NEDO, DERR
Megan Oravec, Ohio EPA, NEDO, DERR
Bob Princic, Ohio EPA, NEDO, DERR
Susan Netzly-Watkins, Ohio EPA, DERR, NEDO
Tom Schneider, Ohio EPA, SWDO, DERR

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

March 19, 2021

Ohio Environmental Protection Agency
DERR-NEDO
Attn: Ed D'Amato
2110 East Aurora Road
Twinsburg, OH 44087-1924

Subject: Ravenna Army Ammunition Plant (RVAAP) Restoration Program, Portage/Trumbull Counties, Final Remedial Design for Soil, Sediment and Surface Water at CC RVAAP-76 Depot Area (Ohio EPA Work Flow Activity #267000859243)

Dear Mr. D'Amato:

Enclosed for Ohio EPA's files is 1 electronic copy (sent via the liquid file site) of the *Final Remedial Design for Soil, Sediment and Surface Water at CC RVAAP-76 Depot Area*. This document was prepared for the Army in support of the RVAAP Restoration Program.

Please contact the undersigned at 614-336-6000 Ex 2053 or kevin.m.sedlak.ctr@mail.mil if there are issues or concerns with this submission.

Sincerely,

SEDLAK.KEVIN.MICHAEL.1254440171 Digitally signed by SEDLAK.KEVIN.MICHAEL.1254440171 Date: 2021.03.19 09:08:08 -04'00'

Kevin Sedlak
RVAAP Restoration Program Manager
Army National Guard Directorate

cc: Bob Princic, Ohio EPA, NEDO, DERR
Tom Schneider, Ohio EPA, SWDO, DERR
Katie Tait, OHARNG, Camp James A. Garfield
Nathaniel Peters, USACE Louisville
Steve Kvaal, USACE Louisville
Rebecca Shreffler, Chenega
Jennifer Tierney, Vista Sciences Corporation
Pat Ryan, Leidos – REIMS

Ohio Environmental Protection Agency

**Mike DeWine**, Governor
**Jon Husted**, Lt. Governor
**Laurie A. Stevenson**, Director

March 11, 2021

**TRANSMITTED ELECTRONICALLY**

Kevin M. Sedlak
Army National Guard
Installations & Environment
Cleanup Branch IPA Designation
1438 State Route 534 SW
Newton Falls, OH 44444

RE: US Army Ravenna Ammunition Plt RVAAP
Remediation Response
Project Records
Remedial Response
Portage County
ID # 267000859243

**Subject: No Further Comments, Draft Remedial Design for Soil, Sediment and Surface Water at CC RVAAP-76 Depot Area Dated October 29, 2020**

Dear Mr. Sedlak:

The Ohio Environmental Protection Agency (Ohio EPA), Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR) has received and reviewed the Army's response to Ohio EPA's December 23, 2020 comment letter on the "Draft Remedial Design for Soil, Sediment, and Surface Water at CC RVAAP-76 Depot Area."

Below is the comment and the Army's response:

1. The print on page 92 (as numbered by the .pdf document) gives the soil volumes for removal and replacement. The excavation area for U-4 is given as 432 square feet. That value should be closer to 17,400 square feet to be consistent with a removal volume of 645 cubic yards. In addition, the clean fill replacement volumes are equal to the in-situ removal volumes. Given that the replacement fill is to be compacted, the clean fill volume could be greater that the removed volume by as much as 20%.

   **Army Response:** *The excavation area for Building U-4 specified on Drawing B-2 has been revised to 17,427 sq. ft., consistent with the approximate surface area provided on Figure 1-3 and Table 3-1. The clean fill replacement volumes have been updated to reflect approximately 775 cubic yards for Building U-4 and 585 cubic yards for Building U-5. See attached revised Drawing B-2.*

Ohio EPA accepts the Army's response. Please incorporate the above correction and submit the document in final form.

RECEIVED
MAR 12 2021

The Alaniz-Endpoint Team is contracted to conduct remediation work at a total of five areas of concern (AOCs). Ohio EPA has reviewed and commented on the remedial design (RD) for AOC Load Line 9 (LL9) and Wet Storage Area. We have also received the draft RDs for the NACA Test Area and Sand Creek Disposal Road Landfill.

In Ohio EPA's October 9, 2020 "Response to Comments of the Draft Remedial Design Work Plan for RVAAP Load Line 9," Ohio EPA commented on the Endpoint 2020 Sampling and Analysis Plan (SAP), specifically Appendix I, regarding quality assurance and quality control.

Ohio EPA is working with you on revising the SAP. Once revisions are made to the Endpoint 2020 SAP, the Endpoint 2020 SAP as revised applies to the other Alaniz-Endpoint contracted remediation work noted above.

As a precautionary response to COVID-19, Ohio EPA is currently operating with most staff working remotely. During this time, we will not be issuing hard-copy mail. This letter is an official response from Ohio EPA that will be maintained as a public record.

If you have any questions concerning this letter, please contact Edward D'Amato at (330) 963-1170, or via email at ed.damato@epa.ohio.gov.

Sincerely,

Edward J D'Amato

Edward D'Amato
Site Coordinator
Division of Environmental Response and Revitalization

ED/sc

ec: Katie Tait, OHARNG RTLS
Nat Peters, USACE
Steven Kvaal, USACE
Rebecca Shreffler, Chenega
Mark Leeper, ARNG
Natalie Oryshkewych, Ohio EPA, NEDO, DERR
Megan Oravec, Ohio EPA, NEDO, DERR
Bob Princic, Ohio EPA, NEDO, DERR
Susan Netzly-Watkins, Ohio EPA, DERR, NEDO
Tom Schneider, Ohio EPA, SWDO, DERR

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

January 28, 2021

Ohio Environmental Protection Agency
DERR-NEDO
Attn: Ed D'Amato
2110 East Aurora Road
Twinsburg, OH 44087-1924

Subject: Ravenna Army Ammunition Plant (RVAAP) Restoration Program, Portage/Trumbull Counties, Response to Comments on Draft Remedial Design for Soil, Sediment and Surface Water for CC RVAAP-76 Depot Area
(Ohio EPA Work Flow Activity #267000859243)

Dear Mr. D'Amato:

The Army National Guard (ARNG) has reviewed comments provided by the Ohio Environmental Protection Agency (Ohio EPA) for the *Draft Remedial Design for Soil, Sediment and Surface Water at CC RVAAP-76 Depot Area* (RD work plan) dated October 29, 2020.

The responses on the attached comment resolution table reflect ARNG responses to Ohio EPA comments received on December 23, 2020 regarding the subject RD work plan.

Please contact the undersigned at 614-336-6000 Ext 2053 or kevin.m.sedlak.ctr@mail.mil if there are issues or concerns with this submission.

Sincerely,

SEDLAK.KEVIN.MICHAEL.1254440171
Digitally signed by SEDLAK.KEVIN.MICHAEL.1254440171
Date: 2021.01.28 14:07:46 -05'00'

Kevin M. Sedlak
RVAAP Restoration Program Manager
Army National Guard Directorate

cc: Mark Leeper, ARNG
Bob Princic, Ohio EPA, NEDO, DERR
Tom Schneider, Ohio EPA, SWDO, DERR
Susan Netzly-Watkins, Ohio EPA, NEDO, DERR
Natalie Oryshkewych, Ohio EPA, NEDO, DERR
Megan Oravec, Ohio EPA, NEDO, DERR
Katie Tait, OHARNG, Camp James A. Garfield
Steve Kvaal, USACE Louisville
Nathaniel Peters, USACE Louisville
Rebecca Shreffler, Chenega
Pat Ryan, Leidos – REIMS

**Comment Resolution Table**

**Installation**: Camp James A. Garfield/Former RVAAP
**Document**: Draft Remedial Design Work Plan for CC RVAAP-76 Depot Area
**Reviewer(s)**: Ed D'Amato, Site Coordinator, Ohio EPA
**Date**: January 28, 2021

| Cmt. No. | Page or Sheet | Comment and Recommendation | Response |
|---|---|---|---|
| Ohio EPA 1 | Attachment B Drawing B-2 | The print on page 92 of the pdf gives the soil volumes for removal and replacement. The excavation area for U-4 is given as 432 sq. ft. That value should be closer to 17,400 sq. ft. to be consistent with a removal volume of 645 cu. yd. Second, the clean fill replacement volumes are equal to the in-situ removal volumes. Given that the replacement fill is to be compacted, the clean fill volume will be greater than the removed volume by as much as 20%. | The excavation area for Building U-4 specified on Drawing B-2 has been revised to 17,427 sq. ft., consistent with the approximate surface area provided on Figure 1-3 and Table 3-1.<br><br>The clean fill replacement volumes have been updated to reflect approximately 775 cubic yards for Building U-4 and 585 cubic yards for Building U-5.<br><br>See attached revised Drawing B-2. |

## GENERAL NOTES

SITE MUST ATTEND A DAILY HEALTH AND SAFETY

BY THE ALANIZ-ENDPOINT TEAM CONSTRUCTION

FOR THE DAY, POTENTIAL HAZARDS, ANTICIPATED

OR REMINDERS. THE ALANIZ-ENDPOINT TEAM CONSTRUCTION MANAGER IS RESPONSIBLE FOR

S GNATURES FROM ALL PERSONNEL WHO HAVE BEEN BRIEFED

8 ACCESS TO THE FORMER RVAAP/CAMP JAMES A. GARFIELD JOINT MILITARY TRAINING CENTER SHALL BE

BE REQUIRED TO ALLOW FOR DELAYS WITHOUT ADDITIONAL CHARGES

9

SITE-RELATED DOCUMENTS PREPARED BY PARSONS

FIELD CONDITIONS MAY BE ENCOUNTERED AND SHALL NOT CAUSE FOR ADDITIONAL CHARGES. THE ALANIZ-ENDPOINT TEAM SHALL VERIFY EXISTING

START OF CONSTRUCTION

10 THE ALANIZ-ENDPOINT TEAM SHALL CONTACT OHARNG PRIOR TO COORDINATING AND CONDUCTING UTILITY SURVEY AND CLEARANCES

11.

INITIATION OF ANY CONSTRUCTION ACTIVITY THAT MAY CAUSE EROS ON OR SEDIMENTATION. STORMWATER CONTROL MEASURES SHALL BE MAINTAINED AND REINSTALLED AS NECESSARY FOR THE DURATION OF CONSTRUCTION AND RESTORATION ACTIVITIES.

INCH OR MORE.

12.

INDICATED ON THE DRAWINGS, UNLESS FIELD

OF STORMWATER CONTROLS. EROS ON CONTROL MEASURES SHALL MEET ALL FEDERAL AND STATE REQUIREMENTS.

13 IF UNEXPECTED MATERIALS, SUCH AS EXPLOSIVE COMPONENTS, DRUMS CYLINDERS, ABANDONED PIPELINES, UTILITIES, ARCHEOLOGICAL ARTIFACTS OR HUMAN REMAINS ARE DISCOVERED DURING THE

AND THE ALANIZ-ENDPOINT TEAM SHALL NOT RESUME

OR THE OHARNG CULTURAL RESOURCE MANAGER AND THE ALANIZ-ENDPOINT TEAM

14. NO WORK SHALL TAKE PLACE DURING INCLEMENT

FOR EROS ON AND SEDIMENT RUNOFF.

15.

EXCESSIVE DUST, ADDITIONAL DUST CONTROLS OR CEASING WORK MAY BE REQUIRED AS DETERMINED BY THE ALANIZ-ENDPOINT TEAM

16

TRANSPORTATION GUIDELINES. THE ALANIZ-ENDPOINT TEAM SHALL ENSURE TRUCKS DO NOT LEAVE THE

17. THE ALANIZ-ENDPOINT TEAM SHALL INSPECT HAUL

TRACKED ONTO PUBLIC OR OHARNG ROADWAYS. ALL HAUL TRUCKS LOADS SHALL BE COVERED PRIOR TO DEPARTING PROJECT AREAS

REMOVING ANY MATERIAL/MUD SPILLED OR TRACKED ON

20. THE ALANIZ-ENDPOINT TEAM SHALL BE RESPONSIBLE FOR FOLLOWING ALL OHARNG, FEDERAL, STATE AND

ALL PERSONS AND PROPERTY. THE ALANIZ-ENDPOINT TEAM SHALL ALSO INITIATE, MAINTAIN AND SUPERVISE ALL SAFETY REQUIREMENTS AND PRECAUTIONS IN ACCORDANCE WITH THE SITE SAFETY AND HEALTH PLAN (SSHP).

21. A FIRST AID KIT AND HOSPITAL ROUTE MAP SHALL BE MAINTAINED ON-SITE BY THE ALANIZ-ENDPOINT TEAM DURING CONSTRUCTION ACTIVITIES.

22.

THE SSHP IS PRESENT ON-SITE AT ALL TIMES DURING CONSTRUCTION ACTIVITIES.

23. ALL EXCAVATION AREAS SHALL BE BACKFILLED WITH CLEAN SOIL IMPORTED FROM AN OFF-SITE / SOURCE AND GRADED TO MATCH EXISTING CONTOURS. ALL DISTURBED AREAS SHALL I ACCORDING TO TABLE 8-1 OF THE CC RVAA AREA REMEDIAL DESIGN.

## MATERIAL NOTES

1. EROSION AND SEDIMENTATION CONTROL PI AND ANCHORING SHALL BE COMPLETED IN / WITH THE MANUFACTURER RECOMMENDAT RELEVANT STATE OF OHIO REQUIREMENTS.

## LEGEND FOR ALL DRAWINGS

- ASPHALT ROADWAY
- PROJECT SITE
- HAUL ROUTE
- AREAS TO BE CLEARED AS NEEDED FOR ACCESS
- SOIL EXCAVATION AREA

## DRAWING INDEX


| | |
|---|---|
| B-1 | |
| B-2 | |
| | |


## LIST OF SUBMITTALS

1. SITE SAFETY AND HEALTH PLAN (SSHP)
2. ACCIDENT PREVENTION PLAN (APP)
3. WASTE PROFILES

## MEDIA, CHEMICALS OF CONCERN, AND CLEANUP GOALS

| AREA | MEDIA | CHEMICALS OF CONCERN |
|---|---|---|
| U-4 | SURFACE SOIL (0-1 ft. bgs) | PAHs |
| U-5 | SURFACE SOIL (0-1 ft. bgs) | PAHs |

CHEMICALS OF CONCERN WERE NOT IDENTIFIED FOR SUBSURFACE SOIL (1-13 FT BGS), SEDIMENT, OR SURFACE WATER.

| AREA | EXCAVATION AREA SQ. FT | ESTIMATED TREATMENT VOLUME CU. YD | ESTIMATED WASTE VOLUME CU. YD | ESTIMATED IMPORTED CLEAN FILL CU. YD |
|---|---|---|---|---|
| BUILDING U-4 | 17,427 | NA | 645 (in-situ) | 775 |
| BUILDING U-5 | 13,166 | NA | 488 (in-situ) | 585 |

1. ESTIMATED QUANTITIES MAY CHANGE DUE TO CONFIRMATION SAMPLING.
2. THE ALANIZ-ENDPOINT TEAM SHALL VERIFY QUANTITIES.

DES.GNED BY: | APPROVED BY:
DRAWN BY | CHECKED BY
SCALE: NOT TO SCALE | WES JOB/TASK#:
DATE: 08/24/2019 | PROJECT/CONTRACT NO.

| REV | DATE | DESCRIPTIONS | DRAWN BY | CHEC |
|---|---|---|---|---|

PROJECT: REMEDIAL DESIGN RVAAP-76 DEPOT AREA

DRAWING TITLE: GENERAL NOTES

US Army Corps of Engineers Louisville District

CLIENT: US Army Corps of Engineers, Former Ravenna Army Ammunition Plant/CJAG, Portage and Trumbull Counties, Ohio

Endpoint Strategy. Science. Sustainability

Basemap Source: Leidos, 2014. Remedial Design for Soil, Sediment and Surface Water at RVAAP-13 Building 1200 and RVAAP-48 Anchor Test Area. Drawn by P. Holm and Leidos, 2017. Final Proposed Plan for Soil, Sediment and Surface Water at RVAAP-42 Load Line 9. Drawn by P. Holm

Ohio Environmental Protection Agency

**Mike DeWine**, Governor
**Jon Husted**, Lt. Governor
**Laurie A. Stevenson**, Director

May 17, 2021

**RE: US Army Ravenna Ammunition**
**Remediation Response**
**Project Records**
**Remedial Response**
**Portage County**
**267000859216**

**Transmitted Electronically**

Kevin M. Sedlak
Army National Guard
Installations & Environment Cleanup Branch IPA Designation
1438 State Route 534 SW
Newton Falls, OH 44444

**Subject: Review of Final Remedial Action Completion Report for CC RVAAP-78 Quarry Pond Surface Dump**

Dear Mr. Sedlak:

The Ohio Environmental Protection Agency (Ohio EPA) Northeast District Office (NEDO) Division of Environmental Response and Revitalization (DERR) has reviewed Final Remedial Action Completion Report for CC RVAAP-78 Quarry Pond Surface Dump dated April 15, 2021.

Ohio EPA approves the document.

**As a precautionary response to COVID-19, Ohio EPA is currently operating with most staff working remotely. During this time, we will not be issuing hard-copy mail. This letter is an official response from Ohio EPA that will be maintained as a public record.**

If you have any questions, please feel free to contact me at (330) 963-1170 or by e-mail at ed.damato@epa.ohio.gov.

Sincerely,

Edward J D'Amato

Edward J. D'Amato
Site Coordinator
Division of Environmental Response and Revitalization

RECEIVED
MAY 17 2021

EJD/cs

ec: Nat Peters, USACE, nathaniel.peters.ii@usace.army.mil
Katie Tait, OHARNG RTLS, kathryn.s.tait.nfg@mail.mil
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Natalie Oryshkewych, Ohio EPA, NEDO DERR
Megan Oravec, Ohio EPA, NEDO DERR
Bob Princic, Ohio EPA, NEDO DERR
Tom Schneider, Ohio EPA, SWDO DERR
kevin.m.sedlak.civ@mail.mil

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

April 15, 2021

Ohio Environmental Protection Agency
DERR-NEDO
Attn: Mr. Ed D'Amato
2110 East Aurora Road
Twinsburg, OH 44087-1924

Subject: Ravenna Army Ammunition Plant (RVAAP) Restoration Program, Portage/Trumbull Counties, Final Remedial Action Completion Report (RACR) Non-Time Critical Removal Action for RVAAP-78 Quarry Pond Surface Dump (Ohio EPA Work Flow Activity 267000859216)

Dear Mr. D'Amato:

An electronic version of the *Final RACR for RVAAP-78 Quarry Pond Surface Dump, Ravenna Army Ammunition Plant Restoration Program, Camp James A. Garfield,* will be sent using the Ohio EPA Liquid File system. A hard copy and CDs will be sent when they are able to be received by the Ohio EPA. This document was prepared for the Army in support of the RVAAP Restoration Program.

Please contact the undersigned at (330) 235-2153 or ***kevin.m.sedlak.ctr@mail.mil*** if there are issues or concerns with this submission.

Sincerely,

SEDLAK.KEVIN.MICHAEL.1254440171 Digitally signed by SEDLAK.KEVIN.MICHAEL.1254440171 Date: 2021.04.15 12:34:43 -04'00'

Mr. Kevin Sedlak
RVAAP Restoration Program Manager
Army National Guard Directorate

cc: Bob Princic, Ohio EPA, NEDO, DERR
Tom Schneider, Ohio EPA, SWDO
Natalie Oryshkewych, Ohio EPA, NEDO
Mark Leeper, ARNG
Katie Tait, OHARNG, Camp James A. Garfield
Steven Kvaal, USACE Louisville
Nathaniel Peters, USACE Louisville
Jennifer Tierney, Vista Sciences Corporation
Pat Ryan, Leidos - REIMS

Ohio Environmental Protection Agency

**Mike DeWine**, Governor
**Jon Husted**, Lt. Governor
**Laurie A. Stevenson**, Director

April 13, 2021

**TRANSMITTED ELECTRONICALLY**

Mr. Kevin M. Sedlak
Army National Guard
Installations and Environment
Cleanup Branch IPA Designation
1438 State Route 534 SW
Newton Falls, OH 44444

RE: US Army Ravenna Ammunition
Remediation Response
Project Records
Remedial Response
Portage County
ID # 267000859216

**Subject: Review of Response to Comments, Draft Remedial Action Completion Report for CC RVAAP-78 Quarry Pond Surface Dump**

Dear Mr. Sedlak:

The Ohio Environmental Protection Agency (Ohio EPA), Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR) has reviewed the Army's February 25, 2021 response to comments on the Draft Remedial Action Completion Report for CC RVAAP-78 Quarry Pond Surface Dump. The responses are acceptable. Please submit the document in final form.

As a precautionary response to COVID-19, Ohio EPA is currently operating with most staff working remotely. During this time, we will not be issuing hard-copy mail. This letter is an official response from Ohio EPA that will be maintained as a public record. If you have any questions, please feel free to contact me at (330) 963-1170 or by email at ed.damato@epa.ohio.gov.

Sincerely,

Edward J D'Amato

Edward J. D'Amato
Site Coordinator
Division of Environmental Response and Revitalization

ED/sc

ec: Nat Peters, USACE
Steven Kvaal, USACE
Katie Tait, OHARNG RTLS
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Natalie Oryshkewych, Ohio EPA, NEDO, DERR
Megan Oravec, Ohio EPA, NEDO, DERR
Bob Princic, Ohio EPA, NEDO, DERR
Tom Schneider, Ohio EPA, SWDO, DERR

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APR 13 2021

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

February 23, 2021

Ohio Environmental Protection Agency
DERR-NEDO
Attn: Mr. Ed D'Amato
2110 East Aurora Road
Twinsburg, OH 44087-1924

Subject: Ravenna Army Ammunition Plant (RVAAP) Restoration Program, Portage/Trumbull Counties, Response to Comments for the Draft Remedial Action Completion Report (RACR) for the Non Time-Critical Removal Action for CC RVAAP-78 Quarry Pond Surface Dump (Ohio EPA Work Flow Activity #267000859216)

Dear Mr. D'Amato:

Thank you for your review of the *Draft Remedial Action Completion Report Non-Time Critical Removal Action Work Plan for CC RVAAP-78, Quarry Pond Surface Dump*. Please see the responses below to your comments.

"***1. Executive Summary:*** *Lines 324-326 of Section 3.3.2 states:* No confirmation samples were required to be collected from debris piles A and B because only surface debris was removed, and bedrock was encountered during removal. *The executive summary states that bedrock was encountered for debris pile A, but there is no mention of encountering bedrock in debris pile B.*

***Action Item:*** *Please make the language regarding debris pile B consistent between the two sections."*

**Response:** The approved Work Plan did not require samples to be collected from beneath Debris Piles A, B and C as the removal action targeted surficial debris piles at these areas of concern. Only two confirmation soil samples were planned for this remedial action, one from each 10x10 square foot excavation (TP-5 and C78SB-021M-0001-SO). As the comment is concerned with the discussion of why samples were not collected from the soils at former debris piles A and B, Section 3.3.2 Lines 324 – 326 has been changed for correctness to state that, "No confirmation samples were required to be collected from debris piles A and B" matching that of the Executive Summary.

***"2. Conclusion:*** *Lines 17 and 18 of the Executive Summary states:* Additional delineation will be required to determine the extent of buried ACM in Debris Pile. *The additional delineation required for debris pile C is an important point for the Conclusion section.*

***Action item:*** *Please add additional language in the Conclusion section explaining the additional delineation that is necessary and a general explanation of the Army's intended path forward for addressing the additional asbestos contamination.*"

**Response:** The following text will be added to the conclusion section: *The Army will proceed to a Remedial Investigation to investigate remaining asbestos debris associated with debris pile C. This RI will delineate the horizontal and vertical extent of the buried asbestos debris.*

Please contact the undersigned at (330) 235-2153 or ***kevin.m.sedlak.ctr@mail.mil*** if there are issues or concerns with this submission.

Sincerely,

SEDLAK.KEVIN.MICHAEL.1254440171

Digitally signed by SEDLAK.KEVIN.MICHAEL.1254440171
Date: 2021.02.24 08:22:02 -05'00'

Mr. Kevin Sedlak
RVAAP Restoration Program Manager
Army National Guard Directorate

cc: Bob Princic, Ohio EPA, NEDO, DERR
Tom Schneider, Ohio EPA, SWDO
Natalie Oryshkewych, Ohio EPA, NEDO
Mark Leeper, ARNG
Katie Tait, OHARNG, Camp James A. Garfield
Steven Kvaal, USACE Louisville
Nathaniel Peters, USACE Louisville
Jennifer Tierney, Vista Sciences Corporation
Pat Ryan, Leidos - REIMS

Ohio Environmental Protection Agency

**Mike DeWine**, Governor
**Jon Husted**, Lt. Governor
**Laurie A. Stevenson**, Director

February 19, 2021

**TRANSMITTED ELECTRONICALLY**

Mr. Kevin M. Sedlak
Army National Guard
Installations & Environment
Cleanup Branch IPA Designation
1438 State Route 534 SW
Newton Falls, OH 44444

RE: US Army Ravenna Ammunition
Remediation Response
Project Records
Remedial Response
Portage County
ID # 267000859216

**Subject: Review of Draft Remedial Action Completion Report for CC RVAAP-78 Quarry Pond Surface Dump**

Dear Mr. Sedlak:

The Ohio Environmental Protection Agency (Ohio EPA) Northeast District Office (NEDO) Division of Environmental Response and Revitalization (DERR) has reviewed the Draft Remedial Action Completion Report for CC RVAAP-78 Quarry Pond Surface Dump.

Ohio EPA has the following comments:

1. **Executive Summary:** Lines 324-326 of Section 3.3.2 states: *No confirmation samples were required to be collected from debris piles A and B because only surface debris was removed, and bedrock was encountered during removal.*

   The executive summary states that bedrock was encountered for debris pile A, but there is no mention of encountering bedrock in debris pile B.

   **Action Item:** Please make the language regarding debris pile B consistent between the two sections.

2. **Conclusion:** Lines 17 and 18 of the Executive Summary states: *Additional delineation will be required to determine the extent of buried ACM in Debris Pile.* The additional delineation required for debris pile C is an important point for the Conclusion section.

   **Action item:** Please add additional language in the Conclusion section explaining the additional delineation that is necessary and a general explanation of the Army's intended path forward for addressing the additional asbestos contamination.

RECEIVED
FEB 19 2021

As a precautionary response to COVID-19, Ohio EPA is currently operating with most staff working remotely. During this time, we will not be issuing hard-copy mail. This letter is an official response from Ohio EPA that will be maintained as a public record.

If you have any questions, please feel free to contact me at (330) 963-1170, or by email at ed.damato@epa.ohio.gov.

Sincerely,

Edward J D'Amato

Edward J. D'Amato
Site Coordinator
Division of Environmental Response and Revitalization

ED/sc

ec: Katie Tait, OHARNG RTLS
Nat Peters, USACE
Steve Kvaal, USACE
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Natalie Oryshkewych, Ohio EPA, NEDO, DERR
Megan Oravec, Ohio EPA, NEDO, DERR
Bob Princic, Ohio EPA, NEDO, DERR
Tom Schneider, Ohio EPA, SWDO, DERR

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

January 7, 2021

Ohio Environmental Protection Agency
DERR-NEDO
Attn: Mr. Ed D'Amato
2110 East Aurora Road
Twinsburg, OH 44087-1924

Subject: Ravenna Army Ammunition Plant (RVAAP) Restoration Program, Portage/Trumbull Counties, Draft Remedial Action Completion Report (RACR), Non Time-Critical Removal Action for CC RVAAP-78 Quarry Pond Surface Dump. (Ohio EPA Work Flow Activity #267000859216)

Dear Mr. D'Amato:

An electronic version of the Draft RACR for CC RVAAP-78 Quarry Pond Surface Dump, Ravenna Army Ammunition Plant Restoration Program, Camp James A. Garfield, will be sent using the Ohio EPA Liquid File system. A hard copy and CDs will be sent when they are able to be received by the Ohio EPA. This document was prepared for the Army in support of the RVAAP Restoration Program.

Please contact the undersigned at (330) 235-2153 or kevin.m.sedlak.ctr@mail.mil if there are issues or concerns with this submission.

Sincerely,

SEDLAK.KEVIN.MICHAEL.1254440171 Digitally signed by SEDLAK.KEVIN.MICHAEL.1254440171 Date: 2021.01.07 10:50:04 -05'00'

Mr. Kevin Sedlak
RVAAP Restoration Program Manager
Army National Guard Directorate

cc: Bob Princic, Ohio EPA, NEDO, DERR
Tom Schneider, Ohio EPA, SWDO
Natalie Oryshkewych, Ohio EPA, NEDO
Mark Leeper, ARNG
Katie Tait, OHARNG, Camp James A. Garfield
Steven Kvaal, USACE Louisville
Nathaniel Peters, USACE Louisville
Jennifer Tierney, Vista Sciences Corporation
Pat Ryan, Leidos - REIMS

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

August 25, 2021

Ohio Environmental Protection Agency
DERR-NEDO
Attn: Edward J. D'Amato
2110 East Aurora Road
Twinsburg, OH 44087-1924

Subject: Former Ravenna Army Ammunition Plant (RVAAP) Restoration Program Draft RI Addendum/ Draft Feasibility Study, CC RVAAP-79 DLA Ore Storage Sites, Ore Storage Pond Sub-Area Portage/Trumbull Counties, Ohio EPA ID # 267-000859-211

Dear Mr. D'Amato:

The Army appreciates the recent opportunity during the August 20, 2021 Conference Call to discuss the Ohio EPA's concerns regarding the Draft Remedial Investigation (RI) Addendum for the CC RVAAP-79 DLA Ore Storage Sites, Ore Storage Pond Sub-Area. Additionally, Ohio EPA expressed concern that new sediment data from the Ore Storage Pond collected for the bioassays may impact the conclusions of the Human Health Risk Assessment for the Ore Storage Pond in the Final 2020 RI (*approved December 17, 2020)*.

The Army proposes the following approach to continue to make progress on this Area of Concern (AOC) while providing a process to address the Ohio EPA's concerns that were provided for discussion on August 20, 2021. The Army plans to address all the concerns provided by the Ohio EPA, in the proposed following approach.

1.) CC RVAAP-79 RI Addendum for Ore Storage Pond

- Ohio EPA should stop review of the Draft CC RVAAP-79 RI Addendum.
- Army will revise the RI Addendum as follows:

  1.) The findings will be revised to state that the "No Further Action" determination only applies for ecological receptors and that no further remedial actions are warranted to address ecological risk.

  2.) A statement, where appropriate, will be added to state:
  *"Because the additional data for the Ore Storage Pond sediments collected for this RI Addendum, has concentrations of arsenic that are greater than those used to estimate risks to Human Health Receptors in the CC RVAAP-79 RI, these potential risks need to be reassessed considering the new sediment and pond data. Since the CC RVAAP-79 RI has been finalized, the Army will revise the Draft CC RVAAP-79 Feasibility (FS) to include a reassessment of potential human health risks for current and future receptors of the Ore Storage Pond that includes the new data collected for this RI Addendum. The revised HHRA will be incorporated into the Risk Management Portion of the CC RVAAP-79 FS."*

2.) CC RVAAP-79 RI (*approved December 17, 2020)*

- • No change proposed.

3.) CC RVAAP-79 FS (draft and under review by the Ohio EPA)

- Ohio EPA should stop review of this Draft document.
- Army will revise the FS to include a revised Baseline Human Health Risk Assessment for the Ore Storage Pond using all available data (previously and newly collected for CC RVAAP-79 RI Addendum).
- Army will revise the FS to address the applicable Ohio EPA's comments provided on August 20, 2021.
- Army will redevelop Alternatives.
- Army will resubmit revised Draft FS.

If this approach is acceptable, please provide a notification of agreement and the Army will proceed as proposed. Please contact the undersigned at kevin.m.sedlak.ctr@mail.mil or (614) 336-6000 ext 2053 if there are concerns or if you would like to discuss the proposed approach.

Sincerely,

SEDLAK.KEVIN.MICHAEL.1254440171

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Date: 2021.08.25 13:16:29 -04'00'

Kevin Sedlak
RVAAP Restoration Program Manager
Army National Guard Directorate

cc: Tom Schneider, Ohio EPA, SWDO
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Megan Oravec, Ohio EPA, DERR-NEDO
Mark Leeper, ARNG
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Patrick Ryan, Leidos

**NATIONAL GUARD BUREAU**
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July 23, 2021

Ohio Environmental Protection Agency
DERR-NEDO
Attn: Edward J. D'Amato, Site Coordinator
2110 East Aurora Road
Twinsburg, Ohio 44087-1924

Subject: Responses to Comments (dated July 15, 2021) on the *Draft Feasibility Study for CC RVAAP-79 DLA Ore Storage Sites*, dated June 1, 2021, for the Ravenna Army Ammunition Plant (RVAAP) Restoration Program, Portage/Trumbull Counties, Ohio. Ohio EPA ID# 267000859258

Dear Mr. D'Amato:

The Army appreciates your time and comments (dated July 15, 2021) on the *Draft Feasibility Study for CC RVAAP-79 DLA Ore Storage Sites*, dated June 1, 2021. Enclosed for your review are responses to your comments.

Upon final resolution of these responses to comments, the Army will update conclusions, and distribute final version of this report for Ohio EPA approval.

Please contact the undersigned at (614) 336-6000 Ext 2053 or kevin.m.sedlak.ctr@mail.mil if there are issues or concerns with this submission.

Sincerely,

SEDLAK.KEVIN.MICHAEL.1254440171
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Date: 2021.07.23 10:13:41 -04'00'

Kevin Sedlak
RVAAP Restoration Program Manager

ec. Tom Schneider, Ohio EPA SWDO
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Bob Princic, Ohio EPA, NEDO, DERR
Megan Oravec, Ohio EPA, DERR-NEDO
Mark Leeper, ARNG
Katie Tait, OHARNG
Kevin Mieczkowski, USACE Louisville
Steven Kvaal, USACE Louisville
Jennifer Tierney, Vista Sciences
Patrick Ryan, Leidos
Ed Heyse, Parsons

**Responses to Ohio EPA Comments (dated July 15, 2021)**
***Draft Feasibility Study for CC RVAAP-79 DLA Ore Storage Sites, Ravenna Army Ammunition Plant Restoration Program, Portage and Trumbull Counties, Ohio,* June 1, 2021.**
**Ohio EPA ID# 267000859258**

1) **Risk management and use of the National Contingency Plan (NCP) risk range.** Section 2.4 should be significantly revised or removed and replaced with the background screening for arsenic using the background level of 19.8 mg/kg. It should be noted that mean values are generally not used to evaluate background values with decision units (DU) or area of concern (AOC) concentrations. However, Table 2-2 and its results are acceptable and should be retained in the revised feasibility study (FS).

   Risk management as used in the FS (Section 2.4) should be revised to exclude comparisons to values based on 1 E-4 excess lifetime cancer risk (ELCR) and hazard quotient (HQ) of other than one (e.g., removal management levels (RMLs)) for all land uses. DUs excluded from evaluation in the draft FS based on this approach should be retained in the revised draft FS. This includes subsurface soils with arsenic concentrations greater than background concentrations. Section 2.4.2 should be removed from the draft FS. This includes removing Tables 2-3 and 2-4.

   It is not clear why this approach was used in the draft FS as a fixed 1 E-5 risk goal has been well established in RVAAP AOCs for decision making. In addition, all remedial goals are to be based on an ELCR of 1E-5 or HQ=1 as provided in multiple RVAAP specific memorandum and Ohio EPA Technical Decision Compendium: HH Cumulative Care Risk and Non-Care Hazard Goals.pdf (Ohio.gov).

   ***Response: Clarification.*** *The DoD follows CERCLA and the NCP. The NCP discusses a generally acceptable risk range for the ELCR from $10^{-4}$ to $10^{-6}$ and HQ = 1. The USEPA has further clarified the extent of the acceptable risk range by stating that the upper boundary generally is not a discrete line at $1\times10^{-4}$. Risks slightly greater than $1\times10^{-4}$ may be considered to be acceptable (i.e., protective) if justified based on site-specific conditions, including any uncertainties about the nature and extent of contamination and associated risks. [See Role of the Baseline Risk Assessment in Superfund Remedy Selection Decisions (U.S. EPA, 1991)]. Therefore, the Army believes that comparison to the NCP acceptable risk range is appropriate for inclusion in the FS and provides valuable information for the Army's future risk management decisions.*

   *The Army understands that Ohio EPA is mandating use of risk goals based on ECLR of $10^{-5}$, HQ = 1 or background as cited in the document: Human Health Cumulative Carcinogenic Risk and Non-carcinogenic Hazard Goals for the DERR Remedial Response Program dated 21 August 2009. However, the referenced document goes on to say that "The defined risk and hazard goals should be applied as a goal, recognizing the need to retain flexibility during the evaluation and selection of remedial alternatives." Given the site conditions, former release mechanisms, and distribution of the arsenic concentrations, the Army believes this approach (using the mandated $10^{-5}$ ELCR) is overly conservative for subsurface soil at DU13 at the Main Storage Area.*

   *The Army will retitle and revise to Section 2.4 to address Ohio EPA concerns. The revised text (see below) will not eliminate any DUs based solely on NCP acceptable risk range. The COCs for the NGT/Industrial Receptors will be retained and will be incorporated into the evaluation of alternatives (e.g., we will add limitations on Military Training Land Use under the LUCs alternative). The Army has added some new text (new section 2.4.3) to address why we believe risks based on exposures to*

*contaminants in subsurface soil are overly conservative and why we believe that no further action is necessary for subsurface soil at Main Source Area DU13:*

### 2.4.2 Comparison of the Risks at Decision Units to NCP Acceptable Risk Range for Additional Risk Management Information

In accordance with NCP subpart 300.430(e)(2)(i)(A)(2) and Office of Solid Waste and Emergency Response (OSWER) Directive 9355.0-30, if site conditions present an acceptable risk based on the reasonable maximum exposure for current and future exposures, then a response action generally is not required. The acceptable risk ranges include the situation where the excess cumulative upper-bound lifetime cancer risk to an individual is between $10^{-4}$ and $10^{-6}$ and the HQ/hazard index for non-cancer adverse effects is equal to or less than 1. The Ohio EPA has adopted the excess lifetime cancer risk (ELCR) as $1\times 10^{-5}$, as cited in the document: *Human Health Cumulative Carcinogenic Risk and Non-carcinogenic Hazard Goals for the DERR Remedial Response Program* dated 21 August 2009. The cumulative cancer risk and non-cancer adverse effects were calculated for each DU where COCs were identified, to determine if site conditions present acceptable risk. Risk and cumulative HQ are calculated using soil RSLs for Resident and Composite Worker Receptors. Risks for Resident Receptors are presented in Table 2-3 and risks for NGT/Industrial Receptors are presented in Table 2-4.

Risks to the Residential Receptor posed by arsenic in subsurface soil at Main Storage Area DU13 is within the NCP acceptable risk range but slightly exceeds the $1\times10^{-5}$ acceptable ELCR that Ohio EPA uses. Risks to the NGT/Industrial Receptor posed by arsenic in surface and subsurface soil are within the NCP acceptable risk range for all DUs. Based on this evaluation, the Army further evaluated the risk management decision for arsenic in subsurface soil at Main Storage Area DU13 to determine if the subsurface soil (after a removal action of the surface soil) presents likely risks.

### 2.4.3 Exposure Scenarios and Considerations for Contacting Arsenic in Subsurface Soil

Arsenic in subsurface soil at Main Storage Area DU13 exceeds the background concentration for arsenic at the former RVAAP (19.8 mg/kg) by less than a factor of three. Risk to human health from arsenic exceeds an ECLR of $10^{-5}$ but is within the NCP acceptable risk range of $10^{-4}$ to $10^{-6}$. The calculated risk is based on conservative assumptions about exposure of residential, NGT or industrial receptors to subsurface soil. While exposure to contaminants in surface soil can occur on an on-going basis, exposure to contaminants in subsurface soil is incidental and infrequent. Arsenic is not volatile and will not migrate in the gas phase into indoor air of homes or basements. Future residents may till surface soil for gardens but will only infrequently dig deeper than one foot bgs. The NGT receptors normally do not encounter the subsurface soil. The NGT's exposure scenario included subsurface soil because they may have to occasionally dig in the soil to free tracked vehicles that become stuck in the mud (an infrequent and transient occurrence). Industrial receptors would only dig below one foot bgs to work on buried utilities (currently no subsurface utilities located on site). Given the low frequency of exposure, consideration that the 0 to 1 foot of surface soil would be removed (source removal), plus the risks are only slightly greater than $1.0\times10^{-5}$ (and within the upper end of the NCP acceptable risk range (ELCR of $10^{-4}$)), the DU13 subsurface soil should not be remediated to meet Unrestricted (Residential) Land Use. Because exposure to subsurface soil would be limited and the risks are within the NCP acceptable risk range (only slightly exceeding the $1\times10^{-5}$), no additional action for the 4.2 acres of subsurface soil is warranted once the surface soil is removed. Therefore, the Army concludes that no further remedial action is

necessary to address subsurface soil at Main Storage Area DU13, if the selected alternative remediates surface soil at that location.

2) **Remedial Action Objectives (RAOs) and Remediation Levels.** Revise Section 3.0 to include cleanup levels for National Guard Trainee (NGT) and commercial and industrial receptors as they were inappropriately excluded from the draft FS. In addition, the arsenic cleanup goal for residential receptors is the background value of 19.8 mg/kg.

   Section 3.3 should also be corrected to only include remedial goals based on ELCR of 1 E-5 and HQ=1 for residential, NGT, and commercial/industrial receptors (see facility wide cleanup goals (FWCUGs) and regional screening levels (RSLs) as described above). Background level of arsenic may be used if greater than the risk-based remedial goals. The RML information should be removed from the next FS draft.

   Section 3.4 requires revisions on the volumes for removals based on corrected remedial goals and soil depths. This also includes the addition of the commercial/industrial receptors that will be included in the next draft FS. These changes will also require full scale revisions to the cost estimates for technologies as part of the detailed analysis step of the FS.

   ***Response*: Clarification.** *Cleanup levels are set to be protective of the Residential Receptor. Cleanup levels that are protective of the Residential Receptor are also protective of the NGT, Industrial and Commercial Receptors. The purpose of showing various potential RGs is to demonstrate the wide range of potential RGs and also to show that RGs set for the Residential Receptor are protective of NGT/Industrial Receptors.*

   *The Army will adjust RGs to be consistent with Residential RSLs or FWCUGs set at ELCR of $10^{-5}$ or HQ =1 (whichever is less) or background if risk-based levels are below background. RGs will be adjusted as follows:*

   - *Arsenic RG = 19.8 mg/kg (based on RVAAP background)*
   - *Manganese RG = 3,030 mg/kg (based on RVAAP background)*
   - *Antimony RG = 31 mg/kg (no change to FS).*

   *Tables 3-1 through 3-4 and accompanying text will be revised to indicate these revised RGs. Note that the only impact to the DUs requiring remediation is that Concrete Storage Pad Area DU29 will now require remediation. Table 3-5 will be revised to include the volume of soil to be addressed at Concrete Storage Pad Area DU29. Costs will be revised to include this additional volume of soil to be remediated.*

3) **Table 5-1 and Remedial Technologies.** Regarding Table 5-1 under Institutional Controls, Access Restrictions: Please clarify that the use of a fence would also require land use controls. A fence cannot be the only remedial element.

   Volumes of soil treated/excavated and related cost all need to be revised based on the comments above.

   ***Response*: Agree.** *A sentence is added to Table 5-1 to indicate that use of a fence would be considered for implementation only in conjunction with LUCs.*

   *Volume of soil to be treated/excavated and all costs will be revised to include Concrete Storage Pad Area DU29 surface soil.*

Ohio Environmental Protection Agency

**Mike DeWine**, Governor
**Jon Husted**, Lt. Governor
**Laurie A. Stevenson**, Director

July 15, 2021

**TRANSMITTED ELECTRONICALLY**

Mr. Kevin M. Sedlak
Army National Guard
Installations & Environment -
Cleanup Branch IPA Designation
1438 State Route 534 SW
Newton Falls, OH 44444

RE: US Army Ravenna Ammunition Plt RVAAP
Remediation Response
Project Records
Remedial Response
Portage County
ID # 267000859258

**Subject: Review of Draft Feasibility Study for CC RVAAP-79 DLA Ore Storage Sites**

Dear Mr. Sedlak:

The Ohio Environmental Protection Agency (Ohio EPA) has reviewed the Draft Feasibility Study for CC RVAAP-79 DLA Ore Storage Sites dated June 1, 2021. The document was prepared by Parsons.

Ohio EPA has the following comments:

1) **Risk management and use of the National Contingency Plan (NCP) risk range.** Section 2.4 should be significantly revised or removed and replaced with the background screening for arsenic using the background level of 19.8 mg/kg. It should be noted that mean values are generally not used to evaluate background values with decision units (DU) or area of concern (AOC) concentrations. However, Table 2-2 and its results are acceptable and should be retained in the revised feasibility study (FS).

   Risk management as used in the FS (Section 2.4) should be revised to exclude comparisons to values based on 1E-4 excess lifetime cancer risk (ELCR) and hazard quotient (HQ) of other than one (*e.g.*, removal management levels (RMLs)) for all land uses. DUs excluded from evaluation in the draft FS based on this approach should be retained in the revised draft FS. This includes subsurface soils with arsenic concentrations greater than background concentrations. Section 2.4.2 should be removed from the draft FS. This includes removing Tables 2-3 and 2-4.

   It is not clear why this approach was used in the draft FS as a fixed 1E-5 risk goal has been well established in RVAAP AOCs for decision making. In addition, all remedial goals are to be based on an ELCR of 1E-5 or HQ=1 as provided in multiple RVAAP specific memorandum and Ohio EPA Technical Decision Compendium: HH Cumulative Carc Risk and Non-Carc Hazard Goals.pdf (ohio.gov).

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JUL 15 2021

2) **Remedial Action Objectives (RAOs) and Remediation Levels.**
Revise Section 3.0 to include cleanup levels for National Guard Trainee (NGT) and commercial and industrial receptors as they were inappropriately excluded from the draft FS. In addition, the arsenic cleanup goal for residential receptors is the background value of 19.8 mg/kg.

Section 3.3 should also be corrected to only include remedial goals based on ELCR of 1E-5 and HQ=1 for residential, NGT, and commercial/industrial receptors (see facility wide cleanup goals (FWCUGs) and regional screening levels (RSLs) as described above). Background level of arsenic may be used if greater than the risk-based remedial goals. The RML information should be removed from the next FS draft.

Section 3.4 requires revisions on the volumes for removals based on corrected remedial goals and soil depths. This also includes the addition of the commercial/industrial receptors that will be included in the next draft FS. These changes will also require full scale revisions to the cost estimates for technologies as part of the detailed analysis step of the FS.

3) **Table 5-1 and Remedial Technologies.**
Regarding Table 5-1 under Institutional Controls, Access Restrictions: Please clarify that the use of a fence would also require land use controls. A fence cannot be the only remedial element.

Volumes of soil treated/excavated and related cost all need to be revised based on the comments above.

This letter is an official response from Ohio EPA that will be maintained as a public record.

If you have any questions concerning this letter, please contact me at (330) 963-1170 or via email at ed.damato@epa.ohio.gov.

Sincerely,

Edward J D'Amato

Edward D'Amato
Site Coordinator
Division of Environmental Response and Revitalization

ED/sc

ec: Nat Peters, USACE
Steven Kvaal, USACE
Katie Tait, OHARNG RTLS
Rebecca Shreffler, Chenega
Mark Leeper, ARNG
Natalie Oryshkewych, Ohio EPA, NEDO, DERR
Megan Oravec, Ohio EPA, NEDO, DERR
Bob Princic, Ohio EPA, NEDO, DERR
Susan Netzly-Watkins, Ohio EPA, NEDO, DERR
Tom Schneider, Ohio EPA, DERR, SWDO
Brian Tucker, Ohio EPA, DERR, CO

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

July 14, 2021

Ohio Environmental Protection Agency
DERR-NEDO
Attn: Edward J. D'Amato
2110 East Aurora Road
Twinsburg, OH 44087-1924

Subject: Ravenna Army Ammunition Plant (RVAAP) Restoration Program
Analytical Results for the April 20, 2021 Sediment Sampling Event for the
Draft Remedial Investigation Addendum Report for CC RVAAP-79 DLA Ore Storage Sites, Ore Storage Pond Sub-Area
Portage/Trumbull Counties, Contract Number W912QR-12-D-0002, Delivery Order 0003, Ohio EPA ID # 267-000859-258

Dear Mr. D'Amato:

An electronic version of the analytical results for the April 20, 2021 sediment sampling event for the Draft Remedial Investigation for Addendum Report for CC RVAAP-79 DLA Ore Storage Sites, Ore Storage Pond Sub-Area at the former Ravenna Army Ammunition Plant (RVAAP) will be uploaded for your review to the Ohio EPA LiquidFile Site. A hard copy and CD will be sent when they are able to be received by the Ohio EPA. Please contact the undersigned at (614) 336-6000 Ex 2053 or kevin.m.sedlak.ctr@mail.mil if there are issues or concerns with this submission.

Sincerely,

SEDLAK.KEVIN.MICHAEL.1254440171
Digitally signed by SEDLAK.KEVIN.MICHAEL.1254440171
Date: 2021.07.15 07:26:36 -04'00'

Kevin Sedlak
RVAAP Restoration Program Manager

Attachment

cc: Tom Schneider, Ohio EPA, DERR-SWDO (email transmittal letter only)
Bob Princic, Ohio EPA, DERR-NEDO (email transmittal letter only)
Natalie Oryshkewych, Ohio EPA, DERR-NEDO (email transmittal letter only)
Megan Oravec, Ohio EPA, DERR-NEDO (email transmittal letter only)
Katie Tait, OHARNG (one [1] electronic copy)
Mark Leeper, ARNG (one [1] electronic copy)
Kevin Mieczkowski, USACE Louisville (one [1] electronic copy, one [1] hard copy)
Steven Kvaal, USACE Louisville (email transmittal letter only)
Jennifer Tierney, Vista Sciences (one [1] electronic copy)
Patrick Ryan, Leidos (email transmittal letter only)
Ed Heyse, Parsons (one [1] electronic copy)

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

July 08, 2021

Ohio Environmental Protection Agency
DERR-NEDO
Attn: Edward J. D'Amato
2110 East Aurora Road
Twinsburg, OH 44087-1924

Subject: Ravenna Army Ammunition Plant (RVAAP) Restoration Program
Draft Remedial Investigation Addendum Report for CC RVAAP-79 DLA Ore Storage Sites, Ore Storage Pond Sub-Area
Portage/Trumbull Counties, Contract Number W912QR-12-D-0002, Delivery Order 0003, Ohio EPA ID # 267-000859-258

Dear Mr. D'Amato:

An electronic version of the Draft Remedial Investigation for Addendum Report for CC RVAAP-79 DLA Ore Storage Sites, Ore Storage Pond Sub-Area at the former Ravenna Army Ammunition Plant (RVAAP) will be uploaded for your review to the Ohio EPA LiquidFile Site. A hard copy and CD will be sent when they are able to be received by the Ohio EPA. This document recommends no further action for Ore Storage Pond sediments.

This report was prepared by Parsons in support of the RVAAP cleanup program. Please contact the undersigned at (614) 336-6000 Ex 2053 or kevin.m.sedlak.ctr@mail.mil if there are issues or concerns with this submission.

Sincerely,

SEDLAK.KEVIN.MICHAEL.1254440171
Digitally signed by SEDLAK.KEVIN.MICHAEL.1254440171
Date: 2021.07.08 14:23:57 -04'00'

Kevin Sedlak
RVAAP Restoration Program Manager

Attachment

cc: Tom Schneider, Ohio EPA, DERR-SWDO (email transmittal letter only)
Bob Princic, Ohio EPA, DERR-NEDO (email transmittal letter only)
Natalie Oryshkewych, Ohio EPA, DERR-NEDO (email transmittal letter only)
Megan Oravec, Ohio EPA, DERR-NEDO (email transmittal letter only)
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Kevin Mieczkowski, USACE Louisville (one [1] electronic copy, one [1] hard copy)
Steven Kvaal, USACE Louisville (email transmittal letter only)
Jennifer Tierney, Vista Sciences (one [1] electronic copy)
Patrick Ryan, Leidos (email transmittal letter only)
Ed Heyse, Parsons (one [1] electronic copy)

401 Diamond Drive, NW | Huntsville, Alabama 35806
Direct: +1 256.217.25730 / Office: +1 256.837.5200 / parsons.com

**June 10, 2021**

United States Army Corps of Engineers, Louisville District
ATTN: Mr. Kevin Mieczkowski
600 Dr. Martin Luther King, Jr. Place
Room 708
Louisville, Kentucky 40202
(502) 315-6324

Subject: Preliminary Draft Remedial Investigation Addendum Report
CC RVAAP-79 DLA Ore Storage Sites, Ore Storage Pond Sub-Area
Ravenna Army Ammunition Plant Restoration Program
Portage and Trumbull Counties, Ohio
Contract No.W912QR-12-D-0002, Delivery Order 0003

Dear Mr. Mieczkowski,

Parsons has prepared the Preliminary Draft Remedial Investigation (RI) Report for CC RVAAP-79 Ore Storage Pond in accordance with the Performance Work Statement Modification 08. Enclosed for your approval are one hard copy and one CD of the Preliminary Draft RI Addendum. This document recommends no further action for Ore Storage Pond sediments. The distribution to other team members is shown below.

As agreed in discussion with Angela Schmidt on 1 June 2021, the main text of the report only presents the results of the bioassays as these results dictate the no further action decision. Parsons scope also included chemical analyses of sediment and wetlands delineation to support an FS (if needed). Parsons included the results of chemical analyses of sediment and wetlands delineation in Appendices D and E respectively for the Army's consideration. These appendices may be deleted from the report if the Army deems them not relevant.

If you have any questions or comments, please contact me at (303) 563-9452 or email ed.heyse@parsons.com.

Sincerely,

PARSONS GOVERNMENT SERVICES INC.

Edward Heyse, PhD, PE
Project Manager

C: Kevin Sedlak, ARNG, (one [1] electronic copy)
Katie Tait, OHARNG, (one [1] electronic copy)
Mark Leeper, ARNG, (one [1] electronic copy)
Jennifer Tierney, Vista Science Corp. (one [1] electronic copy)
Angela Schmidt, USACE – Louisville (one [1] electronic copy)
Pat Ryan, Leidos-REIMS (Email Transmittal Letter Only)
Steven Kvaal, USACE – Louisville (Email Transmittal Letter Only)

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

June 2, 2021

Ohio Environmental Protection Agency
DERR-NEDO
Attn: Edward J. D'Amato
2110 East Aurora Road
Twinsburg, OH 44087-1924

Subject: Ravenna Army Ammunition Plant (RVAAP) Restoration Program
Draft Feasibility Study for CC RVAAP-79 DLA Ore Storage Sites
Portage/Trumbull Counties, Contract Number W912QR-12-D-0002, Delivery Order 0003, Ohio EPA ID # 267-000859-258

Dear Mr. D'Amato:

An electronic version of the Draft Feasibility Study for CC RVAAP-79 DLA Ore Storage Sites at the former Ravenna Army Ammunition Plant (RVAAP) will be uploaded for your approval to the Ohio EPA LiquidFile Site. A hard copy and CD will be sent when they are able to be received by the Ohio EPA. This document recommends excavation and off-site disposal of contaminated soil to meet Unrestricted (Residential) Land Use.

This report was prepared by Parsons in support of the RVAAP cleanup program. Please contact the undersigned at (614) 336-6000 Ex 2053 or kevin.m.sedlak.ctr@mail.mil if there are issues or concerns with this submission.

Sincerely,

SEDLAK.KEVIN.MICHAEL.1254440171
Digitally signed by SEDLAK.KEVIN.MICHAEL.1254440171
Date: 2021.06.02 10:56:09 -04'00'

Kevin Sedlak
RVAAP Restoration Program Manager

Attachment

cc: Tom Schneider, Ohio EPA, DERR-SWDO (email transmittal letter only)
Bob Princic, Ohio EPA, DERR-NEDO (email transmittal letter only)
Natalie Oryshkewych, Ohio EPA, DERR-NEDO (email transmittal letter only)
Megan Oravec, Ohio EPA, DERR-NEDO (email transmittal letter only)
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Jennifer Tierney, Vista Sciences (one [1] electronic copy)
Patrick Ryan, Leidos (email transmittal letter only)
Ed Heyse, Parsons (one [1] electronic copy)

Ohio Environmental Protection Agency

**Mike DeWine**, Governor
**Jon Husted**, Lt. Governor
**Laurie A. Stevenson**, Director

April 12, 2021

**TRANSMITTED ELECTRONICALLY**

Mr. Kevin M. Sedlak
Army National Guard
Installations & Environment
Cleanup Branch IPA Designation
1438 State Route 534 SW
Newton Falls, OH 44444

RE: US Army Ravenna Ammunition Plt RVAAP
Remediation Response
Project Records
Remedial Response
Portage County
ID # 267000859258

**Subject: Review of Final Work Plan Addendum: Additional Sampling for CC RVAAP-79 DLA Ore Storage Sites Remedial Investigation, Ore Storage Pond Sub-Area**

Dear Mr. Sedlak:

The Ohio Environmental Protection Agency (Ohio EPA) has reviewed the Final Work Plan Addendum: Additional Sampling for CC RVAAP-79 DLA Ore Storage Sites Remedial Investigation, Ore Storage Pond Sub-Area, dated March 24, 2021. Ohio EPA approves the document.

As a precautionary response to COVID-19, Ohio EPA is currently operating with most staff working remotely. During this time, we will not be issuing hard-copy mail. This letter is an official response from Ohio EPA that will be maintained as a public record. If you have any questions concerning this letter, please contact me at (330) 963-1170 or via email at ed.damato@epa.ohio.gov.

Sincerely,

Edward J D'Amato

Edward D'Amato
Site Coordinator
Division of Environmental Response and Revitalization

ED/sc

ec: Nat Peters, USACE
Steven Kvaal, USACE
Katie Tait, OHARNG RTLS
Rebecca Shreffler, Chenega
Mark Leeper, ARNG
Natalie Oryshkewych, Ohio EPA, NEDO, DERR
Megan Oravec, Ohio EPA, NEDO, DERR
Bob Princic, Ohio EPA, NEDO, DERR
Susan Netzly-Watkins, Ohio EPA, DERR, NEDO
Tom Schneider, Ohio EPA, DERR, SWDO
Brian Tucker, Ohio EPA, DERR, CO

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

March 26, 2021

Ohio Environmental Protection Agency
DERR-NEDO
Attn: Mr. Ed D'Amato
2110 East Aurora Road
Twinsburg, OH 44087-1924

Subject: Notification of Field Work, Ravenna Army Ammunition Plant (RVAAP) Restoration Program, Portage/Trumbull Counties, Additional Sampling for CC RVAAP-79 Defense Logistics Agency (DLA) Ore Storage Sites Remedial Investigation, Ore Storage Pond Sub-Area, Ohio EPA ID # 267-000859-258

Dear Mr. D'Amato:

In accordance with the Director's Final Findings and Orders, Section XIII, #28, for the RVAAP Restoration Program, the Army National Guard (ARNG) is providing notification of field activities at Camp James A. Garfield / former RVAAP 15 days prior to the scheduled start date. Parsons will be conducting sediment sampling at Ore Storage Pond sub-area within CC RVAAP-79 DLA Ore Storage Sites during the week of 19 April 2021 (anticipate two days of sampling, 20 through 21 April 2021).

For additional information on the field activities, please refer to the *Final Work Plan Addendum Additional Sampling for CC RVAAP-79 DLA Ore Storage Sites Remedial Investigation, Ore Storage Pond Sub-Area, RVAAP Restoration Program, Portage and Trumbull Counties, Ohio* submitted to Ohio EPA on 23 March 2021.

Please contact the undersigned at (614) 336-6000 Ex 2053 or kevin.m.sedlak.ctr@mail.mil if there are issues or concerns with this submission.

Sincerely,
SEDLAK.KEVIN.MICHAEL.1254440171
Digitally signed by SEDLAK.KEVIN.MICHAEL.1254440171
Date: 2021.03.26 09:05:16 -04'00'
Kevin Sedlak
RVAAP Restoration Program Manager

cc: Bob Princic, Ohio EPA, DERR-NEDO
Tom Schneider, Ohio EPA, SWDO
Natalie Oryshkewych, Ohio EPA, DERR-NEDO
Megan Oravec, Ohio EPA, DERR-NEDO
Mark Leeper, ARNG
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Kevin Mieczkowski, USACE Louisville
Jennifer Tierney, Vista Sciences
Edward Heyse, Parsons

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

March 22, 2021

Ohio Environmental Protection Agency
DERR-NEDO
Attn: Edward J. D'Amato
2110 East Aurora Road
Twinsburg, OH 44087-1924

Subject: Ravenna Army Ammunition Plant (RVAAP) Restoration Program
Final Work Plan Addendum Additional Sampling for CC RVAAP-79 DLA Ore Storage Sites Remedial Investigation, Ore Storage Pond Sub-Area,
Portage/Trumbull Counties, Contract Number W912QR-12-D-0002, Delivery Order 0003, Ohio EPA ID # 267-000859-258

Dear Mr. D'Amato:

An electronic version of the Final Work Plan Addendum for CC RVAAP-79 DLA Ore Storage Sites, Ore Storage Pond Sub-Area at the former Ravenna Army Ammunition Plant (RVAAP) will be uploaded for your approval to the Ohio EPA LiquidFile Site. A hard copy and CD will be sent when they are able to be received by the Ohio EPA. This document presents a sediment sampling approach to complete the Remedial Investigation at the Ore Storage Pond Sub-Area and includes a bioassay study and pond characteristics data collection, as required by the Ohio EPA.

This report was prepared by Parsons in support of the RVAAP cleanup program. Please contact the undersigned at (614) 336-6000 Ex 2053 or kevin.m.sedlak.ctr@mail.mil if there are issues or concerns with this submission.

Sincerely,

SEDLAK.KEVIN.MICHAEL.1254440171

Digitally signed by SEDLAK.KEVIN.MICHAEL.1254440171
Date: 2021.03.23 07:24:03 -04'00'

Kevin Sedlak
RVAAP Restoration Program Manager

Attachment

cc: Tom Schneider, Ohio EPA, DERR-SWDO (email transmittal letter only)
Bob Princic, Ohio EPA, DERR-NEDO (email transmittal letter only)
Natalie Oryshkewych, Ohio EPA, DERR-NEDO (email transmittal letter only)
Megan Oravec, Ohio EPA, DERR-NEDO (email transmittal letter only)
Katie Tait, OHARNG (one [1] electronic copy)
Mark Leeper, ARNG ((one [1] electronic copy)
Kevin Mieczkowski, USACE Louisville (one [1] electronic copy, two [2] hard copies)
Steven Kvaal, USACE Louisville (email transmittal letter only)
Jennifer Tierney, Vista Sciences (one [1] electronic copy, one [1] hard copy)
Patrick Ryan, Leidos (email transmittal letter only)
Ed Heyse, Parsons (one [1] electronic copy)

Ohio Environmental Protection Agency

**Mike DeWine**, Governor
**Jon Husted**, Lt. Governor
**Laurie A. Stevenson**, Director

March 19, 2021

**TRANSMITTED ELECTRONICALLY**

Mr. Kevin M. Sedlak
Army National Guard
Installations & Environment
Cleanup Branch IPA Designation
1438 State Route 534 SW
Newton Falls, OH 44444

RE: US Army Ravenna Ammunition Plt RVAAP
Remediation Response
Project Records
Remedial Response
Portage County
ID # 267000859258

**Subject: Review of Work Plan Addendum: Additional Sampling for CC RVAAP-79 DLA Ore Storage Sites Remedial Investigation, Ore Storage Pond Sub-Area**

Dear Mr. Sedlak:

The Ohio Environmental Protection Agency (Ohio EPA) has reviewed the Army's March 5, 2021 response to Ohio EPA's February 26, 2021 comment letter on the Draft Work Plan Addendum: Additional Sampling for CC RVAAP-79 DLA Ore Storage Sites Remedial Investigation, Ore Storage Pond Sub-Area.

Ohio EPA finds the Army's responses to be acceptable. Please submit the document in final form.

As a precautionary response to COVID-19, Ohio EPA is currently operating with most staff working remotely. During this time, we will not be issuing hard-copy mail. This letter is an official response from Ohio EPA that will be maintained as a public record. If you have any questions concerning this letter, please contact me at (330) 963-1170, or by email at ed.damato@epa.ohio.gov.

Sincerely,

Edward J D'Amato

Edward D'Amato
Site Coordinator
Division of Environmental Response and Revitalization

ED/sc

ec: Katie Tait, OHARNG RTLS
Nat Peters, USACE
Steven Kvaal, USACE
Rebecca Shreffler, Chenega
Mark Leeper, ARNG
Natalie Oryshkewych, Ohio EPA, NEDO, DERR
Megan Oravec, Ohio EPA, NEDO, DERR
Bob Princic, Ohio EPA, NEDO, DERR
Susan Netzly-Watkins, Ohio EPA, NEDO, DERR
Tom Schneider, Ohio EPA, SWDO, DERR
Brian Tucker, Ohio EPA, CO, DERR

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MAR 19 2021

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

March 05, 2021

Ohio Environmental Protection Agency
DERR-NEDO
Attn: Edward J. D'Amato, Site Coordinator
2110 East Aurora Road
Twinsburg, Ohio 44087-1924

Subject: Responses to Comments (dated February 26, 2021) on the *Draft Work Plan Addendum: Additional Sampling for CC RVAAP-79 DLA Ore Storage Sites Remedial Investigation, Ore Storage Pond Sub-Area* dated January 14, 2021, for the Ravenna Army Ammunition Plant (RVAAP) Restoration Program, Portage and Trumbull Counties, Ohio. Ohio EPA ID# 267-000859-258

Dear Mr. D'Amato:

The Army appreciates your time and comments (dated February 26, 2021) on the *Draft Work Plan Addendum: Additional Sampling for CC RVAAP-79 DLA Ore Storage Sites Remedial Investigation, Ore Storage Pond Sub-Area, Ravenna Army Ammunition Plant Restoration Program, Ravenna, Ohio*, dated January 14, 2021. Enclosed for your review are responses to your comments.

Please contact the undersigned at (614) 336-6000 Ex 2053 or kevin.m.sedlak.ctr@mail.mil if there are issues or concerns with this submission.

Sincerely,

SEDLAK.KEVIN.MICHAEL.1254440171
Digitally signed by SEDLAK.KEVIN.MICHAEL.1254440171
Date: 2021.03.05 08:46:02 -05'00'

Mr. Kevin Sedlak
RVAAP Restoration Program Manager

ec. Tom Schneider, Ohio EPA, SWDO
Natalie Oryshkewych, Ohio EPA, NEDO, DERR
Megan Oravec, Ohio EPA, NEDO, DERR
Bob Princic, Ohio EPA, NEDO, DERR
Katie Tait, OHARNG, CJAG
Kevin Mieczkowski, USACE Louisville
Steven Kvaal, USACE
Mark Leeper, ARNG
Jennifer Tierney, Vista Sciences
Becky Shreffler, Chenega Tri-Services, LLC
Patrick Ryan, Leidos
Ed Heyse, Parsons

**Draft Work Plan Addendum:**
**Additional Sampling for CC RVAAP-79 DLA Ore Storage Sites,**
**Ore Storage Pond Sub-Area**
***Ravenna Army Ammunition Plant (RVAAP) Restoration Program,* January 14, 2021.**
**Ohio EPA ID# 267-000859-258**

## General Comments

The Ohio Environmental Protection Agency (Ohio EPA) has reviewed the Work Plan Addendum: Additional Sampling for CC RVAAP-79 DLA Ore Storage Sites Remedial Investigation, Ore Storage Pond Sub-Area, received on January 14, 2021. Ohio EPA has the following comments. Please note that all citations are to U.S. EPA Methods for Measuring the Toxicity and Bioaccumulation of Sediment-associated Contaminants with Freshwater Invertebrates, Second Edition, EPA 617 600/R-99/064 (U.S. EPA 2000).

**1.) Table 3-1, Data Quality Objectives:** Table 3-1 in the draft Work Plan Addendum (WPA) states in part: "(d)etermine the toxicity of the sediment via bioassays. A bioassay test is considered acceptable (i.e. passing) if there is at least 70 percent survival and a mean ash-free dry weight of 0.48 mg/organism in the control. Toxicity is indicated if one or both bioassays fail." This criterion is a description of the acceptability of the tests and not an indication of toxicity.

Failure (i.e., considered toxic) of bioassay results generally will be considered as a 20% difference when compared to the control using the appropriate statistics/power. However, other methods (e.g., comparing mean values) may be appropriate given the variability of the results of the bioassays. Section 16 of the U.S. EPA 2000 bioassay manual should be reviewed and the failure criteria in the WPA is to be consistent with the above.

Both mortality and growth are to be assessed in the bioassays. Per U.S. EPA 2000, the endpoints in the 10-day toxicity test with *H. azteca* and *C. tentans* are survival and growth. Information was provided in the draft WPA that indicate only mortality was to be assessed. However, the standard 10-day bioassay provides information on both mortality and growth. Revise text to clarify both endpoints will be assessed. Also, it is recommended that the project be discussed with the contracted laboratory doing the bioassays, prior to revising the WPA as many of the comments could be easily addressed with their assistance.

***Response*: Agree.** *We coordinated with the laboratory (EA Science and Technology) and revised Table 3-1 in the work plan to clarify that both survival and growth will be used to assess toxicity. A revised Table 3-1 is attached to this response.*

*Survival is measured by counting living (moving) organisms at the end of the 10-day test. Growth is measured by average dry weight (for H. azteca) or ash-free dry weight (for C. dilutus) of surviving organisms.*

*Acceptable tests meet the following criteria in the controls:*

- *Hyalella azteca Test Acceptability Criteria (TAC): 80% survival and measurable growth in the control*
- *Chironomus dilutus TAC: 70% survival and a mean ash-free dry weight of 0.48 mg/organism in the control*

*The survival and growth results from the Ore Pond sediment will be compared to those of the control or reference sediment to determine toxicity using statistical methods in accordance with U.S. EPA Methods for Measuring the Toxicity and Bioaccumulation of Sediment-associated Contaminants with Freshwater Invertebrates, Second Edition, EPA 617 600/R-99/064 (U.S. EPA 2000). If the data are normally distributed, then a t-Test will be performed to detect statistically significant (p = 0.05) differences between test sediments and the control sediment. If the data distribution is non-normal, then a Wilcoxon Two-Sample Test will be used to compare the group means. Shapiro-Wilk's Test will be used to determine if the data are normally distributed, and the F-Test will be used to test for homogeneity of variance.*

*Should the test results indicate a high degree of statistical strength due to low variability in the data or if the data is highly variable, an indication of biological significance of >20% difference from the control, is sufficient to indicate that a sample may have a substantial impact.*

**2.) Section 4.1: Sediment Sampling**: The current WPA is suggesting a single transect that runs through the area of the pond with largest area of open water. Ohio EPA recommends two transects running perpendicular to and instead of the current line, one crossing approximately between samples 411 and 412, and one approximately between 413 and 414 (Figure 4-1 draft WPA). A total of six samples as proposed in the draft WPA is sufficient, with three from each suggested transect. Wetland sediment/soil should also be included but only within the historical boundary of the ore storage pond. The proposed single transect in the draft WPA avoids the sediment sample with the maximum concentration of arsenic. The two-transect approach should provide representative sediment samples for the bioassay work.

***Response*: Agree.** *Please see attached revised Figure 4-1 for new sample transects and locations.*

**3.) Section 4.1 Sediment Sampling:** The draft WPA indicates that sediment samples will be collected from the zero to 0.5-foot depth. It is recommended that samples of zero to one-foot depth be collected for two reasons: a) six samples from a zero to 0.5-foot interval may not provide enough sediment mass for the required bioassay replicates and metal analysis, and b) the zero to one-foot interval will provide a slightly more historical sediment sample and represent the biologically active zones of the sediment and fringe wetland sediment/soil environments.

***Response*: Clarification.** *The 0.5-foot sampling depth for sediment is based on the July 2018 Ohio EPA Ecological Risk Assessment Guidance Document. Because the purpose of the sampling is to determine toxicity to aquatic macroinvertebrates inhabiting the sediments of the Ore Storage Pond, the Ohio EPA recommended sampling depth of 0.5-foot was utilized, which is based on the depth of macroinvertebrate activities in sediment. This 0.5-foot depth is also in accordance with USEPA recommended sampling depths for sampling the bioactive zone/burrowing depths of oligochaetes in freshwater sediment (USEPA, 2000). To ensure that enough sample material is collected to provide the mass for the required bioassay replicates and metal analyses, additional co-located cores will be collected until sufficient sample volume is achieved. Thus, the sediment sampling depth was not changed.*

**4.) Section 4.2: Bioassay:** Composite sediment samples used for bioassay/replicates should also be analyzed for Target Analyte List (TAL) metals. One approach would be to equally split (using incremental sampling methodology (ISM) sample preparation methods) the composite of three sediment samples (odd and even as proposed) into 10 equal amounts, one for metal analysis and eight for bioassay replicates with one remaining for a replacement, if needed.

***Response*: Clarification.** *The purpose of collecting the TAL metals is to use those results as part of the remedy evaluation if the bioassay toxicity tests fail; not for site investigation purposes. Thus, no change will be made to the collection of TAL metals. The laboratory will create the eight bioassay replicates at the laboratory from the composite samples that are delivered to them.*

Please revise the document accordingly and re-submit it.

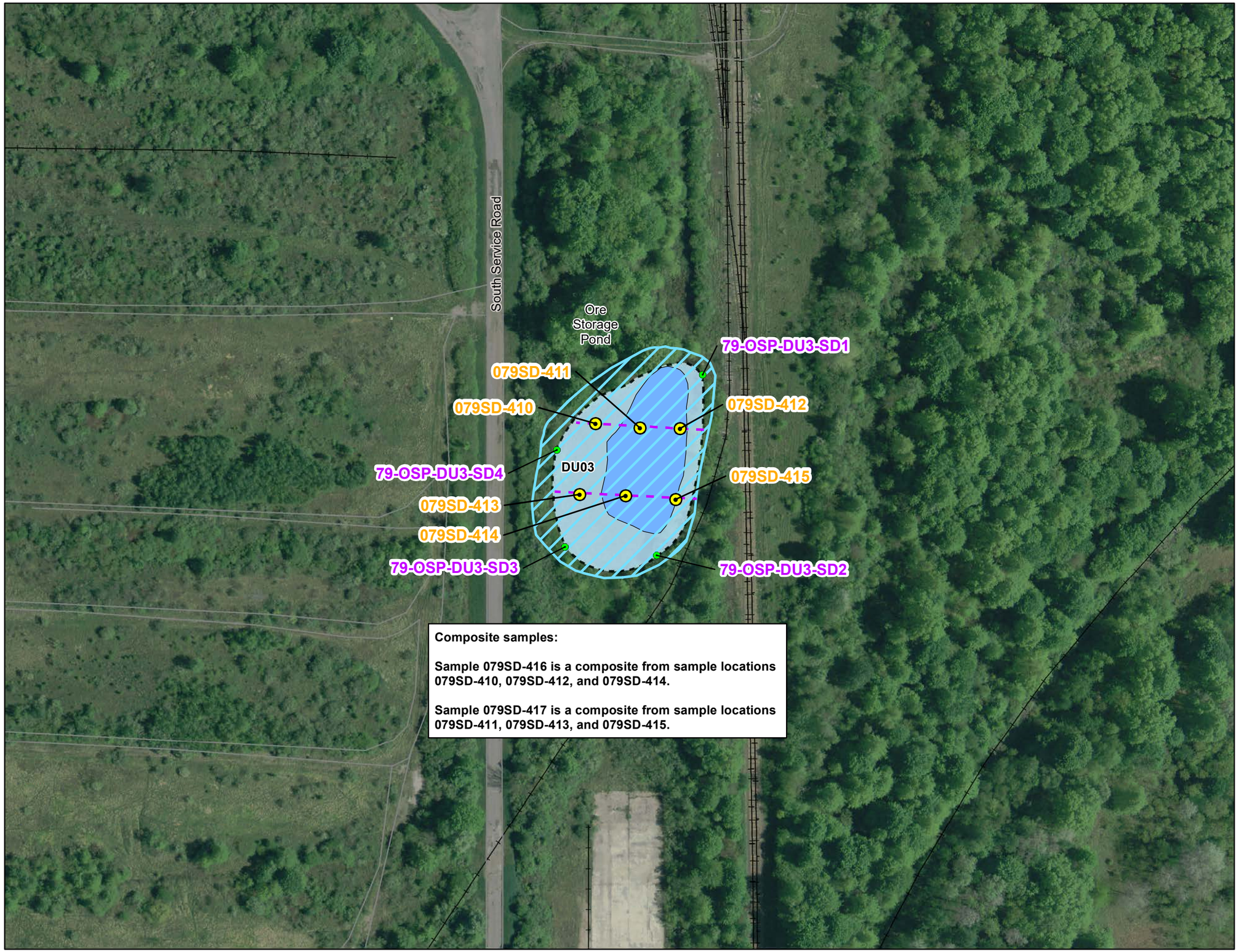
***Response*:** *Upon resolution of comments, we will prepare and submit the Final Work Plan Addendum for Ohio EPA approval.*

634 **Table 3-1 Data Quality Objectives**

635

| State the Problem | Identify Goals of the Study | Identify Information Inputs | Define the Boundaries of the Study | Develop the Analytic Approach | Specify Performance or Acceptance Criteria | Develop the Detailed Plan for Obtaining Data |
|---|---|---|---|---|---|---|
| CC RVAAP-79 DLA Ore Storage Sites, Ore Storage Pond Sub-Area | | | | | | |
| Concentrations of metals were detected in the sediment samples from the Ore Storage Pond that were greater than Ohio EPA Sediment Reference Values. Although the Army showed there were unlikely to be unacceptable risks to ecological receptors that use the pond using standard ERA tools; the Ohio EPA per their regulations, stated that there were only two options: test the sediment by completing two bioassays or remediate the sediment. | Is the sediment toxic as measured by *Hyalella azteca* 10 day bioassay and /or *Chironomus dilutus* (*tentans*) 10 day bioassay?<br><br>If bioassays indicate toxicity, report results and close the RI phase, then proceed to evaluation of remedial alternatives. If not toxic, report and close the RI phase with conclusion that no further action is required. | Sediment toxicity is evaluated by survival and growth of in 10-day bioassays. Survival is measured by counting living (moving) organisms at the end of the 10-day test. Growth is measured by average dry weight (for *H. azteca*) or ash-free dry weight (for *C. dilutus*) of surviving organisms.<br><br>Acceptable tests meet the following criteria in the controls:<br>• *H. azteca* Test Acceptability Criteria (TAC): 80% survival and measurable growth in the control<br>• *C. dilutus* TAC: 70% survival and a mean ash-free dry weight of 0.48 mg/organism in the control<br><br>The survival and growth results from the Ore Pond sediment will be compared to those of the control or reference sediment to determine toxicity using statistical methods in accordance with *US EPA Methods for Measuring the Toxicity and Bioaccumulation of Sediment-associated Contaminants with Freshwater Invertebrates, Second Edition*, EPA 617 600/R-99/064, March 2000. If the data are normally distributed, then a t-Test will be performed to detect statistically significant ($p = 0.05$) differences between test sediments and the control sediment. If the data distribution is non-normal, then a Wilcoxon Two-Sample Test will be used to compare the group means. Shapiro-Wilk's Test will be used to determine if the data are normally distributed, and the F-Test will be used to test for homogeneity of variance.<br><br>Should the test results indicate a high degree of statistical strength due to low variability in the data or if the data is highly variable, an indication of biological significance of >20% difference from the control, is sufficient to indicate that a sample may have a substantial impact. | Sediment from within the submerged portions of Ore Storage Pond. The pond is small (0.36 acres). Because the pond has not been maintained, the pond has filled in significantly since it was originally constructed. The size of the pond changes seasonally and with rain events. | Analytic approach is in accordance with *US EPA Methods for Measuring the Toxicity and Bioaccumulation of Sediment-associated Contaminants with Freshwater Invertebrates, Second Edition*, EPA 617 600/R-99/064, March 2000. | All sampling and analysis will be performed in accordance with the procedures outlined in the UFP-QAPP and the *Work Plan Addendum, Additional Sampling for CC RVAAP-79 DLA Ore Storage Sites Remedial Investigation, Ore Storage Pond Sub-Area, Former Ravenna Army Ammunition Plant, Portage and Trumbull Counties, Ohio.* | Collect six sediment samples across the pond. Prepare field composite samples that each contain portions from three of the six sediment samples) and perform the two bioassays:<br>• *Hyalella azteca* 10 day bioassay and<br>• *Chironomus dilutus (tentans)* 10 day bioassay<br>Bioassays should follow *US EPA Methods for Measuring the Toxicity and Bioaccumulation of Sediment-associated Contaminants with Freshwater Invertebrates*, Second Edition, EPA 600/R-99/064, March 2000. Other appropriate organism(s) may be substituted for *Chironomus dilutus (tentans)* if needed. Refer to Section 4.0 for further details. |

636




LEGEND

- Proposed Sediment Sample Location
- Sampling Transect across Pond
- 2013 Sediment Sample Location
- Sediment Decision Unit (2013 Sampling Event)
- Surface Water (2014)
- Extent of Surface Water During 2013 Sampling Event
- Road
- Railroad Bed/Former Railroad

NOTES & SOURCES

1. Map Coordinates: NAD 83, UTM Zone 17N, 2014 Orthoimagery from Ohio Army National Guard.
2. DU = Decision Unit
3. RVAAP = Ravenna Army Ammunition Plant
4. CC = Army Environmental Compliance-Related Cleanup Program
5. DLA = Defense Logistics Agency

0 100 200 Feet

N

PARSONS

Former Ravenna Army Ammunition Plant, Portage and Trumbull Counties, Ohio

**Figure 4-1**
**Proposed Sediment Sampling Locations at Ore Storage Pond**
**CC RVAAP-79 DLA Ore Storage Sites**

| | |
|---|---|
| SCALE: As Shown | PROJECT NUMBER: 640030.0005.110051 |
| DATE: 3/4/2021 | FIGURE NUMBER: 4-1 |
| FILE: | |

Path: S:\ES\Remed\Ravenna\Database\GIS\2020\CC-79\WPA\Figure 4-1_CC-79_WPA_MOS_ProposedSampLOC.mxd

Ohio Environmental Protection Agency

**Mike DeWine**, Governor
**Jon Husted**, Lt. Governor
**Laurie A. Stevenson**, Director

February 26, 2021

**TRANSMITTED ELECTRONICALLY**

Mr. Kevin M. Sedlak
Army National Guard
Installations & Environment
Cleanup Branch IPA Designation
1438 State Route 534 SW
Newton Falls, OH 44444

RE: US Army Ravenna Ammunition Plt RVAAP
Remediation Response
Project Records
Remedial Response
Portage County
ID # 267000859258

**Subject: Review of Work Plan Addendum: Additional Sampling for CC RVAAP-79 DLA Ore Storage Sites Remedial Investigation, Ore Storage Pond Sub-Area.**

Dear Mr. Sedlak:

The Ohio Environmental Protection Agency (Ohio EPA) has reviewed the Work Plan Addendum: Additional Sampling for CC RVAAP-79 DLA Ore Storage Sites Remedial Investigation, Ore Storage Pond Sub-Area, received on January 14, 2021. Ohio EPA has the following comments. Please note that all citations are to U.S. EPA Methods for Measuring the Toxicity and Bioaccumulation of Sediment-associated Contaminants with Freshwater Invertebrates, Second Edition, EPA 617 600/R-99/064 (U.S. EPA 2000).

1) **Table 3-1, Data Quality Objectives:** Table 3-1 in the draft Work Plan Addendum (WPA) states in part: "(d)etermine the toxicity of the sediment via bioassays. A bioassay test is considered acceptable (i.e. passing) if there is at least 70 percent survival and a mean ash-free dry weight of 0.48 mg/organism in the control. Toxicity is indicated if one or both bioassays fail." This criterion is a description of the acceptability of the tests and not an indication of toxicity.

   Failure (i.e., considered toxic) of bioassay results generally will be considered as a 20% difference when compared to the control using the appropriate statistics/power. However, other methods (e.g., comparing mean values) may be appropriate given the variability of the results of the bioassays. Section 16 of the U.S. EPA 2000 bioassay manual should be reviewed and the failure criteria in the WPA is to be consistent with the above.

Received -
26 FEB 2021 -

Both mortality and growth are to be assessed in the bioassays. Per U.S. EPA 2000, the endpoints in the 10-day toxicity test with *H. azteca* and *C. tentans* are survival and growth. Information was provided in the draft WPA that indicate only mortality was to be assessed. However, the standard 10-day bioassay provides information on both mortality and growth. Revise text to clarify both endpoints will be assessed. Also, it is recommended that the project be discussed with the contracted laboratory doing the bioassays, prior to revising the WPA as many of the comments could be easily addressed with their assistance.

2) **Section 4.1: Sediment Sampling:** The current WPA is suggesting a single transect that runs through the area of the pond with largest area of open water. Ohio EPA recommends two transects running perpendicular to and instead of the current line, one crossing approximately between samples 411 and 412, and one approximately between 413 and 414 (Figure 4-1 draft WPA). A total of six samples as proposed in the draft WPA is sufficient, with three from each suggested transect. Wetland sediment/soil should also be included but only within the historical boundary of the ore storage pond. The proposed single transect in the draft WPA avoids the sediment sample with the maximum concentration of arsenic. The two-transect approach should provide representative sediment samples for the bioassay work.

3) **Section 4.1 Sediment Sampling:** The draft WPA indicates that sediment samples will be collected from the zero to 0.5-foot depth. It is recommended that samples of zero to one-foot depth be collected for two reasons: a) six samples from a zero to 0.5-foot interval may not provide enough sediment mass for the required bioassay replicates and metal analysis, and b) the zero to one-foot interval will provide a slightly more historical sediment sample and represent the biologically active zones of the sediment and fringe wetland sediment/soil environments.

4) **Section 4.2: Bioassay:** Composite sediment samples used for bioassay/replicates should also be analyzed for Target Analyte List (TAL) metals. One approach would be to equally split (using incremental sampling methodology (ISM) sample preparation methods) the composite of three sediment samples (odd and even as proposed) into 10 equal amounts, one for metal analysis and eight for bioassay replicates with one remaining for a replacement, if needed.

Please revise the document accordingly and re-submit it.

As a precautionary response to COVID-19, Ohio EPA is currently operating with most staff working remotely. During this time, we will not be issuing hard-copy mail. This letter is an official response from Ohio EPA that will be maintained as a public record.

If you have any questions concerning this letter, please contact me at (330) 963-1170, or via email at ed.damato@epa.ohio.gov.

Sincerely,

Edward J D'Amato

Edward D'Amato
Site Coordinator
Division of Environmental Response and Revitalization

ED/sc

ec: Katie Tait, OHARNG RTLS
Nat Peters, USACE
Steve Kvaal, USACE
Rebecca Shreffler, Chenega
Mark Leeper, ARNG
Natalie Oryshkewych, Ohio EPA, NEDO DERR
Megan Oravec, Ohio EPA, NEDO, DERR
Bob Princic, Ohio EPA, NEDO, DERR
Susan Netzly-Watkins, Ohio EPA, NEDO, DERR
Tom Schneider, Ohio EPA, SWDO, DERR
Brian Tucker, Ohio EPA, CO, DERR

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

January 14, 2021

Ohio Environmental Protection Agency
DERR-NEDO
Attn: Edward J. D'Amato
2110 East Aurora Road
Twinsburg, OH 44087-1924

Subject: Former Ravenna Army Ammunition Plant (RVAAP) Restoration Program
Draft Work Plan Addendum Additional Sampling for CC RVAAP-79 DLA Ore Storage Sites Remedial Investigation, Ore Storage Pond Sub-Area,
Portage/Trumbull Counties, Contract Number W912QR-12-D-0002, Delivery Order 0003, Ohio EPA ID # 267-000859-258

Dear Mr. D'Amato:

An electronic version of the Draft Work Plan Addendum for CC RVAAP-79 DLA Ore Storage Sites, Ore Storage Pond Sub-Area at the former Ravenna Army Ammunition Plant (RVAAP) will be uploaded for your review to the Ohio EPA LiquidFile Site. A hard copy and CD will be sent when they are able to be received by the Ohio EPA. This document presents a sediment sampling approach to complete the Remedial Investigation at the Ore Storage Pond Sub-Area and includes a bioassay study and pond characteristics data collection, as required by the Ohio EPA.

This report was prepared by Parsons in support of the RVAAP cleanup program. Please contact the undersigned at (614) 336-6000 Ex 2053 or kevin.m.sedlak.ctr@mail.mil if there are issues or concerns with this submission.

Sincerely,

SEDLAK.KEVIN.MICHAEL.1254440171
Digitally signed by SEDLAK.KEVIN.MICHAEL.1254440171
Date: 2021.01.14 14:12:56 -05'00'

Kevin Sedlak
RVAAP Restoration Program Manager

Attachment

cc: Tom Schneider, Ohio EPA, DERR-SWDO (email transmittal letter only)
Bob Princic, Ohio EPA, DERR-NEDO (email transmittal letter only)
Natalie Oryshkewych, Ohio EPA, DERR-NEDO (email transmittal letter only)
Megan Oravec, Ohio EPA, DERR-NEDO (email transmittal letter only)
Katie Tait, OHARNG (one [1] electronic copy)
Mark Leeper, ARNG ((one [1] electronic copy)
Kevin Mieczkowski, USACE Louisville (one [1] electronic copy, two [2] hard copies)
Steven Kvaal, USACE Louisville (email transmittal letter only)
Jennifer Tierney, Vista Sciences (one [1] electronic copy)
Patrick Ryan, Leidos (email transmittal letter only)
Ed Heyse, Parsons (one [1] electronic copy)

Ohio Environmental Protection Agency

**Mike DeWine**, Governor
**Jon Husted**, Lt. Governor
**Laurie A. Stevenson**, Director

June 10, 2021

**TRANSMITTED ELECTRONICALLY**

Mr. Kevin M. Sedlak
Army National Guard
Installations & Environment
Cleanup Branch IPA Designation
1438 State Route 534 SW
Newton Falls, OH 44444

RE: US Army Ravenna Ammunition Plt RVAAP
Remediation Response
Project Records
Remedial Response
Portage County
ID # 267000859241

**Subject:** **Review of the Final After Action Report, Surface Clearance for MEC, Block D Igloo (RVAAP-060-R-01) Munitions Response Site, Former Ravenna Army Ammunition Plant, Portage/Trumbull Counties, Ohio, dated May 19, 2021**

Dear Mr. Sedlak:

The Ohio Environmental Protection Agency (Ohio EPA), Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR) has received and reviewed the "Final After Action Report, Surface Clearance for MEC, Block D Igloo (RVAAP-060-R-01) Munitions Response Site, Former Ravenna Army Ammunition Plant, Portage/Trumbull Counties, Ohio," dated May 19, 2021.

After reviewing the document, Ohio EPA concurs with findings of the Final After Action Report.

During this time, we will not be issuing hard-copy mail. This letter is an official response from Ohio EPA that will be maintained as a public record. 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/sc

RECEIVED
JUN 10 2021

ec: Rebecca Shreffler, Chenega
Bob Princic, Ohio EPA, NEDO, DERR
Natalie Oryshkewych, Ohio EPA, NEDO, DERR
Thomas Schneider, Ohio EPA, SWDO, DERR
Katie Tait, OHARNG RTLS, CJAG
Steve Kvaal, USACE Louisville
Nathaniel Peters, USACE Louisville

Ohio Environmental Protection Agency

**Mike DeWine,** Governor
**Jon Husted,** Lt. Governor
**Laurie A. Stevenson,** Director

May 13, 2021

**TRANSMITTED ELECTRONICALLY**

Mr. Kevin M. Sedlak
Army National Guard
Installations and Environment - Cleanup Branch
IPA Designation
1438 State Route 534 SW
Newton Falls, OH 44444

RE: US Army Ravenna
Ammunition Plt RVAAP
Remediation Response
Project records
Remedial Response
Portage County
267000859241

**Subject: Request for Final After-Action Report Surface Clearance for MEC RVAAP-060-R-01 Block D Igloo Munitions Response Site**

Dear Mr. Sedlak:

Ohio Environmental Protection Agency (Ohio EPA), Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR) has received and reviewed the "Army Responses to Comments to Ohio EPA correspondence dated March 30, 2021: Draft After Action Report, Surface Clearance for MEC, RVAAP-060-R-01 Block D Igloo Munitions Response Site. Former Ravenna Army Ammunition Plant, Portage/Trumbull Counties, Ohio," dated May 4, 2021.

After reviewing the responses to Ohio EPA's comments, Ohio EPA has no additional comments and we request the final After-Action Report, Surface Clearance for MEC, RVAAP-060-R-01 Block D Igloo Munitions Response Site be submitted for review and concurrence.

As a precautionary response to COVID-19, Ohio EPA is currently operating with most staff working remotely. During this time, we will not be issuing hard-copy mail. This letter is an official response from Ohio EPA that will be maintained as a public record.

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

RECEIVED
MAY 14 2021

NCR/ams

ec: Rebecca Shreffler, Chenega
Bob Princic, Ohio EPA, NEDO, DERR
Natalie Oryshkewych, Ohio EPA, NEDO, DERR
Thomas Schneider, Ohio EPA, SWDO, DERR
Katie Tait, OHARNG RTLS, CJAG
Steve Kvaal, USACE Louisville
Nathaniel Peters, USACE Louisville

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

May 4, 2021

Ohio Environmental Protection Agency
DERR-NEDO
Attn: Nick Roope, Site Coordinator
2110 East Aurora Road
Twinsburg, OH 44087-1924

SUBJECT: Army Responses to Comments to Ohio EPA correspondence dated March 30, 2021: Draft After Action Report, Surface Clearance for MEC, RVAAP-060-R-01 Block D Igloo Munitions Response Site. Former Ravenna Army Ammunition Plant, Portage/Trumbull Counties, Ohio, (Ohio EPA Work Activity 267-000859-241)

Dear Mr. Roope:

Enclosed for your review are the responses to comments to the Ohio EPA letter dated March 30, 2021 for the Draft After Action Report, Surface Clearance for MEC, RVAAP-060-R-01 Block D Igloo Munitions Response Site. A hard copy will be sent when they are able to be received by the Ohio EPA. These responses were prepared in support of the Munitions Response Services and were prepared by the US Army Corps of Engineers (USACE) – Baltimore District in support of the RVAAP Restoration Program.

Please contact the undersigned at (330) 235-2153 or kevin.m.sedlak.ctr@mail.mil if there are issues or concerns with this submission.

Sincerely,

SEDLAK.KEVIN.MICHAEL.1254440171
Digitally signed by SEDLAK.KEVIN.MICHAEL.1254440171
Date: 2021.05.04 14:59:19 -04'00'

Kevin M. Sedlak
RVAAP Restoration Program Manager
Army National Guard Directorate

cc: Kathryn Tait, OHARNG, Camp James A. Garfield
Travis McCoun, USACE Baltimore
Jennifer Tierney, Vista Sciences Corporation
Steve Kvaal, USACE Louisville
Nathaniel Peters, USACE Louisville
Bob Princic, Ohio EPA, NEDO, DERR
Tom Schneider, Ohio EPA, SWDO, DERR
Natalie Oryshkewych, Ohio EPA, NEDO, DERR
Mark Leeper, ARNG
Rebecca Shreffler, Chenega Tri-Services, LLC

**Responses to Comments – Ohio EPA letter dated, March 30, 2021**

**Comment 1.** Ohio EPA requests including a figure to help aid in summarizing where Material Documented as Safe (MDAS) was found specifically in each grid. This would assist in determining if there are visible clusters of high-density areas.

**Response 1.** Figure 2 provides a summary of grids where MDAS was recovered. Because MDAS does not contain an explosive safety hazard, specific locations of MDAS recoveries within each grid were not recorded during fieldwork. Consequently, this information is not available and cannot be added to the report. It is unlikely clusters would be present given the site has undergone several surface clearances since the igloo explosion.

**Comment 2.** The Weekly Site Report work logs for the weeks spanning September 7 through 11 and September 21 through 25 were not included in the report. Please provide rationale for not including the work logs.

**Response 2.** These weekly reports will be added to Appendix A.

**Comment 3.** The Weekly Report of October 5 through 9, states "Weights, MDAS: 10, MPPEH: 0". There is no unit of measurement of the weight. Please provide what the unit is per report. In addition, there were 10 pounds, ounces, grams, etc. identified involving MDAS. However, Appendix B, from the corresponding date does not provide the location of the MDAS items found in the grids investigated during this time. Please provide the location and amount in Appendix B accordingly.

**Response 3.** The unit of measure (lb) will be added to the weekly reports in Appendix A. Because MDAS does not contain an explosive safety hazard, specific locations of MDAS recoveries within each grid were not recorded. Consequently, this information is not available and cannot be added to the report.

Ohio Environmental Protection Agency

**Mike DeWine**, Governor
**Jon Husted**, Lt. Governor
**Laurie A. Stevenson**, Director

March 30, 2021

**TRANSMITTED ELECTRONICALLY**

Mr. Kevin M. Sedlak
Army National Guard
Installations & Environment
Cleanup Branch IPA Designation
1438 State Route 534 SW
Newton Falls, OH 44444

RE: US Army Ravenna Ammunition Plt RVAAP
Remediation Response
Project Records
Remedial Response
Portage County
ID # 267000859241

**Subject: Ohio EPA Comments for the Draft After Action Report Surface Clearance for MEC RVAAP-060-R-01 Block D Igloo Munitions Response Site**

Dear Mr. Sedlak:

The Ohio Environmental Protection Agency (Ohio EPA), Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR) has received and reviewed the "Draft After Action Report Surface Clearance for [Munitions and Explosives of Concern] MEC RVAAP-060-R-01 Block D Igloo Munitions Response Site," dated February 19, 2021. It was prepared by the Environmental and Munitions Design Center, Baltimore District, U.S. Army Corps of Engineers.

Ohio EPA requests that the comments found below be addressed prior to issuing the final After Action Report.

Comment 1: Figures

Ohio EPA requests including a figure to help aid in summarizing where Material Documented as Safe (MDAS) was found specifically in each grid. This would assist in determining if there are visible clusters of high-density areas.

Comment 2: Work Logs

The Weekly Site Report work logs for the weeks spanning September 7 through 11 and September 21 through 25 were not included in the report. Please provide rationale for not including the work logs.

RECEIVED
MAR 30 2021

Comment 3: Units of Measure and Reporting

The Weekly Report of October 5 through 9, states "Weights, MDAS: 10, MPPEH: 0". There is no unit of measurement of the weight. Please provide what the unit is per report. In addition, there were 10 pounds, ounces, grams, etc. identified involving MDAS. However, Appendix B, from the corresponding date does not provide the location of the MDAS items found in the grids investigated during this time. Please provide the location and amount in Appendix B accordingly.

As a precautionary response to COVID-19, Ohio EPA is currently operating with most staff working remotely. During this time, we will not be issuing hard-copy mail. This letter is an official response from Ohio EPA that will be maintained as a public record.

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/sc

ec: Rebecca Shreffler, Chenega
Katie Tait, OHARNG RTLS, CJAG
Steve Kvaal, USACE Louisville
Nathaniel Peters, USACE Louisville
Mark Leeper, ARNG
Bob Princic, Ohio EPA, NEDO, DERR
Natalie Oryshkewych, Ohio EPA, NEDO, DERR
Thomas Schneider, Ohio EPA, SWDO, DERR

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

January 6, 2021

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

Subject: Final Record of Decision for RVAAP-063-R-01 Group 8 Munitions Response Site, Version 1.0, Munitions Response Services at the Former Ravenna Army Ammunition Plant, Portage and Trumbull Counties, Ohio, Contract No. W912DR-15-D-0016, Delivery Order 0001 (Ohio EPA Work Activity # 267-000859-246)

Dear Mr. Roope:

The Ohio Environmental Protection Agency (Ohio EPA) previously provided a concurrence letter for the above-referenced Record of Decision (ROD) on October 22, 2020. The compiled ROD was then submitted for signature to the Army National Guard. Final signature has been received; therefore, an electronic version (a courtesy copy for your files) of the signed *Final Record of Decision*, for RVAAP-063-R-01 Group 8 Munitions Response Site, Version 1.0 was uploaded to the Ohio EPA LiquidFile site.

This document was prepared in support of the Munitions Response Services performed at Former Ravenna Army Ammunition Plant, Portage and Trumbull Counties, Ohio. This document was prepared for the US Army Corps of Engineers (USACE) – Louisville District by HydroGeoLogic, Inc., under Contract No. W912DR-15-D-0016.

Please contact the undersigned at 614-336-6000, extension 2053 or by email at: kevin.m.sedlak.ctr@mail.mil if there are issues or concerns with this submission.

Sincerely,

SEDLAK.KEVIN.MICHAEL.1254440171
Digitally signed by SEDLAK.KEVIN.MICHAEL.1254440171
Date: 2021.01.04 14:39:10 -05'00'

Kevin M. Sedlak
RVAAP Restoration Program Manager

ec: Natalie Oryshkewych, Ohio EPA, DERR, NEDO (cover letter via email only)
Bob Princic, Ohio EPA, DERR, NEDO (cover letter via email only)
Tom Schneider, Ohio EPA, SWDO (cover letter via email only)
Katie Tait, OHARNG (cover letter via email only)
Steve Kvaal, USACE – Louisville Project Manager (cover letter via email only)
Travis McCoun, USACE Baltimore District (one [1] electronic copy)
Jennifer Tierney, Vista Sciences Corp. (two [2] hard copies, one with archival CDROM)
Mark Leeper, ARNG (cover letter via email only)

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

December 8, 2021

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

Subject: Ravenna Army Ammunition Plant (RVAAP) Restoration Program, Portage/Trumbull Counties, Ohio, Monthly Activity Report - November 2021

Dear Ms. Oryshkewych:

Enclosed for your review is the "RVAAP Restoration Program - DFFO Monthly Summary Report – November 2021". The report summarizes the Restoration Program activities conducted at the former RVAAP for the period from November 1, 2021 through November 30, 2021. This report is being submitted to the Ohio EPA to comply with the Ohio EPA Director's Final Findings and Orders, Section XVI, paragraphs 36 and 37.

This electronic letter and attachment are being sent to meet the deadline for submittal. Due to the Ohio EPA teleworking at this time and not accepting mail, a hardcopy of the letter and attachment will not be sent at this time.

Please contact the undersigned at (614) 336-6000 Ext. 2053 or kevin.m.sedlak.ctr@army.mil if there are issues or concerns with this submission.

Sincerely,

SEDLAK.KEVIN.MICHAEL.1254440171
Digitally signed by SEDLAK.KEVIN.MICHAEL.1254440171
Date: 2021.12.08 07:15:52 -05'00'

Kevin M. Sedlak
RVAAP Restoration Program Manager
Army National Guard Directorate

Attachment

cc: Bob Princic, Ohio EPA, DERR
Thomas Schneider, Ohio EPA, DERR
Kevin Palombo, Ohio EPA, DERR
Mark Leeper, ARNG HQ
Kevin Sedlak, ARNG, CJAG
Katie Tait, OHARNG, CJAG
Steve Kvaal, USACE - Louisville

**RVAAP RESTORATION PROGRAM - DFFO MONTHLY SUMMARY REPORT**
**November 2021**

**Status of project activities for reporting period (November 2021)**

| PROJECT NAME | USACE TECH MGR /Contractor | PROJECT STATUS |
|---|---|---|
| 2021 RI/FS Completion Contract for IRP AOCs | N. Peters / Leidos | The contractor provided responses to Army comments on the updated Pre-Draft RI Report for RVAAP-67 Facility-Wide Sewers on November 23, 2021 and began preparing the draft version. On November 5, 2021, the Ohio EPA provided comments on the Draft ROD for RVAAP-50 Atlas Scrap Yard. The Army requested a clarification call which is scheduled for December 3, 2021. |
| 5-Year Review | Tanner Reliford/DAWSON | USACE completed their review of the USACE-only preliminary draft report. DAWSON responded to USACE comments. |
| CC RVAAP-78 Quarry Pond Surface Dump | N. Peters / TBD | PARS is finished with their contract. USACE and ARNG are planning a new award for FY22 to delineate remaining buried ACM. When a new contract is issued this site will be updated in the monthly status report. |
| 2018 Environmental Program Support Services | N. Peters / Chenega | The contractor conducted annual Land Use Control (LUC) inspections for Ramsdell Quarry Landfill, Winklepeck Burning Grounds, Load Line 1-4 & 12, and Dump Along Paris-Windham Road on November 1, 3, 8 and 16, 2021. Contractor began preparing the Pre-Draft Annual LUC Report on November 8, 2021. The contractor also performed clearing of access to various monitoring wells and maintenance of various wells. |
| RVAAP-004-R-01 ODA #2 | Nicole Walworth & Steve Kvaal / CENAB / Arcadis | The QAPP Work Plan comments were submitted to Arcadis on August 27, 2021. On September 22, 2021, the Army met to review comments and guide Arcadis on comment resolution. Arcadis is working on responses to Army comments. |
| RVAAP-66 Facility Wide Ground Water Monitoring | J. Trumble / Leidos | Ohio EPA provided comments on the Draft Spring 2021 Semi-Annual FWGWMP Report on November 19, and 30, 2021. |
| VEG Remediation Contract | N. Peters / Alaniz-Endpoint JV (AEJ) | The contractor began excavation, transport, and disposal of nonhazardous contaminated soils to the approved landfill. |
| Load Lines 1 - 4 & 12 Remediation Contract | N. Peters / CH2M | The Final Remedial Action Completion Report for Load Lines 1- 4 & 12 was submitted on November 3, 2021. A typographical error in the Table of Contents was corrected on November 29, 2021 and a revised document was provided to the Ohio EPA. On December 1, 2021, the Ohio EPA provided a letter accepting the Final report. |

**B. Describe difficulties encountered during the reporting period and actions taken to rectify any difficulties**

**C. Identify changes in key personnel**

Mark Leeper is taking a job with HQDA and leaving ARNG. His last day is December 3, 2021.

**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 1,098 cy of nonhazardous contaminated soil was properly transported and disposed at American Landfill in Waynesburg Ohio as part of the Endpoint/Alaniz project at 5 AOCs.

**G. Describe activities planned for the following month (December 2021)**

1. Chenega plans to submit both the Preliminary Draft Annual LUC Inspection Report and the annual update to the Property Management Plan appendices for Army review.

2. Alaniz-Endpoint plans to continue excavation and transport and disposal of soil to a permitted landfill. They also plan to continue submitting confirmation sample results for Army and Ohio EPA review.

3. Arcadis will address Army comments on the ODA2 QAPP Work Plan and submit the Draft QAPP Work Plan for backcheck and approval.

4. Leidos plans on initiating the Fall Semi Annual FWGWMP sampling in December.

5. Leidos will schedule a resolution meeting to discuss the RTCs on the RI Report for the Facility Wide Groundwater.

6. The Army received comments from the Ohio EPA on the Draft Spring 2021 FWGWMP Report, and will provide responses to the comments.

7. Leidos plans to host a refresher meeting regarding the revised Draft Remedial Investigation Report for Facility-Wide Sewers on December 3, 2021 and subsequently submit the draft RI Report for Ohio EPA review.

8. The Army anticipates receiving Ohio EPA comments on the Draft ROD for C Block Quarry.

9. A clarification call regarding comments on the Draft ROD for Atlas Scrap Yard will be held with the Ohio EPA on December 3, 2021. After that, Leidos and the Army will submit Responses to Comments or will submit a revised ROD.

10. HGL will submit TPP meeting materials and start preparations for TPP1 proposed to be held in January 2022.

11. Dawson will continue to work on the Five Year Review document. Dawson will conduct a site visit on December 7 and 8, 2021

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

November 9, 2021

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

Subject: Ravenna Army Ammunition Plant (RVAAP) Restoration Program, Portage/Trumbull Counties, Ohio, Monthly Activity Report - October 2021

Dear Ms. Oryshkewych:

Enclosed for your review is the "RVAAP Restoration Program - DFFO Monthly Summary Report – October 2021". The report summarizes the Restoration Program activities conducted at the former RVAAP for the period from October 1, 2021 through October 31, 2021. This report is being submitted to the Ohio EPA to comply with the Ohio EPA Director's Final Findings and Orders, Section XVI, paragraphs 36 and 37.

This electronic letter and attachment are being sent to meet the deadline for submittal. Due to the Ohio EPA teleworking at this time and not accepting mail, a hardcopy of the letter and attachment will not be sent at this time.

Please contact the undersigned at (614) 336-6000 Ext. 2053 or kevin.m.sedlak.ctr@army.mil if there are issues or concerns with this submission.

Sincerely,

SEDLAK.KEVIN.MICHAEL.1254440171

Digitally signed by SEDLAK.KEVIN.MICHAEL.1254440171
Date: 2021.11.04 12:03:18 -04'00'

Kevin M. Sedlak
RVAAP Restoration Program Manager
Army National Guard Directorate

Attachment

cc: Bob Princic, Ohio EPA, DERR
Thomas Schneider, Ohio EPA, DERR
Kevin Palombo, Ohio EPA, DERR
Mark Leeper, ARNG HQ
Kevin Sedlak, ARNG, CJAG
Katie Tait, OHARNG, CJAG
Steve Kvaal, USACE - Louisville

**RVAAP RESTORATION PROGRAM - DFFO MONTHLY SUMMARY REPORT**
**October 2021**

**Status of project activities for reporting period (October 2021)**

| | | |
|---|---|---|
| 2021 RI/FS Completion Contract for IRP AOCs | N. Peters / Leidos | The contractor is beginning to respond to Army comments on the updated Pre-Draft RI Report for RVAAP-67 Facility-wide Sewers. On October 8, 2021, the Army submitted the Draft ROD for RVAAP-50 Atlas Scrap Yard to Ohio EPA for review. On October 29, 2021, the Army submitted the Draft ROD for RVAAP-06 C Block Quarry to Ohio EPA for review. |
| CC RVAAP-78 Quarry Pond Surface Dump | N. Peters / TBD | PARS is finished with their contract. USACE and ARNG are planning a new award for FY22 to delineate remaining buried ACM. When a new contract is issued this site will be updated in the monthly status report. |
| 2018 Environmental Program Support Services | N. Peters / Chenega | The contractor continued processing and tracking correspondence, managing the Admin Record, maintaining REIMS, and conducting applicable system maintenance. The contractor also performed clearing of access to various monitoring wells and painted various wells. |
| RVAAP-004-R-01 ODA #2 | Nicole Walworth & Steve Kvaal / CENAB / Arcadis | The QAPP Work Plan comments were submitted to Arcadis on 27 August 2021. On September 22, 2021, the Army met to review comments and guide Arcadis on comment resolution. Arcadis is working on responses to Army comments. |
| RVAAP-66 Facility Wide Ground Water Monitoring | J. Trumble / Leidos | Responses to Ohio EPA comments on the Draft RI Report were transmitted to the Ohio EPA on October 5, 2021. |
| VEG Remediation Contract | N. Peters / Alaniz-Endpoint JV (AEJ) | The contractor continued preparing waste profiles for off-site disposal and collecting confirmation samples at the excavation sites. On October 28, 2021, the Army submitted Excavation Confirmation Report No. 1 for the project to Ohio EPA for review. |
| Load Lines 1 - 4 & 12 Remediation Contract | N. Peters / CH2M | On October 19, 2021, the Army received Ohio EPA comments on the Draft Remedial Action Completion Report for Load Lines 1- 4 & 12. On October 28, 2021, the Army submitted a response to those comments. On October 29, 2021, the Ohio EPA provided a letter accepting the Army responses and asking the Army to submit the final report. The contractor is preparing the Final report. |

**B. Describe difficulties encountered during the reporting period and actions taken to rectify any difficulties**

The VEG Remediation contractor continued having difficulty with mechanical systems and requested that they be allowed to switch the remediation approach to excavation and off-site disposal. The approved Proposed Plans and Decision Documents allow for excavation and off-site disposal. Excavation at one of the AOCs CC RVAAP-76 Depot Area has begun.

**C. Identify changes in key personnel**

None

**D. List target and actual completion dates for each element of activity, including project completion**

The actual completion dates and target dates where applicable are provided with the status of activities in Section A.

**E. Provide an explanation for any deviation from applicable schedules**

None

**F. Indicate how much soil and groundwater was generated and/or transported and disposed as part of RVAAP restoration activities**

None.

**G. Describe activities planned for the following month (November 2021)**

1. CH2M will submit the Final Remedial Action Completion Report for Loads Lines 1 - 4 & 12 to Ohio EPA and to the Administrative Record File.

2. Chenega plans to conduct the annual Land Use Control (LUC) Inspections in November and begin preparing the Annual LUC Inspection Report. Chenega will also begin the annual update to the Property Management Plan appendices.

3. Alaniz-Endpoint plans to begin excavation and transport and disposal of soil to a permitted landfill. They also plan to continue submitting confirmation samples for Army and Ohio EPA review.

4. Arcadis will address Army comments on the ODA2 QAPP Work Plan and submit the Draft QAPP Work Plan for backcheck and approval.

5. Leidos plans on conducting the Fall Semi Annual FWGWMP sampling in November.

6. Leidos will schedule a resolution meeting to discuss the RTCs on the RI Report for the Facility Wide Groundwater.

7. The Army will receive comments from the Ohio EPA on the Draft Spring 2021 FWGWMP Report, and will begin responding to the comments.

8. Leidos plans to respond to Army comments on the revised Pre-Draft Remedial Investigation Report for Facility Wide Sewers.

9. HGL will submit TPP meeting materials and start preparations for TPP1 proposed to be held in January 2022.

10. Dawson will continue to work on the Five Year Review document and address USACE comments.

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

September 9, 2021

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

Subject: Ravenna Army Ammunition Plant (RVAAP) Restoration Program, Portage/Trumbull Counties, Ohio, Monthly Activity Report - August 2021

Dear Ms. Oryshkewych:

Enclosed for your review is the "RVAAP Restoration Program - DFFO Monthly Summary Report – August 2021". The report summarizes the Restoration Program activities conducted at the former RVAAP for the period from August 1, 2021 through August 31, 2021. This report is being submitted to the Ohio EPA to comply with the Ohio EPA Director's Final Findings and Orders, Section XVI, paragraphs 36 and 37.

This electronic letter and attachment are being sent to meet the deadline for submittal. Due to the Ohio EPA teleworking at this time and not accepting mail, a hardcopy of the letter and attachment will not be sent at this time.

Please contact the undersigned at (614) 336-6000 Ext. 2053 or kevin.m.sedlak.ctr@mail.mil if there are issues or concerns with this submission.

Sincerely,

SEDLAK.KEVIN.MICHAEL.1254440171
Digitally signed by SEDLAK.KEVIN.MICHAEL.1254440171
Date: 2021.09.09 06:52:05 -04'00'

Kevin M. Sedlak
RVAAP Restoration Program Manager
Army National Guard Directorate

Attachment

cc: Bob Princic, Ohio EPA, DERR
Thomas Schneider, Ohio EPA, DERR
Kevin Palombo, Ohio EPA, DERR
Mark Leeper, ARNG HQ
Kevin Sedlak, ARNG, CJAG
Katie Tait, OHARNG, CJAG
Steve Kvaal, USACE - Louisville

**RVAAP RESTORATION PROGRAM - DFFO MONTHLY SUMMARY REPORT**
**August 2021**

**Status of project activities for reporting period (August 2021)**

| | | |
|---|---|---|
| 2021 RI/FS Completion Contract for IRP AOCs | N. Peters / Leidos | The contractor continued updating the RI Report for RVAAP-67 Facility-wide Sewers. The Army provided comments on the Pre-Draft RODs for RVAAP-50 Atlas Scrap Yard and RVAAP-06 C Block Quarry. The contractor began preparing responses to Army comments. |
| CC RVAAP-78 Quarry Pond Surface Dump | N. Peters / TBD | PARS is finished with their contract. USACE and ARNG are planning a new award for FY22 to delineate remaining buried ACM. When a new contract is issued this site will be placed back into the monthly status report. |
| 2018 Environmental Program Support Services | N. Peters / Chenega | The contractor continued processing and tracking correspondence, managing the Admin Record, maintaining REIMS, and conducting applicable system maintenance. The contractor also performed clearing of access to various monitoring wells and painted various wells. |
| RVAAP-004-R-01 ODA #2 | Nicole Walworth & Steve Kvaal / CENAB / Arcadis | The QAPP Work Plan comments were submitted to Arcadis on August 27, 2021. Arcadis is working on responses to Army comments. TPP meeting minutes were submitted to the Ohio EPA on July 16, 2021, and a no comment letter was received from Ohio EPA on August 12, 2021. |
| PBA 16 Compliance Cleanup Sites | K. Mieczkowski / Parsons | The Parsons contract for multiple CC sites has ended and a new contract is being prepared. |
| RVAAP-66 Facility Wide Ground Water Monitoring | J. Trumble / Leidos | On August 12, 2021 the Army received the Pre Draft 2021 FWGWMP Semi-Annual Report for review. On August 30, 2021, the Draft 2021 FWGWMP Semi-Annual Report was transmitted to the Ohio EPA for review. |
| VEG Remediation Contract | N. Peters / Alaniz-Endpoint JV (AEJ) | The contractor continued experiencing various mechanical issues with the VEG equipment. A new unit was brought to the site and was still being tested on August 30, 2021. The contractor has not yet accomplished any consistent through-put using the treatment system. |
| Load Lines 1 - 4 & 12 Remediation Contract | N. Peters / CH2M | On August 12, 2021, the Army submitted the Draft Remedial Action Completion Report for Load Lines 1- 4 & 12 to Ohio EPA for review. |

**B. Describe difficulties encountered during the reporting period and actions taken to rectify any difficulties**

The VEG Remediation contractor continued having difficulty with mechanical systems and brought a new VEG unit to the site. That unit was set up on August 27 and 28 and was still being tested on August 30, 2021.

**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**

The Spring 2021 FWGWMP well redevelopment, and sampling produced 18 55-gallon drums of IDW water. Analytical results determined the IDW to be Nonhazardous and were labeled as such. The characterization and disposal plan was approved by the Army on July 27, 2021. The water is being properly stored and inspected at Building 1036 while awaiting waste transport and disposal (currently scheduled for September 9, 2021).

**G. Describe activities planned for the following month (September 2021)**

1. Parsons contract has expired. A new contract action will be issued to complete the remaining work/tasks for these AOCs.
2. CH2M plans to receive Ohio EPA comments on the Draft Remedial Action Completion Report for Loads Lines 1 - 4 & 12 in late September and will begin developing a response to those comments.
3. Alaniz-Endpoint plans to begin using a new VEG treatment unit to address mechanical issues and establish a consistent rate of treatment.
4. Arcadis will address Army comments on the ODA2 QAPP Work Plan.
5. Leidos has scheduled pickup of the IDW from the spring FWGWMP sampling event for September 9, 2021.
6. Leidos plans to respond Army comments on the Preliminary Draft RODs for Atlas Scrap Yard and C Block Quarry and submit Draft RODs for Ohio EPA review once Army comments are resolved. Leidos also plans to submit the revised Preliminary Draft Facility-wide Sewers RI Report for Army review.

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

October 7, 2021

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

Subject: Ravenna Army Ammunition Plant (RVAAP) Restoration Program, Portage/Trumbull Counties, Ohio, Monthly Activity Report - September 2021

Dear Ms. Oryshkewych:

Enclosed for your review is the "RVAAP Restoration Program - DFFO Monthly Summary Report – September 2021". The report summarizes the Restoration Program activities conducted at the former RVAAP for the period from September 1, 2021 through September 30, 2021. This report is being submitted to the Ohio EPA to comply with the Ohio EPA Director's Final Findings and Orders, Section XVI, paragraphs 36 and 37.

This electronic letter and attachment are being sent to meet the deadline for submittal. Due to the Ohio EPA teleworking at this time and not accepting mail, a hardcopy of the letter and attachment will not be sent at this time.

Please contact the undersigned at (614) 336-6000 Ext. 2053 or kevin.m.sedlak.ctr@mail.mil if there are issues or concerns with this submission.

Sincerely,

TAIT.KATHRYN.SERENA.1289508275 Digitally signed by TAIT.KATHRYN.SERENA.1289508275 Date: 2021.10.07 08:33:06 -04'00'

**FOR** Kevin M. Sedlak
RVAAP Restoration Program Manager
Army National Guard Directorate

Attachment

cc: Bob Princic, Ohio EPA, DERR
Tom Schneider, Ohio EPA
Kevin Palombo, Ohio EPA, DERR
Mark Leeper, ARNG HQ
Katie Tait, OHARNG, CJAG
Steve Kvaal, USACE - Louisville

**RVAAP RESTORATION PROGRAM - DFFO MONTHLY SUMMARY REPORT**
**September 2021**

**Status of project activities for reporting period (September 2021)**

| | | |
|---|---|---|
| 2021 RI/FS Completion Contract for IRP AOCs | N. Peters / Leidos | The contractor submitted the updated Pre-Draft RI Report for RVAAP-67 Facility-wide Sewers for Army review. The contractor addressed Army comments on the Pre-Draft RODs for RVAAP-50 Atlas Scrap Yard and RVAAP-06 C Block Quarry. |
| CC RVAAP-78 Quarry Pond Surface Dump | N. Peters / TBD | PARS is finished with their contract. USACE and ARNG are planning a new award for FY22 to delineate remaining buried ACM. When a new contract is issued this site will be placed back into the monthly status report. |
| 2018 Environmental Program Support Services | N. Peters / Chenega | The contractor continued processing and tracking correspondence, managing the Admin Record, maintaining REIMS, and conducting applicable system maintenance. The contractor also performed clearing of access to various monitoring wells and painted various wells. |
| RVAAP-004-R-01 ODA #2 | Nicole Walworth & Steve Kvaal / CENAB / Arcadis | The QAPP Work Plan comments were submitted to Arcadis on 27 August 2021. On September 22, 2021, the Army met to review comments and guide Arcadis on comment resolution. Arcadis is working on responses to Army comments. |
| RVAAP-66 Facility Wide Ground Water Monitoring | J. Trumble / Leidos | The IDW from the Spring Semi Annual FWGWMP was properly transported and disposed of on September 9, 2021. |
| VEG Remediation Contract | N. Peters / Alaniz-Endpoint JV (AEJ) | The contractor prepared a Field Change Request (FCR) to switch to 100% excavation and off-site disposal due to on-going VEG equipment issues. That FCR was submitted on September 15, 2021 and approved by Ohio EPA September 17, 2021. The contractor began developing additional subcontracts, while collecting waste profile and confirmation samples. |
| Load Lines 1 - 4 & 12 Remediation Contract | N. Peters / CH2M | The Draft Remedial Action Completion Report for Load Lines 1- 4 & 12 is undergoing Ohio EPA review. On September 16, 2021, during the monthly schedule call, the Ohio EPA requested a 30-day extension. |

**B. Describe difficulties encountered during the reporting period and actions taken to rectify any difficulties**

The VEG Remediation contractor continued having difficulty with mechanical systems and requested that they be allowed to switch the remediation approach to excavation and off-site disposal. The approved Proposed Plans and Decision Documents allow for excavation and off-site disposal.

**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**

The Nonhazardous IDW (18 55-gallon drums) from the Spring 2021 FWGWMP well redevelopment and sampling was properly transported and disposed of on September 9, 2021.

**G. Describe activities planned for the following month (October 2021)**

1. Parsons contract has expired. A new contract action will be issued to complete the remaining work/tasks for these AOCs.
2. CH2M anticipates receiving Ohio EPA comments on the Draft Remedial Action Completion Report for Loads Lines 1 - 4 & 12 in late October and will begin developing a response to those comments.
3. Alaniz-Endpoint plans to begin hauling excavated soil to a permitted landfill after the Army and the disposal facility approves the waste profiles. They also plan to submit confirmation samples for Army and Ohio EPA review.
4. Arcadis will address Army comments on the ODA2 QAPP Work Plan and submit the Draft QAPP Work Plan for backcheck and approval.
5. Leidos plans on conducting the Fall Semi Annual FWGWMP sampling in October.
6. Leidos will submit revised comments on the Draft RI for the Facility Wide Groundwater.
7. Leidos plans to submit Draft RODs for Atlas Scrap Yard and C Block Quarry for Ohio EPA review.
8. HGL will have a kickoff meeting with the Army for the RAs for Block D and Group 8 MRSs.
9. Dawson will continue to work on the Five Year Review document and address USACE comments.

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

August 10, 2021

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

Subject: Ravenna Army Ammunition Plant (RVAAP) Restoration Program, Portage/Trumbull Counties, Ohio, Monthly Activity Report - July 2021

Dear Ms. Oryshkewych:

Enclosed for your review is the "RVAAP Restoration Program - DFFO Monthly Summary Report – July 2021". The report summarizes the Restoration Program activities conducted at the former RVAAP for the period from July 1, 2021 through July 31, 2021. This report is being submitted to the Ohio EPA to comply with the Ohio EPA Director's Final Findings and Orders, Section XVI, paragraphs 36 and 37.

This electronic letter and attachment are being sent to meet the deadline for submittal. Due to the Ohio EPA teleworking at this time and not accepting mail, a hardcopy of the letter and attachment will not be sent at this time.

Please contact the undersigned at (614) 336-6000 Ext. 2053 or kevin.m.sedlak.ctr@mail.mil if there are issues or concerns with this submission.

Sincerely,

SEDLAK.KEVIN.MICHAEL.1254440171

Digitally signed by SEDLAK.KEVIN.MICHAEL.1254440171
Date: 2021.08.09 12:25:38 -04'00'

Kevin M. Sedlak
RVAAP Restoration Program Manager
Army National Guard Directorate

Attachment

cc: Bob Princic, Ohio EPA, DERR
Thomas Schneider, Ohio EPA, DERR
Kevin Palombo, Ohio EPA, DERR
Mark Leeper, ARNG HQ
Kevin Sedlak, ARNG, CJAG
Katie Tait, OHARNG, CJAG
Steve Kvaal, USACE - Louisville

**RVAAP RESTORATION PROGRAM - DFFO MONTHLY SUMMARY REPORT**
**July 2021**

**Status of project activities for reporting period (July 2021)**

| | | |
|---|---|---|
| 2021 RI/FS Completion Contract for IRP AOCs | N. Peters / Leidos | A new task order was awarded to Leidos on July 6, 2021 for finalization of the Facility-wide Sewers RI Report and the Atlas Scrap Yard and C Block Quarry RODs. Leidos began updating the RI Report for Facility-wide Sewers to include the NTCRA results. The Pre-Draft RODs for Atlas Scrap Yard and C Block Quarry were issued for Army review on July 12, 2021. |
| CC RVAAP-78 Quarry Pond Surface Dump | N. Peters / TBD | PARS is finished with their contract. USACE and ARNG are planning a new award for FY22 to delineate remaining buried ACM. When a new contract is issued this site will be placed back into the monthly status report. |
| 2018 Environmental Program Support Services | N. Peters / Chenega | The contractor continued processing and tracking correspondence, managing the Admin Record, maintaining REIMS, and conducting applicable system maintenance. The contractor also performed clearing of access to various monitoring wells and painted various wells.<br><br>The contractor continued tracking decision documents in preparation for the annual update to the Property Management Plan. |
| PBA16 - MMRP Sites | Travis McCoun & Steve Kvaal / CENAB / HGL | The project is complete, and will no longer be included in the monthly status reports. |
| RVAAP-004-R-01 ODA #2 | Nicole Walworth & Steve Kvaal / CENAB / Arcadis | The QAPP Work Plan was submitted to USACE on July 7, 2021 and is undergoing review. TPP meeting minutes were submitted to the Ohio EPA on July 16, 2021. |

| | | |
|---|---|---|
| PBA 16 Compliance Cleanup Sites | K. Mieczkowski / Parsons | The Parsons contract for multiple CC sites has ended and a new contract is being prepared.<br><br>On May 5, 2021, the Draft RI was submitted to the Ohio EPA for review. The Ohio EPA requested an extension to August 9, 2021 to complete their review of CC RVAAP-69. Pending Ohio EPA review.<br><br>The CC RVAAP-74 Final Record of Decision is awaiting ARNG signature. When signature is obtained the signature page will be inserted into the Final Record of Decision in Administrative Record and a Final signed version will be sent to the Ohio EPA.<br><br>The CC RVAAP-79 RI addendum report (Ore Pond) was submitted to the Ohio EPA on July 12, 2021. The analytical table and reports were submitted to the Ohio EPA under separate Letter of Transmittal on July 15, 2021. Ohio EPA review is pending.<br><br>CC RVAAP-79 (DLA Ore Storage Sites) responses to the Ohio EPA and NGB legal reviews were submitted to reviewers on July 26, 2021<br><br>The RVAAP-03 (Open Demolition Area #1) Final Record of Decision is pending ARNG signature. When signed, the signature page will be inserted into the Final document and a copy will be sent to the Ohio EPA.<br><br>CC RVAAP-69 (Building 1048 Fire Station)- The Draft RI was submitted to the Ohio EPA for review and is pending. The Preliminary Draft FS submitted for Army review. Due to the contract ending the FS is still in the Preliminary Draft version. |
| RVAAP-66 Facility Wide Ground Water Monitoring | J. Trumble / Leidos | In a letter dated July 12, 2021, Ohio EPA approved responses to comments on the Draft 2020 FWGWMP Annual Report.<br><br>On July 22, 2021, the Final version of the 2020 FWGWMP Annual Report was submitted to Ohio EPA.<br><br>In a letter dated July 9, 2021, Ohio EPA approved the Final 2021 FWGWMP Addendum. |
| VEG Remediation Contract | N. Peters / Alaniz-Endpoint JV (AEJ) | The contractor continued excavations and set up and testing of the thermal treatment equipment. The Contractor treated a small amount of soil, while experiencing some mechanical issues including issues with the screw-type conveyor getting clogged up. The contractor has not yet accomplished any consistent through-put using the treatment system. |
| Load Lines 1 - 4 & 12 Remediation Contract | N. Peters / CH2M | The contractor and Army conducted the final restoration walkthrough and removal of erosion and sediment controls along with two minor repairs to access roads on July 6, 2021. The contractor responded to Army comments on the Preliminary Draft Remedial Action Completion Report. |

**B. Describe difficulties encountered during the reporting period and actions taken to rectify any difficulties**

The VEG Remediation contractor is repairing mechanical systems and has brought out a vibratory screen to aid in feeding the soils into the heater unit to hopefully increase soils thru-put.

**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**

The Spring 2021 FWGWMP well redevelopment, and sampling produced 18 55-gallon drums of IDW water. Analytical results determined the IDW to be Nonhazardous and were labeled as such. The characterization and disposal plan was approved by the Army on July 27, 2021. The water is being properly stored and inspected at Building 1036 while awaiting waste transport and disposal.

**G. Describe activities planned for the following month (August 2021)**

1. Parsons contract has expired. A new contract action will be issued to complete the remaining work/tasks for these AOCs.

2. CH2M plans to submit the Draft Remedial Action Completion Report for Loads Lines 1 - 4 & 12 to the Ohio EPA.

3. Alaniz-Endpoint plans to address mechanical issues and establish a consistent rate of treatment using the VEG system.

4. Arcadis will address comments on the ODA2 QAPP Work Plan.

5. Leidos plans to receive Army comments on the Preliminary Draft RODs for Atlas Scrap Yard and C Block Quarry and develop responses to comments, while continuing to update the Facility-wide Sewers RI Report.

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

July 8, 2021

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

Subject: Ravenna Army Ammunition Plant (RVAAP) Restoration Program, Portage/Trumbull Counties, Ohio, Monthly Activity Report - June 2021

Dear Ms. Oryshkewych:

Enclosed for your review is the "RVAAP Restoration Program - DFFO Monthly Summary Report - June 2021". The report summarizes the Restoration Program activities conducted at the former RVAAP for the period from June 1, 2021 through June 30, 2021. This report is being submitted to the Ohio EPA to comply with the Ohio EPA Director's Final Findings and Orders, Section XVI, paragraphs 36 and 37.

This electronic letter and attachment are being sent to meet the deadline for submittal. Due to the Ohio EPA teleworking at this time and not accepting mail, a hardcopy of the letter and attachment will not be sent at this time.

Please contact the undersigned at (614) 336-6000 Ext. 2053 or kevin.m.sedlak.ctr@mail.mil if there are issues or concerns with this submission.

Sincerely,

SEDLAK.KEVIN.MICHAEL.1254440171
Digitally signed by SEDLAK.KEVIN.MICHAEL.1254440171
Date: 2021.07.07 12:41:30 -04'00'

Kevin M. Sedlak
RVAAP Restoration Program Manager
Army National Guard Directorate

Attachment

cc: Bob Princic, Ohio EPA, DERR
Thomas Schneider, Ohio EPA, DERR
Kevin Palombo, Ohio EPA, DERR
Mark Leeper, ARNG HQ
Kevin Sedlak, ARNG, CJAG
Katie Tait, OHARNG, CJAG
Steve Kvaal, USACE - Louisville

**RVAAP RESTORATION PROGRAM - DFFO MONTHLY SUMMARY REPORT**
**June 2021**

**Status of project activities for reporting period (June 2021)**

| PROJECT NAME | USACE TECH MGR /Contractor | PROJECT STATUS |
|---|---|---|
| 2015 RI/FS Completion Contract for IRP AOCs | N. Peters / TBD | The Leidos contract ended on September 29, 2020. As such, finalization of the Facility-wide Sewers RVAAP-67 RI Report and the Atlas Scrap Yard and C Block Quarry RODs will be completed under a new contract. The Contractor has been selected and funds have been provided by ARNG. Contract award is expected to be finalized immediately after the July 4 holiday. |
| CC RVAAP-78 Quarry Pond Surface Dump | N. Peters / TBD | PARS is finished with their contract. USACE and ARNG are planning a new award for FY22 to delineate remaining buried ACM. |
| 2018 Environmental Program Support Services | N. Peters / Chenega | On June 15, 2021, the Army received Ohio EPA approval of the Final Annual 2020 LUC Inspection Report for Ramsdell Quarry Landfill, Winklepeck Burning Grounds, Load Lines 1 - 4 & 12, and the Dump Along Paris-Windham Road.<br><br>On June 18, 2021, the contractor submitted the Final Property Management Plan Appendices to Ohio EPA for review and approval.<br><br>On June 23, 2021, the Army and Ohio EPA had a teleconference to discuss Ohio EPA's concerns regarding how interim controls at ODA2 would be documented until the MMRP ROD is prepared.<br><br>The contractor continued processing and tracking correspondence, managing the Admin Record, maintaining REIMS, and conducting applicable system maintenance. The contractor also performed clearing of access to various monitoring wells and painted various wells. |
| PBA16 - MMRP Sites | Travis McCoun & Steve Kvaal / CENAB / HGL | The Final After-Action Report (AAR) for the Block D Surface Clearance was accepted by Ohio EPA on June 10, 2021. |
| RVAAP-004-R-01 ODA #2 | Nicole Walworth & Steve Kvaal / CENAB / Arcadis | Arcadis is working on the Work Plan for the RI Addendum field work. |
| PBA 16 Compliance Cleanup Sites | K. Mieczkowski / Parsons | On May 5, 2021, the Draft RI was submitted to the Ohio EPA for review. On May 25, 2021, the Ohio EPA requested an extension to complete their review until July 19, 2021 which was approved. The contractor submitted a letter report transmitting data from the May 21, 2021 sampling event which was approved by Army and sent to Ohio EPA via Liquid files on June 29, 2021. All IDW from the sampling of groundwater wells at CC RVAAP-69 has been properly transported and disposed.<br><br>On June 22, 2021, NGB Legal approved responses and Revision 1.0 to the Final Action Memo for CC RVAAP-70 East Classification Yard.The Draft FS for the CC RVAAP-79, DLA Ore Storage was submitted to Ohio EPA on June 2, 2021 and is pending Ohio EPA review. On June 10, 2021 the Preliminary Draft RI addendum for RVAAP-79 Ore Pond was submitted to Army for review. |

| PROJECT NAME | USACE TECH MGR /Contractor | PROJECT STATUS |
|---|---|---|
| RVAAP-66 Facility Wide Ground Water Monitoring | J. Trumble / Leidos | The Army replied to Ohio EPA comments on the Draft 2020 Annual Report on June 1, 2021. |
| VEG Remediation Contract | N. Peters / Alaniz-Endpoint JV (AEJ) | The contractor began bringing equipment onto the installation the week of June 14, 2021 and started land clearing activities. The week of June 21, 2021, the thermal treatment equipment began arriving and set up was commenced. The contractor also began excavation in preparation for starting up the treatment system. |
| Load Lines 1 - 4 & 12 Remediation Contract | N. Peters / CH2M | Inspections of erosion and sediment controls continued in June. The contractor received Army comments on the Preliminary Draft Remedial Action Completion Report and began preparing the draft version. The Contractor and Army planned final restoration walkthrough, removal of erosion and sediment controls, and two minor repairs to access roads to occur in early July. |

**B. Describe difficulties encountered during the reporting period and actions taken to rectify any difficulties**

**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**

As part of the groundwater well sampling activities a CC RVAAP-69, the contractor generated 29 gallons of nonhazardous liquid IDW that was properly transported and disposed at a municipal treatment facility on June 15, 2021.

The Spring 2021 FWGWMP well redevelopment, and sampling produced 18 55-gallon drums of IDW water. Analytical results determined the IDW to be Nonhazardous and were labeled as such. The water is being properly stored and inspected at Building 1036 while awaiting waste transport and disposal.

**G. Describe activities planned for the following month (July 2021)**

1. Leidos will submit the Final 2020 FWGWMP Annual Report upon completion of comment/response resolution.

2. Parsons plans on addressing Ohio EPA comments on the Draft RI Report for CC RVAAP-69 Building 1048 Fire Station. Parsons also plans on addressing Army comments on the Preliminary Draft FS for

CC RVAAP-69.

3. Parsons plans to address Ohio EPA comments on the Draft FS for CC RVAAP-79 DLA Ore Storage Sites. In addition, Parsons plans on resolving Army comments on the Preliminary Draft RI addendum for CC RVAAP-79 Ore Pond.

4. Parsons plans to submit Archive copies of the final RODs for CC RVAAP-74 and RVAAP-03 and Final Action Memo for CC RVAAP-70 after ARNG signature.

5. CH2M plans to conduct a final restoration walkthrough, removal of erosion and sediment controls, and two minor repairs to access roads on July 6, 2021.

6. CH2M plans to respond to Army comments on the Preliminary Draft Remedial Action Completion Report for Loads Lines 1 – 4 & 12 and prepare a Draft version for Army acceptance prior to submittal to Ohio EPA.

7. Alaniz-Endpoint plans to begin remediation using the VEG system.

8. Arcadis will submit the ODA2 Work Plan for Army review and comment.

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

June 9, 2021

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

Subject: Ravenna Army Ammunition Plant (RVAAP) Restoration Program, Portage/Trumbull Counties, Ohio, Monthly Activity Report - May 2021

Dear Ms. Oryshkewych:

Enclosed for your review is the "RVAAP Restoration Program - DFFO Monthly Summary Report - May 2021". The report summarizes the Restoration Program activities conducted at the former RVAAP for the period from May 1, 2021 through May 31, 2021. This report is being submitted to the Ohio EPA to comply with the Ohio EPA Director's Final Findings and Orders, Section XVI, paragraphs 36 and 37.

This electronic letter and attachment are being sent to meet the deadline for submittal. Due to the Ohio EPA teleworking at this time and not accepting mail, a hardcopy of the letter and attachment will not be sent at this time.

Please contact the undersigned at (614) 336-6000 Ext. 2053 or kevin.m.sedlak.ctr@mail.mil if there are issues or concerns with this submission.

Sincerely,

SEDLAK.KEVIN.MICHAEL.1254440171

Digitally signed by SEDLAK.KEVIN.MICHAEL.1254440171
Date: 2021.06.09 06:50:16 -04'00'

Kevin M. Sedlak
RVAAP Restoration Program Manager
Army National Guard Directorate

Attachment

cc: Bob Princic, Ohio EPA, DERR
Thomas Schneider, Ohio EPA, DERR
Kevin Palombo, Ohio EPA, DERR
Mark Leeper, ARNG HQ
Kevin Sedlak, ARNG, CJAG
Katie Tait, OHARNG, CJAG
Steve Kvaal, USACE - Louisville

**RVAAP RESTORATION PROGRAM - DFFO MONTHLY SUMMARY REPORT**
**May 2021**

**Status of project activities for reporting period (May 2021)**

| | | |
|---|---|---|
| 2015 RI/FS Completion Contract for IRP AOCs | N. Peters / TBD | The Leidos contract ended on September 29, 2020. As such, finalization of the Facility-wide Sewers RVAAP-67 RI Report and the Atlas Scrap Yard and C Block Quarry RODs will be completed under a new contract. The new contract is planned to be a Large Business Architect-Engineer contract. A new selection process will push this award into June 2021. |
| CC RVAAP-78 Quarry Pond Surface Dump NTCRA | N. Peters / PARS | On May 17, 2021, the Army received a letter from Ohio EPA approving the Final RACR. PARS is finished with their contract. |
| 2018 Environmental Program Support Services | N. Peters / Chenega | On May 18, 2021 the Army received the Ohio EPA's concurrence with the Army's response to Ohio EPA comments on the Draft Annual 2020 LUC Inspection Report for Ramsdell Quarry Landfill, Winklepeck Burning Grounds, Load Lines 1 - 4 & 12, and the Dump Along Paris-Windham Road to Ohio EPA. On May 26, 2021, the Final Annual 2020 LUC Inspection Report was submitted.<br><br>On May 26, 2021, the Army received Ohio EPA's concurrence with Army responses to Ohio EPA comments on the Draft Property Management Plan Appendices. The contractor began preparing the Final Property Management Plan Appendices.<br><br>The contractor continued processing and tracking correspondence, managing the Admin Record, maintaining REIMS, and conducting applicable system maintenance. The contractor also performed clearing of access to various monitoring wells and painted various wells. |
| PBA16 - MMRP Sites | Travis McCoun & Steve Kvaal / CENAB / HGL | The Final After-Action Report (AAR) for the Block D Surface Clearance was submitted to Ohio EPA on May 21, 2021. |
| RVAAP-004-R-01 ODA #2 | Nicole Walworth & Steve Kvaal / CENAB / Arcadis | A site visit was conducted on Tuesday May 25, 2021. Arcadis is working on the Work Plan. USACE conducted a creek walk for MPPEH the week of May 17, 2021. An After-Action Report will follow. |
| PBA 16 Compliance Cleanup Sites | K. Mieczkowski / Parsons | On May 4, 2021, the contractor resolved responses to Army comments on the Preliminary Draft RI for CC RVAAP-69. On May 5, 2021, the Draft RI was submitted to the Ohio EPA for review. On May 25, 2021, the Ohio EPA requested an extension to complete their review until July 19, 2021 which was approved. Also, on May 25, 2021, the contractor sampled the five most recent installed groundwater wells at CC RVAAP-69.<br><br>On May 6, 2021, the contractor submitted the Final Action Memorandum for CC RVAAP-70 East Classification Yard to the Army.<br><br>On April 19, 2021, the contractor completed the sediment sampling, bioassays, and wetlands delineation at the CC RVAAP-79, DLA Ore Storage pond. The Draft FS for the CC RVAAP-79, DLA Ore Storage Sites is still pending resolution of Army comments. |

| PROJECT NAME | USACE TECH | |
|---|---|---|
| RVAAP-66 Facility Wide Ground Water Monitoring | J. Trumble / Leidos | The 2021 spring sampling event for the FWGWMP was completed on May 10, 2021.<br><br>The Ohio EPA provided a reply to the Army's responses to comments on the Draft RI Report in a letter dated May 12, 2021.<br><br>The Ohio EPA concurred with the Army's responses to comments on the Draft 2021 Addendum in a letter dated May 5, 2021.<br><br>The Army submitted the Final 2021 FWGWMP Addendum to Ohio EPA on May 22, 2021.<br><br>The Ohio EPA provided comments on the Draft 2020 Annual Report in a letter dated May 12, 2021. |
| NTCRA RVAAP-67 | N. Peters / PARS | On May 6, 2021, the OHARNG agreed that vegetation was adequately established to consider restoration complete. On May 12, 2021 erosion and sediment controls were removed. On May 18, 2021, the Final RACR was submitted to the Ohio EPA. On May 28, 2021 the Army received a letter from the Ohio EPA approving the Final RACR. |
| VEG Remediation Contract | N. Peters / Alaniz-Endpoint JV (AEJ) | On May 11, 2021, the Army received Ohio EPA approval of the Final NTCRA Work Plan for RVAAP-34 Sand Creek Disposal Road Landfill.<br><br>On May 17, 2021, the Army received Ohio EPA approval of the Final RD for RVAAP-42 Load Line 9. |
| Load Lines 1 - 4 & 12 Remediation Contract | N. Peters / CH2M | Inspections of erosion and sediment controls continued in May. On May 19, 2021, the contractor submitted the Preliminary Draft Remedial Action Completion Report for Army review. |

**B. Describe difficulties encountered during the reporting period and actions taken to rectify any difficulties**

**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**

As part of the groundwater well sampling activities a CC RVAAP-69, the contractor generated 29 gallons of nonhazardous liquid IDW that is being properly stored and inspected at Building 1036 while awaiting waste transport and disposal.

The Spring 2021 FWGWMP well redevelopment, and sampling has produced 18 55-gallon drums of IDW water. The water is being properly stored and inspected at Building 1036 while awaiting analytical results, waste transport, and disposal.

**G. Describe activities planned for the following month (June 2021)**

1. Leidos will resolve responses to comments on the 2020 FWGWMP Annual Report and submit the Final (done June 1).

2. Parsons plans on addressing Ohio EPA comments on the Draft RI Report for CC RVAAP-69 Building 1048 Fire Station. Parsons will validate data of the fourth quarter sampling of the five groundwater monitoring wells at CC RVAAP-69 Building 1048 Fire Station and IDW inspections will continue until the one drum of purge water is disposed of in June 2021. Parsons also plans on addressing Army comments on the Preliminary Draft FS for CC RVAAP-69.

3. Parsons plans to address Army comments on the Preliminary Draft FS for CC RVAAP-79 DLA Ore Storage Sites. In addition, Parsons plans on preparing the Preliminary Draft RI addendum for CC RVAAP-79 Ore Pond.

4. Parsons plans to submit Archive copies of the final RODs for CC RVAAP-74 and CC RVAAP-03 and Final Action Memo for CC RVAAP-70 after ARNG signature.

5. Chenega will finalize the updated appendices for the Property Management Plan and submit to the Ohio EPA.

6. CH2M plans to receive Army comments on the Preliminary Draft Remedial Action Completion Report for Load Lines 1-4 and 12 (RVAAP-08 – RVAAP-12) and begin preparing the draft version. Stormwater inspections will occur until 70% vegetative cover is achieved at the excavation sites/disturbed areas.

7. Alaniz-Endpoint plans to begin bringing equipment onto the installation the week of June 14, 2021 to start the setup and site preparation necessary to begin remediation.

8. Arcadis will continue developing the Work Plan for the ODA2 RI.

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

May 10, 2021

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

Subject: Ravenna Army Ammunition Plant (RVAAP) Restoration Program, Portage/Trumbull Counties, Ohio, Monthly Activity Report - April 2021

Dear Ms. Oryshkewych:

Enclosed for your review is the "RVAAP Restoration Program - DFFO Monthly Summary Report - April 2021". The report summarizes the Restoration Program activities conducted at the former RVAAP for the period from April 1, 2021 through April 30, 2021. This report is being submitted to the Ohio EPA to comply with the Ohio EPA Director's Final Findings and Orders, Section XVI, paragraphs 36 and 37.

This electronic letter and attachment are being sent to meet the deadline for submittal. Due to the Ohio EPA teleworking at this time and not accepting mail, a hardcopy of the letter and attachment will not be sent at this time.

Please contact the undersigned at (614) 336-6000 Ext. 2053 or kevin.m.sedlak.ctr@mail.mil if there are issues or concerns with this submission.

Sincerely,

SEDLAK.KEVIN.MICHAEL.1254440171
Digitally signed by SEDLAK.KEVIN.MICHAEL.1254440171
Date: 2021.05.10 07:55:29 -04'00'

Kevin M. Sedlak
RVAAP Restoration Program Manager
Army National Guard Directorate

Attachment

cc: Bob Princic, Ohio EPA, DERR
Thomas Schneider, Ohio EPA, DERR
Kevin Palombo, Ohio EPA, DERR
Mark Leeper, ARNG HQ
Kevin Sedlak, ARNG, CJAG
Katie Tait, OHARNG, CJAG
Steve Kvaal, USACE - Louisville

**RVAAP RESTORATION PROGRAM - DFFO MONTHLY SUMMARY REPORT**
**April 2021**

**Status of project activities for reporting period (April 2021)**

| PROJECT NAME | USACE TECH MGR /Contractor | PROJECT STATUS |
|---|---|---|
| 2015 RI/FS Completion Contract for IRP AOCs | N. Peters / TBD | The Leidos contract ended on September 29, 2020. As such, finalization of the Facility-wide Sewers RVAAP-67 RI Report and the Atlas Scrap Yard and C Block Quarry RODs will be completed under a new contract. The new contract is planned to be a Large Business Architect-Engineer contract. A new selection process will push this award into May 2021. |
| CC RVAAP-78 Quarry Pond Surface Dump NTCRA | N. Peters / PARS | On April 13, 2021, the Ohio EPA accepted the Army's responses to Ohio EPA comments on the Draft RACR. The Final RACR was submitted to Ohio EPA on April 15, 2021. |
| 2018 Environmental Program Support Services | N. Peters / Chenega | On April 19, 2021 the contractor received Ohio EPA review comments on the Draft Annual 2020 LUC Inspection Report for Ramsdell Quarry Landfill, Winklepeck Burning Grounds, Load Lines 1 – 4 & 12, and the Dump Along Paris-Windham Road to Ohio EPA. On April 27, 2021, the contractor submitted a response to those comments.<br><br>On April 16, 2021, the contractor submitted responses to Ohio EPA review comments on the Draft Property Management Plan Appendices.<br><br>The contractor continued processing and tracking correspondence, managing the Admin Record, maintaining REIMS, and conducting applicable system maintenance. The contractor also performed clearing of access to various monitoring wells ahead of groundwater sampling and painted wells at Load Lines 7, 10, and 11. |
| PBA16 - MMRP Sites | Travis McCoun & Steve Kvaal / CENAB / HGL | The Block D MRS Surface Clearance Activities (concrete removal from surface) were completed January 22, 2021. Responses to Ohio EPA comments on the Draft After-Action Report (AAR) for the Block D Surface Clearance were submitted to Ohio EPA on May 5, 2021. |
| RVAAP-004-R-01 ODA #2 | Nicole Walworth & Steve Kvaal / CENAB / Arcadis | A site visit is scheduled for Tuesday May 25, 2021. |

| PROJECT NAME | | |
|---|---|---|
| PBA 16 Compliance Cleanup Sites | K. Mieczkowski / Parsons | On April 1, 2021 the contractor issued the Draft ROD for RVAAP-03 Open Demolition Area #1 for Ohio EPA review. On April 19, 2021, Ohio EPA accepted the Draft ROD with no comments. On April 20, 2021 the contractor issued the Final ROD for RVAAP-03 Open Demolition Area #1 for submittal to the Ohio EPA.<br><br>On April 29, 2021 the contractor provided responses to Army comments on the Preliminary Draft RI for CC RVAAP-69.<br><br>On April 15, 2021 the contractor submitted the Draft Action Memorandum for CC RVAAP-70 East Classification Yard for Army review. Army review is still pending.<br><br>On April 19, 2021 the Final ROD for CC RVAAP-74 Building 1034-Motor Pool Hydraulic Lift was accepted by the Ohio EPA.<br><br>On April 19, 2021, the contractor completed the sediment sampling, bioassays, and wetlands delineation at the CC RVAAP-79, DLA Ore Storage pond. The Draft FS for the CC RVAAP-79, DLA Ore Storage Sites is still pending Army Discussion and resolution on the Preliminary Draft. |
| RVAAP-66 Facility Wide Ground Water Monitoring | J. Trumble / Leidos | The Army notified the Ohio EPA on April 5, 2021 of the 2021 spring FWGWMP sampling event, that began on April 19, 2021.<br><br>By April 30, 2021, all eleven wells needing to be redeveloped were completed, and 34 for the 53 wells to be sampled, had been sampled. |
| NTCRA RVAAP-67 | N. Peters / PARS | On April 16, 2021 Ohio EPA and the Army had a teleconference to discuss some questions that Ohio EPA had on the Draft RACR. On April 30, 2021, the Army received a letter from Ohio EPA stating that there were no comments on the Draft RACR. The contractor began putting together the Final RACR. The contractor also continued inspections of erosion and sediment controls. |
| VEG Remediation Contract | N. Peters / Alaniz-Endpoint JV (AEJ) | On April 1, 2021, the Army received a response a revision to Table 2-1 of the QAPP was required for the Draft RD for RVAAP-42 Load Line 9. On April 8, 2021, the Army submitted the Final RD for RVAAP-42.<br><br>On April 9, 2021, the Army submitted the Final NTCRA Work Plan for RVAAP-34 Sand Creek Disposal Road Landfill for Ohio EPA review.<br><br>On April 16, 2021, the Army received Ohio EPA concurrence on the Final RD for RVAAP-45 Wet Storage Area. |
| Load Lines 1 - 4 & 12 Remediation Contract | N. Peters / CH2M | From April 4 to April 14, 2021, the contractor completed final grading and permanent seeding of disturbed areas. Inspections of erosion and sediment controls continued in April. In April, the contractor also continued preparing the Preliminary Draft Remedial Action Completion Report. |

**B. Describe difficulties encountered during the reporting period and actions taken to rectify any difficulties**

**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**

As part of the groundwater well sampling activities a CC RVAAP-69, the contractor generated 19 gallons of nonhazardous liquid IDW that is being properly stored and inspected at Building 1036 while awaiting waste transport and disposal.

The Spring 2021 FWGWMP well redevelopment, and sampling has produced 18 55-gallon drums of IDW water. The water is being properly stored and inspected at Building 1036 while awaiting characterization, waste transport, and disposal.

**G. Describe activities planned for the following month (May 2021)**

1. Leidos will resolve responses to comments on the 2021 FWGWMP Addendum and submit the Final.

2. Leidos will update the FWGWMP Remedial Investigation Report and submit the Final, if agreement is made on the Ohio EPA comments/responses.

3. Leidos will complete the Spring 2021 FWGWMP sampling event.

4. Parsons plans to continue addressing Army comments on the Preliminary Draft RI Report for CC RVAAP-69 Building 1048 Fire Station and prepare the draft version. The quarterly sampling is scheduled in late May for five groundwater monitoring wells at CC RVAAP-69 Building 1048 Fire Station and IDW inspections will continue until the one drum of purge water is disposed of after the May sampling event.

5. Parsons plans to address Army comments on the Preliminary Draft FS for CC RVAAP-79 DLA Ore Storage Sites. In addition, Parson's will receive the validated analytical data from the fieldwork completed in April pursuant to the Final Work Plan Addendum and prepare the Preliminary Draft RI addendum for CC RVAAP-79 Ore Pond.

6. Parsons plans to address Army comments on the Draft Action Memorandum for the CC RVAAP-70 EE/CA.

7. Chenega anticipates receiving Ohio EPA concurrence on the Draft Property Management Plan Appendices. Upon receipt of those comments, Chenega will begin preparing the Final version of the Property Management Plan.

8. Chenega anticipates submitting responses to Ohio EPA comments on the Draft Annual 2020 LUC Inspection Report for Ramsdell Quarry Landfill, Winklepeck Burning Grounds, Load Lines 1 – 4 & 12, and the Dump Along Paris-Windham Road. Upon approval of those comment responses, Chenega will begin preparing the Final Annual 2020 LUC Inspection Report.

9. CH2M plans to submit the Preliminary Draft Remedial Action Completion Report for Load Lines 1-4 and 12 (RVAAP-08 – RVAAP-12) to the Army.

10. PARS plans to submit the Final Removal Action Completion Report for the NTCRA at Load Line 2 for RVAAP-67 Facility-Wide Sewers and CC RVAAP-75.

11. The Army and Alaniz-Endpoint anticipate receiving Ohio EPA concurrence on the Final RD for RVAAP-42 Load Line 9 and on the Final NTCRA Work Plan for RVAAP-34 Sand Creek Disposal Road Landfill.

12. Arcadis will continue developing the Work Plan for the ODA2 RI.

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

March 9, 2021

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

Subject: Ravenna Army Ammunition Plant (RVAAP) Restoration Program, Portage/Trumbull Counties, Ohio, Monthly Activity Report - February 2021

Dear Ms. Oryshkewych:

Enclosed for your review is the "RVAAP Restoration Program - DFFO Monthly Summary Report - February 2021". The report summarizes the Restoration Program activities conducted at the former RVAAP for the period from February 1, 2021 through February 28, 2021. This report is being submitted to the Ohio EPA to comply with the Ohio EPA Director's Final Findings and Orders, Section XVI, paragraphs 36 and 37.

This electronic letter and attachment are being sent to meet the deadline for submittal. Due to the Ohio EPA teleworking at this time and not accepting mail, a hardcopy of the letter and attachment will not be sent at this time.

Please contact the undersigned at (614) 336-6000 Ext. 2053 or kevin.m.sedlak.ctr@mail.mil if there are issues or concerns with this submission.

Sincerely,

SEDLAK.KEVIN.MICHAEL.1254440171

Digitally signed by SEDLAK.KEVIN.MICHAEL.1254440171
Date: 2021.03.09 06:54:02 -05'00'

Kevin M. Sedlak
RVAAP Restoration Program Manager
Army National Guard Directorate

Attachment

cc: Bob Princic, Ohio EPA, DERR
Thomas Schneider, Ohio EPA, DERR
Kevin Palombo, Ohio EPA, DERR
Mark Leeper, ARNG HQ
Kevin Sedlak, ARNG, CJAG
Katie Tait, OHARNG, CJAG
Steve Kvaal, USACE - Louisville

**RVAAP RESTORATION PROGRAM - DFFO MONTHLY SUMMARY REPORT**
**February 2021**

**A. Status of project activities for reporting period (February 2021)**

| | | |
|---|---|---|
| 2015 RI/FS Completion Contract for IRP AOCs | N. Peters / TBD | The Leidos contract ended on September 29, 2020. As such, finalization of the Facility-wide Sewers RVAAP-67 RI Report and the Atlas Scrap Yard and C Block Quarry RODs will be completed under a new contract. The new contract is planned to be a Large Business Architect-Engineer contract. A new selection process will push this award into April 2021. |
| CC RVAAP-78 Quarry Pond Surface Dump NTCRA | N. Peters / PARS | On February 19, 2021, the Army received Ohio EPA comments on the Draft RACR. On February 25, 2021, the Army provided a response letter to Ohio EPA addressing the comments. |
| 2018 Environmental Program Support Services | N. Peters / Chenega | Chenega received Army comments on the Preliminary Draft Annual LUC Inspection Report for Ramsdell Quarry Landfill, Winklepeck Burning Grounds, Load Lines 1 – 4 & 12, and the Dump Along Paris-Windham Road and began preparing responses and revisions to the document.<br><br>On February 9, 2021, Chenega submitted the Draft Property Management Plan Appendices for Ohio EPA review.<br><br>Chenega received Army comments on the Draft 2021 Community Relations Plan and began preparing the final document.<br><br>Chenega continued processing and tracking correspondence, managing the Admin Record, maintaining REIMS, and conducting applicable maintenance. |
| PBA16 - MMRP Sites | Travis McCoun & Steve Kvaal / CENAB / HGL | The Block D MRS Surface Clearance Activities (concrete removal from surface) were completed January 22, 2021. The Draft After-Action Report (AAR) for the Block D Surface Clearance was submitted to Ohio EPA on February 19, 2021. |
| RVAAP-004-R-01 ODA #2 | Nicole Walworth & Steve Kvaal / CENAB / Arcadis | TPP1 planning is underway and will be scheduled in March 2021. In preparation for the TPP1 meeting, Arcadis is developing an updated Conceptual Site Model (CSM) for ODA2 which will be presented at the TPP1 meeting. |
| PBA 16 Compliance Cleanup Sites | K. Mieczkowski / Parsons | The Draft Work Plan Addendum for CC RVAAP-79, DLA Ore Storage pond for additional sampling was submitted to the Ohio EPA electronically on January 14, 2021. In addition, the preliminary draft FS report for the Ore Storage Sites was submitted for Army review.<br><br>Parsons submitted the Preliminary Draft RI Report for CC RVAAP-69, Building 1048 Fire Station for Army review on February 26, 2021. .<br><br>Parsons submitted the Preliminary Draft ROD for RVAAP-03 Open Demolition Area #1 on February 17, 2021 for Army review. |
| RVAAP-66 Facility Wide Ground Water Monitoring | J. Trumble / Leidos | Leidos submitted the draft FWGWMP 2020 Annual Report on February 9, 2021 for Ohio EPA review and comment, and the Draft 2021 Addendum on February 11, 2021. |
| NTCRA RVAAP-67 | N. Peters / PARS | The Draft Removal Action Completion Report was submitted to Ohio EPA on February 23, 2021. Erosion control inspections continue at the AOC. |

| | | |
|---|---|---|
| VEG Remediation Contract | N. Peters / Alaniz-Endpoint JV (AEJ) | The Army and Endpoint continued to work with Ohio EPA to resolve Ohio EPA concerns on the Sampling and Analysis Plan (SAP) that will apply to all five areas of concern to be remedied under this contract. The SAP was submitted as an addendum to the Remedial Design (RD) for RVAAP-42 Load Line 9. On January 14, 2021, the Army submitted a fifth response to Ohio EPA comments. No response was received as of February 28, 2021.<br><br>On February 19, 2021, the Army received a letter from Ohio EPA providing one technical comment on the Army's January 29 Response to Ohio EPA Comments on the Draft NTCRA Work Plan for RVAAP-34 Sand Creek Disposal Road Landfill. Five of the six Army responses were accepted.<br><br>On January 29, 2021, the Army provided a Response to Ohio EPA Comments on the Draft RD for CC RVAAP-76 Depot Area. The Army is awaiting a response from the Ohio EPA. |
| Load Lines 1 - 4 & 12 Remediation Contract | N. Peters / CH2M | In early February, CH2M and their subcontractor Iron Creek completed rough grading and temporary stabilization of the excavations, treatment pad area, and support areas and de-mobilized personnel and equipment from the site. A site walk/inspection was conducted with installation representatives on February 8, 2021. CH2M began preparing the Preliminary Draft Remedial Action Completion Report. |

**B. Describe difficulties encountered during the reporting period and actions taken to rectify any difficulties**

**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**

The following is a summary of wastes and recyclables generated during field activities as part of the thermal treatment remediation activities at LL1-4 and 12:

Recycled concrete: 890.25 tons

Disposal of metals-contaminated Nonhazardous soil: 159.7 tons

Thermally-treated soils (excavated, treated, sampled and recycled as backfill onsite): 3,700 cy

**G. Describe activities planned for the following month (March 2021)**

1. Leidos will submit the Final Spring 2020 FWGWMP Report.

2. Leidos will update the FWGWMP Remedial Investigation Report and submit the Final, if agreement is made on the Ohio EPA comments/responses.

3. Leidos will develop responses to comments on both the 2020 FWGWMP Annual Report, and the 2021 Addendum.

4. Parsons plans to address Army comments on the preliminary draft RI for CC RVAAP-69 when received.
.
5. Parsons plans to sample the 14 groundwater monitoring wells at CC RVAAP-69 the week of March 8, 2021.

6. Parsons plans to prepare the Preliminary Draft FS for CC RVAAP-69.

7. Parsons plans to address Army legal comments on the Preliminary Draft Record of Decision for CC RVAAP-74 Building 1034-Motor Pool Hydraulic Lift when they are received.

8. Parsons plans to address Ohio EPA comments on the Draft WP addendum for CC RVAAP-79 Ore Pond when they are received.

9. Parsons plans to address Army comments on the Preliminary Draft FS for CC RVAAP-79 as they are received.

10. Parsons plans to address Army comments on the Preliminary Draft ROD for RVAAP-03 as they are received.

11. Parsons plans to prepare and submit a public meeting summary package for RVAAP-03 public meeting.

12. Chenega plans to resolve Army comments on the 2020 Annual Land Use Control Inspection Report for Winklepeck Burning Grounds, Ramsdell Quarry Landfill, Load Lines 1 – 4 & 12, and Dump Along Paris-Windham Road and submit the draft version to Ohio EPA.

13. CH2M plans to submit the Preliminary Draft Remedial Action Completion Report for Load Lines 1-4 and 12 (RVAAP-08 – RVAAP-12) to the Army. When the ground thaws, CH2M plans to complete final grading and seeding for the site areas affected by the remedial action.

14. The Army anticipates receiving Ohio EPA comments on the Draft Removal Action Completion Report for the NTCRA at Load Line 2 for RVAAP-67 Facility-Wide Sewers and CC RVAAP-75 in late March or early April.

15. Upon receipt of approval of the Army's response to Ohio EPA comments on the Draft RACR for CC RVAAP-78, PARS will submit the Final RACR.

16. The Army and Alaniz-Endpoint anticipate receiving comments from the Ohio EPA regarding the fifth Response to Comments and finalizing the Sampling and Analysis Plan and the Load Line 9 RD.

17. The Army and Alaniz-Endpoint plan to submit a response to the Ohio EPA comment on the Army's responses to Ohio EPA comments on the Draft NTCRA Work Plan for RVAAP-34 Sand Creek Disposal Road Landfill.

18. Alaniz-Endpoint is in the field the week of March 1, 2021 to survey areas scheduled for excavation and cut down trees required to complete the excavations scheduled for this summer.

19. Arcadis will continue to prepare the CSM and materials for the upcoming TPP1 meeting tentatively scheduled for some time in March 2021.

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

February 9, 2021

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

Subject: Ravenna Army Ammunition Plant (RVAAP) Restoration Program, Portage/Trumbull Counties, Ohio, Monthly Activity Report - January 2021

Dear Ms. Oryshkewych:

Enclosed for your review is the "RVAAP Restoration Program - DFFO Monthly Summary Report - January 2021". The report summarizes the Restoration Program activities conducted at the former RVAAP for the period from January 1, 2021 through January 31, 2021. This report is being submitted to the Ohio EPA to comply with the Ohio EPA Director's Final Findings and Orders, Section XVI, paragraphs 36 and 37.

This electronic letter and attachment are being sent to meet the deadline for submittal. Due to the Ohio EPA teleworking at this time and not accepting mail, a hardcopy of the letter and attachment will not be sent at this time.

Please contact the undersigned at (614) 336-6000 Ext. 2053 or kevin.m.sedlak.ctr@mail.mil if there are issues or concerns with this submission.

Sincerely,

SEDLAK.KEVIN.MICHAEL.1254440171

Digitally signed by SEDLAK.KEVIN.MICHAEL.1254440171
Date: 2021.02.09 06:56:55 -05'00'

Kevin M. Sedlak
RVAAP Restoration Program Manager
Army National Guard Directorate

Attachment

cc: Bob Princic, Ohio EPA, DERR
Thomas Schneider, Ohio EPA, DERR
Kevin Palombo, Ohio EPA, DERR
Mark Leeper, ARNG HQ
Kevin Sedlak, ARNG, CJAG
Katie Tait, OHARNG, CJAG
Steve Kvaal, USACE - Louisville

**RVAAP RESTORATION PROGRAM - DFFO MONTHLY SUMMARY REPORT**
**January 2021**

**A. Status of project activities for reporting period (January 2021)**

| | | |
|---|---|---|
| 2015 RI/FS Completion Contract for IRP AOCs | N. Peters / TBD | The Leidos contract ended on September 29, 2020. As such, finalization of the Facility-wide Sewers RVAAP-67 RI Report and the Atlas Scrap Yard and C Block Quarry RODs will be completed under a new contract. The new contract is planned to be a Large Business Architect-Engineer contract and is planned to be awarded by March 31, 2021. |
| CC RVAAP-78 Quarry Pond Surface Dump NTCRA | N. Peters / PARS | On January 7, 2021 the Army submitted the Draft RACR to Ohio EPA. |
| 2018 Environmental Program Support Services | N. Peters / Chenega | Chenega submitted the Preliminary Draft Annual LUC Inspection Report for Ramsdell Quarry Landfill, Winklepeck Burning Grounds, Load Lines 1 – 4 & 12, and the Dump Along Paris-Windham Road to the Army for review on January 20, 2021.<br><br>Chenega submitted responses to Army comments on the Preliminary Draft Property Management Plan Appendices on January 29, 2021.<br><br>Chenega submitted the Draft 2021 Community Relations Plan to the Army for review on January 29, 2021.<br><br>Chenega continued processing and tracking correspondence, managing the Admin Record, maintaining REIMS, and conducting applicable maintenance such as clearing AOC access roads and repairing damaged monitoring well pads. |
| PBA16 - MMRP Sites | Travis McCoun & Steve Kvaal / CENAB / HGL | The Final Group 8 MRS ROD was signed by the Army National Guard on December 31, 2020. The PBA16 MMRP contract period of performance is up and the contract is complete. The final signed ROD was provided to the Ohio EPA January 7, 2021. Block D MRS Surface Clearance Activities (concrete removal from surface) commenced on January 4, 2021 and were completed January 22, 2021. An After-Action Report (AAR) will be prepared and submitted during the next reporting period. |
| RVAAP-004-R-01 ODA #2 | Nicole Walworth & Steve Kvaal / CENAB / Arcadis | TPP1 planning is underway and will be scheduled in March 2021. In preparation for the TPP1 meeting, Arcadis is developing an updated Conceptual Site Model (CSM) for ODA2 which will be presented at the TPP1 meeting. |
| PBA 16 Compliance Cleanup Sites | K. Mieczkowski / Parsons | The Draft Work Plan Addendum for CC RVAAP-79, DLA Ore Storage Sites additional sampling was submitted to the Army and Ohio EPA electronically on January 14, 2021.<br><br>Parsons completed IDW disposal from well installation, well development and Q1 and Q2 groundwater sampling at the five new groundwater monitoring wells at CC RVAAP-69, Building 1048 Fire Station on January 7, 2021.<br><br>A virtual public meeting was held on January 19, 2021 for RVAAP-03, Open Demolition Area #1.<br><br>Ohio EPA had no comments and the Final EE/CA for CC RVAAP-70 East Classification Yard and was finalized on January 29, 2021. |

| | | |
|---|---|---|
| RVAAP-66 Facility Wide Ground Water Monitoring | J. Trumble / Leidos | Leidos submitted responses to Ohio EPA comments on the Draft Remedial Investigation Report, in a letter dated January 29, 2021.<br><br>Leidos submitted responses to a December 28, 2020 comment letter on the Draft Spring 2020 Semi Annual FWGWMP Sampling event. The response letter was dated January 11, 2021. |
| NTCRA RVAAP-67 | N. Peters / PARS | PARS worked on responding to Army comments on the Preliminary Draft Completion Report and performed weekly inspections of erosion control measures on January 4, 11, and 19, 2021. No inspection occurred the week of January 26, because the ground was frozen. |
| VEG Remediation Contract | N. Peters / Alaniz-Endpoint JV (AEJ) | The Army and Endpoint continued to work with Ohio EPA to resolve Ohio EPA concerns on the Sampling and Analysis Plan (SAP) that will apply to all five areas of concern to be remedied under this contract. The SAP was submitted as an addendum to the Remedial Design (RD) for RVAAP-42 Load Line 9. On January 14, 2021, the Army submitted a fifth response to Ohio EPA comments.<br><br>On January 8, 2021, the Army received a letter from Ohio EPA providing technical comments on the Draft NTCRA Work Plan for RVAAP-34 Sand Creek Disposal Road Landfill.<br><br>On January 29, 2021, the Army provided a Response to Ohio EPA Comments on the Draft RD for CC RVAAP-76 Depot Area. |
| Load Lines 1 - 4 & 12 Remediation Contract | N. Peters / CH2M | During January, CH2M and their subcontractor Iron Creek completed extended excavations and treatment in locations where confirmation samples of initial excavations indicated RGOs were not met. Roll-offs of metals contaminated soils were loaded out for off-site disposal as non-hazardous waste. Remaining concrete debris was loaded out for recycling. Completed excavations were laser scanned to calculate volume removed. Excavations where RGOs were achieved were backfilled with treated soil. |

**B. Describe difficulties encountered during the reporting period and actions taken to rectify any difficulties**

**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**

Nine drums of drill cuttings and 3 drums of purge and decontamination water were generated as part of the well installation and sampling activities at CC RVAAP-69. The waste was determined to be nonhazardous and was labeled as such. The drums were disposed of in January 2021.

As of January 31, 2021, an estimated 3,700 cubic yards (measured in-situ) has been excavated and transported to on-site treatment cells associated with the remedial action at Load Lines 1-4 & 12. Treatment has been completed for that soil. An estimated 80 cubic yards (160 tons) of metals contaminated soil was shipped off-site for disposal as nonhazardous waste. On December 16, 2020, 240.56 tons of demolished concrete was shipped off site to be recycled. On January 21, 2021, approximately 160 tons of demolished concrete was shipped off site to be recycled.

**G. Describe activities planned for the following month (February 2021)**

1. Leidos will update the Spring 2020 FWGWMP Report and submit the Final, if agreement is made on the Ohio EPA comments/responses.

2. Leidos plans on submitting the Draft 2020 FWGWMP Annual Report to the Ohio EPA for review and comment.

3. Leidos plans on submitting the Draft 2021 FWGWMP Addendum to the Ohio EPA for review and comment.

4. Chenega anticipates preparing the Draft 2020 Annual Land Use Control Inspection Report for Winklepeck Burning Grounds, Ramsdell Quarry Landfill, Load Lines 1 – 4 & 12, and Dump Along Paris-Windham Road for submission to Ohio EPA. Chenega plans to address Army comments on the Preliminary Draft Property Management Plan Appendices update and prepare the draft version for submission to Ohio EPA.

5. CH2M plans to complete backfilling, grading, and temporary seeding for the Remedial Action at Load Lines 1-4 and 12 (RVAAP-08 – RVAAP-12) and demobilize equipment and personnel from the installation.

6. PARS plans to prepare the Draft Removal Action Completion Report for the NTCRA at Load Line 2 for RVAAP-67 Facility-Wide Sewers and CC RVAAP-75 for submittal to Ohio EPA.

7. Upon receipt of comments from Ohio EPA on the Draft RACR for CC RVAAP-78, PARS plans to begin preparing responses to comments and the Final RACR.

8. The Army and Alaniz-Endpoint anticipate receiving agreement from the Ohio EPA regarding the fifth Response to Comments so that the Sampling and Analysis Plan and the Load Line 9 RD can be finalized.

9. The Army and Alaniz-Endpoint plan to submit a response to Ohio EPA's comments on the Draft NTCRA Work Plan for RVAAP-34 Sand Creek Disposal Road Landfill.

10. Alaniz-Endpoint plan to survey areas scheduled for excavation and cut down trees required to complete the excavations scheduled for this summer.

11. Arcadis will continue to prepare the CSM and materials for the upcoming TPP1 meeting tentatively scheduled for some time in March 2021.

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

January 8, 2021

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

Subject: Ravenna Army Ammunition Plant (RVAAP) Restoration Program, Portage/Trumbull Counties, Ohio, Monthly Activity Report - December 2020

Dear Ms. Oryshkewych:

Enclosed for your review is the "RVAAP Restoration Program - DFFO Monthly Summary Report - December 2020". The report summarizes the Restoration Program activities conducted at the former RVAAP for the period from December 1, 2020 through December 31, 2020. This report is being submitted to the Ohio EPA to comply with the Ohio EPA Director's Final Findings and Orders, Section XVI, paragraphs 36 and 37.

This electronic letter and attachment are being sent to meet the deadline for submittal. Due to the Ohio EPA teleworking at this time and not accepting mail, a hardcopy of the letter and attachment will not be sent at this time.

Please contact the undersigned at (614) 336-6000 Ext. 2053 or kevin.m.sedlak.ctr@mail.mil if there are issues or concerns with this submission.

Sincerely,

SEDLAK.KEVIN.MICHAEL.1254440171

Digitally signed by SEDLAK.KEVIN.MICHAEL.1254440171
Date: 2021.01.08 07:19:04 -05'00'

Kevin M. Sedlak
RVAAP Restoration Program Manager
Army National Guard Directorate

Attachment

cc: Bob Princic, Ohio EPA, DERR
Thomas Schneider, Ohio EPA, DERR
Kevin Palombo, Ohio EPA, DERR
Mark Leeper, ARNG HQ
Kevin Sedlak, ARNG, CJAG
Katie Tait, OHARNG, CJAG
Steve Kvaal, USACE - Louisville

**RVAAP RESTORATION PROGRAM - DFFO MONTHLY SUMMARY REPORT**
**December 2020**

**A. Status of project activities for reporting period (December 2020)**

| PROJECT NAME | USACE TECH MGR /Contractor | PROJECT STATUS |
|---|---|---|
| 2015 RI/FS Completion Contract for IRP AOCs | N. Peters / Leidos | The Period of Performance for this contract ended on September 29, 2020. As such, finalization of the Facility-wide Sewers RVAAP-67 RI Report and the Atlas Scrap Yard and C Block Quarry RODs will be completed under a new contract. USACE held a preliminary Acquisition Strategy Meeting for this action in December 2020. The contracting mechanism to be used is yet to be determined. |
| CC RVAAP-78 Quarry Pond Surface Dump NTCRA | N. Peters / PARS | PARS continued preparing the Draft RACR for submittal to Ohio EPA. |
| 2018 Environmental Program Support Services | N. Peters / Chenega | Chenega continued preparing the Preliminary Draft Annual LUC Inspection Report for Ramsdell Quarry Landfill, Winklepeck Burning Grounds, Load Lines 1 – 4 & 12, and the Dump Along Paris-Windham Road. The perimeter fence inspection is on-going.<br><br>Chenega submitted the Preliminary Draft Property Management Plan Appendices update for Army review on December 15, 2020.<br><br>Chenega continued processing and tracking correspondence, managing the Admin Record, maintaining REIMS, and conducting applicable maintenance such as clearing AOC access roads and repairing damaged monitoring well pads. |
| PBA16 - MMRP Sites | Travis McCoun & Steve Kvaal / CENAB / HGL | The Final Group 8 MRS ROD was forwarded/signed by the Army National Guard on January 4, 2021. The PBA16 MMRP contract period of performance is up and the contract is complete. The final signed ROD will be provided to the Ohio EPA in January 2021. Block D MRS Surface Clearance Activities (concrete removal from surface) commenced on January 4, 2021 and are ongoing. An After-Action Report (AAR) will be prepared after all fieldwork is completed. |
| RVAAP-004-R-01 ODA #2 | Nicole Walworth & Steve Kvaal / CENAB / Arcadis | TPP1 planning is underway and will be scheduled in February 2020. In preparation for the TPP1 meeting, Arcadis is developing an updated Conceptual Site Model (CSM) for ODA2 which will be presented at the TPP1 meeting. |

| PROJECT NAME | USACE TECH MGR /Contractor | PROJECT STATUS |
|---|---|---|
| PBA 16 Compliance Cleanup Sites | K. Mieczkowski / Parsons | The Preliminary Draft Work Plan Addendum for CC RVAAP-79, DLA Ore Storage Sites additional sampling was submitted for Army review on November 12, 2020. All Army comments were submitted to Parsons by December 17, 2020.<br><br>Parsons completed the second quarter of the scheduled 4 quarters sampling events at the five new groundwater monitoring wells at CC RVAAP-69, Building 1048 Fire Station on December 3, 2020.<br><br>Parsons received Ohio EPA approval of Final RI Report for CC RVAAP-79, DLA Ore Storage Sites.<br><br>Parsons submitted the Final (Revision 2.0) Proposed Plan for RVAAP-03. This revision changed the public meeting from an in-person meeting to a virtual meeting on January 19, 2021.<br><br>Parsons submitted the Draft EE/CA for CC RVAAP-70 East Classification Yard to the Ohio EPA on December 15, 2020. |
| RVAAP-66 Facility Wide Ground Water Monitoring | J. Trumble / Leidos | Ohio EPA provided feedback on responses to Ohio EPA comments on the Draft FWGWMP Semi-annual report on December 28, 2020.<br><br>Leidos is currently preparing responses to the Ohio EPA comments on the FWGWMP Remedial Investigation report.<br><br>Leidos submitted the Preliminary Draft 2020 Annual FWGWMP report to the Army on December 28, 2020.<br><br>Leidos submitted the Preliminary Draft 2020 Annual FWGWMP Addendum to the Army on December 28, 2020. |
| NTCRA RVAAP-67 | N. Peters / PARS | PARS submitted the Preliminary Draft Completion Report for Army review on December 7, 2020 and performed weekly inspections of erosion control measures on December 7, 14, 21, and 29. |
| VEG Remediation Contract | N. Peters / Alaniz-Endpoint JV (AEJ) | The Army and Endpoint continued to work with Ohio EPA to resolve Ohio EPA concerns on the Sampling and Analysis Plan (SAP) that will apply to all five areas of concern to be remedied under this contract. The SAP was submitted as an addendum to the Remedial Design (RD) for RVAAP-42 Load Line 9.<br><br>On December 23, 2020, the Army received letters from Ohio EPA indicating that there were no further comments on the Draft RDs for RVAAP-38 NACA Test Area and RVAAP-45 Wet Storage Area other than the need to resolve the concerns on the SAP.<br><br>On December 23, 3030, the Army received a letter from Ohio EPA providing one technical comment on the Draft RD for RVAAP-76 Depot Area in addition to the concerns on the SAP. |

| PROJECT NAME | USACE TECH MGR /Contractor | PROJECT STATUS |
|---|---|---|
| Load Lines 1 - 4 & 12 Remediation Contract | N. Peters / CH2M | During December, CH2M and their subcontractor Iron Creek completed initial excavations at 12 additional locations not completed in November, completing the initial excavation extents at all 24 locations. Thermal treatment has been conducted on the soil excavated to date. Confirmation sampling at the excavations indicates that 17 excavations meet the RGOs, while 6 excavations have 10 total sample locations that need additional soil removal (9 side walls and one floor). Results for one excavation were still pending. The Army and CH2M worked with Ohio EPA to ensure that confirmation sample results were evaluated appropriately. |

**B. Describe difficulties encountered during the reporting period and actions taken to rectify any difficulties**

**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**

Nine drums of drill cuttings and 3 drums of purge and decontamination water were generated as part of the well installation and sampling activities at CC RVAAP-69. The waste was determined to be nonhazardous and was labeled as such. The drums are properly labeled and stored and being inspected while awaiting transport and disposal in January 2021.

As of December 21, 2020, an estimated 3,036 cubic yards (measured in-situ) has been excavated and transported to on-site treatment cells associated with the remedial action at Load Lines 1-4 & 12. Treatment has been completed for that soil, pending receipt of laboratory results for verification samples. Additional excavation will be done in locations where RGOs were not met. On December 16, 2020 approximately 240 tons of demolished concrete was shipped off site to be recycled.

**G. Describe activities planned for the following month (January 2021)**

1. Parsons will address the Army's comments on the Preliminary Draft work plan addendum for CC RVAAP-79 Ore Pond, including reformatting into a shorter, more consolidated work plan and will submit the draft work plan to Ohio EPA.

2. Parsons will validate data from the September and November 2020 sample events and arrange for pickup/disposal of IDW (soil and decontamination water).

3. Parsons will address comments on the Preliminary Draft Record of Decision for CC RVAAP-74 Building

1034-Motor Pool Hydraulic Lift when they are received.

4. The RVAAP-03 Open Demolition Area #1 public comment period is scheduled for 1 January to 31 January 2021 and the virtual public meeting is scheduled for 19 January 2021 at 6 pm eastern time.

5. Leidos plans on completing responses to Ohio EPA comments on the RVAAP-66 Draft Remedial Investigation Report, and submitting to the Army.

6. Chenega anticipates submitting to the Army the Preliminary Draft 2020 Annual Land Use Control Inspection Report for Winklepeck Burning Grounds, Ramsdell Quarry Landfill, Load Lines 1 – 4 & 12, and Dump Along Paris-Windham Road and receiving Army comments on the Preliminary Draft Property Management Plan Appendices update.

7. CH2M plans to complete additional excavation and treatment of soil for the Remedial Action at Load Lines 1-4 and 12 (RVAAP-08 – RVAAP-12) as required by confirmation samples. They also plan to transport and disposed of the nonhazardous metals-contaminated soil and transport and recycle the remaining demolished concrete. If pending results show treatment RGOs have been met by treatment cells, CH2M plans to begin backfilling excavations with treated soil.

8. PARS plans to resolve Army comments on the Preliminary Draft Removal Action Completion Report for the NTCRA at Load Line 2 for RVAAP-67 Facility-Wide Sewers and CC RVAAP-75 and prepare the Draft for submittal to Ohio EPA.

9. PARS plans to prepare the Draft RACR for CC RVAAP-78 and submit it for Ohio EPA review.

10. The Army and Alaniz-Endpoint plan to submit a response to Ohio EPA regarding the Sampling and Analysis Plan that is anticipated to resolve Ohio EPA's concerns.

11. The Army and Alaniz-Endpoint plan to submit a response to Ohio EPA's comment on the Draft RD for RVAAP-76 Depot Area.

12. Arcadis will continue to prepare the CSM and materials for the upcoming TPP1 meeting tentatively scheduled for some time in February 2021.

13. For the signed Group 8 MRS ROD, HGL will prepare and submit final archival copies to the Army and Ohio EPA.

Ohio Environmental Protection Agency

**Mike DeWine**, Governor
**Jon Husted**, Lt. Governor
**Laurie A. Stevenson**, Director

August 3, 2021

**TRANSMITTED ELECTRONICALLY**

Mr. Kevin M. Sedlak
Restoration Program Manager
ARNG-ILE Clean-up
Camp James A. Garfield JTC
1438 State Route 534
Newton Falls, OH 44444

RE: US Army Ammunition Plt RVAAP
Remediation Response
Project Records
Remedial Response
Portage County
ID # 267000859029

**Subject:** **Approval of the "Final Revised Property Management Plan for the Designated Areas of Concern and Munitions Response Sites, Version 4.0," Former Ravenna Army Ammunition Plant, Camp James A. Garfield Joint Military Training Center, Portage and Trumbull Counties, Ohio, dated June 18, 2021**

Dear Mr. Sedlak:

The Ohio Environmental Protection Agency (Ohio EPA) has received and reviewed the "Final Revised Property Management Plan for the Designated Areas of Concern and Munitions Response Sites, Version 4.0" for the Former Ravenna Army Ammunition Plant, Camp James A. Garfield Joint Military Training Center, Portage and Trumbull Counties, Ohio, dated June 18, 2021. This document was received at Ohio EPA's Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR) via email June 17, 2021. The document was prepared for the United States Army Corps of Engineers on behalf of the National Guard Bureau by Chenega Tri-Services, LLC under Contract Number W912QR-18-C-0013.

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

This letter is an official response from Ohio EPA that will be maintained as a public record.

RECEIVED
AUG 03 2021

If you have any questions, please contact me via email at kevin.palombo@epa.ohio.gov or call me at (330) 963-1292.

Sincerely,

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

KP/sc

ec: Rebecca Shreffler, Chenega
Bob Princic, Ohio EPA, NEDO, DERR
Natalie Oryshkewych, Ohio EPA, NEDO, DERR
Nicholas Roope, Ohio EPA, NEDO, DERR
Thomas Schneider, Ohio EPA, SWDO, DERR
Katie Tait, OHARNG RTLS, CJAG
Steve Kvaal, USACE Louisville
Nathaniel Peters, USACE Louisville

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

June 18, 2021

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

Subject: Ravenna Army Ammunition Plant Restoration Program, Final Revised Property Management Plan, Version 4.0, Former RVAAP, Portage/Trumbull Counties, Ohio (Ohio EPA ID No. 267-000859-029)

Dear Mr. Palombo:

The *Final Revised Property Management Plan for the Designated Areas of Concern and Munitions Response Sites, Version 4.0, Former Ravenna Army Ammunition Plant, Camp James A. Garfield Joint Military Training Center, Portage and Trumbull Counties, Ohio* (PMP) is being submitted to you electronically via the Ohio EPA's fileshare site. The entire PMP is being submitted to you. The main text, figures, Appendix A1, Appendix B and Appendix C have been previously approved by you and have no changes, except for the following:

- Updated footers to read "June 2021, Ver. 4.0".
- Changed "Garrison Commander" to "CJAG Base Operations Supervisor" and changed the address.
- Generally changed "Camp Ravenna" to "CJAG" or "former RVAAP" throughout the document.
- Added a map to Appendix A.1 TAB RVAAP-01 Ramsdell Quarry Landfill.

Appendix A2 is updated with the new NFA AOCs that you reviewed and approved in your May 26, 2021 letter.

One electronic copy is being submitted at this time and a hard copy can be provided when your office can receive them in the future. This PMP was prepared for the Army National Guard in support of the Environmental Program Support Services project at the former Ravenna Army Ammunition Plant.

Please contact the undersigned at (614) 336-2053 or kevin.m.sedlak.ctr@mail.mil if there are issues or concerns with this submission.

Sincerely,

SEDLAK.KEVIN.MICHAEL.1254440171 Digitally signed by SEDLAK.KEVIN.MICHAEL.1254440171 Date: 2021.06.17 15:45:58 -04'00'

Kevin Sedlak
RVAAP Restoration Program Manager
Army National Guard Directorate

cc: Tom Schneider, Ohio EPA (cover letter via email only)
Bob Princic, Ohio EPA (cover letter via email only)
Natalie Oryshkewych, Ohio EPA (cover letter via email only)

Megan Oravec, Ohio EPA (cover letter via email only)
Mark Leeper, ARNG (one [1] electronic copy)
Katie Tait, OHARNG (one [1] electronic copy)
Nathaniel Peters, USACE – Louisville (one [1] electronic copy)
Steve Kvaal, USACE – Louisville (cover letter via email only)
Susan Oliver, Management Solutions, LLC (cover letter via email only)
Jennifer Tierney, Vista Sciences Corp. (one [1] electronic copy, one [1] hard copy)

Ohio Environmental Protection Agency

**Mike DeWine**, Governor
**Jon Husted**, Lt. Governor
**Laurie A. Stevenson**, Director

May 26, 2021

**TRANSMITTED ELECTRONICALLY**

Mr. Kevin M. Sedlak
Restoration Program Manager
ARNG-ILE Clean-up
Camp James A. Garfield JTC
1438 State Route 534
Newton Falls, OH 44444

RE: US Army Ammunition Plt RVAAP
Remediation Response
Project Records
Remedial Response
Portage County
ID # 267000859029

**Subject: Response to Ohio EPA Comments on the "Draft Property Management Plan Appendices" dated April 16, 2021**

Dear Mr. Sedlak:

The Ohio Environmental Protection Agency (Ohio EPA) has received and reviewed the Response to Ohio EPA comments on the "Draft Property Management Plan Appendices" for the Former Ravenna Army Ammunition Plant, Portage and Trumbull Counties, Ohio (Camp James A. Garfield). This document was received at Ohio EPA, Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR) via email on April 16, 2021. The responses were prepared for the United States Army Corps of Engineers (USACE) on behalf of the National Guard Bureau by Chenega Tri-Services, LLC under Contract Number W912QR-18-C-0013.

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

As a precautionary response to COVID-19, Ohio EPA is currently operating with most staff working remotely. During this time, we will not be issuing hard-copy mail. This letter is an official response from Ohio EPA that will be maintained as a public record.

RECEIVED
MAY 26 2021

If you have any questions, please contact me via email at kevin.palombo@epa.ohio.gov, or call me at (330) 963-1292.

Sincerely,

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

KP/sc

ec: Nicholas Roope, Ohio EPA, NEDO, DERR
Bob Princic, Ohio EPA, NEDO, DERR
Natalie Oryshkewych, Ohio EPA, NEDO, DERR
Thomas Schneider, Ohio EPA, SWDO, DERR
Katie Tait, OHARNG RTLS, CJAG
Rebecca Shreffler, Chenega
Steve Kvaal, USACE Louisville
Nathaniel Peters, USACE Louisville

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

April 16, 2021

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

Subject: Ravenna Army Ammunition Plant Restoration Program
Comment Responses for the DRAFT 2021 Property Management Plan Appendices,
Former RVAAP/Camp James A. Garfield, Portage/Trumbull Counties, Ohio
(Ohio EPA ID No. 267-000859-029)

Dear Mr. Palombo:

This letter presents the Army National Guard's (ARNG) responses to your March 30, 2021 comments on the *Draft 2021 Property Management Plan Appendices*.

**General Comments**

1. Ohio EPA comment:
An introductory paragraph should be included that states that Table A2, provided, includes all areas of concern (AOCs) that have achieved the no further action (NFA) status, and that the table is updated annually. The introduction should also state that the site summaries that follow the table are only included for sites added this calendar year if that is the case. There is also some confusion when sites have achieved NFA status under the military munitions response program (MMRP) versus achieving NFA under the installation restoration program (IRP). Maybe some notation can be added. Since we are only seeing an updated table every year, it would be helpful to see a complete table of contents for the entire PMP every year.

1. ARNG response:
The introductory paragraph has been revised as follows:
"The AOCs and MRSs listed in this Appendix are those sites that have achieved No Further Action (NFA) as part of the RVAAP Restoration Program. The sites have achieved NFA status through either the Installation Restoration Program (IRP) or the Military Munitions Response Program (MMRP). The sites that have achieved NFA are listed in the "AOC/MRS" and "Appendix Tab" columns. Each NFA site listed on this table is summarized in the pages following this table. This Appendix will be updated annually to include additional AOCs/MRSs that have achieved NFA.

The "Date NFA Achieved Through Remedial Action" column lists the Remedial Action report date for those sites where a remedial action was required by the Decision Document for the NFA to be achieved.

The "Revision or Update" column lists the date that the PMP was revised or updated for a specific AOC/MRS site after it was originally added to the PMP (ex. Added new media that achieved NFA).

See attached revised Table A2.

Table A2 is updated every year and contains the newly added NFA sites as well as the previously added NFA sites.

Not all NFA sites at the former RVAAP have had appendices added to the PMP, especially sites that were closed out early in the CERCLA program at former RVAAP and sites closed under other regulations and programs (such as RCRA and NPDES). A limited number of NFA sites are added to the PMP each year due to availability in the current contract and contract funds. It is anticipated that all NFA will be added to the PMP within the next several annual updates.

2. Ohio EPA comment:
Please provide a brief update on the solid waste management program that was also agreed to be an appendix to the PMP.

ARNG response:
There were no changes to the solid waste management sites in 2020. Appendix C – Solid Waste Management Sites were added to the PMP in April 2020. It contains a table that summarizes the solid waste management sites at the facility. Appendix C will be included in the Final PMP submittal.

**Specific Comments**

1. Ohio EPA comment:
In order to eliminate confusion between the date the Record of Decision (ROD) was signed, and the actual date No Further Action was achieved through remedial action if one was necessary, another column on the table A2 should be added that provides the date the NFA was achieved.

ARNG response:
A column titled "Date NFA Achieved Through Remedial Action" has been added to Table A2. The dates have been filled in where appropriate. See attached revised Table A2.

2. Ohio EPA comment:
On the Report Documentation Page, line 16, "land use controls" (LUCs) are mentioned. If sites have achieved NFA, then no LUCs should be required. Ohio EPA requests removing the "land use controls" text from line 16 or provide a list of all the sites that have LUCs in the Appendix accordingly.

ARNG response:
The item is incorrect for the draft that was submitted for Ohio EPA review, which only included additions to the PMP for 2021. Only NFA sites were added to the PMP for 2021. This item will be correct for the Final PMP when it is submitted. The Final PMP will have Appendix A1 which summarizes the Land Use Control sites. No additions or changes are being made for Appendix A1 in 2021.

3. Ohio EPA comment:
Table A2 includes a column titled "Revision or Update." Please provide additional information that clarifies what circumstances the revision is anticipated to occur.

ARNG response:
The following explanation for this column has been added to the Table A2 introductory paragraph: "The "Revision or Update" column lists the date that the PMP was revised or updated for a specific AOC/MRS site after it was originally added to the PMP (ex. Added new media that achieved NFA)." See attached revised Table A2.

4. Ohio EPA comment:
The column titled "Record of Decision Signature Date" does not always correspond to the Ohio EPA signature date. Is the date provided the date of the Army signature? A clarification notation would be helpful.

   ARNG response:
   The Table A2 column heading has been revised to "Decision Document Army Signature Date". See attached revised Table A2.

5. Ohio EPA comment:
Table A2 does not reference the Final Record of Decision for Sediment and Surface Water at Six Areas of Concern/Munitions Response Sites for both RVAA-04 Open Demolition Area No. 2 (with co-located RVAAP-004-R-01 ODA2 MRS), and RVAAP-060-R-01 Block D Igloo MRS. Please revise the table to include the listed sites consistent with the other four areas included in the table.

   ARNG response: See ARNG response to Ohio EPA General Comment #1. These AOCs/MRSs will not be added to the PMP this year but may be added to the next annual PMP update or may be deferred until additional required work is completed.

6. Ohio EPA comment:
The Final Record of Decision for Soil, Sediment, and Surface Water at RVAAP-13, Building 1200 determination of NFA was dependent on the completion of the remedial action (RA) selected and not the date of the record of decision. Please confirm the RA was conducted to achieve NFA and revise the document to reflect the date NFA was achieved (date NFA was completed).

   ARNG response:
   The RA is confirmed and the date of the Final RA Completion Report (May 14, 2015) has been added to Table A2 for this NFA site. See attached revised Table A2.

7. Ohio EPA comment:
The Final Record of Decision for Soil, Sediment, and Surface Water at the RVAAP-16, Fuze and Booster Quarry Landfill/Ponds stated that soil removal remedial action was necessary for NFA. Therefore, the determination of NFA is dependent on the completion of the RA selected and not the date of the Record of Decision. Please confirm the RA was conducted to achieve NFA and revise the document to reflect the date NFA was achieved (date NFA was completed). In addition, please revise the summary section to reflect the date NFA was achieved.

   ARNG response:
   The RA for soil and dry sediment removal is confirmed. The following sentence has been added to the end of the last paragraph in section A.2-016.4 No Further Action Required: "The Remedial Action for soil and dry sediment was completed in 2010

(SAIC, 2010)." The date of the Final RA Completion Report (March 6, 2010) has been added to Table A2 for this NFA site. See attached revised Table A2.

8. Ohio EPA comment:
The Final Record of Decision for Soil, Sediment, and Surface Water at RVAAP-48, Anchor Test Area required soil removal to achieve RA. Please confirm the RA was conducted to achieve NFA and revise the Table A2 to reflect the date NFA was achieved (date NFA was completed).

   ARNG response:
The RA is confirmed and the date of the Final RA Completion Report (May 16, 2015) has been added to Table A2 for this NFA site. See attached revised Table A2.

9. Ohio EPA comment:
Page A2-5, CC RVAAP-71, Barn Number 5, Petroleum Release. and CC RVAAP-72 Facility-Wide Underground Storage Tanks. These sites did not receive an NFA through a Decision Document. They can probably be included, but some clarification should be added.

   ARNG response:
A notation has been added to the "Decision Document Army Signature Date" for those sites that achieved NFA through a Site Inspection. See attached revised Table A2.

10. Ohio EPA comment:
Table A2-5, CC RVAAP-73, Facility-Wide Coal Storage. The referenced document was not available on REIMS, and therefore, could not be confirmed. The document may be too recent.

   ARNG response:
The document title should be "Final Record of Decision for CC RVAAP-73 Facility-Wide Coal Storage. Parsons. 26 November 2018". The document is in REIMS but was missing a word in the title both in REIMS and in Table A2. This issue has been corrected and the document is now accessible.

These comment responses were prepared in support of the Environmental Program Support Services project at the former Ravenna Army Ammunition Plant.

Please contact the undersigned at (614) 336-2053 or kevin.m.sedlak.ctr@mail.mil if there are issues or concerns with this submission.

Sincerely,

SEDLAK.KEVIN.MICHAEL.1254440171
Digitally signed by SEDLAK.KEVIN.MICHAEL.1254440171
Date: 2021.04.16 08:43:49 -04'00'

Kevin M. Sedlak
RVAAP Restoration Program Manager
Army National Guard Directorate

Attachment: Revised Table A2
cc: Tom Schneider, Ohio EPA, DERR (one [1] electronic copy)
Bob Princic, Ohio EPA, NEDO (one [1] electronic copy)

Natalie Oryshkewych, Ohio EPA, NEDO, DERR ((one [1] electronic copy)
Kevin Sedlak, ARNG, (one [1] electronic copy)
Katie Tait, OHARNG, (one [1] electronic copy)
Nathaniel Peters, USACE – Louisville (one [1] electronic copy)
Craig Coombs, USACE – Louisville (one [1] electronic copy)
Susan Oliver, Management Solutions, LLC (one [1] electronic copy)
Jennifer Tierney, Vista Science Corp. (one [1] electronic copy, one [1] hard copy)

**Draft Table A2**
**AOC/MRS SITES THAT HAVE ACHIEVED NO FURTHER ACTION (NFA) STATUS**

The AOCs and MRSs listed in this Appendix are those sites that have achieved No Further Action (NFA) as part of the RVAAP Restoration Program. The sites have achieved NFA status through either the Installation Restoration Program (IRP) or the Military Muntions Response Program (MMRP). The sites that have achieved NFA are listed in the "AOC/MRS" and "Appendix Tab" columns. Each NFA site listed on this table is summarized in the pages following this table. This Appendix will be updated annually to include additional AOCs/MRSs that have achieved NFA.

The "Date NFA Achieved Through Remedial Action" column lists the Remedial Action report date for those sites where a remedial action was required by the Decision Document for the NFA to be achieved.
The “Revision or Update” column lists the date that the PMP was revised or updated for a specific AOC/MRS site after it was originally added to the PMP (ex. Added new media that achieved NFA).

| AOC/MRS | Appendix Tab | No Further Action Details | Date NFA Achieved Through Remedial Action | Decision Document Army Signature Date | Date Added to the PMP | Revision or Update |
|---|---|---|---|---|---|---|
| RVAAP-001-R-01 Ramsdell Quarry Area 2 (South) MRS | RVAAP-001-R-01 | Final No Further Action Record of Decision for RVAAP-001-R-01 Ramsdell Quarry Landfill Area 2 (South) Munitions Response Site, Version 2.0 | Not Applicable | November 12, 2019 | February 2020 | May 2021 |
| | | Final Record of Decision for Sediment and Surface Water at Six Areas of Concern/Munitions Response Sites | Not Applicable | September 15, 2020 | | |
| RVAAP-001-R-02 Ramsdell Quarry Landfill Area 1 (North) | RVAAP-001-R-02 | Final No Further Action Record of Decision for RVAAP-001-R-02 Ramsdell Quarry Landfill Area 1 (North) Munitions Response Site, Version 2.0 | Not Applicable | March 8, 2019 | February 2020 | May 2021 |
| | | Final Record of Decision for Sediment and Surface Water at Six Areas of Concern/Munitions Response Sites | Not Applicable | September 15, 2020 | | |

**Draft Table A2**
**AOC/MRS SITES THAT HAVE ACHIEVED NO FURTHER ACTION (NFA) STATUS**

| AOC/MRS | Appendix Tab | No Further Action Details | Date NFA Achieved Through Remedial Action | Decision Document Army Signature Date | Date Added to the PMP | Revision or Update |
|---|---|---|---|---|---|---|
| RVAAP-02 Erie Burning Grounds | RVAAP-02 | Final Record of Decision for Soil and Dry Sediment at RVAAP- 02 Erie Burning Grounds | Not Applicable | October 30, 2007 | August 2018 | May 2021 |
| | | Final Record of Decision for Sediment and Surface Water at Six Areas of Concern/Munitions Response Sites | Not Applicable | September 15, 2020 | | |
| RVAAP-002-R-01 Erie Burning Grounds | RVAAP-002-R-01 | Final No Further Action Record of Decision for RVAAP-002-R-01 Erie Burning Grounds Munitions Response Site, Version 1.0 | Not Applicable | November 12, 2019 | February 2020 | |
| RVAAP-04 Open Demolion Area #2 | RVAAP-04 | Final Record of Decision for Soil and Dry Sediment at the RVAAP- 04 Open Demolition Area #2 | Not Applicable | October 30, 2007 | August 2018 | |
| RVAAP-008-R-01 Load Line 1A MRS | RVAAP-008-R-01 | Final No Further Action Record of Decision for RVAAP-008-R-01 Load Line #1A Munitions Response Site | Not Applicable | December 18, 2018 | August 2018 | |
| RVAAP-13 Building 1200 | RVAAP-13 | Final Record of Decision for Soil, Sediment, and Surface Water at RVAAP-13 Building 1200 | May 14, 2015 | July 1, 2014 | August 2018 | |
| RVAAP-016-R-01 Fuze and Booster Quarry MRS | RVAAP-016-R-01 | Final No Further Action Record of Decision for RVAAP-016-R-01 Fuze and Booster Quarry Munitions Response Site, Version 1.0 | Not Applicable | October 7, 2019 | February 2020 | |
| RVAAP-16 Fuze and Booster Quarry | RVAAP-16 | Final Record of Decision for Soil and Dry Sediment at the RVAAP-16 Fuze and Booster Quarry Landfill/Ponds | March 6, 2010 | October 30, 2007 | May 2021 | |
| | | Final Record of Decision for Sediment and Surface Water at Six Areas of Concern/Munitions Response Sites | Not Applicable | September 15, 2020 | | |

**Draft Table A2**
**AOC/MRS SITES THAT HAVE ACHIEVED NO FURTHER ACTION (NFA) STATUS**

| AOC/MRS | Appendix Tab | No Further Action Details | Date NFA Achieved Through Remedial Action | Decision Document Army Signature Date | Date Added to the PMP | Revision or Update |
|---|---|---|---|---|---|---|
| RVAAP-19 Landfill North of Winklepeck | RVAAP-19 | Final Record of Decision for Soil, Sediment, and Surface Water at RVAAP-19 Landfill North of Winklepeck Burning Grounds | Not Applicable | July 20, 2020 | May 2021 | |
| RVAAP-019-R-01 Landfill North of Winklepeck MRS | RVAAP-019-R-01 | Final No Further Action Record of Decision for RVAAP-019-R-01 Landfill North of Winklepeck Munitions Response Site, Version 2.0 | Not Applicable | March 8, 2019 | February 2020 | |
| RVAAP-28 Suspected Mustard Agent Burial Site | RVAAP-28 | Final Action Memorandum: RVAAP-28 Suspected Mustard Agent Burial Site | Not Applicable | July 17, 2017 | May 2021 | |
| RVAAP-29 Upper and Lower Cobbs Pond | RVAAP-29 | Final Record of Decision for Soil, Sediment and Surface Water at RVAAP-29 Upper and Lower Cobbs Ponds | Not Applicable | June 7, 2019 | February 2020 | |
| RVAAP-032-R-01 40mm Firing Range MRS | RVAAP-032-R-01 | Final No Further Action Record of Decision for RVAAP-032-R-01 40mm Firing Range Munitions Response Site, Version 1.0 | Not Applicable | September 24, 2019 | February 2020 | |
| RVAAP-33 Load Line 6 | RVAAP-33 | Final Record of Decision for Soil, Sediment, and Surface Water at RVAAP-33 Load Line 6 | Not Applicable | May 12, 2018 | February 2020 | |
| RVAAP-033-R-01 Firestone Test Facility MRS | RVAAP-033-R-01 | Final No Further Action Record of Decision for RVAAP-033-R-01 Firestone Test Facility Munitions Response Site | Not Applicable | November 12, 2019 | August 2018 | |

**Draft Table A2**
**AOC/MRS SITES THAT HAVE ACHIEVED NO FURTHER ACTION (NFA) STATUS**

| AOC/MRS | Appendix Tab | No Further Action Details | Date NFA Achieved Through Remedial Action | Decision Document Army Signature Date | Date Added to the PMP | Revision or Update |
|---|---|---|---|---|---|---|
| RVAAP-034-R-01 Sand Creek Dump MRS | RVAAP-034-R-01 | Final No Further Action Record of Decision for RVAAP-034-R-01 Sand Creek Dump Munitions Response Site, Version 1.0 | Not Applicable | November 12, 2019 | August 2018 | |
| RVAAP-39 Load Line 5 | RVAAP-39 | Final Record of Decision for Soil, Sediment, and Surface Water at RVAAP-39 Load Line 5 | Not Applicable | March 16, 2018 | February 2020 | |
| RVAAP-40 Load Line 7 | RVAAP-40 | Final Record of Decision for Soil, Sediment, and Surface Water at RVAAP-40 Load Line 7 | Not Applicable | June 7, 2019 | February 2020 | |
| RVAAP-41 Load Line 8 | RVAAP-41 | Final Record of Decision for Soil, Sediment, and Surface Water at RVAAP-41 Load Line 8 | Not Applicable | June 16, 2018 | February 2020 | |
| RVAAP-43 Load Line 10 | RVAAP-43 | Final Record of Decision for Soil, Sediment, and Surface Water at RVAAP-43 Load Line 10 | Not Applicable | March 16, 2017 | May 2021 | |
| RVAAP-44 Load Line 11 | RVAAP-44 | Final Record of Decision for Soil, Sediment, and Surface Water at RVAAP-44 Load Line 11 | Not Applicable | May 12, 2018 | February 2020 | |
| RVAAP-46 Buildings F-15 and F-16 | RVAAP-46 | Final Record of Decision for Soil, Sediment, and Surface Water at RVAAP-46 Buildings F-15 and F-16 | Not Applicable | July 20, 2020 | May 2021 | |
| RVAAP-48 Anchor Test Area | RVAAP-48 | Final Record of Decision for Soil, Sediment, and Surface Water at RVAAP-48 Anchor Test Area | May 16, 2015 | July 1, 2014 | August 2018 | |

**Draft Table A2**
**AOC/MRS SITES THAT HAVE ACHIEVED NO FURTHER ACTION (NFA) STATUS**

| AOC/MRS | Appendix Tab | No Further Action Details | Date NFA Achieved Through Remedial Action | Decision Document Army Signature Date | Date Added to the PMP | Revision or Update |
|---|---|---|---|---|---|---|
| RVAAP-49 Central Burn Pits | RVAAP-49 | Final Record of Decision for Soil and Dry Sediment at RVAAP-49 Central Burn Pits | December 5, 2008 | June 22, 2009 | August 2018 | |
| RVAAP-050-R-01 Atlas Scrap Yard MRS | RVAAP-050-R-01 | Final No Further Action Record of Decision for RVAAP-050-R-01 Atlas Scrap Yard Munitions Response Site | Not Applicable | December 4, 2018 | February 2020 | |
| RVAAP-061-R-01 Block D Igloo TD MRS | RVAAP-061-R-01 | Final No Further Action Record of Decision for RVAAP-061-R-01 Block D Igloo - TD Munitions Response Site, Version 1.0 | Not Applicable | December 18, 2018 | February 2020 | |
| RVAAP-062-R-01 Water Works No. 4 MRS | RVAAP-062-R-01 | Final No Further Action Record of Decision for RVAAP-062-R-01 Water Works #4 Dump Munitions Response Site, Version 1.0 | Not Applicable | November 12, 2019 | August 2018 | |
| CC RVAAP-68 Electrical Substations (East, West, No. 3) | CC RVAAP-68 | Final Record of Decision for Soil, Sediment, and Surface Water at CC RVAAP-68 Electric Substations (East, West, No. 3) | Not Applicable | May 1, 2017 | May 2021 | |
| CC RVAAP-71 Barn No. 5 Petroleum Release | CC RVAAP-71 | Final Site Inspection CC RVAAP-71 Barn No. 5 Petroleum Release | Not Applicable | Site achieved NFA through Site Inspection in 2015. | May 2021 | |
| CC RVAAP-72 Facility-Wide Storage Tanks | CC RVAAP-72 | Final Site Inspection CC RVAAP-72 Facility-Wide Underground Storage Tanks | Not Applicable | Site achieved NFA through Site Inspection in 2015. | May 2021 | |

**Draft Table A2**
**AOC/MRS SITES THAT HAVE ACHIEVED NO FURTHER ACTION (NFA) STATUS**

| AOC/MRS | Appendix Tab | No Further Action Details | Date NFA Achieved Through Remedial Action | Decision Document Army Signature Date | Date Added to the PMP | Revision or Update |
|---|---|---|---|---|---|---|
| CC RVAAP-73 Facility-Wide Coal Storage | CC RVAAP-73 | Final Record of Decision for CC RVAAP-73 Facility-Wide Coal Storage | Not Applicable | April 24, 2019 | May 2021 | |
| CC RVAAP-77 Building 1037 Laundry Waste Water Sump | CC RVAAP-77 | Final Site Inspection CC RVAAP-77 Building 1037 Laundry Waste Water Sump | Not Applicable | Site achieved NFA through Site Inspection in 2015. | May 2021 | |
| CC RVAAP-80 Group 2 Propellant Can Tops | CC RVAAP-80 | Final Site Inspection Report: CC RVAAP-80 Group 2 Propellant Can Tops | Not Applicable | Site achieved NFA through Site Inspection in 2017. | May 2021 | |
| CC RVAAP-83 Former Buildings 1031 and 1039 | CC RVAAP-83 | Final Site Inspection Report CC RVAAP-83 Former Buildings 1031 and 1039 | Not Applicable | Site achieved NFA through Site Inspection in 2015. | May 2021 | |

Ohio Environmental Protection Agency

**Mike DeWine,** Governor
**Jon Husted,** Lt. Governor
**Laurie A. Stevenson,** Director

March 30, 2021

**TRANSMITTED ELECTRONICALLY**

Mr. Kevin M. Sedlak
Restoration Program Manager
ARNG-ILE Clean-up
Camp James A. Garfield JTC
1438 State Route 534
Newton Falls, OH 44444

RE: US Army Ammunition Plt RVAAP
Remediation Response
Project Records
Remedial Response
Portage County
ID # 267000859029

**Subject: Ohio EPA Comments on the "Draft Property Management Plan Appendices" dated February 8, 2021**

Dear Mr. Sedlak:

The Ohio Environmental Protection Agency (Ohio EPA) has received and reviewed the "Draft Property Management Plan Appendices" for the Former Ravenna Army Ammunition Plant, Portage and Trumbull Counties, Ohio (Camp Garfield). This document was received at Ohio EPA's Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR) via email on February 9, 2021. The report was prepared for the United States Army Corps of Engineers on behalf of the National Guard Bureau by Chenega Tri-Services, LLC under Contract Number W912QR-18-C-0013.

Please provide responses to the enclosed comments in accordance with the Director's Findings and Orders.

**General Comments**

1. An introductory paragraph should be included that states that Table A2, provided, includes all areas of concern (AOCs) that have achieved the no further action (NFA) status, and that the table is updated annually. The introduction should also state that the site summaries that follow the table are only included for sites added this calendar year if that is the case. There is also some confusion when sites have achieved NFA status under the military munitions response program (MMRP) versus achieving NFA under the installation restoration program (IRP). Maybe some notation can be added. Since we are only seeing an updated table every year, it would be helpful to see a complete table of contents for the entire PMP every year.

RECEIVED
MAR 30 2021

2. Please provide a brief update on the solid waste management program that was also agreed to be an appendix to the PMP.

**Specific Comments**

1. In order to eliminate confusion between the date the Record of Decision (ROD) was signed, and the actual date No Further Action was achieved through a remedial action if one was necessary, another column on the table A2 should be added that provides the date the NFA was achieved.

2. On the Report Documentation Page, line 16, "land use controls" (LUCs) are mentioned. If sites have achieved NFA, then no LUCs should be required. Ohio EPA requests removing the "land use controls" text from line 16 or provide a list of all the sites that have LUCs in the Appendix accordingly.

3. Table A2 includes a column titled "Revision or Update." Please provide additional information that clarifies under what circumstances the revision is anticipated to occur.

4. The column titled "Record of Decision Signature Date" does not always correspond to Ohio EPA signature date. Is the date provided the date of the Army signature? A clarification notation would be helpful.

5. Table A2 does not reference the Final Record of Decision for Sediment and Surface Water at Six Areas of Concern/Munitions Response Sites for both RVAAP-04 Open Demolition Area No.2 (with co-located RVAAP-004-R-01 ODA2 MRS), and RVAAP-060-R-01 Block D Igloo MRS. Please revise the table to include the listed sites consistent with the other four areas included in the table.

6. The Final Record of Decision for Soil, Sediment, and Surface Water at RVAAP-13, Building 1200 determination of NFA was dependent on the completion of the remedial action (RA) selected and not the date of the record of decision. Please confirm the RA was conducted to achieve NFA and revise the document to reflect the date NFA was achieved (date RA was completed).

7. The Final Record of Decision for Soil and Dry Sediment at the RVAAP-16 Fuze and Booster Quarry Landfill/Ponds stated that soil removal remedial action was necessary for NFA. Therefore, the determination of NFA is dependent on the completion of the RA selected and not the date of the record of decision. Please confirm the RA was conducted to achieve NFA and revise the document to reflect the date NFA was achieved (date RA was completed). In addition, please revise the summary section to reflect the date NFA was achieved.

8. The Final Record of Decision for Soil, Sediment, and Surface Water at RVAAP-48 Anchor Test Area required soil removal to achieve NFA. Please confirm the RA was conducted to achieve NFA and revise Table A2 to reflect the date the NFA was achieved (date RA was completed).

9. Page A2-5, CC RVAAP-71, Barn Number 5, Petroleum Release, and CC RVAAP-72 Facility-Wide Underground Storage Tanks. These sites did not receive an NFA through a Decision Document. They can probably be included, but some clarification should be added.

10. Table A2-5, CC RVAAP-73, Facility -Wide Coal Storage. The referenced document was not available on REIMS, and therefore, could not be confirmed. The document may be too recent.

As a precautionary response to COVID-19, Ohio EPA is currently operating with most staff working remotely. During this time, we will not be issuing hard-copy mail. This letter is an official response from Ohio EPA that will be maintained as a public record.

If you have any questions or would like to set up a meeting to discuss these comments, please contact me via email at kevin.palombo@epa.ohio.gov, or call me at (330) 963-1292.

Sincerely,

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

KP/sc

ec: Katie Tait, OHARNG RTLS, CJAG
Steve Kvaal, USACE Louisville
Nathaniel Peters, USACE Louisville
Mark Leeper, ARNG
Rebecca Shreffler, Chenega
Bob Princic, Ohio EPA, NEDO, DERR
Natalie Oryshkewych, Ohio EPA, NEDO, DERR
Nicholas Roope, Ohio EPA, NEDO, DERR
Thomas Schneider, Ohio EPA, SWDO, DERR

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

February 8, 2021

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

Subject: Ravenna Army Ammunition Plant Restoration Program, Draft Property Management Plan Appendices, Former RVAAP, Portage/Trumbull Counties, Ohio (Ohio EPA ID No. 267-000859-029)

Dear Mr. Palombo:

The following Draft appendices are being added to the 2020 Property Management Plan (PMP) Version 3.0 and are enclosed for your review:

Appendix A, Section A.2 - No Further Action (NFA) Sites

- AOC/MRS Sites That Have Achieved No Further Action (NFA) Status table (revised)
- Appendix A.2-001-01: Ramsdell Quarry Landfill Munitions Response Site (MRS) Area 2 (South) (RVAAP-001-R-01) No Further Action (NFA) Status (revised).
- Appendix A.2-001-R-02: Ramsdell Quarry Area 1 (North) Munitions Response Site (MRS) – (RVAAP-01-R-02) – No Further Action (NFA) Status (revised).
- Appendix A.2-02: Erie Burning Grounds– (RVAAP-02) – No Further Action (NFA) Status (revised).
- Appendix A.2-16-R-01: Fuze and Booster Quarry (RVAAP-16) No Further Action (NFA) Status (revised).
- Appendix A.2-19: Landfill North of Winklepeck – (RVAAP-19) – No Further Action (NFA) Status.
- Appendix A.2-28: Suspected Mustard Agent Burial Site (RVAAP-28) No Further Action (NFA) Status.
- Appendix A.2-43: Load Line 10 (RVAAP-43) – No Further Action (NFA) Status for Soil, Sediment and Surface Water.
- Appendix A.2-46: Buildings F-15 and F-16 (RVAAP-46) – No Further Action (NFA) Status for Soil, Sediment and Surface Water.
- Appendix A.2-CC68: Electrical Substations (East, West, No. 3) (CC RVAAP-68) – No Further Action (NFA) Status for Soil, Sediment and Surface Water.
- Appendix A.2-CC71: Barn No. 5 Petroleum Release (CC RVAAP-71) – No Further Action (NFA) Status.
- Appendix A.2-CC72: Facility-Wide Underground Storage Tanks – (CC RVAAP-72) – No Further Action (NFA) Status.
- Appendix A.2-CC73: Facility-Wide Coal Storage – (CC RVAAP-73) – No Further Action (NFA) Status.
- Appendix A.2-CC77: Building 1037 Laundry Waste Water Sump – (CC RVAAP-77) – No Further Action (NFA) Status.
- Appendix A.2-CC80: Group 2 Propellant Can Tops – (CC RVAAP-80) – No Further Action (NFA) Status.

- Appendix A.2-CC83: Former Buildings 1031 and 1039 – (CC RVAAP-83) – No Further Action (NFA) Status.

Only these Draft items are being submitted for your review. The main text of the Property Management Plan (PMP) is not being changed. Upon final approval, these appendices will be added to the *Final Property Management Plan for the Designated Areas of Concern and Munitions Response Sites, Version 3.1* (PMP), and the entire Final text and appendices of the PMP will be submitted to the Ohio EPA.

One (1) electronic copy is provided for your review. These appendices were prepared for the Army National Guard in support of the Environmental Program Support Services project at the former Ravenna Army Ammunition Plant.

Please contact the undersigned at (614) 336-2053 or kevin.m.sedlak.ctr@mail.mil if there are issues or concerns with this submission.

Sincerely,

SEDLAK.KEVIN.MICHAEL.1254440171
Digitally signed by SEDLAK.KEVIN.MICHAEL.1254440171
Date: 2021.02.08 14:14:18 -05'00'

Kevin Sedlak
RVAAP Restoration Program Manager
Army National Guard Directorate

cc: Tom Schneider, Ohio EPA (cover letter via email only)
Bob Princic, Ohio EPA (cover letter via email only)
Natalie Oryshkewych, Ohio EPA (cover letter via email only)
Megan Oravec, Ohio EPA (cover letter via email only)
Mark Leeper, ARNG (one [1] electronic copy)
Katie Tait, OHARNG (one [1] electronic copy)
Nathaniel Peters, USACE – Louisville (one [1] electronic copy)
Steve Kvaal Coombs, USACE – Louisville (cover letter via email only)
Susan Oliver, Management Solutions, LLC (cover letter via email only)
Jennifer Tierney, Vista Sciences Corp. (one [1] electronic copy, one [1] hard copy)

**Comment Resolution Table**

**Installation**: Former RVAAP
**Document**: Preliminary Draft Property Management Plan Appendices
**Reviewer(s)**: Katie Tait (KT), Environmental Specialist, OHARNG, (614)336-6136 or kathryn.s.tait.nfg@mail.mil; Kevin Sedlak (KS), Restoration Project Manager, ARNG, (614) 336-6000 ext 2053 or kevin.m.sedlak.ctr@mail.mil
**Comment responses prepared by Chenega Tri-Services, LLC**
**Date**: January 29, 2021

| Cmt. No. | Page or Sheet | Comment and Recommendation | Response |
|---|---|---|---|
| KT1 | General | Need to indicate that the final version will be the main text with final appendices. Also indicate that the main text will not be revised. Just the appendices. This can go in a cover letter that accompanies these appendices. Otherwise I fear we'll get a lot of questions from the Ohio EPA.<br><br>We also need to figure out if the document will require a new signature. I am assuming no new signature is needed due to no main text revisions. However, we may need to discuss. | Agree. A cover letter is attached for your review.<br><br>Our thoughts were that this version would be 3.1 since the Main Text was not revised. When we do significant Main Text revisions, we can change to version 4.0, 5.0, etc. When we do minor changes to the document, such as adding Appendices, we can change the to 3.1, 3.2, etc. As far as a new signature, we will work with whatever you think best. |
| KT2 | Footer | Footer indicated April 2020 Version 3.0 This is incorrect as that was the last version. May be best to delete the footer. What version or revision will this document be? | (See response above). |
| KT3 | Table RVAAP-01 | RVAAP-01 needs to be identified as Ramsdell Quarry Landfill. Although the sediment and surface water are NFA, suggest including this with the other regular site. I don't think we should break up the site media even though some require LUCs and some require NFA. Thoughts? | The table has been revised. See response to KT9. |
| KT4 | Table RVAAP-001-R-01 | The NFA sediment and surface water ROD also addressed this MRS. Need to add. | The table has been revised. See response to KT9. |
| KT5 | Table RVAAP-02 | Format for the date is incorrect. Please revise. | This item has been revised as requested. |
| KT6 | Table Compliance Cleanup Sites | AOC numbers for these should be CC RVAAP-78 not CC-RVAAP-78. Please revise in the left column. | This item has been revised as requested. |
| KT7 | Table Sites With Site Inspections and no ROD | Indicate not Applicable instead of Not Required | These items have been revised as requested. |

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| KT8 | Appendix A.2-001-R-01 | In the title delete reference to munitions constituents, surface water and sediment. Just state No Further Action Status as we did in the last revision | The title was revised as requested. |
| KT9 | Appendix A.2-01 | Suggest adding the NFA for surface water and sediment to RVAAP-001-R-02 appendix as that MRS was NFA. Might be confusing to add this to RVAAP-01 since that portion of the site requires LUCs. Revise here and in the table. Will need to review the revised appendix. | Appendix A.2-01 Ramsdell Quarry Landfill (RQL) Area 1 (North) has been deleted from Appendix A.2. The content of this appendix has been combined with Appendix A.2-001-R-02. Additionally, the accompanying map has been revised as well as the table listing the NFA sites. All are attached for Army review. |
| KT10 | General – Surface Water and Sediment ROD sites | There was a RI Work Plan and Supplemental RI for these 6 sites as well. Suggest adding these into the list of publications for these site appendices. | The RI Work Plan and Supplemental RI have been added to the list of publications for the 4 sites being added to the PMP Appendices at this time (RQL Area 1, RQL Area 2, EBG and FBQ. |
| KT11 | A.2-001.4 | I think here it needs to be more clear that all media and munitions have been addressed whether under the MMRP or the IRP. It indicated MMRP addressed MC and Munitions and IRP addressed surface water and sediment. Now need to tie it all together. The Ohio EPA has had some issues with this thinking that media need addressed under both programs even though it is the same media. | (See response for KT9 above). |
| KT12 | Appendix A.2-01: Ramsdell Quarry Landfill (RQL) Area 1 (North) – (RVAAP-01) | This does not make sense. This NFA is for the RQL MRS (north) yet the RVAAP-01 number is being used which has LUCs. Additionally the description has RVAAP-01 documents. Suggest detailing the NFA for the MRS and the surface water sediment in this section and teasing out references to RVAAP-01 as that portion is not NFA. I think there is already and appendix for RVAAP-001-R-02 and the surface water and sediment information should be added to that.<br><br>Figure used should not include sampling locations. Just needs to be a generic features figure. | (See response for KT9 above) |

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| KT13 | A.2-02.4 | Description discusses soil and dry sediment twice. Not soil, sediment and surface water. Please revise. | |
| KT14 | A.2-016.4 | Why are RSLs and COCs being discussed here? Just site the conclusions of the ROD or PP… that the AOC has been thoroughly investigated and nature and extent was determined, a RA was completed for soil and dry sediment, and NFA is required for soil, sediment and surface. Should be similar text to other NFA sites.<br><br>Figure used should not include sampling locations. Just needs to be a generic features figure. | Section A.2-016.4 now reads "No Further Action (NFA) for soil, dry sediment, sediment, surface water under CERCLA is necessary for the Fuze and Booster Quarry based on Records of Decision for soil and dry sediment (SAIC, 2007) and sediment and surface water (Leidos, 2020), and a Remedial Action for soil and dry sediment (SAIC, 2010)."<br><br>The map has been revised as requested. |
| KT15 | A.2-19.4 | Second paragraph in this section seems like a repeat. Is this needed? Recommend deleting. | Section A.2-19.4 now reads "No Further Action (NFA) under CERCLA is necessary for soil, sediment, and surface water at LNWBG for Unrestricted (Residential) Land Use. Consequently, no further action is necessary for the future use of this site (Military training). Groundwater at LNWBG will be addressed under future CERCLA decisions. Land use controls will not be implemented as part of this decision, as the human health risk assessment (HHRA) did not identify any chemicals of concern (COCs) that pose unacceptable risk to the Resident Receptor (Adult and Child) and the ecological risk assessment (ERA) recommended no further action. Because the HHRA did not identify any COCs that pose unacceptable risk to the Resident Receptor (Adult and Child) and the ERA recommended no further action, five-year reviews will not be required." |
| KT16 | Appendix A.2-28 | AOC number should be RVAAP-28 not RVAAP-028. Please revise. | This item has been revised as requested. |
| KT17 | A.2-28.2 | Need to also list the Action Memo which is the decision document. | The reference for the Action Memo has been added to Section A.2-28.2 as requested. |

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| | | | Side note: The Action Memo is listed for Army Access and is not available through RVAAP.org or other repositories. This item may need to be added to the rvaap.org site. |
| KT18 | A.2-28.1 | Delete the following text in this section:<br>'Unlike most of the AOCs on the former RVAAP, the Suspected Mustard Agent Burial Site (SMABS) Area of Concern (AOC) (RVAAP-28) has never been part of the defined operational history. The site was identified as an AOC based on statements made by employees of the former RVAAP and some of their family members.'<br><br>'A Site Inspection (SI) was completed by the USACE Huntsville District in 2015 which concluded that the presence of mustard agent could not be completely ruled out for the SMABS AOC and that there is a slight potential (Seldom Probability) for mustard agent to be buried at the AOC.' | The text has been deleted as requested. |
| KT19 | A.2-28.3 Site Location and Description | Change to "The SMABS AOC is located in the southwestern portion of the former RVAAP. The AOC consists of the three areas identified by former RVAAP employees. The three areas are as follows:<br>• The 1998 Army Excavation Area is approximately 24,329 $ft_2$.<br>• The 2006 Geophysical Investigation Area is approximately 29,644 $ft_2$, , and<br>• The 2010 Geophysical Survey area is 26,622 $ft_2$.' | This item has been revised as requested. |
| KT20 | A.2-43.2 Publications | Change to 'The following documents for the Load Line 10 AOC can…' | This item has been revised as requested. |
| KT21 | A.2-43.4 | Second paragraph seems like a repeat. Recommend deleting it. | The second paragraph has been deleted as requested. |

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| KT22 | A.2-46.2 | Change to 'The following documents for RVAAP-46 can…' | This item has been revised as requested. |
| KT23 | A.2-46.4 | Same comment. If you don't want to delete the 2nd paragraph make sure surface water is added to the first sentence as a media. | The second paragraph was not deleted, but surface water was added as a media in the first sentence. |
| KT24 | A.2-68.2 | Same comment. | The second paragraph was not deleted, but surface water was added as a media in the first sentence. |
| KT25 | General | For CC site, AOC number should be CC RVAAP-68 not CC-RVAAP-68. Change for all CC sites. | This item has been revised as requested. All CC sites have been checked and revised as needed. |
| KT26 | A.2-68.3 | Fix typos in 3rd paragraph | The typos in the 3rd paragraph have been fixed as needed. |
| KT27 | A.2-71.2 Publications | Change to 'The following publications relevant to CC RVAAP-71…" | This item has been revised as requested. |
| KT28 | A.2-71.4 | Recommend deleting the conclusions or evidence as to why NFA was determined. Just state that the SI indicated NFA was achieved. | This section was revised as requested. Th evidence and conclusions have been deleted. |
| KT29 | A.2-72.4 | I would indicate that 43 of the 58 USTs had NFA documentation based on the HRR and the remaining were determined to be NFA based on the SI and leave it at that. | Section A.2-72.4 now reads "Based on the HRR, 43 of the 58 USTs under CC RVAAP-72 FWUSTs have no further action (NFA) documentation and/or records of soil sampling results less than the State of Ohio Bureau of Underground Storage Tank Regulations (BUSTR) criteria." The conclusions and evidence have been deleted as requested. |
| KT30 | CC RVAAP-72 Figure | Recommend that you use a figure with all USTs | The map has been revised and is attached for Army review. |
| KT31 | CC RVAAP-73 | This AOC needs a better description. Based on the HRR there were a bunch of coal sites (more than 3). Three were recommended for further action and a RI, PP and ROD were completed. Need to describe this as all sites are NFA. | Section A.2-73.1 was revised to describe the 19 sites. A revised CC RVAAP-73 appendix is attached for review. |
| KT32 | CC RVAAP-73 | Suggest using a Figure with all sites. | The first figure has been revised to include all site as requested. The 3 additional figures have been deleted. |

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| KT33 | A.2-77.4 | Need to just indicate that NFA is required based on the final approved SI. Don't like the statement NFA is warranted as it has already been determined. | Section A.2-77.4 now reads "Based on the Final Site Investigation, No Further Action (NFA) is required for soil at the CC RVAAP-77 Building 1037 Laundry Waste Water Sump." The conclusions and evidence have been deleted. |
| KT34 | A.2-80.1 Background | Change text to "The Group 2 Propellant Can Tops Area of Concern (AOC) is located at the southern end of the former Group 2 Ammunition Storage Area. The area is approximately 12.4 acres. Propellant cans and tops were identified at the AOC in 2008. A SI which included removal of tops and cans and sampling was completed in 2016 which determined that NFA was required at this AOC." | The text has been changed as requested. |
| KT35 | A.2-80.2 Publications | Change to "The following publications relevant to the AOC…" | This item has been revised as requested. |
| KT36 | A.2-80.4 No Further Action Required | Change to "Based on the Site Investigation, no contamination or evidence of a release at the AOC was identified and a No Further Action determination was achieved. | This item has been revised as requested. |
| KT37 | A.2-83.1 Background | Delete 'Future OHARNG land use at CC RVAAP83 is projected as Unrestricted Guard Use.'<br><br>Suggest also indicating that the buildings have been demolished. | This item has been revised as requested. |
| KT38 | A.2-83.3 Site Location and Description | Change to "Former Buildings 1031 and 1039 are located in the former Administration Area, which is located in the central southern portion of the facility. Building 1031 was approximately 13,500 square feet. Building 1039 was approximately 6,100 square feet. Both were located along South Service Road." | This item has been revised as requested. |

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| KT39 | A.2-83.4 No Further Action Required | Change text to "Based on the 2015 Site Inspection Report, No Further Action was achieved at the AOC." | This item has been revised as requested. |
| KMS 1 | Page A2-3 | Some confusion For RVAAP-34 the date of the ROD is after the date it was added. | The ROD for RVAAP-034-R-01 is dated 29 September 2015. The PMP Appendix write-up for this AOC was added in August 2018. The Record of Decision Signed Date is listed as 12 November 2019. It is unclear why the AOC was added to the PMP Appendices prior to the Record of Decision Signed Date. |
| KMS 2 | Page A2-5 | Same question for RVAAP 062-R as KMS 1. | The ROD for RVAAP-062-R-01 is dated 29 September 2015. The PMP Appendix write-up for this AOC was added in August 2018. The Record of Decision Signed Date is listed as 12 November 2019. It is unclear why the AOC was added to the PMP Appendices prior to the Record of Decision Signed Date. |
| KMS 3 | Page A.2-02-1 Section A.2-02.4 | The site was closed to meet residential land use in the 2020 not the land uses that are listed. It is also confusing that there are two NFA determinations for soil and dry sediment. One from 2007 and one from 2020. Above the 2020 ROD is for sediment and surface water 4 June 2020. | Section A.2-02.4 has been revised to read: "In 2007, No Further Action (NFA) under CERCLA was proved necessary for soil and dry sediment at EBG.<br>In 2020, NFA under CERCLA was proved necessary for sediment and surface water for Unrestricted (Residential) Land Use at EBG.<br>NFA is protective of human health and the environment and meets the statutory requirements for cleanup standards established in Section 121 of CERCLA. Because contamination at EBG at EBG does not pose a potential risk to human health or the environment, five-year reviews will not be required for soil and dry sediment (SAIC, 2007b and Leidos, 2020)." |
| KMS 4 | Page A.2-CC83.1 section A.2-83.4 | In the first paragraph, it states, "no further investigation was required at this former building site." I think this needs to be plural "at these former building sites" since it is two | This section has been revised as requested in Comment No. KT39. |

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| | | buildings. In the last paragraph, it states, "Since no additional investigation was previously granted at the Former Building 1031 hospital building, the entire AOC, consisting of both former building sites, at CC RVAAP-83 is recommended for NFA." Not sure, of the term further investigation was not granted. I think we should change the language to no further investigation was required… | |

PARSONS

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07 January 2021

United States Army Corps of Engineers, Louisville District
ATTN: Mr. Kevin Mieczkowski
600 Dr. Martin Luther King, Jr. Place
Room 708
Louisville, Kentucky 40202
(502) 315-6324

Subject: Draft Project Management Plan Revision 1.0
Former Ravenna Army Ammunition Plant
Portage and Trumbull Counties, Ohio
Contract No.W912QR-12-D-0002, Delivery Order 0003

Dear Mr. Mieczkowski,

Parsons has prepared the Final Project Management Plan (PMP) in accordance with the Performance Work Statement. Attached for your approval is an electronic PDF of the Final PMP Revision 1.0. This document contains information needed for the management of the Former Ravenna Army Ammunition Plant project. The distribution to other team members is shown below.

If you have any questions or comments, please contact me at (303) 563-9452 or email ed.heyse@parsons.com.

Sincerely,

PARSONS GOVERNMENT SERVICES INC.

Edward Heyse, PhD, PE
Project Manager

C: Mark Leeper, ARNG, Camp Ravenna (one [1] electronic copy)
Kevin Sedlak, ARNG, Camp Ravenna (one [1] electronic copy)
Katie Tait, ARNG, Camp Ravenna (Email Transmittal Letter Only)
Jennifer Tierney, Vista Science Corp. (one [1] hard copy, one [1] electronic copy)
Pat Ryan, Leidos-REIMS (Email Transmittal Letter Only)
Steven Kvaal, USACE – Louisville (Email Transmittal Letter Only)

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

February XX, 2021

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

Subject: Ravenna Army Ammunition Plant Restoration Program, Draft Property Management Plan Appendices, Former RVAAP, Portage/Trumbull Counties, Ohio
(Ohio EPA ID No. 267-000859-029)

Dear Mr. Palombo:

The following Draft appendices are being added to the 2020 Property Management Plan (PMP) Version 3.0 and are enclosed for your review:

Appendix A, Section A.2 - No Further Action (NFA) Sites

- AOC/MRS Sites That Have Achieved No Further Action (NFA) Status table (revised)
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- Appendix A.2-001-R-02: Ramsdell Quarry Area 1 (North) Munitions Response Site (MRS) – (RVAAP-01-R-02) – No Further Action (NFA) Status (revised).
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- Appendix A.2-19: Landfill North of Winklepeck Munitions Response Site – (RVAAP-19) – No Further Action (NFA) Status.
- Appendix A.2-28: Suspected Mustard Agent Burial Site (RVAAP-28) No Further Action (NFA) Status.
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One (1) electronic copy is provided for your review. These appendices were prepared in support of the Environmental Program Support Services project at the former Ravenna Army Ammunition Plant. This document was prepared for the US Army Corps of Engineers (USACE) – Louisville District by Chenega Tri-Services Contract No. W912QR-18C-0013.

Please contact the undersigned at (614) 336-2053 or kevin.m.sedlak.ctr@mail.mil if there are issues or concerns with this submission.

Sincerely,

Kevin Sedlak
RVAAP Restoration Program Manager
Army National Guard Directorate

cc: Tom Schneider, Ohio EPA (cover letter via email only)
Bob Princic, Ohio EPA (cover letter via email only)
Natalie Oryshkewych, Ohio EPA (cover letter via email only)
Megan Oravec, Ohio EPA (cover letter via email only)
Mark Leeper, ARNG (one [1] electronic copy)
Katie Tait, OHARNG (one [1] electronic copy)
Nathaniel Peters, USACE – Louisville (one [1] electronic copy)
Steve Kvaal Coombs, USACE – Louisville (cover letter via email only)
Susan Oliver, Management Solutions, LLC (cover letter via email only)
Jennifer Tierney, Vista Sciences Corp. (one [1] electronic copy, one [1] hard copy)

## AOC/MRS SITES THAT HAVE ACHIEVED NO FURTHER ACTION (NFA) STATUS

The AOCs and MRSs listed in this Appendix are those sites that have achieved No Further Action (NFA) as part of the RVAAP Restoration Program. This Appendix will be updated annually to include additional AOCs/MRSs that have achieved NFA.

| AOC/MRS | Appendix Tab | No Further Action Details | Record of Decision Signature Date | Date Added to the PMP | Revision or Update |
|---|---|---|---|---|---|
| RVAAP-001-R-01 Ramsdell Quarry Area 2 (South) MRS | RVAAP-001-R-01 | Final No Further Action Record of Decision for RVAAP-001-R-01 Ramsdell Quarry Area 2 (South), Version 2.0 (DoD militarry munitions and MEC) | November 12, 2019 | February 2020 | XXX 2021 |
| | | Final Record of Decision for Sediment and Surface Water at Six Areas of Concern/Munitions Response Sites | September 15, 2020 | XXX 2021 | |
| RVAAP-001-R-02 Ramsdell Quarry Landfill Area 1 (North) | RVAAP-001-R-02 | Final No Further Action Record of Decision for RVAAP-001-R-02 Ramsdell Quarry Area 1 (North), Version 2.0 (DoD militarry munitions and MEC) | March 8, 2019 | February 2020 | XXX 2021 |
| | | Final Record of Decision for Sediment and Surface Water at Six Areas of Concern/Munitions Response Sites | September 15, 2020 | XXX 2021 | |
| RVAAP-02 Erie Burning Grounds | RVAAP-02 | Final Record of Decision for Soil and Dry Sediment at RVAAP- 02 Erie Burning Grounds | October 30, 2007 | August 2018 | XXX 2021 |
| | | Final Record of Decision for Sediment and Surface Water at Six Areas of Concern/Munitions Response Sites | September 15, 2020 | XXX 2021 | |
| RVAAP-002-R-01 Erie Burning Grounds | RVAAP-002-R-01 | Final No Further Action Record of Decision for RVAAP-002-R-01 Erie Burning Grounds Munitions Response Site, Version 1.0 | November 12, 2019 | February 2020 | |

## AOC/MRS SITES THAT HAVE ACHIEVED NO FURTHER ACTION (NFA) STATUS

The AOCs and MRSs listed in this Appendix are those sites that have achieved No Further Action (NFA) as part of the RVAAP Restoration Program. This Appendix will be updated annually to include additional AOCs/MRSs that have achieved NFA.

| AOC/MRS | Appendix Tab | No Further Action Details | Record of Decision Signature Date | Date Added to the PMP | Revision or Update |
|---|---|---|---|---|---|
| RVAAP-04 Open Demolion Area #2 | RVAAP-04 | Final Record of Decision for Soil and Dry Sediment at RVAAP- 04 Open Demolition Area #2 | October 30, 2007 | August 2018 | |
| RVAAP-008-R-01 Load Line 1A MRS | RVAAP-008-R-01 | Final No Further Action Record of Decision for RVAAP-008-R-01 Load Line #1A Munitions Response Site | December 18, 2018 | August 2018 | |
| RVAAP-13 Building 1200 | RVAAP-13 | Final Record of Decision for Soil, Sediment, and Surface Water at RVAAP-13 Building 1200 | July 1, 2014 | August 2018 | |
| RVAAP-016-R-01 Fuze and Booster Quarry MRS | RVAAP-016-R-01 | Final No Further Action Record of Decision for RVAAP-016-R-01 Fuze and Booster Quarry Munitions Response Site, Version 1.0 | October 7, 2019 | February 2020 | |
| RVAAP-16 Fuze and Booster Quarry | RVAAP-16 | Final Record of Decision for Soil and Dry Sediment at the RVAAP-16 Fuze and Booster Quarry Landfill/Ponds | October 30, 2007 | XXX 2021 | |
| | | Final Record of Decision for Sediment and Surface Water at Six Areas of Concern/Munitions Response Sites | September 15, 2020 | | |
| RVAAP-19 Landfill North of Winklepeck | RVAAP-19 | Final Record of Decision for Soil, Sediment, and Surface Water at RVAAP-19 Landfill North of Winklepeck Burning Grounds | July 20, 2020 | XXX 2021 | |
| RVAAP-019-R-01 Landfill North of Winklepeck MRS | RVAAP-019-R-01 | Final No Further Action Record of Decision for RVAAP-019-R-01 Landfill North of Winklepeck Munitions Response Site, Version 2.0 | March 8, 2019 | February 2020 | |

## AOC/MRS SITES THAT HAVE ACHIEVED NO FURTHER ACTION (NFA) STATUS

The AOCs and MRSs listed in this Appendix are those sites that have achieved No Further Action (NFA) as part of the RVAAP Restoration Program. This Appendix will be updated annually to include additional AOCs/MRSs that have achieved NFA.

| AOC/MRS | Appendix Tab | No Further Action Details | Record of Decision Signature Date | Date Added to the PMP | Revision or Update |
|---|---|---|---|---|---|
| RVAAP-28 Suspected Mustard Agent Burial Site | RVAAP-28 | Final Action Memorandum: RVAAP-28 Suspected Mustard Agent Burial Site | July 17, 2017 | XXX 2021 | |
| RVAAP-29 Upper and Lower Cobbs Pond | RVAAP-29 | Final Record of Decision (ROD) for Soil, Sediment and Surface Water at RVAAP-29 Upper and Lower Cobbs Ponds | June 7, 2019 | February 2020 | |
| RVAAP-032-R-01 40mm Firing Range MRS | RVAAP-032-R-01 | Final No Further Action Record of Decision for RVAAP-032-R-01 40mm Firing Range Munitions Response Site, Version 1.0 | September 24, 2019 | February 2020 | |
| RVAAP-33 Load Line 6 | RVAAP-33 | Final Record of Decision for Soil, Sediment, and Surface Water at RVAAP-33 Load Line 6 | May 12, 2018 | February 2020 | |
| RVAAP-033-R-01 Firestone Test Facility MRS | RVAAP-033-R-01 | Final No Further Action Record of Decision for RVAAP-033-R-01 Firestone Test Facility Munitions Response Site | November 12, 2019 | August 2018 | |
| RVAAP-034-R-01 Sand Creek Dump MRS | RVAAP-034-R-01 | Final No Further Action Record of Decision for RVAAP-034-R-01 Sand Creek Dump Munitions Response Site, Version 1.0 | November 12, 2019 | August 2018 | |
| RVAAP-39 Load Line 5 | RVAAP-39 | Final Record of Decision for Soil, Sediment, and Surface Water at RVAAP-39 Load Line 5 | March 16, 2018 | February 2020 | |

## AOC/MRS SITES THAT HAVE ACHIEVED NO FURTHER ACTION (NFA) STATUS

The AOCs and MRSs listed in this Appendix are those sites that have achieved No Further Action (NFA) as part of the RVAAP Restoration Program. This Appendix will be updated annually to include additional AOCs/MRSs that have achieved NFA.

| AOC/MRS | Appendix Tab | No Further Action Details | Record of Decision Signature Date | Date Added to the PMP | Revision or Update |
|---|---|---|---|---|---|
| RVAAP-40 Load Line 7 | RVAAP-40 | Final Record of Decision for Soil, Sediment, and Surface Water at RVAAP-40 Load Line 7 | June 7, 2019 | February 2020 | |
| RVAAP-41 Load Line 8 | RVAAP-41 | Final Record of Decision for Soil, Sediment, and Surface Water at RVAAP-41 Load Line 8 | June 16, 2018 | February 2020 | |
| RVAAP-43 Load Line 10 | RVAAP-43 | Final Record of Decision for Soil, Sediment, and Surface Water at RVAAP-43 Load Line 10 | March 16, 2017 | XXX 2021 | |
| RVAAP-44 Load Line 11 | RVAAP-44 | Final Record of Decision for Soil, Sediment, and Surface Water at RVAAP-44 Load Line 11 | May 12, 2018 | February 2020 | |
| RVAAP-46 Buildings F-15 and F-16 | RVAAP-46 | Final Record of Decision for Soil, Sediment, and Surface Water at RVAAP-46 Buildings F-15 and F-16 | July 20, 2020 | XXX 2021 | |
| RVAAP-48 Anchor Test Area | RVAAP-48 | Final Record of Decision for Soil, Sediment, and Surface Water at RVAAP-48 Anchor Test Area | July 1, 2014 | August 2018 | |
| RVAAP-49 Central Burn Pits | RVAAP-49 | Final Record of Decision for Soil and Dry Sediment at RVAAP-49 Central Burn Pits | June 22, 2009 | August 2018 | |
| RVAAP-050-R-01 Atlas Scrap Yard MRS | RVAAP-050-R-01 | Final No Further Action Record of Decision for RVAAP-050-R-01 Atlas Scrap Yard Munitions Response Site | December 4, 2018 | February 2020 | |
| RVAAP-061-R-01 Block D Igloo TD MRS | RVAAP-061-R-01 | Final No Further Action Record of Decision for RVAAP-061-R-01 Block D Igloo - TD Munitions Response Site, Version 1.0 | December 18, 2018 | February 2020 | |

## AOC/MRS SITES THAT HAVE ACHIEVED NO FURTHER ACTION (NFA) STATUS

The AOCs and MRSs listed in this Appendix are those sites that have achieved No Further Action (NFA) as part of the RVAAP Restoration Program. This Appendix will be updated annually to include additional AOCs/MRSs that have achieved NFA.

| AOC/MRS | Appendix Tab | No Further Action Details | Record of Decision Signature Date | Date Added to the PMP | Revision or Update |
|---|---|---|---|---|---|
| RVAAP-062-R-01 Water Works No. 4 MRS | RVAAP-062-R-01 | Final No Further Action Record of Decision for RVAAP-062-R-01 Water Works #4 Dump Munitions Response Site, Version 1.0 | November 12, 2019 | August 2018 | |
| CC RVAAP-68 Electrical Substations (East, West, No. 3) | CC RVAAP-68 | Final Record of Decision for Soil, Sediment, and Surface Water at CC RVAAP-68 Electric Substations (East, West, No. 3) | May 1, 2017 | XXX 2021 | |
| CC RVAAP-71 Barn No. 5 Petroleum Release | CC RVAAP-71 | Final Site Inspection CC RVAAP-71 Barn No. 5 Petroleum Release | Not Required | XXX 2021 | |
| CC RVAAP-72 Facility-Wide Storage Tanks | CC RVAAP-72 | Final Site Inspection CC RVAAP-72 Facility-Wide Underground Storage Tanks | Not Applicable | XXX 2021 | |
| CC RVAAP-73 Facility-Wide Coal Storage | CC RVAAP-73 | Final Record of Decision CC RVAAP-73 Facility-Wide Coal Storage | April 24, 2019 | XXX 2021 | |
| CC RVAAP-77 Building 1037 Laundry Waste Water Sump | CC RVAAP-77 | Final Site Inspection CC RVAAP-77 Building 1037 Laundry Waste Water Sump | Not Applicable | XXX 2021 | |
| CC RVAAP-80 Group 2 Propellant Can Tops | CC RVAAP-80 | Final Site Inspection Report: CC RVAAP-80 Group 2 Propellant Can Tops | Not Applicable | XXX 2021 | |
| CC RVAAP-83 Former Buildings 1031 and 1039 | CC RVAAP-83 | Final Site Inspection Report CC RVAAP-83 Former Buildings 1031 and 1039 | Not Applicable | XXX 2021 | |

**Appendix A.2-001-R-02: Ramsdell Quarry Area 1 (North) Munitions Response Site (MRS) – (RVAAP-01-R-02) and Ramsdell Quarry Landfill (RVAAP-01) - No Further Action (NFA) Status.**

## A.2-001.1 Background

Ramsdell Quarry Landfill (RQL) has been subject to investigation under both the Installation Restoration Program (IRP) and Military Munitions Response Program (MMRP). RQL (RVAAP-01) consists of a 14-acre AOC and a co-located 7-acre MRS called RQL MRS Area 1 North (RVAAP-001-R-02). For clarity and added distinction from other sites discussed in this summary, this area will be called "RQL Area 1."

RQL Area 1 was used as a quarry until 1941. During that time, it was excavated to 30–40 ft below existing grade to provide road and construction ballast materials. Between 1941 and 1989, the western and southern sections of the abandoned quarry were used for landfill operations. No information is available regarding landfill disposal activities from 1941–1976; however, only non-hazardous solid waste was deposited at the landfill from 1976–1989. The permitted sanitary landfill was closed in September 1990 under State of Ohio solid waste regulations. Based on available information, the permitted landfill cap covers approximately 4 of the 14 acres comprising the RQL AOC.

In addition, from 1946 to the 1950s, the bottom of the quarry was used to burn waste explosives from Load Line 1. During this time, approximately 18,000 225-kg (500-lb) incendiary or napalm bombs were reportedly burned in the abandoned quarry. Liquid residues from annealing operations also were dumped in the quarry. No additional historical information is currently available on how the quarry was used, other than for landfill operations, from the 1950s until 1976, when operational records show that non-hazardous solid wastes were placed in RQL.

## A.2-001.2 Publications

The following publications can be located on www.RVAAP.org or in established RVAAP information repositories:

- Final Project Management Plan Performance-Based Contract for Six Environmental Areas of Concern at the Ravenna Army Ammunition Plant, Ravenna, Ohio. SAIC. 14 July 2005.
- Final Sampling and Analysis Plan Addendum No. 2 for the Phase I Remedial Investigation of Ramsdell Quarry Landfill at the Ravenna Army Ammunition Plant, Ravenna, Ohio. SAIC. June 2006.
- Final Phase I Remedial Investigation Report for Ramsdell Quarry Landfill at the Ravenna Army Ammunition Plant, Ravenna, Ohio. SAIC. September 2005.
- Revised Final Feasibility Study for Ramsdell Quarry Landfill (RVAAP-01) at the Ravenna Army Ammunition Plant, Ravenna, Ohio. SAIC. October 2006.
- Final Military Munitions Response Program Historical Records Review, Ravenna Army Ammunition Plant, Ohio. e2M. January 2007.
- Final Site Inspection Report, Ravenna Army Ammunition Plant, Ohio, Military Munitions Response Sites. E2M. May 2008.
- Final Remedial Investigation Report for RVAAP-001-R-01 Ramsdell Quarry Landfill Munitions Response Site, Version 1.0. CB&I Federal Services, LLC. 27 January 2015.
- Wetlands and Other Waters Delineation Report Remedial Action Areas at Ramsdell Quarry Landfill, Load Line 12, and Fuze and Booster Quarry Landfill/Ponds at the Ravenna Army Ammunition Plant and Ravenna Training and Logistics Site, Ravenna, Ohio. EnviroScience. 29 December 2008.
- Final Remedial Investigation Work Plan for Sediment and Surface Water at RVAAP-01, RVAAP-04, RVAAP-16, RVAAP-001-R-01, and Inventory of Sediment and Surface Water at Multiple Sites. Leidos. 12 August 2016.
- Final No Further Action Proposed Plan for RVAAP-001-R-02 Ramsdell Quarry Landfill Munitions Response Site Area 1 (North). HydroGeoLogic, Inc. 1 August 2017.
- Final Supplemental Remedial Investigation for Sediment and Surface Water at RVAAP-01, RVAAP-04, RVAAP-16, RVAAP-001-R-01, and Inventory of Sediment and Surface Water at Multiple Sites.

Leidos. 29 November 2017.

- Final No Further Action Record of Decision for RVAAP-001-R-02 Ramsdell Quarry Landfill Munitions Response Site Area 1 (North) Version 2.0. HydroGeoLogic, Inc. 14 January 2019.
- Final Proposed Plan for Sediment and Surface Water at Six Areas of Concern/Munitions Response Sites. Leidos. 10 May 2019.
- Final Record of Decision for Sediment and Surface Water at Six Areas of Concern/Munitions Response Sites. Leidos. 4 June 2020.

### A.2-001.3 Site Location and Description

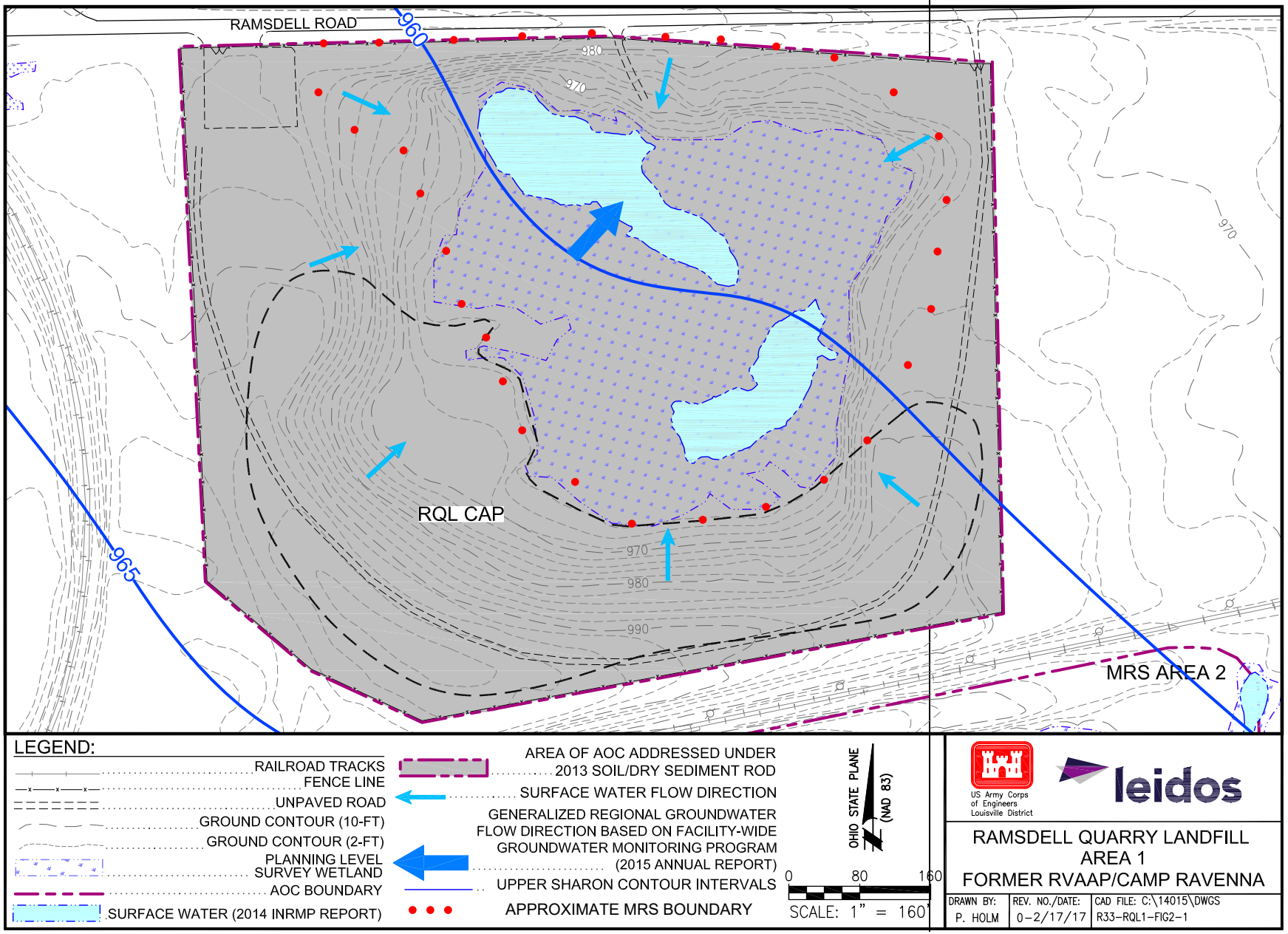
RQL Area 1 is located immediately south of Ramsdell Road near the intersection of Ramsdell Road and Snow Road in the northeastern part of CJAG. RQL Area 1 encompasses approximately 14 acres in the northeastern portion of the former RVAAP. RQL includes old-field communities with patches of forests and grasslands. The land surface in a large portion of the AOC slopes into a former quarry, which occupies most of the AOC. The quarry bottom is about 40 feet below the surrounding area. Former quarry operations resulted in the removal of much of the original soil.

Surface water runoff collects in an isolated wetland in the bottom of the former quarry. There is no surface water drainage outlet from the quarry. When water is present in the wetland, the water depth is usually less than 4 feet. The drainage ways and ditch lines outside of the quarry, located along access roads and the former rail line in the southern part of the AOC, only contain water during rain events. The water levels and horizontal extent of water in the quarry bottom of RQL Area 1 fluctuate seasonally and yearly. In 2008, the IRP stakeholders agreed to use the September 2007 survey results to delineate wet sediment and soil or dry sediment. The areas of the quarry bottom that were under water during the September 2007 survey are considered wet sediment. Areas that were considered soil and dry sediment and were addressed in the Record of Decision for Soil and Dry Sediment for Ramsdell Quarry Landfill (RVAAP-01) (SAIC 2009). Remedial activities for soil and dry sediment were completed for RQL Area 1 in 2011. Land Use Controls for soil and dry sediment were instituted at RQL Area 1 in 2015 (Leidos 2015).

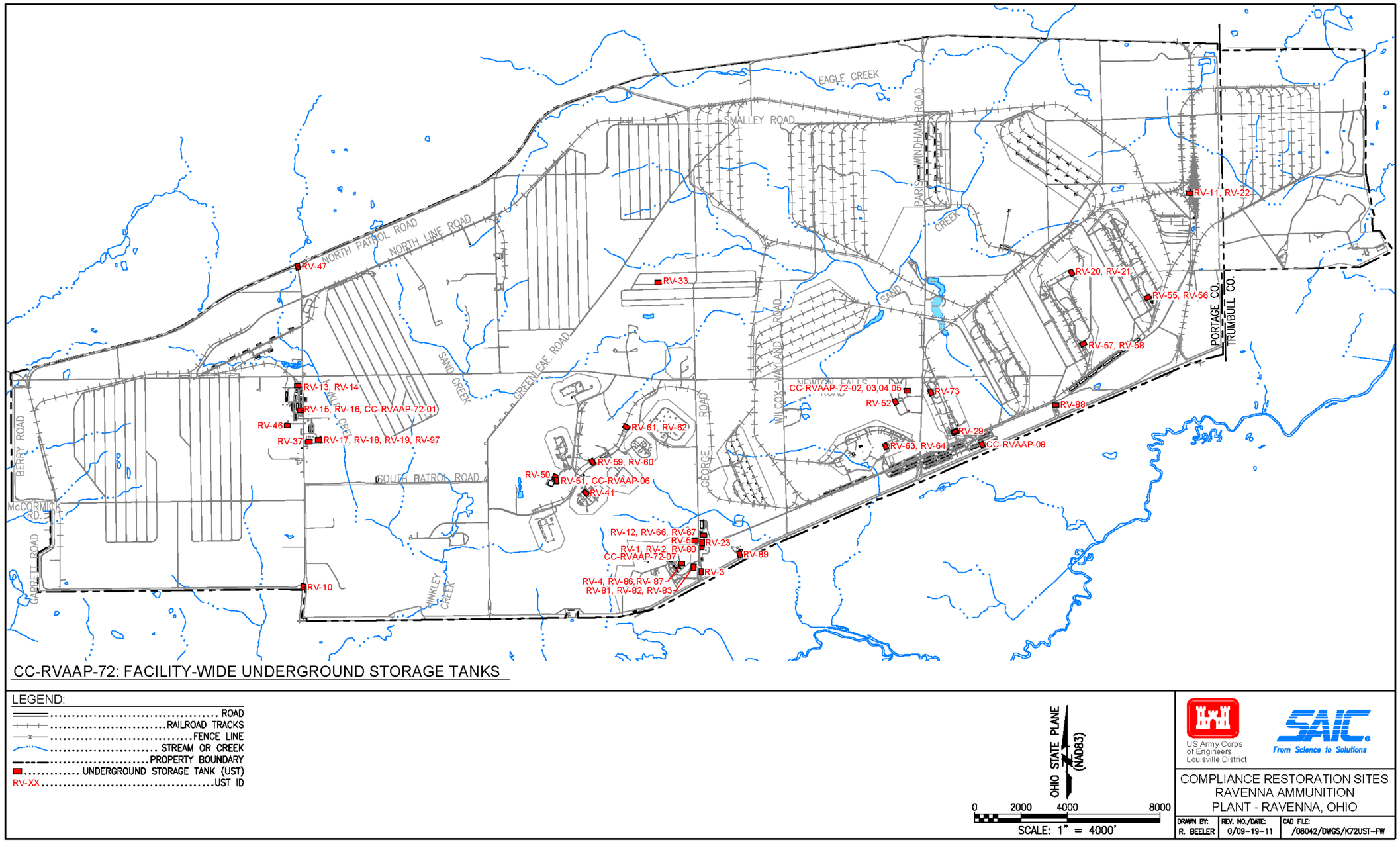
### A.2-001.4 No Further Action Required

No Further Action (NFA) under CERCLA is necessary for Area 1 (North) under the Military Munitions Response Program (MMRP). No evidence of Department of Defense (DoD) military munitions classified as munitions and explosives of concern (MEC) were encountered at the MRS during RI field activities conducted under the MMRP. The MRS was further evaluated for munitions constituents (MC) during the RI and the RI Report concluded that no detected analytes were identified as MC-related contamination (CB&I Federal Services, LLC [CB&I], 2015). Therefore, no risk due to MC-related contamination is present at the MRS.

Additionally, NFA for sediment and surface water under CERCLA is necessary for RQL Area 1.




**Ramsdell Quarry Landfill Area 1 AOC Features**




**. Facility-Wide Underground Storage Tanks Map and Site Features**

# Appendix A.2-73: Facility-Wide Coal Storage – (CC RVAAP-73) – No Further Action (NFA) Status for Soil, Sediment and Surface Water

## A.2-73.1 Background

The former RVAAP received bulk coal primarily by rail at the Sand Creek and North Line Road coal tipples. Bulk coal was typically stored and staged in uncovered piles on the ground surface. Coal was distributed throughout the former RVAAP by truck. Coal storage locations included covered bins and uncovered storage piles on the ground surface. There were 19 former coal storage locations on the former RVAAP that were investigated in the Final Historical Records Review (HRR, SAIC 2011), which include:

- Load Line No. 1 Power House (Power House No. 1);
- Load Line No. 2 Power House (Power House No. 2);
- Load Line No. 4 Power House (Power House No. 7);
- Load Line No. 12 Power House (Power House No. 3);
- Building F-15; • Building F-16; • Atlas Scrap Yard;
- North Line Road Coal Tipple;
- Sand Creek Coal Tipple;
- East Classification Yard;
- Administration Area (Power House No. 6);
- Building U-5; • Building U-14;
- Building 51-25 (Power House No. 5);
- Building 52-15 (Power House No. 4);
- Inert Storage 2F-21;
- Area No. 6 Inert Storage;
- Former Coal Pile South of East Classification Yard; and
- Building U-16 Boiler House U-16.

No documentation of accidental or large volume spills or releases associated with the coal storage areas was found during the HRR. No aboveground storage tanks or underground storage tanks are associated with the former coal storage areas.

The HRR recommended 4 of the 19 areas for additional investigation: North Line Road Coal Tipple, Sand Creek Coal Tipple, Building U-16 Boiler House and the Former Coal Pile South of East Classification Yard. The investigations for the North Line Road Coal Tipple, Sand Creek Coal Tipple, and Building U-16 Boiler House are documented in the Remedial Investigation CC RVAAP-73 Facility-Wide Coal Storage (Parsons 2017). The Former Coal Pile South of East Classification Yard was investigated as part of the Remedial Investigation for CC RVAAP-79 DLA Ore Storage Sites where it is referred to as the Concrete Pad Storage Area. Based on the HRR, the 14 sites were determined to have No Further Action (NFA) status.

Three former coal storage locations on CJAG were designated as CC RVAAP-73 Facility-Wide Coal Storage Areas of Concern (AOC) within the Compliance Restoration Site CC (Army Environmental Compliance-Related Cleanup Program) AOC are the North Line Road Coal Tipple, the Sand Creek Coal Tipple, and the Building U-16 Boiler House.

North Line Road Coal Tipple: This area was used as a bulk coal receiving, storage, and distribution area. Based on historical aerial photographs of this area, coal storage piles appear in the 1952 through 1966 photos. Most of the coal appears to have been removed by 1979.

Sand Creek Coal Tipple: This area was used as a bulk coal receiving, storage, and distribution area. However, historical aerial photographs do not show clear evidence of coal storage in this area.

Building U-16 Boiler House: This area was used to store coal for boiler supply/steam generation. Based on historical aerial photographs of this area, coal storage piles appear in the 1952 through 1966 photos. Most of the coal appears to have been removed by 1979.

### A.2-73.2 Publications

The following publications relevant to the Record of Decision (ROD) for the Facility-Wide Coal Storage AOC can be located on www.RVAAP.org or in established RVAAP information repositories:

- Final Historical Records Review Report for the 2010 Phase I Remedial Investigation Services at Compliance Restoration Sites (9 Areas of Concern) Revision 0. SAIC. 11 December 2011.
- Final Remedial Investigation Report CC RVAAP-73 Facility-Wide Coal Storage. Parsons. 17 February 2017.
- Final Proposed Plan CC RVAAP-73 Facility-Wide Coal Storage. Parsons. 1 February 2018.
- Final Record of Decision for CC RVAAP-73 Facility-Wide Coal Storage. Parsons. 26 November 2018.

### A.2-73.3 Site Location and Description

Building U-16 Boiler House is located north of Bundling/North Line Road, west of Route 80 (also known as Freedom Road) and north of Newton Falls Road  North Line Road Coal Tipple is located just south of Bundling/North Line Road; east of Road 7C, and north of Newton Falls Road. Sand Creek Coal Tipple is located in the north-central portion of CJAG, just east of Paris-Windham Road and west of Building 1200.

The North Line Road Coal Tipple area is approximately 1.22 acres. No building is associated with this location, and the area is generally flat with a slight grade to the east-southeast toward Sand Creek. The area is unpaved and partially vegetated with low shrubs. The surrounding area is wooded. A ditch exists to the north of the area along the south side of North Line Road. The ditch flows east-northeast into Sand Creek. There are no wetlands, creeks, streams, or other water bodies within the North Line Road Coal Tipple area.

The Sand Creek Coal Tipple area is approximately 0.65 acres. The tipple is at the base of the former rail spur and is covered by woody/shrub-type vegetation. The topography in the immediate area of the Sand Creek Coal Tipple is generally flat, but the area topography slopes toward Sand Creek to the east and south. The HRR (SAIC 2011) reported that residual coal was observed at the surface. Sand Creek runs adjacent to the area to the south and east. There are no wetlands, creeks, streams, or other water bodies within the Sand Creek Coal Tipple area. However, Sand Creek is located within 50 feet of the southeast corner of the area. Sand Creek flows to the east paralleling the area's southern boundary where a tributary enters the creek approximately 50 feet east of the northeast corner of the area (Parsons 2017). Sand Creek then flows northeast away from the Sand Creek Coal Tipple area.

The Building U-16 Boiler House area is 0.138 acres and is generally flat, with a slight grade to the southeast. The boiler house has been demolished, and the area has been graded. There are no structures within the investigated area. The surface of the area is covered mainly with grasses and small shrubs. A rail line exists just north of the area. There are no wetlands, creeks, streams, or other water bodies within the Building U-16 Boiler House area. The nearest downgradient surface water body is a tributary (and associated wetlands) of Hinckley Creek, located approximately 1,100 feet south of the Building U-16 Boiler House area (Parsons 2017).

## A.2-73.4 No Further Action Required

No Further Action (NFA) under CERCLA is necessary at CC RVAAP-73 Facility-Wide Coal Storage for soil, sediment, and surface water to meet Unrestricted (Residential) Land Use. Groundwater will be addressed as part of a separate Remedial Investigation for RVAAP-66 Facility-Wide Groundwater. The Army will not be required to implement land use controls (LUCs) as part of this decision, as no Chemicals of Concern (COCs) were identified in soil, sediment, or surface water for the Resident Receptor.

The recommendation NFA for soil, sediment and surface water is protective of human health and the environment. Because this remedy will not result in hazardous substances, pollutants or contaminants remaining on-site above levels that allow for unlimited use and unrestricted exposure, a five-year review will not be required for this remedial action.

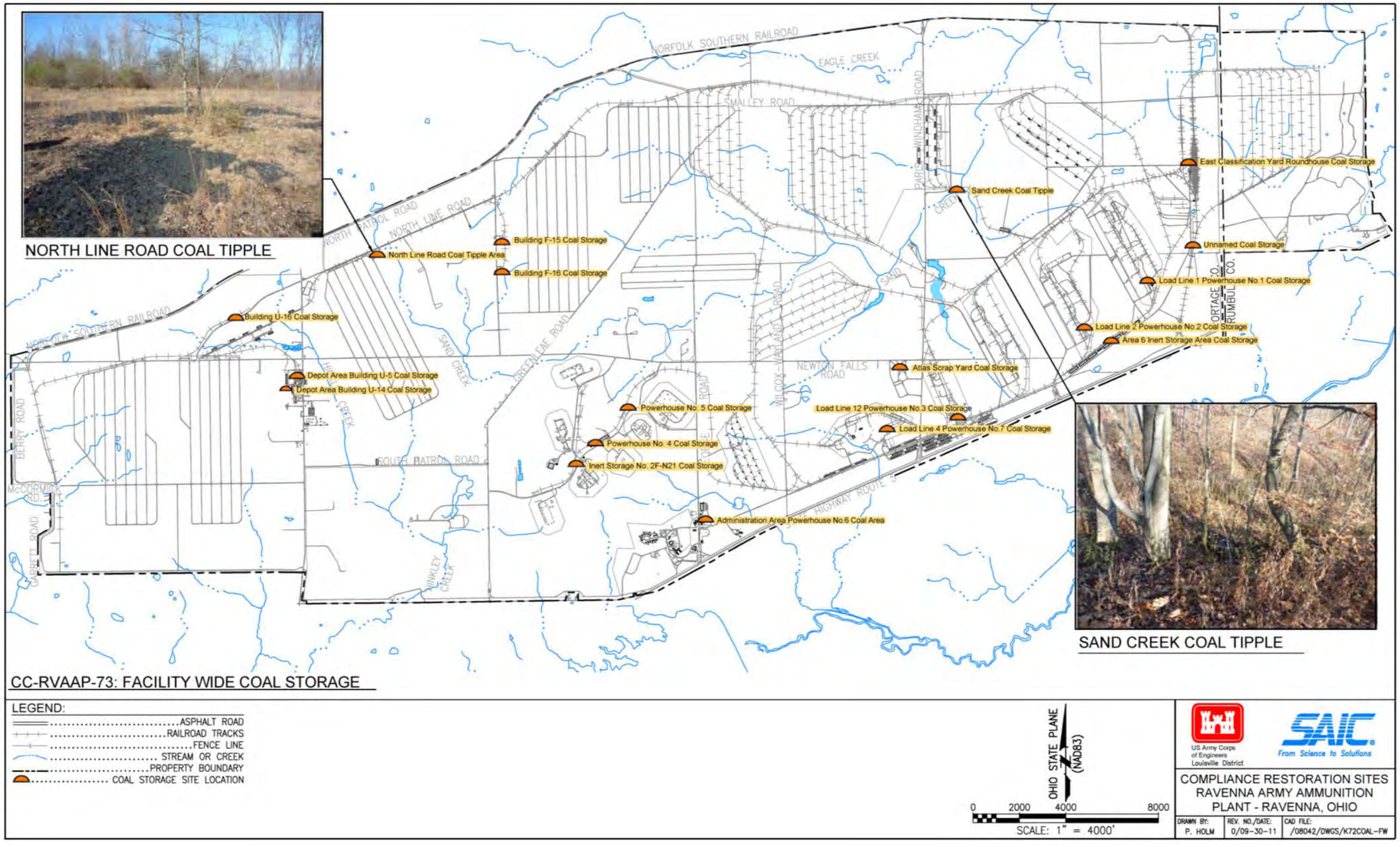



**Figure 6-1. Facility-Wide Coal Storage Map and Site Features**

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

March 9, 2021

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

Subject: Final 2021 Community Relations Plan for the Ravenna Army Ammunition Plant Restoration Program in Portage and Trumbull Counties, Ohio
Contract No. W912QR-18-C-0013

Dear Mr. Palombo,

An electronic copy of the *Final 2021 Community Relations Plan, RVAAP Restoration Program, Portage and Trumbull Counties, Ohio* (CRP) is being sent to you via email. The CRP is being sent to you as a courtesy and is not intended for Ohio EPA review or comment. The CRP is prepared in support of the Environmental Support Services project at Camp James A. Garfield Joint Military Training Center (CJAG) in Portage and Trumbull counties, Ohio, and is updated annually as appropriate.

Please contact Kevin Sedlak at (614) 336-2053 or kevin.m.sedlak.crt@mail.mil if there are issues or concerns with this submission.

Sincerely,

SEDLAK.KEVIN.MICHAEL.1254440171
Digitally signed by SEDLAK.KEVIN.MICHAEL.1254440171
Date: 2021.03.09 13:24:58 -05'00'

Kevin M. Sedlak
RVAAP Restoration Program Manager
Army National Guard Directorate

cc: Tom Schneider, Ohio EPA, DERR (cover letter via email only)
Bob Princic, Ohio EPA, NEDO (cover letter via email only)
Natalie Oryshkewych, Ohio EPA, DERR (cover letter via email only)
Kevin Sedlak, ARNG, CJAG (cover letter via email only)
Katie Tait, OHARNG, CJAG (cover letter via email only)
Nathaniel Peters, USACE – Louisville (one [1] electronic copy)
Steven Kvaal, USACE – Louisville (cover letter via email only)
Susan Oliver, Management Solutions, LLC (cover letter via email only)
Jennifer Tierney, Vista Science Corp. (one [1] electronic copy, four [4] hard copies)

CHENEGA TRI-SERVICES, LLC

January 29, 2021

U.S. Army Corps of Engineers (USACE)
Attn: Dr. Nathaniel Peters II
600 Martin Luther King Jr. PL
Louisville, KY 40202

Subject: Draft Community Relations Plan 2021 for the Ravenna Army Ammunition Plant Restoration Program in Portage and Trumbull Counties, Ohio
Contract No. W912QR-18-C-0013

Dear Dr. Peters,

Attached to the accompanying email is one (1) electronic copy of the *Draft Community Relations Plan 2020, RVAAP Restoration Program, Portage and Trumbull Counties, Ohio* for your review. This document was originally prepared in 2014 in support of the Environmental Support Services project at the former Ravenna Army Ammunition Plant (RVAAP, currently known as Camp James A. Garfield Joint Military Training Center) in Portage and Trumbull counties, Ohio, and has been updated every year since as appropriate. This document was prepared for the U.S. Army Corps of Engineers (USACE) – Louisville District by Vista Sciences Corporation under Contract No. W912QR-18C-0013.

One (1) electronic copy will be submitted to Katie Tait at the Camp James A. Garfield Environmental office. One (1) electronic copy will be submitted each to Kevin Sedlak and Mark Leeper (ARNG) and Steve Kvaal (USACE). One (1) hard copy and one (1) electronic copy will be provided to the Administrative Records Manager at the Camp James A. Garfield Environmental library.

Please feel free to contact me at (330) 980-1289 or at abrillinger@chenega.com by e-mail if there are issues or concerns with this report.

Sincerely,

Allan B Brillinger

Allan B. Brillinger
Program Manager
Chenega Tri-Services, LLC
Camp James A. Garfield Joint Military Training Center

# Excavation Confirmation Sample Results

Excavation Confirmation Report No. 4 DATE INITIATED: 12/30/2020

PROJECT RVAAP Load Lines 1-4 and 12 (RVAAP-08 to 12)

CONTRACT NO W912QR-12-D-0005

REQUESTOR IDENTIFICATION

NAME_ORGANIZATION PHONE Sarah Meyers, CH2M, 703-376-5338

TITLE Project Manager SIGNATURE *Sarah L. Meyers*

BASELINE IDENTIFICATION

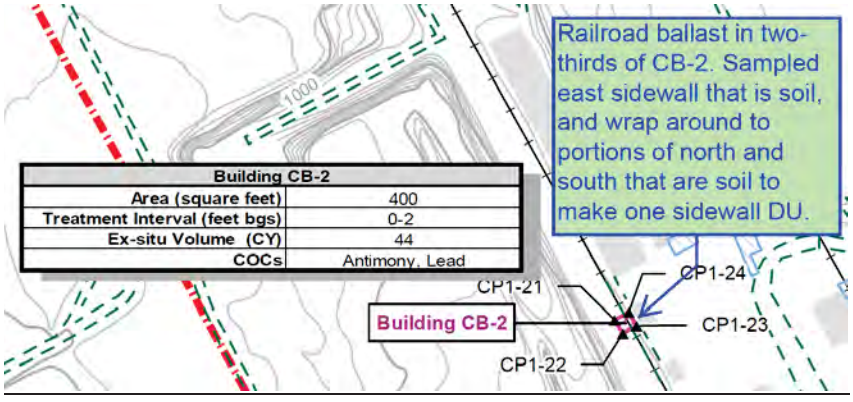
BASELINE(S) AFFECTED ☐ Cost ☐ Scope ☐ Milestone ☐ Method of Accomplishment

AFFECTED DOCUMENTS (TITLE, NUMBER AND SECTION):

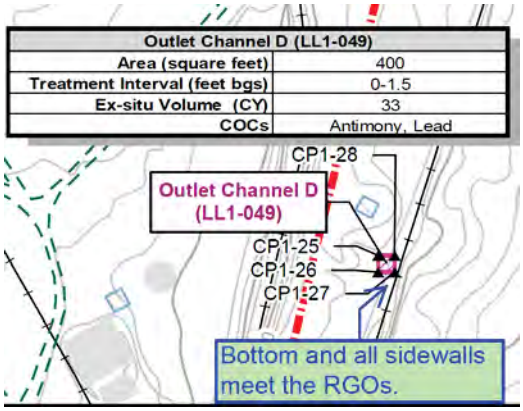
Not applicable

DESCRIPTION OF CHANGE:

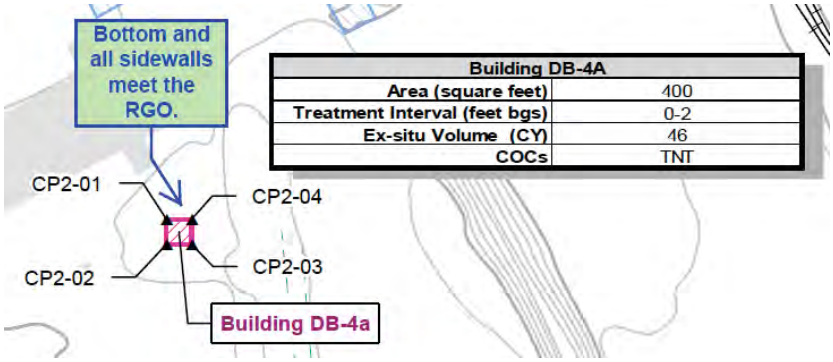
1. Additional analytical results for excavation confirmation samples are attached. Results previously concurred by the Army and Ohio EPA are identified on the table.
2. Excavation confirmation sampling of the initial excavation footprints concluded on 12/21/20 and analysis is ongoing; additional results will be provided as they become available.
3. Three samples in this data set exceeded the remedial goal options (RGOs):
   - Load Line 4, Building G-8(b), Sidewall North – benzo(a)pyrene concentration of 6.69 mg/kg exceeds the RGO of 2.9 mg/kg
   - Load Line 4, Former Water Tower, Sidewall East – lead concentration of 843 mg/kg exceeds the RGO of 800 mg/kg
   - Load Line 4, Former Water Tower, Sidewall West – lead concentration of 1,110 mg/kg exceeds the RGO of 800 mg/kg
4. Load Line 1, excavation Building CB-2 is shown below. Bedrock is present throughout the excavation at approximately 0.5' to 1' below ground surface - no bottom sample. Railroad ballast is present in two-thirds of the excavation, including the west sidewall and portions of the north and south sidewalls – no samples of railroad ballast. Sample collected from east sidewall that is soil, and wrapped around to the adjoining portions of the north and south sidewalls that are also soil to make one sidewall DU. The sample meets the applicable RGOs and the excavation can be backfilled pending the post-excavation survey.



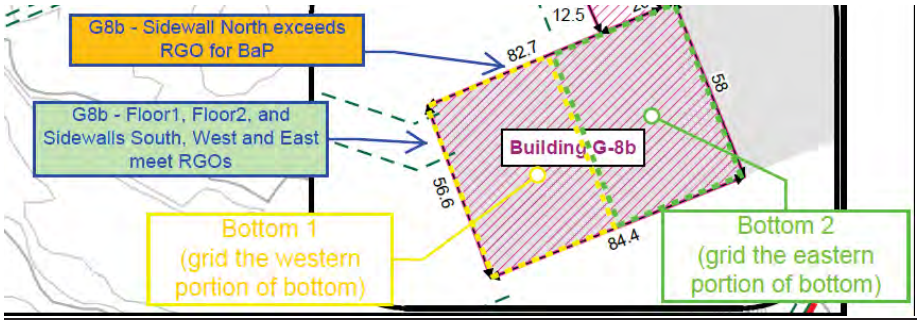
5. Load Line 1, Outlet Channel D is shown below. The applicable RGOs have been met and the excavation can be backfilled pending the post-excavation survey.



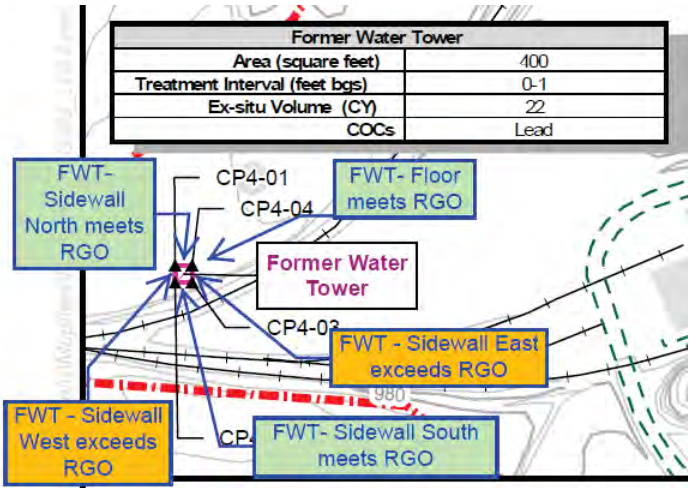

6. Load Line 2, excavation DB-4A is shown below. The applicable RGOs have been met and the excavation can be backfilled pending the post-excavation survey.



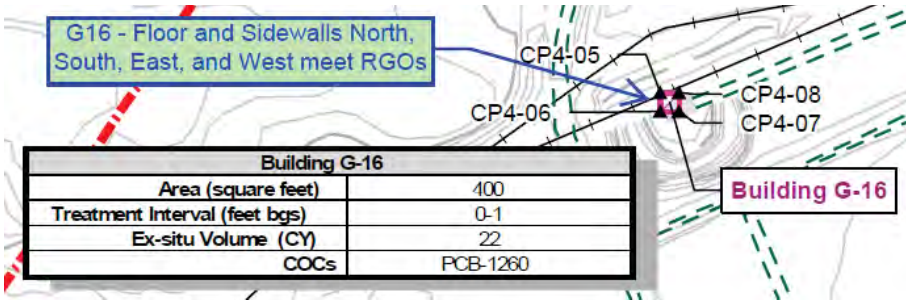

7. Load Line 4, excavation Building G-8(b) is shown below. Sidewall North exceeds the RGO for Benzo(a)pyrene; therefore, additional soil will be removed in this direction followed by an additional sample.



8. Load Line 4, Former Water Tower excavation is shown below. The east and west sidewalls exceed the RGO; therefore, additional soil will be removed to the east followed by an additional sample, and additional soil will be removed to the west followed by an additional sample.




9. Load Line 4, excavation Building G-16 is shown below. The applicable RGO has been met and the excavation can be backfilled pending the post-excavation survey.



JUSTIFICATION:

As detailed above and in the attached table, additional excavation is indicated for three decision units in this data set that exceed an associated RGO:

- LL4, Building G-8(b), North Sidewall
- LL4, Former Water Tower, East Sidewall
- LL4, Former Water Tower, West Sidewall

Overall, additional excavation is indicated for five decision units in four excavations to date:

- LL1, CB4A, South Sidewall
- LL3, EB-4, North Sidewall
- LL4, G-8(b), North Sidewall
- LL4, Former Water Tower, East Sidewall
- LL4, Former Water Tower, West Sidewall

As detailed above and in the attached table, to date there are 14 excavations that meet the associated RGOs or have been excavated to bedrock and can be backfilled pending the post-excavation survey:

- LL1, CB-2
- LL1, CB-4
- LL1, Outlet Channel D
- LL2, DB-4A
- LL3, EA-6(a)
- LL3, EA-6(b)
- LL3, EA-6(c)
- LL3, EA-7
- LL3, EB-9A
- LL3, EB-10(a)
- LL3, EB-10(b)
- LL3, EB-803
- LL4, Building G-8(a)
- LL4, Building G-16

Analytical results are pending for the six remaining excavations.

IMPACT OF NOT IMPLEMENTING REQUEST

Not applicable.

PARTICIPANTS AFFECTED BY IMPLEMENTING REQUEST

Not applicable.

COST ESTIMATE: NA ESTIMATOR SIGNATURE _____

PHONE: DATE___

USACE COTR PETERS.NATHANIEL.II.1248279466 Digitally signed by PETERS.NATHANIEL.II.1248279466 Date: 2021.01.05 08:05:29 -05'00' DATE Jan 05, 2021

OHIO EPA PROJECT MANAGER _____ DATE _____

MANAGER SIGNATURE N/A DATE _____

**LL 1-4 & 12 Remedial Action**
**Excavation Confirmation Sample Results (unvalidated)**

| | | | | | | | | | Analyte/Units/Remedial Goal Option (RGO)/Result | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | Antimony | | Lead | | PCB-1254 | | PCB-1260 | | B(a)a | | BaP | | BbF | | DA | | RDX | | TNT | | 2,6-DNT | | |
| | | | | | | | | | mg/kg | | mg/kg | | mg/kg | | mg/kg | | mg/kg | | mg/kg | | mg/kg | | mg/kg | | mg/kg | | mg/kg | | mg/kg | | |
| Load Line | Remediation Area | COCs | Description/ Rationale | Location | Sample Date | Lab | Lab SDG # | Sample ID/Location | 470 | | 800 | | 9.7 | | 9.9 | | 29 | | 2.9 | | 29 | | 2.9 | | 280 | | 510 | | 15 | | Action |
| 1 | CB-4A | RDX, TNT | Excavation Sample | Sidewall East 1 | 11/20/2020 | CT | 158141 | LL1CB4Acs-737-001-SO (SW East 1) | - | | - | | - | | - | | - | | - | | - | | - | | 5.4 | Z | 71 | Q | - | | - RGOs met in each individual replicate sample;<br>- - RSD >100% for RDX and TNT;<br>- 95% UCL (Chebychev method) is less than RGOs;<br>- no further excavation in this direction |
| 1 | CB-4A | RDX, TNT | Excavation Sample - ISM TRIPLICATE set2 | | | | | LL1CB4Acs-737-002-SO (SW East 1) | - | | - | | - | | - | | - | | - | | - | | - | | 0.21 | P | 270 | Q | - | | |
| 1 | CB-4A | RDX, TNT | Excavation Sample - ISM TRIPLICATE set2 | | | | | LL1CB4Acs-737-003-SO (SW East 1) | - | | - | | - | | - | | - | | - | | - | | - | | 0.2 | U | 1.2 | Q | - | | |
| 1 | CB-4A | RDX, TNT | | | | | | **arithmetic mean** | | | | | | | | | | | | | | | | | 1.937 | | 114.067 | | | | |
| 1 | CB-4A | RDX, TNT | | | | | | **standard deviation** | | | | | | | | | | | | | | | | | 2.999 | | 139.479 | | | | |
| 1 | CB-4A | RDX, TNT | | | | | | **CV = SD / mean** | | | | | | | | | | | | | | | | | 155% | | 122% | | | | |
| 1 | CB-4A | RDX, TNT | | | | | | **count (r)** | | | | | | | | | | | | | | | | | 3 | | 3 | | | | |
| 1 | CB-4A | RDX, TNT | | | | | | **alpha (95% = 0.05)** | | | | | | | | | | | | | | | | | 0.05 | | 0.05 | | | | |
| 1 | CB-4A | RDX, TNT | | | | | | **t(alpha, df=r-1)** | | | | | | | | | | | | | | | | | 2.92 | | 2.92 | | | | |
| 1 | CB-4A | RDX, TNT | | | | | | **Student's t UCL** | | | | | | | | | | | | | | | | | 6.99 | | 349.21 | | | | |
| 1 | CB-4A | RDX, TNT | | | | | | **Chebychev UCL** | | | | | | | | | | | | | | | | | 9.48 | | 465.08 | | | | |
| 1 | CB-4A | RDX, TNT | Excavation Sample | Sidewall South | 11/20/2020 | CT | 158141 | LL1CB4Acs-738-001-SO (SW South) | - | | - | | - | | - | | - | | - | | - | | - | | 0.2 | U | 2.2 | Q | - | | - RGOs met in each individual replicate sample;<br>- RSD >100% for RDX and TNT;<br>- 95% UCL (Chebychev method) is less than RGO for RDX but greater than RGO for TNT;<br>- additional excavation in this direction (south) for TNT |
| 1 | CB-4A | RDX, TNT | Excavation Sample - ISM TRIPLICATE set1 | | | | | LL1CB4Acs-738-002-SO (SW South) | - | | - | | - | | - | | - | | - | | - | | - | | 2.6 | P | 480 | Q | - | | |
| 1 | CB-4A | RDX, TNT | Excavation Sample - ISM TRIPLICATE set1 | | | | | LL1CB4Acs-738-003-SO (SW South) | - | | - | | - | | - | | - | | - | | - | | - | | 7.6 | | 44 | Q | - | | |
| 1 | CB-4A | RDX, TNT | | | | | | **arithmetic mean** | | | | | | | | | | | | | | | | | 3.467 | | 175.400 | | | | |
| 1 | CB-4A | RDX, TNT | | | | | | **standard deviation** | | | | | | | | | | | | | | | | | 3.775 | | 264.618 | | | | |
| 1 | CB-4A | RDX, TNT | | | | | | **CV = SD / mean** | | | | | | | | | | | | | | | | | 109% | | 151% | | | | |
| 1 | CB-4A | RDX, TNT | | | | | | **count (r)** | | | | | | | | | | | | | | | | | 3 | | 3 | | | | |
| 1 | CB-4A | RDX, TNT | | | | | | **alpha (95% = 0.05)** | | | | | | | | | | | | | | | | | 0.05 | | 0.05 | | | | |
| 1 | CB-4A | RDX, TNT | | | | | | **t(alpha, df=r-1)** | | | | | | | | | | | | | | | | | 2.92 | | 2.92 | | | | |
| 1 | CB-4A | RDX, TNT | | | | | | **Student's t UCL** | | | | | | | | | | | | | | | | | 9.83 | | 621.51 | | | | |
| 1 | CB-4A | RDX, TNT | | | | | | **Chebychev UCL** | | | | | | | | | | | | | | | | | 12.97 | | 841.34 | | | | |
| 1 | CB-4A | RDX, TNT | Excavation Sample | Sidewall North 1 | 11/24/2020 | CT | 158211 | LL1CB4ACS-739-001-SO (SWN1) | - | | - | | - | | - | | - | | - | | - | | - | | 0.2 | U | 13 | | 0.113 | | - RGOs met in each individual replicate sample;<br>- RSD >100% for TNT;<br>- 95% UCL (Chebychev method) is less than RGO;<br>- no further excavation in this direction |
| 1 | CB-4A | RDX, TNT | Excavation Sample - ISM TRIPLICATE set3 | | | | | LL1CB4ACS-739-002-SO (SWN1) | - | | - | | - | | - | | - | | - | | - | | - | | 0.2 | U | 0.2 | UQ | 0.119 | | |
| 1 | CB-4A | RDX, TNT | Excavation Sample - ISM TRIPLICATE set3 | | | | | LL1CB4ACS-739-003-SO (SWN1) | - | | - | | - | | - | | - | | - | | - | | - | | 0.2 | U | 0.2 | UQ | 0.107 | | |
| 1 | CB-4A | RDX, TNT | | | | | | **arithmetic mean** | | | | | | | | | | | | | | | | | 0.200 | | 4.467 | | | | |
| 1 | CB-4A | RDX, TNT | | | | | | **standard deviation** | | | | | | | | | | | | | | | | | 0.000 | | 7.390 | | | | |
| 1 | CB-4A | RDX, TNT | | | | | | **CV = SD / mean** | | | | | | | | | | | | | | | | | 0% | | 165% | | | | |
| 1 | CB-4A | RDX, TNT | | | | | | **count (r)** | | | | | | | | | | | | | | | | | 3 | | 3 | | | | |
| 1 | CB-4A | RDX, TNT | | | | | | **alpha (95% = 0.05)** | | | | | | | | | | | | | | | | | 0.05 | | 0.05 | | | | |
| 1 | CB-4A | RDX, TNT | | | | | | **t(alpha, df=r-1)** | | | | | | | | | | | | | | | | | 2.92 | | 2.92 | | | | |
| 1 | CB-4A | RDX, TNT | | | | | | **Student's t UCL** | | | | | | | | | | | | | | | | | 0.20 | | 16.93 | | | | |
| 1 | CB-4A | RDX, TNT | | | | | | **Chebychev UCL** | | | | | | | | | | | | | | | | | 0.20 | | 23.06 | | | | |
| 1 | CB-4A | RDX, TNT | Excavation Sample | Sidewall North 2 (bumpout) | 11/24/2020 | CT | 158211 | LL1CB4ACS-740-001-SO (SWN2) | - | | - | | - | | - | | - | | - | | - | | - | | 0.2 | U | 1 | JQ | - | | RGOs have been met, no further excavation in this direction, Army and OEPA concur |
| 1 | CB-4A | RDX, TNT | Excavation Sample | Sidewall North 3 | 11/30/2020 | CT | 158269 | LL1CB4ACS-741-001-SO (SWN3) | - | | - | | - | | - | | - | | - | | - | | - | | 0.2 | U | 14 | M,Q | - | | RGOs have been met, no further excavation in this direction |
| 1 | CB-4A | RDX, TNT | Excavation Sample | Sidewall East 2 (Bumpout) | 11/30/2020 | CT | 158269 | LL1CB4ACS-742-001-SO (SWE2, bumpout) | - | | - | | - | | - | | - | | - | | - | | - | | 0.2 | U | 0.2 | UQ | - | | RGOs have been met, no further excavation in this direction |
| 1 | CB-4A | RDX, TNT | Excavation Sample | Sidewall West 2 (bumpout) | 11/19/2020 | CT | 158139 | LL1CB4Acs-736-001-SO (SW West 2) | - | | - | | - | | - | | - | | - | | - | | - | | 0.2 | U | 0.32 | Q | - | | RGOs have been met, no further excavation in this direction, Army and OEPA concur |
| 1 | CB-4A | RDX, TNT | Excavation Sample | Sidewall West 1 | 12/1/2020 | CT | 158323 | LL1CB4ACS-743-001-SO (SWW1) | - | | - | | - | | - | | - | | - | | - | | - | | 8.3 | | 2.1 | Q | - | | RGOs have been met, no further excavation in this direction, Army and OEPA concur |
| 1 | CB-4A | RDX, TNT | Excavation Sample | Bottom | NA | | | No sample due to shallow bedrock throughout excavation | | | | | | | | | | | | | | | | | | | | | | | No sample |
| 1 | CB-4 | PCB-1254 | Excavation Sample | No Samples | NA | NA | NA | no samples | - | | - | | - | | - | | NA | | NA | | NA | | NA | | - | | - | | - | | Overburden removed to bedrock encountered throughout at 2 feet bgs (treatment interval 2-3'bgs). Per Army direction document excavation and backfill, no samples.<br>RGOs have been met. Pending post-excavation survey, excavation can be backfilled. |

**LL 1-4 & 12 Remedial Action**
**Excavation Confirmation Sample Results (unvalidated)**

| | | | | | | | | | Analyte/Units/Remedial Goal Option (RGO)/Result | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | Antimony | Lead | PCB-1254 | PCB-1260 | B(a)a | BaP | BbF | DA | RDX | TNT | 2,6-DNT | |
| | | | | | | | | | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | |
| Load Line | Remediation Area | COCs | Description/ Rationale | Location | Sample Date | Lab | Lab SDG # | Sample ID/Location | 470 | 800 | 9.7 | 9.9 | 29 | 2.9 | 29 | 2.9 | 280 | 510 | 15 | Action |
| 3 | EA-6 (a) | B(a)a, BaP, BbF, DA | Excavation Sample | Sidewall West | 12/2/2020 | CT | 158363 | LL3EA6ACS-749-001-SO (SWW) | - | - | - | - | 6.37 | 4.42 | 5.86 | 0.374 | - | - | - | Additional excavation removed approximately 20 feet additional to the west and down to bedrock at approximately 2'bgs, coincides with footprint of EA6c. Soil added to treatment cell. Beyond that 20 feet had already been excavated for EA6c. No additional samples collected. |
| 3 | EA-6 (a) | B(a)a, BaP, BbF, DA | Excavation Sample | Sidewall North | 12/2/2020 | CT | 158363 | LL3EA6ACS-750-001-SO (SWN) | - | - | - | - | 0.445 | 0.308 | 0.391 | 0.0331 | - | - | - | RGOs have been met. Pending post-excavation survey, excavation can be backfilled. Army and OEPA concur. |
| 3 | EA-6 (a) | B(a)a, BaP, BbF, DA | Excavation Sample | Sidewall South | 12/2/2020 | CT | 158363 | LL3EA6ACS-751-001-SO (SWS) | - | - | - | - | 1.72 | 1.24 | 1.56 | 0.128 | - | - | - | |
| 3 | EA-6 (a) | B(a)a, BaP, BbF, DA | Excavation Sample | Sidewall East | NA | CT | 158363 | No sample (due to topography there is not an eastern sidewall for this excavation) | | | | | | | | | | | | |
| 3 | EA-6 (a) | B(a)a, BaP, BbF, DA | Excavation Sample | Bottom | 12/2/2020 | CT | 158363 | LL3EA6ACS-752-001-SO (BOTTOM) | - | - | - | - | 0.801 | 0.576 | 0.707 | 0.0552 | - | - | - | |
| 3 | EA-6 (b) | BaP, DA | Excavation Sample | Sidewall West | 12/1/2020 | CT | 158323 | LL3EA6Bcs-744-001-SO (SWW) | - | - | - | - | 0.162 | 0.114 | 0.174 | 0.015 M | - | - | - | RGOs have been met. Pending post-excavation survey, excavation can be backfilled. Army and OEPA concur. |
| 3 | EA-6 (b) | BaP, DA | Excavation Sample | Sidewall North | 12/1/2020 | CT | 158323 | LL3EA6Bcs-745-001-SO (SWN) | - | - | - | - | 1.51 | 1.01 | 1.45 | 0.0839 | - | - | - | |
| 3 | EA-6 (b) | BaP, DA | Excavation Sample | Sidewall South | 12/1/2020 | CT | 158323 | LL3EA6Bcs-746-001-SO (SWS) | - | - | - | - | 0.29 | 0.168 | 0.267 | 0.0227 | - | - | - | |
| 3 | EA-6 (b) | BaP, DA | Excavation Sample | Sidewall East | 12/1/2020 | CT | 158323 | LL3EA6Bcs-747-001-SO (SWE) | - | - | - | - | 0.235 | 0.156 | 0.18 | 0.02 | - | - | - | |
| 3 | EA-6 (b) | BaP, DA | Excavation Sample | Bottom | 12/1/2020 | CT | 158323 | LL3EA6Bcs-748-001-SO (Bottom) | - | - | - | - | 1.39 | 0.925 | 1.32 | 0.0822 | - | - | - | |
| 3 | EA-6 (c) | B(a)a, BaP, BbF, DA | Excavation Sample | No Samples | NA | NA | NA | no samples | - | - | - | - | NA | NA | NA | NA | - | - | - | Bedrock encountered - one pocket had soils in the treatment interval (approximately 10CY of impacted soils from an area just south of EA6b excavated to bedrock and added to treatment cell ETC 2A-6). Bedrock throughout bottom of excavation, no soil on sidewalls in treatment interval 4.5-6'bgs, no samples. Per Army direction document excavation and backfill, no samples.<br><br>Pending post-excavation survey, excavation can be backfilled. |
| 3 | EB-4 | PCB-1254 | Excavation Sample | Sidewall West 4 | 12/2/2020 | CT | 158363 | LL3EB4CS-753-001-SO (SWW4) | - | - | 0.348 | - | - | - | - | - | - | - | - | RGOs have been met, no further excavation in this direction. Army and OEPA concur. |
| 3 | EB-4 | PCB-1254 | Excavation Sample | Sidewall North 1 | 12/3/2020 | CT | 158405 | LL3EB4CS-555-001-SO (SWN1) | - | - | 11.3 | - | - | - | - | - | - | - | - | Additional soil will be excavated in this direction for treatment, and an additional ISM sample will be collected for the new northern sidewall. |
| 3 | EB-4 | PCB-1254 | Excavation Sample | Sidewall South 1 | 12/7/2020 | CT | 158449 | LL3EB4cs-561-001-SO (SWS1) | - | - | 1.68 | - | - | - | - | - | - | - | - | RGOs have been met, no further excavation in this direction |
| 3 | EB-4 | PCB-1254 | Excavation Sample | Sidewall West 1 | 12/7/2020 | CT | 158449 | LL3EB4cs-562-001-SO (SWW1) | - | - | 1.13 | - | - | - | - | - | - | - | - | RGOs have been met, no further excavation in this direction |
| 3 | EB-4 | PCB-1254 | Excavation Sample | Sidewall East 3 | 12/7/2020 | CT | 158449 | LL3EB4cs-563-001-SO (SWE3) | - | - | 1.33 | - | - | - | - | - | - | - | - | RGOs have been met, no further excavation in this direction |
| 3 | EB-4 | PCB-1254 | Excavation Sample | Sidewall West 2 | 12/7/2020 | CT | 158449 | LL3EB4cs-564-001-SO (SWW2) | - | - | 0.0943 | - | - | - | - | - | - | - | - | RGOs have been met, no further excavation in this direction |
| 3 | EB-4 | PCB-1254 | Excavation Sample | Sidewall South 2 | 12/7/2020 | CT | 158449 | LL3EB4cs-565-001-SO (SWS2) | - | - | 0.041 | - | - | - | - | - | - | - | - | RGOs have been met, no further excavation in this direction |
| 3 | EB-4 | PCB-1254 | Excavation Sample | Sidewall North 2 | 12/8/2020 | CT | 158489 | LL3EB4CS-566-001-SO (SWN2) | - | - | 0.0573 | - | - | - | - | - | - | - | - | RGOs have been met, no further excavation in this direction |
| 3 | EB-4 | PCB-1254 | Excavation Sample | Sidewall West 3 | 12/8/2020 | CT | 158489 | LL3EB4CS-567-001-SO (SWW3) | - | - | 2.16 | - | - | - | - | - | - | - | - | RGOs have been met, no further excavation in this direction |
| 3 | EB-4 | PCB-1254 | Excavation Sample | Bottom 1 | 12/8/2020 | CT | 158489 | LL3EB4CS-568-001-SO (Bottom1) | - | - | 9 | - | - | - | - | - | - | - | - | RGOs have been met, no further excavation in this direction |
| 3 | EB-4 | PCB-1254 | Excavation Sample | Sidewall East 1 | 12/8/2020 | CT | 158489 | LL3EB4CS-569-001-SO (SWE1) | - | - | 0.487 | - | - | - | - | - | - | - | - | RGOs have been met, no further excavation in this direction |
| 3 | EB-4 | PCB-1254 | Excavation Sample | Sidewall South 3 | 12/8/2020 | CT | 158489 | LL3EB4CS-570-001-SO (SWS3) | - | - | 0.571 | - | - | - | - | - | - | - | - | RGOs have been met, no further excavation in this direction |
| 3 | EB-4 | PCB-1254 | Excavation Sample | Bottom 3 | 12/10/2020 | CT | 158584 | LL3EB4CS-571-001-SO (Bottom3) | - | - | 0.752 | - | - | - | - | - | - | - | - | RGOs have been met, no further excavation in this direction |
| 3 | EB-4 | PCB-1254 | Excavation Sample | Sidewall North 3 | 12/10/2020 | CT | 158584 | LL3EB4CS-572-001-SO (SWN3) | - | - | 1.37 | - | - | - | - | - | - | - | - | RGOs have been met, no further excavation in this direction |

**LL 1-4 & 12 Remedial Action**
**Excavation Confirmation Sample Results (unvalidated)**

| | | | | | | | | | Analyte/Units/Remedial Goal Option (RGO)/Result | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | Antimony | | Lead | | PCB-1254 | | PCB-1260 | | B(a)a | | BaP | | BbF | | DA | | RDX | | TNT | | 2,6-DNT | | Action |
| | | | | | | | | | mg/kg | | mg/kg | | mg/kg | | mg/kg | | mg/kg | | mg/kg | | mg/kg | | mg/kg | | mg/kg | | mg/kg | | mg/kg | | |
| Load Line | Remediation Area | COCs | Description/ Rationale | Location | Sample Date | Lab | Lab SDG # | Sample ID/Location | 470 | | 800 | | 9.7 | | 9.9 | | 29 | | 2.9 | | 29 | | 2.9 | | 280 | | 510 | | 15 | | |
| 3 | EA-7 | PCB-1254 | Excavation Sample | Sidewall North | 12/3/2020 | CT | 158405 | LL3EA7CS-556-001-SO (SWN) | - | | - | | 0.229 | | - | | - | | - | | - | | - | | - | | - | | - | | - RGO met in each individual replicate sample;<br>- RSD <35%<br>- no further excavation in this direction; pending post-excavation survey, excavation can be backfilled. Army and OEPA concur. |
| 3 | EA-7 | PCB-1254 | Excavation Sample - ISM TRIPLICATE set 4 | | | | | LL3EA7CS-556-002-SO (SWN) | - | | - | | 0.395 | | - | | - | | - | | - | | - | | - | | - | | - | | |
| 3 | EA-7 | PCB-1254 | Excavation Sample - ISM TRIPLICATE set 4 | | | | | LL3EA7CS-556-003-SO (SWN) | - | | - | | 0.27 | | - | | - | | - | | - | | - | | - | | - | | - | | |
| 3 | EA-7 | PCB-1254 | | | | | | **arithmetic mean** | | | | | 0.298 | | | | | | | | | | | | | | | | | | |
| 3 | EA-7 | PCB-1254 | | | | | | **standard deviation** | | | | | 0.086 | | | | | | | | | | | | | | | | | | |
| 3 | EA-7 | PCB-1254 | | | | | | **CV = SD / mean** | | | | | 29% | | | | | | | | | | | | | | | | | | |
| 3 | EA-7 | PCB-1254 | | | | | | **count (r)** | | | | | 3 | | | | | | | | | | | | | | | | | | |
| 3 | EA-7 | PCB-1254 | Excavation Sample | Sidewall East | 12/4/2020 | CT | 158423 | LL3EA7CS-557-001-SO (SWE) | - | | - | | 1.27 | | - | | - | | - | | - | | - | | - | | - | | - | | RGOs have been met. Pending post-excavation survey, excavation can be backfilled. |
| 3 | EA-7 | PCB-1254 | Excavation Sample | Sidewall South | 12/4/2020 | CT | 158423 | LL3EA7CS-558-001-SO (SWS) | - | | - | | 0.622 | | - | | - | | - | | - | | - | | - | | - | | - | | |
| 3 | EA-7 | PCB-1254 | Excavation Sample | Sidewall West | 12/4/2020 | CT | 158423 | LL3EA7CS-559-001-SO (SWW) | - | | - | | 0.716 | | - | | - | | - | | - | | - | | - | | - | | - | | |
| 3 | EA-7 | PCB-1254 | Excavation Sample | Bottom | 12/4/2020 | CT | 158423 | LL3EA7CS-560-001-SO (Bottom) | - | | - | | 0.429 | | - | | - | | - | | - | | - | | - | | - | | - | | |
| 3 | EB-803 | PCB-1254 | Excavation Sample | Bottom | 12/11/2020 | CT | 158590 | LL3EB803cs-578-001-SO (Bottom) | - | | - | | 0.0729 | | - | | - | | - | | - | | - | | - | | - | | - | | RGOs have been met. Pending post-excavation survey, excavation can be backfilled. |
| 3 | EB-803 | PCB-1254 | Excavation Sample | Sidewall North | 12/11/2020 | CT | 158590 | LL3EB803cs-579-001-SO (SWN) | - | | - | | 0.0355 | | - | | - | | - | | - | | - | | - | | - | | - | | |
| 3 | EB-803 | PCB-1254 | Excavation Sample | Sidewall East | 12/11/2020 | CT | 158590 | LL3EB803cs-580-001-SO (SWE) | - | | - | | 0.04 | | - | | - | | - | | - | | - | | - | | - | | - | | |
| 3 | EB-803 | PCB-1254 | Excavation Sample | Sidewall West | NA | NA | NA | no sample - railroad ballast | - | | - | | NA | | - | | - | | - | | - | | - | | - | | - | | - | | |
| 3 | EB-803 | PCB-1254 | Excavation Sample | Sidewall South | NA | NA | NA | no sample - railroad ballast | - | | - | | NA | | - | | - | | - | | - | | - | | - | | - | | - | | |
| 3 | EB-9A | TNT | Excavation Sample | Bottom | 12/10/2020 | CT | 158584 | LL3EB9ACS-573-001-SO (Bottom) | - | | - | | - | | - | | - | | - | | - | | - | | - | | 11 | Q | - | | RGOs have been met. Pending post-excavation survey, excavation can be backfilled. |
| 3 | EB-9A | TNT | Excavation Sample | Sidewall South | 12/10/2020 | CT | 158584 | LL3EB9ACS-574-001-SO (SWS) | - | | - | | - | | - | | - | | - | | - | | - | | - | | 0.34 | Q | - | | |
| 3 | EB-9A | TNT | Excavation Sample | Sidewall North | 12/10/2020 | CT | 158584 | LL3EB9ACS-575-001-SO (SWN) | - | | - | | - | | - | | - | | - | | - | | - | | - | | 0.1 | Q | - | | |
| 3 | EB-9A | TNT | Excavation Sample | Sidewall East | 12/10/2020 | CT | 158584 | LL3EB9acs-576-001-SO (SWE) | - | | - | | - | | - | | - | | - | | - | | - | | - | | 0.15 | | - | | |
| 3 | EB-9A | TNT | Excavation Sample | Sidewall West | 12/10/2020 | CT | 158584 | LL3EB9acs-577-001-SO (SWW) | - | | - | | - | | - | | - | | - | | - | | - | | - | | 0.2 | | - | | |
| 3 | EB-10 (a) | B(a)a, BaP, BbF, DA | Excavation Sample | No Samples | NA | NA | NA | no samples | - | | - | | - | | - | | NA | | NA | | NA | | NA | | - | | - | | - | | Bedrock encountered - bedrock throughout bottom of excavation, no soil on sidewalls in treatment interval 3-5'bgs, no samples. Per Army direction document excavation and backfill, no samples.<br>Pending post-excavation survey, excavation can be backfilled. |

**LL 1-4 & 12 Remedial Action**
**Excavation Confirmation Sample Results (unvalidated)**

| | | | | | | | | | Analyte/Units/Remedial Goal Option (RGO)/Result | | | | | | | | |

**LL 1-4 & 12 Remedial Action**
**Excavation Confirmation Sample Results (unvalidated)**

| | | | | | | | | | Analyte/Units/Remedial Goal Option (RGO)/Result | | | | | | | | |

Ohio Environmental Protection Agency

**Mike DeWine**, Governor
**Jon Husted**, Lt. Governor
**Laurie A. Stevenson**, Director

December 1, 2021

**TRANSMITTED ELECTRONICALLY**

Mr. Kevin Sedlak
Army National Guard
Installation and Environment
Clean-up Branch
IPA Designation
1438 State Route 534 SW
Newton Falls, OH 44444

RE: US Army Ravenna Ammunition Plt RVAAP
Remediation Response
Project Records
Remedial Response
Portage County
ID # 267000859263

**Subject: Receipt and Review of the "Final Remedial Action Completion Report Load Lines 1 – 4 and 12 (RVAAP-08 through RVAAP-12)," dated October 2021**

The Ohio Environmental Protection Agency (Ohio EPA), Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR) received and reviewed the document entitled, "Final Remedial Action Completion Report Load Lines 1 – 4 and 12 (RVAAP-08 through RVAAAP-12)."

We have no further comments and concur with this document.

This letter is an official response from Ohio EPA that will be maintained as a public record. If you have any questions or concerns, please do not hesitate to contact me at (330) 963-1201, or via email at Susan.Netzly-Watkins@epa.ohio.gov.

Sincerely,

Sue Netzly-Watkins

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

RECEIVED
DEC 0 1 2021

SNW/sc

ec: Katie Tait, OHARNG RTLS
Nat Peters, USACE
Steve Kvaal, USACE
Sarah Meyers, Jacobs
Rebecca Shreffler, Chenega
Natalie Oryshkewych, Ohio EPA, NEDO, DERR
Bob Princic, Ohio EPA, NEDO, DERR
Megan Oravec, Ohio EPA, NEDO, DERR
Tom Schneider, Ohio EPA, SWDO, DERR
Brian Tucker, Ohio EPA, CO, DERR

# Field Change Request (FCR)

FCR NO. 1 DATE INITIATED: 11/23/2020

PROJECT RVAAP Load Lines 1-4 and 12 (RVAAP-08 to 12)

CONTRACT NO W912QR-12-D-0005

REQUESTOR IDENTIFICATION

NAME_ORGANIZATION PHONE Sarah Meyers, CH2M, 703-376-5338

TITLE Project Manager SIGNATURE *Sarah L. Meyers*

BASELINE IDENTIFICATION

BASELINE(S) AFFECTED ☐ Cost ☐ Scope ☐ Milestone ☒ Method of Accomplishment

AFFECTED DOCUMENTS (TITLE, NUMBER AND SECTION):

*FINAL Remedial Design Work Plan for RVAAP Load Lines 1, 2, 3, 4, and 12 (RVAAP-08 to 12), Former Ravenna Army Ammunition Plant, Portage and Trumbull Counties, Ohio*

*Appendix C Quality Assurance Project Plan (QAPP)*

DESCRIPTION OF CHANGE:

1. Page 2: Worksheet 11, "Who will collect and generate the data?" Replacing "to be determined" with the name of the QA Laboratory GEL.
2. Page 19: Table 18-1, "Excavation Confirmation Sample IDs, Analytical Parameters and Locations". For Quality Control Samples, adding a row for the ISM Triplicate samples. Revising the "Sample ID Sequential Sample Number for Project" for the duplicate and triplicate ISM samples to -002 and -003, respectively, with the remainder of the sample ID being the same as the parent sample; also adding the Sample ID for QA splits (-002). Revising the MS and MSD sample IDs to the same as the parent sample.
3. Page 21: Table 18-2, "Treatment Verification Sample IDs, Analytical Parameters and Locations". For Quality Control Samples, revising the "Sample ID Sequential Sample Number for Project" for the duplicate samples to -002, with the remainder of the sample ID being the same as the parent sample; also adding the Sample ID for QA splits (-002). Revising the MS and MSD sample IDs to the same as the parent sample.
4. Pages 23 and 24: Table 19-1, "Sample Containers, Preservation, and Hold Times". Correcting the sample container for explosives analysis in soil to one 4 oz. glass. Adding footnote to the Quantity column to explain the number of containers needed for MS and MSDs: "MS and MSD for treatment verification samples require additional volume to be collected and therefore will each require an additional container, one for the MS and one for the MSD, in addition to the container for the parent sample. MS and MSD for ISM excavation confirmation samples do not require additional volume."
5. Page 25: Replaced "to be determined" for the QA Split Laboratory information to reflect GEL Laboratories LLC as the QA lab.
6. Page 32: Table 26-1, "Summary of Sample Handling, Custody, and Disposal Procedures". Replaced TBD for the QA laboratory with GEL.

JUSTIFICATION:

- Update TBD placeholders regarding identification of the QA Laboratory with updated information.
- Add missing information for Sample ID for ISM triplicates, and correct Sample ID protocol for ISM duplicates, triplicates, MS and MSD.
- Correct sample container requirements.
- Clarify volume requirements for MS and MSDs.

IMPACT OF NOT IMPLEMENTING REQUEST

Missing or incorrect information for samplers.

PARTICIPANTS AFFECTED BY IMPLEMENTING REQUEST

N/A

COST ESTIMATE: NA ESTIMATOR SIGNATURE _____

PHONE: DATE___

PREVIOUS FCR AFFECTED ☐YES ☒NO;

USACE COTR PETERS.NATHANIEL.II.1248279466 Digitally signed by PETERS.NATHANIEL.II.1248279466 Date: 2020.11.24 11:03:48 -05'00' DATE November 24, 2020

OHIO EPA PROJECT MANAGER _____ DATE _____

MANAGER SIGNATURE N/A DATE _____

# FIELD CHANGE REQUEST

REVISED FCR NO. 2 DATE INITIATED: Nov. 19, 2021

PROJECT: Remediation at RVAAP-34 Sand Creek Disposal Road Landfill, RVAAP-38 NACA Test Area, RVAAP-42 Load Line 9, RVAAP-45 Wet Storage Area and CC RVAAP-76 Depot Area at the Former Ravenna Army Ammunition Plant.

CONTRACT NO. W912QR17C0045

REQUESTOR IDENTIFICATION

NAME: Tim Naughton ORGANIZATION: Endpoint-Alaniz Joint-Venture PHONE 714-697-8994

TITLE Project Manager SIGNATURE: Tim Naughton

BASELINE IDENTIFICATION

BASELINE(S) AFFECTED ☐ Cost ☒ Scope ☐ Milestone ☒ Method of Accomplishment

AFFECTED DOCUMENT (TITLE, NUMBER AND SECTION):

1. Final Non Time-Critical Removal Action Work Plan for RVAAP-34 Sand Creek Disposal Road Landfill
2. Final Remedial Designs for Soil, Sediment and Surface Water at RVAAP-38 NACA Test Area, RVAAP-42 Load Line 9, RVAAP-45 Wet Storage Area and CC RVAAP-76 Depot Area, at the Former Ravenna Army Ammunition Plant.
3. Final Sampling and Analysis Plan for Remediation Completion of Multiple Areas of Concern Using VEG Thermal Desorption Technology at the Former Ravenna Army Ammunition Plant.

DESCRIPTION OF CHANGE:

**Comments were received from the Ohio EPA on November 17, 2021 via email. Responses have been incorporated into this Revised FCR #2 and are also included as Attachment A. Refer to Attachment A for responses to Ohio EPA comments related to sloughing.**

Due to the unavailability of a working Vapor Energy Generator (VEG) system and the unanticipated large volume of precipitation encountered during the field effort, it is not viable to collect and recycle rainwater from within open excavations using the VEG system, as stated in the Section titled “Excavation Water” in the above-referenced documents for each of these AOCs.

We are proposing procedures for the collection, sampling, and potential discharge or disposal of rainwater collected within excavation pits at Wet Storage Area, NACA Test Area, Depot Area, Sand Creek, and Load Line 9. Dewatering of the open excavation pits may be required in order to collect confirmation samples or to perform additional excavation step-out activities. Currently, the estimated volume of water already accumulated in the existing excavations is as follows: Wet Storage (3500 gallons), NACA Test Area (4000 gallons), Depot Area (500 gallons), Load Line 9 (5500 gallons) and Sand Creek (1000 gallons).

The following describes the proposed procedures for managing water that may have been in contact with impacted soil in excavations above the project cleanup goals for site specific COCs and water from excavations that has not come into contact with impacted soils:

1. Water contained in excavation pits that may be in contact with impacted soils (based on soil confirmation sample results above the RGOs) will be pumped and temporarily stored in a 21,000-gallon baker tank while awaiting sampling results. One baker tank will be will be staged at each of the AOCs, as needed,

with the exception of Sand Creek due to limited access. Water collected from Sand Creek will be collected in a water buffalo and transferred to the baker tank at Load Line 9.

2. Sampling of water temporarily stored in the onsite baker tank will consist of the following:
    a. One grab sample will be collected from each baker tank and analyzed for project specific COCs, including PAHs (benz(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, dibenz(a,h)anthracene, and indeno(1,2,3-cd)pyrene) and metals (mercury, lead and arsenic). In the event that a tank is filled to capacity and the water is sampled and discharged/disposed, and then additional water is collected/added to the tank, a new grab sample will be collected. Analysis will be performed by Euofins Test America, Savannah GA (the same lab used for all project sample analysis).
    b. Results of sampling performed in step 2a will be submitted to Ohio EPA for review/approval that the water is below MCLs and the IMZM (inside mixing zone maximum for the Ohio River Water Quality Standards).
    c. If sampling results are below USEPA Tap Water RSLs, USEPA MCLs and the IMZM for project specific PAHs and below RVAAP background concentrations for metals, the water from the baker tank will be discharged in accordance with Item #3 below. Water will be discharged at four separate locations (AOC specific).
    d. If sampling results are above USEPA Tap Water RSLs, USEPA MCLs and the IMZM for project specific PAHs or above RVAAP background concentrations for metals, the water will be profiled, transported and disposed of offsite at a permitted wastewater disposal facility under a waste manifest.
3. Water that has been sampled and confirmed to be below the regulatory limits for project specific PAHs and/or metals will be discharged as follows:
    a. Water will be discharged in accordance with OAC 3745-42-13 (C) and (J);
    b. Water will be discharged through a 100µm bag filter and through a straw bale; and
    c. Water will be discharged at a slow rate to prevent ponding and through a well vegetated area and not directly into a water feature, such as a wetland, ditch or stream.
4. If water in the excavation is not in contact with impacted soils based on soil confirmation results (noncontaminated stormwater), then it will be discharged from the excavation without sampling in accordance with Step 3 above.
5. Results of sampled excavation water from impacted excavations and proposed method (discharge or disposal) and comparison to referenced regulatory limits will be submitted to the Army and Ohio EPA for approval prior to discharge or disposal at a municipal wastewater treatment facility.
6. In order to limit the amount of water that accumulates in the excavations, confirmation samples will be collected as soon as feasible and safe to do so, and further excavation will be completed once results are received. Expedited turnaround will be requested from the laboratory. Water sampling will also be performed in an expedient manner and approved backfill will be ready for restoration.

JUSTIFICATION:

The justification of this FCR is to obtain approval for sampling of water in contact with soils confirmed to be above cleanup goals and for the discharge/disposal method of that water depending on the analytical results due to the unavailability of recycling water within the VEG system.

IMPACT OF NOT IMPLEMENTING REQUEST:

Without the ability to collect, sample and discharge water that has been confirmed to be non-impacted, remediation schedule delays may be incurred due to standing water within excavations limiting the ability to collect confirmation samples or perform additional excavation step out activities, in addition to incurring unnecessary costs due to potentially disposing of non-impacted water as non-hazardous waste.

PARTICIPANTS AFFECTED BY IMPLEMENTING REQUEST:

Endpoint-Alaniz Joint Venture, ARNG, Ohio EPA

COST ESTIMATE ($): NA

ESTIMATOR SIGNATURE: Tim Nyfa

PHONE: 714-697-8994

DATE: November 18, 2021

PREVIOUS FCR AFFECTED: NO IF YES, FCR NO.

USACE COR: For Nat Peters SEDLAK.KEVIN.MICHAEL.1254440171 Digitally signed by SEDLAK.KEVIN.MICHAEL.1254440171 Date: 2021.11.19 13:23:22 -05'00' DATE:

OHIO EPA PROJECT MANAGER: _____ DATE:

ENDPOINT H&S MANGER: Kaylyn Ramirez DATE: 11/19/21

**ATTACHMENT A**

**Email Correspondence with Response to Ohio EPA Comments Received on November 17, 2021**

**(Ohio EPA comments are in Black text, Army Responses are in Red text)**

All active links contained in this email were disabled. Please verify the identity of the sender, and confirm the authenticity of all links contained within the message prior to copying and pasting the address to a Web browser.

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Katie and Kevin,

We can discuss our comments with you further during our call tomorrow, if you have any questions.

On November 16, 2021, Ohio EPA received via email the "Field Change Request FCR-2 Remediation at RVAAP-34 Sand Creek Disposal Road Landfill, RVAAP-38 NACA Test Area, RVAAP-42 Load Line 9, and RVAAP-45 Wet Storage Area at the Former Ravenna Army Ammunition Plant" dated November 15, 2021.

In the approved RDs for the above AOCs, excavation water was planned to be used in the Vapor Energy Generator (VEG) system. However, due to problems encountered with this system, the use of the VEG was discontinued. An alternative method to address excavation water is needed.

The November 15, 2021, Field Change Request outlines your revised proposal for managing the water removed from the excavation pits at these AOCs.

Ohio EPA has the follow clarification comments regarding the proposed field change request.

1. Representative water samples are needed:
    1. What is the capacity of the baker tank? Typical Baker, or "Frac" tanks are 21,000 gallons. Those are the tanks we are planning to get.
    2. Are you collecting water in separate baker tanks and taking samples specific to the AOC, or specific to a particular excavation site on an AOC, or are you aggregating water from multiple AOCs in the baker tanks? We plan to have one tank at each of the five areas of concern, with the exception of Sand Creek due to access restrictions. Water from Sand Creek will be collected in a water buffalo and transferred to a baker tank at Load Line 9.
    3. What is the anticipated representative volume of water for each sample you plan to collect? We planned to collect one sample per each tank. In the event that a tank is emptied, and then more water is added to that tank, a new sample will be collected. However, based on historic rainfall, it is not anticipated that water pumped from excavations at any AOC will exceed the volume of one tank.
2. What laboratory do you plan to use to analyses the water sample? Eurofins TestAmerica Savannah. This is the lab approved by Ohio EPA for all project sample analysis.
3. Ohio EPA would like to review the data prior to you releasing the water to confirm it is below standards – both MCLs and IMZM (inside mixing zone maximum for the Ohio River Water Quality Standards). OK
4. Clarify how you plan to control the excavation areas to minimize new water refilling excavations. Remaining excavation confirmation samples will be collected as soon as feasible and safe to do so, and further excavation will be completed once results are received. We will request accelerated turnaround times from the laboratory.

5. Will there be one central location to release the water, or will there be five separate locations (AOC specific) for collecting and releasing the water? four separate locations (AOC specific) for collecting and releasing the water
6. Which AOCs have open excavations currently that require water removal? Wet Storage Area, NACA Test Area, Depot Area, Sand Creek, and Load Line 9 Area
7. Clarify the estimated volume of water already accumulated in the existing excavations. Wet Storage (3500 gallons), NACA Test Area (4000 gallons), Depot (500 gallons), Load Line 9 (5500 gallons), Sand Creek (1000 gallons)

We would also like to discuss a bit the status of those AOCs with open excavation areas that required further removals actions to achieve CUGs.

1. Have the sidewalls of those excavation area requiring further removal caved into the excavation area and had you previously designated the step out distance or will you measure the step out based on the current location of the side wall? Sloughing has occurred on excavations deeper than one foot (i.e., two excavations at Sand Creek). The step out distance for all excavations was designated in the work plans. Per the work plan, step out excavations, where required based on confirmation samples, will be measured from the plane where confirmation samples were collected, regardless of sloughing. Material that has soughed from beyond the step out will be treated as impacted soil and disposed.
2. Have the excavation floors filled in with sidewall material that has caved inward? Only sloughing has occurred on excavations deeper than one foot (i.e., two excavations at Sand Creek). The floors of these excavations are not filled up. Some of the soughed material has fallen to the bottom, but not in quantities that have fill up the excavations.

Please revise the Change Order Request to address the above clarification comments.

Sincerely,

Susan Netzly-Watkins
Environmental Specialist 3
Northeast District Office
Susan.Netzly-Watkins@epa.ohio.gov < Caution-mailto:Susan.Netzly-Watkins@epa.ohio.gov >
Phone: (330) 963-1201

Ohio Environmental Protection Agency

Susan Netzly-Watkins
Environmental Specialist 3
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Phone: (330) 963-1201

# FIELD CHANGE REQUEST

FCR NO. 2 DATE INITIATED: Nov. 15, 2021

PROJECT: Remediation at RVAAP-34 Sand Creek Disposal Road Landfill, RVAAP-38 NACA Test Area, RVAAP-42 Load Line 9, RVAAP-45 Wet Storage Area and CC RVAAP-76 Depot Area at the Former Ravenna Army Ammunition Plant.

CONTRACT NO. W912QR17C0045

REQUESTOR IDENTIFICATION

NAME: Tim Naughton ORGANIZATION: Endpoint-Alaniz Joint-Venture PHONE 714-697-8994

TITLE Project Manager SIGNATURE: 

BASELINE IDENTIFICATION

BASELINE(S) AFFECTED ☐ Cost ☒ Scope ☐ Milestone ☒ Method of Accomplishment

AFFECTED DOCUMENT (TITLE, NUMBER AND SECTION):

1. Final Non Time-Critical Removal Action Work Plan for RVAAP-34 Sand Creek Disposal Road Landfill
2. Final Remedial Designs for Soil, Sediment and Surface Water at RVAAP-38 NACA Test Area, RVAAP-42 Load Line 9, RVAAP-45 Wet Storage Area and CC RVAAP-76 Depot Area, at the Former Ravenna Army Ammunition Plant.
3. Final Sampling and Analysis Plan for Remediation Completion of Multiple Areas of Concern Using VEG Thermal Desorption Technology at the Former Ravenna Army Ammunition Plant.

DESCRIPTION OF CHANGE:

Due to the unavailability of a working Vapor Energy Generator (VEG) system and the unanticipated large volume of precipitation encountered during the field effort, it is not viable to collect and recycle rainwater from within open excavations using the VEG system, as stated in the Section titled “Excavation Water” in the above-referenced documents for each of these AOCs.

We are proposing procedures for the collection, sampling, and potential discharge or disposal of rainwater collected within excavation pits. Dewatering of the open excavation pits may be required in order to collect confirmation samples or to perform additional excavation step-out activities.

The following describes the proposed procedures for managing water that may have been in contact with impacted soil in excavations above the project cleanup goals for site specific COCs and water from excavations that has not come into contact with impacted soils:

1. Water contained in excavation pits that may be in contact with impacted soils (based on soil confirmation sample results above the RGOs) will be pumped and temporarily stored in a baker tank while awaiting sampling results.
2. Sampling of water temporarily stored in the onsite baker tank will consist of the following:
    a. One grab sample will be collected from the baker tank and analyzed for project specific COCs, including PAHs (benz(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, dibenz(a,h)anthracene, and indeno(1,2,3-cd)pyrene) and metals (mercury, lead and arsenic).
    b. If sampling results are below USEPA Tap Water RSLs and USEPA MCLs for project specific PAHs and below RVAAP background concentrations for metals, the water from the baker tank will be discharged in accordance with Item #3 below.

c. If sampling results are above USEPA Tap Water RSLs and USEPA MCLs for project specific PAHs or above RVAAP background concentrations for metals, the water will be profiled, transported and disposed of offsite at a permitted wastewater disposal facility under a waste manifest.

3. Water that has been sampled and confirmed to be below the regulatory limits for project specific PAHs and/or metals will be discharged as follows:
   a. Water will be discharged in accordance with OAC 3745-42-13 (C) and (J);
   b. Water will be discharged through a 100µm bag filter and through a straw bale; and
   c. Water will be discharged at a slow rate to prevent ponding and through a well vegetated area and not directly into a water feature, such as a wetland, ditch or stream.
4. If water in the excavation is not in contact with impacted soils based on soil confirmation results (noncontaminated stormwater), then it will be discharged from the excavation without sampling in accordance with Step 3 above.
5. Results of sampled excavation water from impacted excavations and proposed method (discharge or disposal) and comparison to referenced regulatory limits will be submitted to the Army and Ohio EPA for approval prior to discharge or disposal at a municipal wastewater treatment facility.
6. In order to limit the amount of water that accumulates in the excavations, confirmation and water sampling will be performed in an expedient manner and approved backfill will be ready for restoration.

JUSTIFICATION:

The justification of this FCR is to obtain approval for sampling of water in contact with soils confirmed to be above cleanup goals and for the discharge/disposal method of that water depending on the analytical results due to the unavailability of recycling water within the VEG system.

IMPACT OF NOT IMPLEMENTING REQUEST:

Without the ability to collect, sample and discharge water that has been confirmed to be non-impacted, remediation schedule delays may be incurred due to standing water within excavations limiting the ability to collect confirmation samples or perform additional excavation step out activities, in addition to incurring unnecessary costs due to potentially disposing of non-impacted water as non-hazardous waste.

PARTICIPANTS AFFECTED BY IMPLEMENTING REQUEST:

Endpoint-Alaniz Joint Venture, ARNG, Ohio EPA

COST ESTIMATE ($): NA ESTIMATOR SIGNATURE: 

PHONE: 714-697-8994 DATE: November 15, 2021

PREVIOUS FCR AFFECTED: NO IF YES, FCR NO.

USACE COR: PETERS.NATHANIEL.II.1248279466 Digitally signed by PETERS.NATHANIEL.II.1248279466 Date: 2021.11.15 16:55:16 -05'00' DATE:

OHIO EPA PROJECT MANAGER: _____ DATE:

ENDPOINT H&S MANGER: _____ DATE:

Ohio Environmental Protection Agency

**Mike DeWine**, Governor
**Jon Husted**, Lt. Governor
**Laurie A. Stevenson**, Director

November 4, 2021

**TRANSMITTED ELECTRONICALLY**

Mr. Kevin Sedlak
Army National Guard
Installation and Environment
Clean-up Branch
IPA Designation
1438 State Route 534 SW
Newton Falls, OH 44444

RE: US Army Ravenna Ammunition Plt RVAAP
Remediation Response
Project Records
Remedial Response
Portage County
ID # 267000859264
ID # 267000859265
ID # 267000859267

**Subject: Receipt and Review of the "Excavation Confirmation Report No. 1" for RVAAP Load Line 9, Wet Storage and NACA (RVAAP-42 RVAAP-45, RVAAP-38), Received October 28, 2021**

Dear Mr. Sedlak:

The Ohio Environmental Protection Agency (Ohio EPA), Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR) received and reviewed "Excavation Confirmation Report No. 1" for RVAAP Remediation Projects that include RVAAP-34 Sand Creek Disposal Road Landfill, RVAAAP-38 NACA Test Area, RVAAP-42 Load Line 9, RVAAP-45 Wet Storage Area, and CC-RVAAAP 76 Depot Area.

This document, received by Ohio EPA's NEDO on October 28, 2021, was prepared by Tim Naughton with Endpoint-Alaniz. It included information on the excavations conducted at Load Line 9, Wet Storage and NACA Test Area.

Ohio EPA has no comments.

This letter is an official response from Ohio EPA that will be maintained as a public record.

RECEIVED
NOV 04 2021

If you have any questions or concerns, please do not hesitate to contact me at (330) 963-1201, or via email at Susan.Netzly-Watkins@epa.ohio.gov.

Sincerely,

*Sue Netzly-Watkins*

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

SNW/sc

ec: Katie Tait, OHARNG RTLS
Nat Peters, USACE
Steve Kvaal, USACE
Tim Naughton, Endpoint-Alaniz
Rebecca Shreffler, Chenega
Mark Leeper, ARNG
Bob Princic, Ohio EPA, NEDO, DERR
Megan Oravec, Ohio EPA, NEDO, DERR
Ed D'Amato, Ohio EPA, NEDO, DERR
Kevin Palombo, Ohio EPA, NEDO, DERR
Tom Schneider, Ohio EPA, SWDO, DERR
Brian Tucker, Ohio EPA, CO, DERR

Ohio Environmental Protection Agency

**Mike DeWine**, Governor
**Jon Husted**, Lt. Governor
**Laurie A. Stevenson**, Director

October 29, 2021

**TRANSMITTED ELECTRONICALLY**

Mr. Kevin Sedlak
Army National Guard
Installation and Environment
Clean-up Branch
IPA Designation
1438 State Route 534 SW
Newton Falls, OH 44444

RE: US Army Ravenna Ammunition Plt RVAAP
Remediation Response
Project Records
Remedial Response
Portage County
ID # 267000859263

**Subject:** **Receipt and Review of the Response to Ohio EPA Comments for the Draft Completion Report for RVAAP Load Lines 1 – 4 and 12 (RVAAP-08 through RVAAP-12), Dated October 27, 2021**

Dear Mr. Sedlak:

Ohio EPA, Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR) received and reviewed your responses to our comments for the document entitled "Draft Completion Report" for RVAAP Load Lines 1 – 4 and 12.

Our comments were addressed. Please submit the document in final form.

This letter is an official response from Ohio EPA that will be maintained as a public record. If you have any questions or concerns, please do not hesitate to contact me at (330) 963-1201, or via email at Susan.Netzly-Watkins@epa.ohio.gov

Sincerely,

*Sue Netzly-Watkins*

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

SNW/sc

ec: Katie Tait, OHARNG RTLS
Nat Peters, USACE
Steve Kvaal, USACE
Sarah Meyers, Jacobs
Rebecca Shreffler, Chenega
Mark Leeper, ARNG
Natalie Oryshkewych, Ohio EPA, NEDO, DERR
Bob Princic, Ohio EPA, NEDO, DERR
Tom Schneider, Ohio EPA, SWDO, DERR
Brian Tucker, Ohio EPA, CO, DERR

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OCT 29 2021

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

October 27, 2021

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

Subject: Ravenna Army Ammunition Plant (RVAAP) Restoration Program, Portage/Trumbull Counties, Responses to Ohio EPA comments on the Draft Remedial Action Completion Report for Load Lines 1, 2, 3, 4, and 12 (RVAAP-08 to 12) (Work Activity No. 267-000-859-030)

Dear Ms. Netzly-Watkins:

An electronic version of the responses to Ohio EPA comments received October 19, 2021 on the August 2021 *Draft Remedial Action Completion Report for RVAAP Load Lines 1, 2, 3, 4, and 12 (RVAAP-08 to 12)* will be sent for your review and approval using the Ohio EPA LiquidFile system. This report was prepared for the Army in support of the RVAAP restoration program. Please contact the undersigned at 614-336-6000 Ex 2053 or kevin.m.sedlak.ctr@mail.mil if there are issues or concerns with this submission.

Sincerely,

SEDLAK.KEVIN.MICHAEL.1254440171 Digitally signed by SEDLAK.KEVIN.MICHAEL.1254440171 Date: 2021.10.27 15:01:29 -04'00'

Mr. Kevin Sedlak
RVAAP Restoration Program Manager
IPA Designation
Camp James A. Garfield JTC

cc: Tom Schneider, Ohio EPA SWDO (Email transmittal letter only)
Bob Princic, Ohio EPA NEDO-DERR (Email transmittal letter only)
Natalie Oryshkewych, Ohio EPA NEDO-DERR (Email transmittal letter only)
Katie Tait, OHARNG, CJAG (pdf via Email or ftp)
Admin Records Manager – Jennifer Tierney, Vista Sciences Corp (pdf via Email or ftp)
Pat Ryan, Leidos-REIMS (Email transmittal letter only)
Steve Kvaal, USACE – Louisville District (Email transmittal letter only)
Nathaniel Peters, USACE – Louisville District (pdf via Email or ftp)
John Hearn, USACE – Louisville District - WPAO (pdf via Email or ftp)

**Comment Resolution Table**

**Installation**: Camp James A Garfield/Former RVAAP
**Document**: Draft Remedial Action Completion Report for RVAAP Load Lines 1 - 4 and 12 (RVAAP-08 through RVAAP-12), dated August 2021
**Reviewer(s)**: Sue Netzly-Watkins (SNW), Site Coordinator, Ohio EPA (330-963-1235 or Susan.Netzly-Watkins@epa.ohio.gov) dated October 19, 2021
**Date**: October 27, 2021

| Cmt. No. | Page or Sheet and Issue | Comment | Response |
|---|---|---|---|
| | General | The Draft Completion Report documents the activities conducted in the field and the data that were collected. The information included in the report supports the remedial activities outline in the Remedial Design plan were completed to meet the Remedial Goal Options (RGOs). The RGOs rely on land use controls (LUCs). Ohio EPA has several clarification comments regarding the LUCs and the Project Management Plan (PMP). | Comment Noted |
| SNW 1 | Appendix A, Land Use Controls (LUCs) and the Project Management Plan (PMP) | Section 5 of the August 2021 Draft Completion Report notes that the LUCs will be revised in the PMP. The Draft Completion Report did not indicate when the next planned update to the PMP was scheduled. The latest update of the PMP was June 2021. Please clarify when the next revision of the PMP is scheduled. | The Property Management Plan (PMP) is currently updated on an annual basis. The annual PMP update for 2022 will start in January 2022 and will be completed by Chenega/Vista on behalf and in coordination with the ARNG and OHARNG with the Final PMP document for 2021 being completed around June 2022. |
| SNW2 | Appendix A, Section A.1 of the June 2021 PMP | The table in Appendix A, Section A.1 of the June 2021 PMP should also note that the Record of Decision (ROD) for Load Lines 1-4 and 12 was amended. Ohio EPA issued its concurrence on February 5, 2020, to amend the ROD, recommending remedial action to address soils that exceed the facility-wide Clean-up Goals (CUGs) for commercial/industrial use. | Now that the Remedial Action achieving Commercial/Industrial Use is complete at LL1-4 and 12, the table in Appendix A, Section A.1 of the 2022 PMP will be updated to document the 2020 ROD Amendment for LL1-4 and 12. |

**Comment Resolution Table**

**Installation**: Camp James A Garfield/Former RVAAP
**Document**: Draft Remedial Action Completion Report for RVAAP Load Lines 1 - 4 and 12 (RVAAP-08 through RVAAP-12), dated August 2021
**Reviewer(s)**: Sue Netzly-Watkins (SNW), Site Coordinator, Ohio EPA (330-963-1235 or Susan.Netzly-Watkins@epa.ohio.gov) dated October 19, 2021
**Date**: October 27, 2021

| Cmt. No. | Page or Sheet and Issue | Comment | Response |
|---|---|---|---|
| SNW3 | June 2021 PMP | Aside from the figure entitled "RVAAP/Camp Ravenna" on pdf page 23 of the June 2021 PMP, individual figures showing the boundaries of each Load Line 1, 2, 3, 4 and 12 are not included in the PMP. When the PMP is updated, include figures that show the location on Camp Ravenna and boundaries for Load Lines 1, 2, 3, 4 and 12 to clearly show where LUCs are applicable. | Now that the Remedial Action achieving Commercial/Industrial Use is complete at LL1-4 and 12, Figures showing the boundaries of each Load Line (1-4 and 12) will be included in the 2022 PMP at the end of the applicable revised Appendix. |
| SNW4 | June 2021 PMP | It is not clear where the completed annual inspection reports required by the PMP are kept and how to get a copy of the completed inspection reports. Section 5.0 of the June 2021 PMP notes, "The AOC/MRS-specific Inspection Forms will be completed by the Army or OHARNG for each LUC inspection on an AOC/MRS and submitted to the Ohio EPA." The completed reports were not in the June 2021 PMP.<br><br>Clarify how Ohio EPA can obtain copies or view the completed annual inspection reports. Ohio EPA would like to be copied on the completed Areas of Concern annual inspection reports or have these included in the annual PMP report. | The completed Annual LUC Inspections are developed and finalized as a separate document from the PMP. Each year the Annual LUC Inspection is started in November with the Preliminary Draft report issued to the ARNG/OHARNG around January. Once the Preliminary Draft is approved by the OHARNG and ARNG, a Draft version of the report is sent to the Ohio EPA for review. Once Ohio EPA comments are resolved (if any) on the Draft document, then the Annual LUC Inspection Report is finalized and posted on the RVAAP public website (rvaap.org). A Final version of the document is also sent to the Ohio EPA for their administrative record as well as one being kept and archived in the RVAAP restoration program administrative record. Therefore, the Annual LUC Inspection Reports can be viewed at the Ohio EPA, on the RVAAP public website or at the RVAAP restoration program administrative record located at the CJAG Environmental Office. |
| SNW5 | Appendix B - 15-day Notification to Ohio EPA of Field Work | The letter included in Appendix B was not signed. Ohio EPA had received an electronically signed letter on November 21, 2020. | Security features removed the digital signature when it was added to the larger document. The signed letter will be included in the Final report. |

Ohio Environmental Protection Agency

**Mike DeWine**, Governor
**Jon Husted**, Lt. Governor
**Laurie A. Stevenson**, Director

October 19, 2021

**TRANSMITTED ELECTRONICALLY**

Mr. Kevin Sedlak
Army National Guard
Installation and Environment
Clean-up Branch
IPA Designation
1438 State Route 534 SW
Newton Falls, OH 44444

RE: US Army Ravenna Ammunition Plt RVAAP
Remediation Response
Project Records
Remedial Response
Portage County
ID # 267000859263

**Subject: Receipt and Review of the Draft Completion Report for RVAAP Load Lines 1 – 4 and 12 (RVAAP-08 through RVAAP-12), Dated August 17, 2021**

Dear Mr. Sedlak:

The Ohio Environmental Protection Agency (Ohio EPA), Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR) received and reviewed the document entitled, "Draft Completion Report" for RVAAP Load Lines 1 – 4 and 12." This document, received by Ohio EPA, NEDO on August 17, 2021, was prepared for the U.S. Army Corps of Engineers Louisville District, by Sarah Meyers with CH2M HILL Constructors, Inc., 2411 Dulles Corner Park, Suite 500, Herndon, VA.
We have the following comments on the draft report.

The electronic version of the Draft Completion Report consisted of three pdf files: 1) transmittal letter, 2) report narrative, and 3) appendices.

The Draft Completion Report documents the activities conducted in the field and the data that were collected. The information included in the report supports the remedial activities outline in the Remedial Design plan were completed to meet the Remedial Goal Options (RGOs).

The RGOs rely on land use controls (LUCs). Ohio EPA has several clarification comments regarding the LUCs and the Project Management Plan (PMP).

RECEIVED
OCT 19 2021

**Draft Completion Report Appendix A: Land Use Controls (LUCs) and the Project Management Plan (PMP)**

**Comment 1:** Section 5 of the August 2021 Draft Completion Report notes that the LUCs will be revised in the PMP. The Draft Completion Report did not indicate when the next planned update to the PMP was scheduled. The latest update of the PMP was June 2021. Please clarify when the next revision of the PMP is scheduled.

**Comment 2:** The table in Appendix A, Section A.1 of the June 2021 PMP should also note that the Record of Decision (ROD) for Load Lines 1-4 and 12 was amended. Ohio EPA issued its concurrence on February 5, 2020, to amend the ROD, recommending remedial action to address soils that exceed the facility-wide Clean-up Goals (CUGs) for commercial/industrial use.

**Comment 3:** Aside from the figure entitled "RVAAP/Camp Ravenna" on pdf page 23 of the June 2021 PMP, individual figures showing the boundaries of each Load Line 1, 2, 3, 4 and 12 are not included in the PMP.

When the PMP is updated, include figures that show the location on Camp Ravenna and boundaries for Load Lines 1, 2, 3, 4 and 12 to clearly show where LUCs are applicable.

**Comment 4:** It is not clear where the completed annual inspection reports required by the PMP are kept and how to get a copy of the completed inspection reports. Section 5.0 of the June 2021 PMP notes, "The AOC/MRS-specific Inspection Forms will be completed by the Army or OHARNG for each LUC inspection on an AOC/MRS and submitted to the Ohio EPA." The completed reports were not in the June 2021 PMP.

Clarify how Ohio EPA can obtain copies or view the completed annual inspection reports. Ohio EPA would like to be copied on the completed Areas of Concern annual inspection reports or have these included in the annual PMP report.

**Appendix B – 15-day Notification to Ohio EPA of Field Work**

**Comment 1:** The letter included in Appendix B was not signed. Ohio EPA had received an electronically signed letter on November 21, 2020.

This letter is an official response from Ohio EPA that will be maintained as a public record.

Ohio EPA request the comments above be addressed. If you have any questions or concerns, please do not hesitate to contact me at (330) 963-1201, or via email at Susan.Netzly-Watkins@epa.ohio.gov

Sincerely,

Sue Netzly-Watkins

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

SNW/sc

ec: Katie Tait, OHARNG RTLS
Nat Peters, USACE
Steve Kvaal, USACE
Sarah Meyers, Jacobs
Rebecca Shreffler, Chenega
Mark Leeper, ARNG
Natalie Oryshkewych, Ohio EPA, NEDO, DERR
Bob Princic, Ohio EPA, NEDO, DERR
Tom Schneider, Ohio EPA, SWDO, DERR
Brian Tucker, Ohio EPA, CO, DERR

Ohio Environmental Protection Agency

**Mike DeWine**, Governor
**Jon Husted**, Lt. Governor
**Laurie A. Stevenson**, Director

September 17, 2021

**TRANSMITTED ELECTRONICALLY**

Mr. Kevin Sedlak
Restoration Program Manager
ARNG-ILE
Camp James A. Garfield JTC
1438 State Route 534 SW
Newton Falls, OH 44444

RE: US Army Ammunition Plt RVAAP
Remediation Response
Project Records
Remedial Response
Portage County
ID # 267000859013
ID # 267000859267
ID # 267000859264
ID # 267000859127

**Subject: Remedial Design Field Change Request for RVAAP-34 Sand Creek Disposal Road Landfill (267000859013), RVAAP-38 NACA Test Area (267000859267), RVAAP-42 Load Line 9 (267000859264), and RVAAP-45 Wet Storage Area (267000859127), Dated September 14 2021**

Dear Mr. Sedlak:

The Ohio Environmental Protection Agency (Ohio EPA), Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR) is in receipt of the U.S. Army Corps of Engineers (USACE) Field Change Request (FCR) received on September 15, 2021. This change request was in relation to the ongoing remediation project being conducted by Endpoint-Alaniz Joint-Venture (Endpoint) utilizing thermal treatment of excavated soils from several former Ravenna Army Ammunition Plant (RVAAP) Areas of Concern (AOCs).

Ohio EPA concurs with this request.

This letter is an official response from Ohio EPA that will be maintained as a public record.

RECEIVED
SEP 17 2021

If you have any questions or concerns, please do not hesitate to contact me at (330) 963-1230, or via email at Bob.princic@epa.ohio.gov.

Sincerely,

*Bob Princic*

Bob Princic
Environmental Supervisor
Division of Environmental Response and Revitalization

BP/sc

ec: Katie Tait, OHARNG RTLS
Nat Peters, USACE
Steve Kvaal, USACE
Rebecca Shreffler, Chenega
Natalie Oryshkewych, Ohio EPA, NEDO, DERR
Ed D'Amato, Ohio EPA, NEDO, DERR
Kevin Palombo, Ohio EPA, NEDO, DERR
Susan Netzly-Watkins, Ohio EPA, NEDO, DERR
Tom Schneider, Ohio EPA, SWDO, DERR

# FIELD CHANGE REQUEST

FCR NO. 1 DATE INITIATED: Sept. 14, 2021

PROJECT: Remediation at RVAAP-34 Sand Creek Disposal Road Landfill, RVAAP-38 NACA Test Area, RVAAP-42 Load Line 9, and RVAAP-45 Wet Storage Area at the Former Ravenna Army Ammunition Plant.

CONTRACT NO. W912QR17C0045

REQUESTOR IDENTIFICATION

NAME: Tim Naughton ORGANIZATION: Endpoint-Alaniz Joint-Venture PHONE 714-697-8994

TITLE Project Manager SIGNATURE: Tim Naughton

BASELINE IDENTIFICATION

BASELINE(S) AFFECTED ☐ Cost ☒ Scope ☐ Milestone ☒ Method of Accomplishment

AFFECTED DOCUMENT (TITLE, NUMBER AND SECTION):

1. Final Non Time-Critical Removal Action Work Plan for RVAAP-34 Sand Creek Disposal Road Landfill
2. Final Remedial Designs for Soil, Sediment and Surface Water at RVAAP-38 NACA Test Area, RVAAP-42 Load Line 9, and RVAAP-45 Wet Storage Area, at the Former Ravenna Army Ammunition Plant.
3. Final Sampling and Analysis Plan for Remediation Completion of Multiple Areas of Concern Using VEG Thermal Desorption Technology at the Former Ravenna Army Ammunition Plant.

DESCRIPTION OF CHANGE:

Due to unavailability of working Vapor Energy Generator (VEG) system for the treatment of Polycyclic Aromatic Hydrocarbon (PAH) impacted soil, all soil impacted by PAHs from planned excavations (in-situ) at RVAAP-34 Sand Creek Landfill and RVAAP-38 NACA Test Area, as well as previously excavated and stockpiled soil from RVAAP-45 Wet Storage Area, RVAAP-38 NACA Test Area, and RVAAP-42 Load Line 9 will be properly excavated, loaded, transported and disposed off-site at a licensed landfill. Final Decision Documents for each of these AOCs indicated that if a thermal treatment unit was not available or feasible, excavation and offsite disposal could also be implemented. The profiling, handling, and disposal methods will be consistent with the procedure for transportation and disposal of PAH impacted soil outlined in the Ohio EPA approved Remedial Design (RD) Work Plan for CC RVAAP-76 Depot Area.

The following describes the procedures that will be followed for soil at the AOCs defined above:

1. Waste Profile Sampling will be performed in accordance with the Ohio EPA approved RD Work Plan for CC RVAAP-76, Section 6.2, and the Final Sampling and Analysis Plan for Remediation Completion of Multiple Areas of Concern at the Former Ravenna Army Ammunition Plant, Sections 3.4 and 3.6. The following is a description of waste profile sampling procedures that will be used for remaining soil on-site:
    a. One 8-point composite sample will be collected in-situ for each excavation, per the Ohio EPA approved RD Work Plan for CC RVAAP-76, Section 6.
    b. One 8-point composite sample will be collected per every 250 cy of ex-situ, stockpiled soil, per the Final Sampling and Analysis Plan for Remediation Completion of Multiple Areas of Concern at the Former Ravenna Army Ammunition Plant, Section 3.4.
    c. For excavations with a target depth of 1-foot, the 8-point composite samples will be collected at a depth of 0-1 ft below ground surface, per the Ohio EPA approved RD Work Plan for CC RVAAP-76, Section 6.
    d. For excavations with a target depth greater than 1-foot, the 8-point composite samples will be collected within the anticipated excavation area at depths ranging between ground surface and the anticipated total depth of the excavation, per the Final Sampling and Analysis Plan for

Remediation Completion of Multiple Areas of Concern at the Former Ravenna Army Ammunition Plant, Section 3.6.

2. Excavation, handling, and disposal will be performed in accordance with the Ohio EPA approved RD Work Plan for CC RVAAP-76, Sections 5.2 and 6.2.
3. Imported backfill soil will be sampled in accordance with the Ohio EPA approved RD Work Plan for CC RVAAP-76, Section 6.0, and the Final Sampling and Analysis Plan for Remediation Completion of Multiple Areas of Concern at the Former Ravenna Army Ammunition Plant, Sections 3.4 and 3.6. Once sampled and results are received, they will be provided to the ARNG/OHARNG for review and approval of the backfill source.
4. Backfill and Site restoration will be performed in accordance with the Ohio EPA approved RD Work Plan for CC RVAAP-76, Section 8.0. Note that based on discussion with the Ohio EPA regarding the excavation areas at RVAAP-45 Wet Storage Area, these areas will not be backfilled and will be seeded with an approved wetlands seed mix to allow for the reestablishment of wetlands.

JUSTIFICATION:

The justification of this FCR is to obtain approval for the transportation and disposal of excavated soil at an offsite licensed landfill in the areas defined above due to challenges related to operation of the VEG leading to this thermal treatment method being unavailable. An issues list for the VEG system has been included as Attachment A.

IMPACT OF NOT IMPLEMENTING REQUEST:

Without transition to transportation and disposal of PAH impacted soil, remediation may not be completed within the calendar year or USACE contract period of performance. If remediation is not completed within the contract period of performance, current contract funding will be lost to the ARNG, a new contract will need to be procured in the future, and new funds (which are not currently planned) will need to be obtained; all of which would significantly delay completion of the subject remedial actions.

PARTICIPANTS AFFECTED BY IMPLEMENTING REQUEST:

Endpoint-Alaniz Joint Venture, ARNG, Ohio EPA

COST ESTIMATE ($): NA ESTIMATOR SIGNATURE: Tim Nyk

PHONE: 714-697-8994 DATE: September 14, 2021

PREVIOUS FCR AFFECTED: NO; IF YES, FCR NO.

USACE COR: Nathaniel Peters, II DATE: September 15, 2021

OHIO EPA PROJECT MANAGER: _____ DATE:

ENDPOINT H&S MANGER: _____ DATE:

**ATTACHMENT A – Endpoint Equipment Issue Log**

**ATTACHMENT A**

**Endpoint Equipment Issue Log**

**Screw conveyor** – estimated days lost (8)

1. Repeated overload due to rock. Cause likely too much rock content catching between screw and trough.
2. Repeated overload due to friction of soil. Cause: likely heavy water content of soil that is causing compaction combined with heat drying out and hardening.
3. Replaced with belt conveyor.

**Gate Valve** – estimated days lost (2)

1. Repeated overload due to rock catching in the valve. Cause: excessive rock in soil.

**Kiln** – estimated days lost (4)

1. Kiln stops turning. Cause: soil loading near front.
2. Kiln Skipping. Cause: chain loose during heat treatment losing connection.
3. Crack discovered in steam pipe inside treatment chamber. Cause: possible damage during transit. Fixed on site by mobile welder.

**Propane Vaporizer** – estimated days lost (1)

1. Propane vaporizer not holding pressure. Cause: repeated use/end of life. Replaced with backup vaporizer.

**Vibrating Screen** – estimated days lost (8)

1. Bolts holding vibratory unit to screen snapped. Cause: vibration and bolts provided on brand new screen were only grade 5. Replaced with grade 8 bolts.
2. Vibration unit power supply shorting out. Cause: Poor design in supplied wiring harness caused wires to rub together and arc. Manually re-wired vibration unit to screen.
3. Vibratory screen weld failures. Cause: improper bolts provided by manufacturer combined with excess torque when installed bolts led to weld damage during operation.

**Water pump** – estimated days lost (4)

1. Water pump motor failure. Cause: overheating cause motor failure.
2. Replacement water pump failure. Cause: Insufficient pressure causing pump overload and burnout.
3. Note we have had approximately 8 water pump replacements.

**Feed screw** – estimated days lost (12)

1. Repeated overload due to rock. Cause likely too much rock content catching between screw and trough.
2. Repeated overload due to friction of soil. Cause: likely heavy water content of soil that is causing compaction combined with heat drying out and hardening.
3. Auger flight bent – repaired on site by mobile welder.
4. Auger flight bent – planned repair (09/15/2021).

**Belt conveyor** – estimated days lost (5)

1. Power supply fault. Cause: insufficient supply from generator.

**Airflow** – estimated days lost (5)

1. Delayed Thermal Oxidizer set-up. Cause: Damaged in transit.
2. Thermal Oxidizer overheating. Cause: exhaust vent heat transfer.
3. Insufficient airflow. Cause: Oxidizer fan insufficient flow rate.

**Vapor Energy Generator** – estimated days lost (12)

1. VEG Unit water compression failure. Cause: Overheating of unit cause inner wall failure/melting. VEG run for over a month but failed after overheating.
2. Two new VEGs manufactured incorrectly. Field repairs completed on one unit.
3. Four total VEGs tested successfully at Endpoint in Nevada. Unsuccessful burn in Ohio.
4. Low oxygen in influent air stream. Added oxygen to blower air to supplement.

**Soil** – estimated days lost (10)

1. High soil moisture. Cause: Rain
2. High Rock Content. Purchased soil screen for sorting rock, but delivery delayed two weeks.

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

August 11, 2021

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

Subject: Ravenna Army Ammunition Plant (RVAAP) Restoration Program, Portage/Trumbull Counties, Draft Remedial Action Completion Report for Load Lines 1, 2, 3, 4, and 12 (RVAAP-08 to 12) (Work Activity No. 267-000-859-030)

Dear Ms. Netzly-Watkins:

An electronic version of the Draft Remedial Action Completion Report for RVAAP Load Lines 1, 2, 3, 4, and 12 (RVAAP-08 to 12) will be sent using the Ohio EPA LiquidFile system. A hard copy and CD will be sent when they are able to be received by Ohio EPA.

This Remedial Action Completion Report was prepared for the Army National Guard in support of the RVAAP Restoration Program. Please contact the undersigned at 614-336-6000, ext 2053 or kevin.m.sedlak.ctr@mail.mil if there are issues or concerns with this submission.

Sincerely,

SEDLAK.KEVIN.MICHAEL.1254440171
Digitally signed by SEDLAK.KEVIN.MICHAEL.1254440171
Date: 2021.08.11 12:51:14 -04'00'

Kevin M. Sedlak
RVAAP Restoration Program Manager
Army National Guard Directorate

cc: Tom Schneider, Ohio EPA SWDO
Bob Princic, Ohio EPA NEDO-DERR
Natalie Oryshkewych, Ohio EPA NEDO-DERR
Kevin Sedlak, ARNG, CJAG
Katie Tait, OHARNG, CJAG
Admin Records Manager – Jennifer Tierney, Vista Sciences Corporation
Pat Ryan, Leidos-REIMS
Steven Kvaal, USACE – Louisville District
Nathaniel Peters, USACE – Louisville District
John Hearn, USACE – Louisville District - WPAO

CH2M
2411 Dulles Corner Park
Suite 500
Herndon, VA 20171

August 11, 2021

Mr. Nathaniel Peters
US Army Corps of Engineers – Louisville District
600 Dr. Martin Luther King, Jr. Pl., Room 351
Louisville, KY 40202

Subject: Former Ravenna Army Ammunition Plant (RVAAP)
Draft Remedial Action Completion Report for
RVAAP Load Lines 1, 2, 3, 4, and 12
Contract No. W912QR-12-D-0005, Delivery Order W912QR19F0952

Dear Mr. Peters:

CH2M HILL Constructors, Inc. (CH2M) is pleased to submit for Ohio EPA review the Draft Remedial Action Completion Report for RVAAP Load Lines 1, 2, 3, 4, and 12 prepared under Contract No. W912QR-12-D-0005, Delivery Order W912QR19F0952. This document reflects resolution of comments received from you, Katie Tait (OHARNG) and Kevin Sedlak (ARNG) on the May 19, 2021 PreDraft version. Additional copies have been distributed as noted below.

If you have any questions regarding this deliverable, please don't hesitate to contact me at 571-212-6989 or via email at sarah.meyers@jacobs.com.

Sincerely,

CH2M




Sarah Meyers
Project Manager

cc: Sue Netzly-Watkins, Project Coordinator, Ohio EPA NEDO-DERR (pdf via Email or ftp)
Tom Schneider, Ohio EPA SWDO (Email transmittal letter only)
Bob Princic, Ohio EPA NEDO-DERR (Email transmittal letter only)
Natalie Oryshkewych, Ohio EPA NEDO-DERR (Email transmittal letter only)
Mark Leeper, ARNG, Headquarters (1 ftp site)
Kevin Sedlak, ARNG, Camp James A. Garfield (1 ftp site)
Katie Tait, OHARNG, Camp James A. Garfield (1 ftp site)
Admin Records Manager – Jennifer Tierney, Camp James A. Garfield (1 ftp site)
Pat Ryan, Leidos-REIMS (email transmittal letter only)
Steven Kvaal, USACE – Louisville District (email transmittal letter only)
John Hearn, USACE – Louisville District – WPRO (1 ftp site)

**From:** Tait, Kathryn S NFG NG OHARNG (USA)
**To:** jennifer.tierney@vistasciences.com
**Subject:** FW: FY22 RVAAP Restoration Program Milestones (UNCLASSIFIED)
**Date:** Monday, August 9, 2021 11:33:17 AM

---

CLASSIFICATION: UNCLASSIFIED

Please add this email correspondence to the admin record. It documents FY22 milestone approval. Thanks. Katie

-----Original Message-----
From: bob.princic@epa.ohio.gov <bob.princic@epa.ohio.gov>
Sent: Monday, August 9, 2021 10:43 AM
To: Tait, Kathryn S NFG NG OHARNG (USA) <kathryn.s.tait.nfg@mail.mil>; Thomas.Schneider@epa.ohio.gov
Cc: Sedlak, Kevin M CTR NG OHARNG (USA) <kevin.m.sedlak.ctr@mail.mil>
Subject: [Non-DoD Source] RE: FY22 RVAAP Restoration Program Milestones (UNCLASSIFIED)

Greetings, Katie --

Welcome back from your well-deserved vacation. It was nice talking to you again. As we discussed this morning, please accept this response as our acceptance of the FY 2022 RVAAP Restoration Program milestones, as provided to us and discussed at our July 16, 2021 monthly RVAAP status call among Ohio EPA, OHARNG, ARND and ACOE representatives. Subsequent to that meeting, I discussed with Kevin Sedlak a couple of other projects currently not on the 2022 milestones list. Kevin explained that those additional projects needed to proceed through the federal contracting process, and once they were awarded, realistic schedules for those tasks could be scheduled. That explanation addressed all our questions, and we have no additional questions regarding the 2022 milestones as currently listed. If you have any additional questions, please contact either Tom or me.

Thank you,

Bob

-----Original Message-----
From: Tait, Kathryn S NFG NG OHARNG (USA) <kathryn.s.tait.nfg@mail.mil>
Sent: Tuesday, August 3, 2021 1:47 PM
To: Princic, Bob <bob.princic@epa.ohio.gov>; Schneider, Thomas <Thomas.Schneider@epa.ohio.gov>
Cc: Sedlak, Kevin M CTR NG OHARNG (USA) <kevin.m.sedlak.ctr@mail.mil>
Subject: FY22 RVAAP Restoration Program Milestones (UNCLASSIFIED)

CLASSIFICATION: UNCLASSIFIED

Bob and Tom:
Hope you are doing well. At the last Ohio EPA schedule meeting, you had received the FY22 milestones and we had chatted about them a little bit. We are wondering if you have had a chance to review the FY22 milestones and either have any questions or are ready to approve them so we can get them on the schedule and start planning. Let us know. Thanks. Katie

Katie Tait
Environmental Specialist 2
Ohio Army National Guard
1438 State Route 534 SW
Newton Falls, OH 44444
(614)336-6136 (office)
(330)704-8758 (cell)
kathryn.s.tait.nfg@mail.mil

CLASSIFICATION: UNCLASSIFIED
This email is intended for the sole use of the intended recipient and may contain privileged, sensitive or protected information. If you are not the intended recipient, be advised that the unauthorized use, disclosure, copying, distribution, or action taken in reliance on the contents of this communication is prohibited. If you have received this email in error, please notify the sender via telephone or return email and immediately delete this email.

CLASSIFICATION: UNCLASSIFIED

Ohio Environmental Protection Agency

**Mike DeWine**, Governor
**Jon Husted**, Lt. Governor
**Laurie A. Stevenson**, Director

August 3, 2021

**TRANSMITTED ELECTRONICALLY**

Mr. Kevin M. Sedlak
Restoration Program Manager
ARNG-ILE Clean-up
Camp James A. Garfield JTC
1438 State Route 534
Newton Falls, OH 44444

RE: US Army Ammunition Plt RVAAP
Remediation Response
Project Records
Remedial Response
Portage County
ID # 267000859029

**Subject:** **Approval of the "Final Revised Property Management Plan for the Designated Areas of Concern and Munitions Response Sites, Version 4.0," Former Ravenna Army Ammunition Plant, Camp James A. Garfield Joint Military Training Center, Portage and Trumbull Counties, Ohio, dated June 18, 2021**

Dear Mr. Sedlak:

The Ohio Environmental Protection Agency (Ohio EPA) has received and reviewed the "Final Revised Property Management Plan for the Designated Areas of Concern and Munitions Response Sites, Version 4.0" for the Former Ravenna Army Ammunition Plant, Camp James A. Garfield Joint Military Training Center, Portage and Trumbull Counties, Ohio, dated June 18, 2021. This document was received at Ohio EPA's Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR) via email June 17, 2021. The document was prepared for the United States Army Corps of Engineers on behalf of the National Guard Bureau by Chenega Tri-Services, LLC under Contract Number W912QR-18-C-0013.

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

This letter is an official response from Ohio EPA that will be maintained as a public record.

RECEIVED
AUG 03 2021

If you have any questions, please contact me via email at kevin.palombo@epa.ohio.gov or call me at (330) 963-1292.

Sincerely,

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

KP/sc

ec: Rebecca Shreffler, Chenega
Bob Princic, Ohio EPA, NEDO, DERR
Natalie Oryshkewych, Ohio EPA, NEDO, DERR
Nicholas Roope, Ohio EPA, NEDO, DERR
Thomas Schneider, Ohio EPA, SWDO, DERR
Katie Tait, OHARNG RTLS, CJAG
Steve Kvaal, USACE Louisville
Nathaniel Peters, USACE Louisville

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

July 1, 2021

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, request Ohio EPA review and comment on the Draft DFFO Milestones for FY22. Former RVAAP, Portage/Trumbull Counties, Ohio

Dear Mr. Princic:

The Draft DFFO Milestones are enclosed for the Ohio EPA to review and provide comment. The Draft DFFOs for FY22 are being submitted to you electronically via email.

One electronic copy is being submitted at this time and a hard copy can be provided when your office can receive them in the future. These Draft DFFOs for FY22 were prepared by the Army National Guard in support of the Environmental Restoration Program at the former Ravenna Army Ammunition Plant.

Please contact the undersigned at (614) 336-2053 or kevin.m.sedlak.ctr@mail.mil if there are issues or concerns with this submission.

Sincerely,

SEDLAK.KEVIN.MICHAEL.1254440171
Digitally signed by SEDLAK.KEVIN.MICHAEL.1254440171
Date: 2021.07.01 12:53:38 -04'00'

Kevin Sedlak
RVAAP Restoration Program Manager
Army National Guard Directorate

cc: Tom Schneider, Ohio EPA (email only)
Natalie Oryshkewych, Ohio EPA (email only)
Megan Oravec, Ohio EPA (email only)
Mark Leeper, ARNG (one [1] electronic copy)
Katie Tait, OHARNG (one [1] electronic copy)
Nathaniel Peters, USACE – Louisville (one [1] electronic copy)
Steve Kvaal, USACE – Louisville (cover letter via email only)
Susan Oliver, Management Solutions, LLC (cover letter via email only)
Jennifer Tierney, Vista Sciences Corp. (one [1] electronic copy)

# PROPOSED ORDER MILESTONES
## For FY 2022



| Activity ID | Activity Name | Scheduled Finish Date | Proposed Order Date | Program | Contractor | Act Comments |
|---|---|---|---|---|---|---|
| **IRP-RVAAP RAVENNA - Update (DD 6-15-21)** | | | | | | |
| **RVAAP-06, C-BLOCK QUARRY** | | | | | | |
| **(RD) REMEDIAL DESIGN** | | | | | | |
| PBA8-A995 | (TARGET) DRAFT RD SUBMITTAL | 20-Jun-22 | 31-Aug-22 | IRP | AAA | |
| **RVAAP-38, NACA TEST AREA** | | | | | | |
| **(CC) COMPLETION REPORTS** | | | | | | |
| RV38A3205 | (TARGET) DRAFT COMPLETION REPORT SUBMITTAL | 20-Mar-22 | 31-May-22 | IRP | EA-JV | |
| **RVAAP-50, ATLAS SCRAP YARD** | | | | | | |
| **(ROD) RECORD OF DECISION** | | | | | | |
| PBA15-441 | (TARGET) DRAFT ROD SUBMITTAL | 29-Aug-21 | 31-Oct-21 | IRP | AAA | |
| **RVAAP-66, GROUNDWATER & ENV INVESTIGATION SERVICES** | | | | | | |
| **(GWM) GROUNDWATER MONITORING** | | | | | | |
| GW-21495 | (TARGET) DRAFT GW LETTER REPORT SUBMITTAL | 12-Feb-22 | 15-Feb-22 | IRP | Leidos | |
| GW-21595 | (TARGET) DRAFT GW LETTER REPORT SUBMITTAL | 12-Feb-22 | 15-Feb-22 | IRP | Leidos | |
| **CC RVAAP-76, DEPOT AREAS** | | | | | | |
| **(CC) COMPLETION REPORTS** | | | | | | |
| RV76A2791 | (TARGET) DRAFT COMPLETION RPT SUBMITTAL | 13-Apr-22 | 30-Jun-22 | CC | EA-JV | |

Ohio Environmental Protection Agency

**Mike DeWine**, Governor
**Jon Husted**, Lt. Governor
**Laurie A. Stevenson**, Director

June 15, 2021

**TRANSMITTED ELECTRONICALLY**

Mr. Kevin M. Sedlak
Restoration Program Manager
ARNG-ILE Clean up
Camp James A. Garfield JTC
1438 State Route 534
Newton Falls, OH 44444

RE: US Army Ravenna Ammunition Plt RVAAP
Remediation Response
Project Records
Remedial Response
Portage County
ID # 267000859029

**Subject:** **US Army Ravenna Ammunition Plant (RVAAP); Review of the Final 2020 Annual Land Use Control Monitoring Report, RVAAP-01 Ramsdell Quarry Landfill, RVAAP-05 Winklepeck Burning Grounds, RVAAP-08 through RVAAP-11 (Load Lines 1 through 4), RVAAP-12 (Load Line 12) and RVAAP-51 (Dump Along Paris Windham Road) – Dated May 24, 2021**

Dear Mr. Sedlak:

The Ohio Environmental Protection Agency (Ohio EPA), Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR) acknowledges receipt of the "Final 2020 Annual Land Use Control Monitoring Report, RVAAP-01 Ramsdell Quarry Landfill, RVAAP-05 Winklepeck Burning Grounds, RVAAP-08 through RVAAP-11 (Load Lines 1 through 4), RVAAP-12 (Load Line 12) and RVAAP-51 (Dump Along Paris Windham Road)" dated May 24, 2021. The report was prepared by Chenega Tri-Services, LLC on behalf of the U.S. Army Corps of Engineers Louisville District, and received by the Agency on May 26, 2021.

Ohio EPA concurs with the findings of the report.

During this time, we will not be issuing hard-copy mail. This letter is an official response from Ohio EPA that will be maintained as a public record.

RECEIVED
JUN 15 2021

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/sc

ec: Rebecca Shreffler, Chenega
Bob Princic, Ohio EPA, NEDO, DERR
Natalie Oryshkewych, Ohio EPA, NEDO, DERR
Thomas Schneider, Ohio EPA, SWDO, DERR
Katie Tait, OHARNG RTLS, CJAG
Steve Kvaal, USACE Louisville
Nathaniel Peters, USACE Louisville

Ohio Environmental Protection Agency

**Mike DeWine**, Governor
**Jon Husted**, Lt. Governor
**Laurie A. Stevenson**, Director

May 28, 2021

**TRANSMITTED ELECTRONICALLY**

Mr. Kevin M. Sedlak
Army National Guard
Installations & Environment
Cleanup Branch IPA Designation
1438 State Route 534 SW
Newton Falls, OH 44444

RE: US Army Ravenna Ammunition Plt RVAAP
Remediation Response
Project Records
Remedial Response
Portage County
ID # 267000859087

**Subject: Review of Final Removal Action Completion Report For RVAAP-67 Facility-wide Sewers and CC RVAAP-75 George Road Sewage Treatment Plant**

Dear Mr. Sedlak:

The Ohio Environmental Protection Agency (Ohio EPA), Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR) has received and reviewed the "Final Removal Action Completion Report For RVAAP-67 Facility-wide Sewers and CC RVAAP-75 George Rd Sewage Treatment Plant", dated April 30, 2021 and prepared by Parsons and Gannett Fleming, was received by Ohio EPA on May 18, 2021.

Ohio EPA approves the document.

As a precautionary response to COVID-19, Ohio EPA is currently operating with most staff working remotely. During this time, we will not be issuing hard-copy mail. This letter is an official response from Ohio EPA that will be maintained as a public record.

RECEIVED
MAY 28 2021

If you have any questions or concerns related to this review or would like to schedule a meeting or conference call, please contact me at (330) 963-1170.

Sincerely,

Edward J D'Amato

Edward J. D'Amato
Project Coordinator
Division of Environmental Response and Revitalization

ED/sc

ec: Nat Peters, USACE
Steven Kvaal, USACE
Katie Tait, OHARNG RTLS
Mark Leeper, ARNG
Rebecca Shreffler, Chenega
Natalie Oryshkewych, Ohio EPA, NEDO, DERR
Megan Oravec, Ohio EPA, NEDO, DERR
Bob Princic, Ohio EPA, NEDO, DERR
Sue Netzly-Watkins, Ohio EPA, NEDO, DERR
Tom Schneider, Ohio EPA, SWDO, DERR
Carrie Rasik, Ohio EPA, CO, DERR
Brian Tucker, Ohio EPA, CO, DERR

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

May 24, 2021

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

Subject: Ravenna Army Ammunition Plant Restoration Program
FINAL 2021 Annual Land Use Control Monitoring Report, RVAAP-01 Ramsdell Quarry Landfill, RVAAP-05 Winklepeck Burning Grounds, RVAAP-08 - 11 Load Lines 1 through 4, RVAAP-12 Load Line 12, RVAAP-51 Dump Along Paris Windham Road, Camp James A. Garfield, Portage/Trumbull Counties, Ohio
(Ohio EPA ID No. 267-000859-029)

Dear Mr. Roope:

An electronic version of the Final 2020 Annual Land Use Control Monitoring Report, RVAAP-01 Ramsdell Quarry Landfill, RVAAP-05 Winklepeck Burning Grounds, RVAAP-08 through 11 Load Lines 1 through 4, RVAAP-12 Load Line 12 and RVAAP-51 Dump Along Paris Windham Road will be sent using the Ohio EPA LiquidFile system. A hard copy and CD will be sent when they are able to be received by Ohio EPA.

This report was prepared for the Army National Guard in support of the RVAAP Restoration Program. Please contact the undersigned at (614) 336-2053 or kevin.m.sedlak.ctr@mail.mil if there are issues or concerns with this submission.

Sincerely,

SEDLAK.KEVIN.MICHAEL.1254440171 Digitally signed by SEDLAK.KEVIN.MICHAEL.1254440171 Date: 2021.05.25 08:57:37 -04'00'

Kevin Sedlak
RVAAP Restoration Program Manager
Army National Guard Directorate

cc: Tom Schneider, Ohio EPA (cover letter via email only)
Bob Princic, Ohio EPA (cover letter via email only)
Natalie Oryshkewych, Ohio EPA (cover letter via email only)
Megan Oravec, Ohio EPA (cover letter via email only)
Mark Leeper, ARNG (one [1] electronic copy)
Katie Tait, OHARNG (cover letter via email only)
Nathaniel Peters, USACE – Louisville (one [1] electronic copy)
Steve Kvaal, USACE – Louisville (cover letter via email only)
Susan Oliver, Management Solutions, LLC (cover letter via email only)
Jennifer Tierney, Vista Sciences Corp. (one [1] electronic copy, one [1] hard copy)

Ohio Environmental Protection Agency

**Mike DeWine**, Governor
**Jon Husted**, Lt. Governor
**Laurie A. Stevenson**, Director

May 18, 2021

**TRANSMITTED ELECTRONICALLY**

Mr. Kevin M. Sedlak
Restoration Program Manager
ARNG-ILE Clean up
Camp James A. Garfield JTC
1438 State Route 534
Newton Falls, OH 44444

RE: US Army Ravenna Ammunition Plt RVAAP
Remediation Response
Project Records
Remedial Response
Portage County
ID # 267000859029

**Subject:** **Ohio EPA Receipt and Review - "Comment Response Letter for the Draft 2020 Annual Land Use Control Monitoring Report, RVAAP-01 Ramsdell Quarry Landfill, RVAAP-05 Winklepeck Burning Grounds, RVAAP-08 – 11 Load Lines 1 – 4, RVAAP-12 Load Line 12 and RVAAP-51 Dump Along Paris-Windham Road, Camp James A. Garfield (CJAG), Portage/Trumbull Counties, Ohio" - Dated April 27, 2021**

Dear Mr. Sedlak:

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 "Comment Response Letter for the Draft 2020 Annual Land Use Control Monitoring Report, RVAAP-01 Ramsdell Quarry Landfill, RVAAP-05 Winklepeck Burning Grounds, RVAAP-08 – 11 Load Lines 1 – 4, RVAAP-12 Load Line 12 and RVAAP-51 Dump Along Paris-Windham Road, Camp James A. Garfield (CJAG), Portage/Trumbull Counties, Ohio" (Comment Letter), dated April 27, 2021. This Comment Letter provided the Army National Guard's (ARNG) response to Ohio EPA's comment letter dated April 19, 2021.

Ohio EPA has reviewed this documentation and finds it meets the reporting requirements described in Records of Decision (RODs) for these Areas of Concern (AOCs). Ohio EPA is requesting that a final version of this document be submitted for concurrence.

However, Ohio EPA would like to request future discussion and clarification of the land use and land use control documents established under the 2013 and 2014 Final Technical Memoranda and the 2012 Property Management Plan (PMP), and how these apply to RODs established before the Final Technical Memoranda were in place.

RECEIVED
MAY 18 2021

**Recommendations for Clarification**

1) Currently, Open Demolition Area #2 (ODA2) is under further investigation to address the Material Potentially Presenting an Explosive Hazard (MPPEH) through the Military Munitions Response Program (MMRP). Ohio EPA recommends, at a minimum, the Army consider adding the language to the PMP indicating that a Land Use Control (LUC) will need to be implemented consistent with Part III: Section 4 of the Final ROD for ODA2. In addition, if the MMRP investigation cannot account for the remaining depth of soil/dry sediment meeting the unrestricted use/unlimited exposure scenario, Ohio EPA may continue to assess the overall protectiveness of a remedy during the review of the five-year review report.

2) Clarification is needed regarding the land use designation under which ODA2 is listed per the 2014 Technical Memorandum and if engineering controls that are currently in place are consistent with the 2012 PMP LUC reporting requirements.

**Revisions to Land Uses and Receptors at ODA2**

Since the concurrence of the 2007 ODA2 ROD, Ohio EPA and the Ohio Army National Guard (OHARNG) developed several guidance documents that redefined the land uses and the receptors at Camp Garfield and the process to memorialize engineering controls and LUCs. The Ohio EPA acknowledges that the current use of ODA2 is consistent with the 2007 Final ROD.

However, as described the 2013 Final Technical Memorandum, the security guard/maintenance worker receptor was put under the Military Training Land Use that requires a LUC. Then the 2014 Final Technical Memorandum added a third land use: Commercial/Industrial Land Use. It is not clear to Ohio EPA if the security and maintenance personnel working at ODA2 still falls under the Military Training land use or commercial/industrial land use. The 2014 Final Technical Memorandum indicates the military training land use would require a LUC limiting exposure of personnel as well as any other necessary LUC defined during the Feasibility Study (FS) process, (2014 Final Technical Memo, paragraph 5, page 3).

As referenced in the 2021 Comment Letter, the 2007 Final ROD for ODA2 states:

> "No further action under [the Comprehensive Environmental Response, Compensation and Liability Act] CERCLA is necessary for soil and dry sediment at ODA2. Ground water and surface water at ODA2 will be addressed under future CERCLA decisions. Land use controls [LUCs] will not be implemented as part of this decision because chemicals in soil and dry sediment do not exceed cleanup goals for the intended land use. Land use is currently restricted at ODA2 because of the documented presence of munitions and explosives of concern (MEC). ODA2 will be maintained as restricted access under intended future land use. The Army will address land use controls for ODA2 under the Military Munitions Response

Program (MMRP), as part of future response actions for MEC. The Army will maintain current interim use restrictions at ODA2 until such time that final actions are completed under the MMRP."

The same 2007 Final ROD for ODA2 contains the following sections of text:

**Section G.1 - Human Health Risk Assessment**
"The human health risk assessment at ODA2 evaluated risks and hazards for one potential human receptor (Security Guard/Maintenance Worker) [emphasis added] exposed to shallow surface soil (0 to 1 ft deep). The extensive presence of MEC prevents most activities at ODA2, including OHARNG training activities, and precludes unrestricted (residential) land use. Consequently, the risk assessment did not evaluate OHARNG training and residential land use receptors [emphasis added]."

**Part III: Section 4. - Land Use**
"Comment: One commenter asked whether a mechanism is in place to ensure ODA2 will remain under restricted use unless the areas are cleaned up to a higher level for another use. The commenter asked if there are safeguards against it being forgotten or the documentation being lost that the site is only acceptable for restricted use. Response: This is a government-to-government transfer. The federal government will maintain a property management plan, wherein these restrictions and so forth will be documented, and will include provisions to go along with the property [emphasis added]. If, in the future, the property is sold to private ownership, land use controls would be institutionalized legally so that necessary restrictions would be maintained."

It should be noted the Final Technical Memorandum: Land Uses and Revised Risk Assessment Process for the Ravenna Army Ammunition Plant (RVAAP) Installation Restoration Program, Portage/Trumbull Counties, Ohio – Dated February 4, 2014 states:

**Section 5.b.**
"Military Training Land Use (existing) describes potential exposure for military and civilian personnel (receptors) that would train or work (part-time) on any AOC or [Munitions Response Site] MRS within the former RVAAP/Camp Ravenna. This Land Use includes activities that are currently necessary to properly train soldiers and operate/maintain a training base as defined by the Army and activities necessary to support that training objective. This Land Use has specific assumptions that would require a LUC limiting exposure of personnel to the hours assumed for the National Guard Trainee in the [Facility-wide Human Health Risk Analysis Memorandum] FWHHRAM, as well as any other necessary LUC as defined during the FS process."

It is the understanding of Ohio EPA that the Security Guard/Maintenance Worker receptor category falls under the National Guard Trainee, which in turn falls under the Military Training Land Use:

> **Section 6.e.**
> "Remedies other than those based on Unrestricted (Residential) Land Use will require LUCs, operation and maintenance plans and Five-Year Reviews. Land use controls (e.g., use restrictions) for Commercial/Industrial Land Use are readily available. Specifics on the land use restrictions for military training have not yet been developed."
>
> **Section 7.b.**
> "For AOCs or MRSs with Record of Decisions (RODs) already in place, the CERCLA Five Year Review will be the appropriate time to evaluate whether the remedy is protective for the applicable receptors."

**Conclusion**

Therefore, at this time, Ohio EPA concurs with the rationale for not implementing a LUC currently at ODA2. However, Ohio EPA would like to engage in further discussion with the Army to consider implementation of LUCs and/or the PMP for this AOC, and others as necessary, in the future.

As a precautionary response to COVID-19, Ohio EPA is currently operating with most staff working remotely. During this time, we will not be issuing hard-copy mail. This letter is an official response from Ohio EPA that will be maintained as a public record.

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/sc

ec: Rebecca Shreffler, Chenega
Bob Princic, Ohio EPA, NEDO, DERR
Natalie Oryshkewych, Ohio EPA, NEDO, DERR
Thomas Schneider, Ohio EPA, SWDO, DERR
Katie Tait, OHARNG RTLS, CJAG
Steve Kvaal, USACE Louisville
Nathaniel Peters, USACE Louisville

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

May 14, 2021

Ohio Environmental Protection Agency
DERR-NEDO
Attn: Mr. Ed D'Amato
2110 East Aurora Road
Twinsburg, OH 44087-1924

Subject: Ravenna Army Ammunition Plant (RVAAP) Restoration Program, Portage/Trumbull Counties, Final Removal Action Completion Report for RVAAP-67 Facility-Wide Sewers and CC RVAAP-75 George Road Sewage Treatment Plant. (Ohio EPA Work Flow Activity 267000859257)

Dear Mr. D'Amato:

An electronic version of the *Final RACR for RVAAP-67 Facility-Wide Sewers and CC RVAAP-75 George Road Sewage Treatment Plant, Ravenna Army Ammunition Plant Restoration Program* will be sent using the Ohio EPA Liquid File system. A hard copy and CDs will be sent when they are able to be received by the Ohio EPA by request. This document was prepared for the Army National Guard in support of the RVAAP Restoration Program.

Please contact the undersigned at (330) 235-2153 or ***kevin.m.sedlak.ctr@mail.mil*** if there are issues or concerns with this submission.

Sincerely,

SEDLAK.KEVIN.MICHAEL.1254440171

Digitally signed by SEDLAK.KEVIN.MICHAEL.1254440171
Date: 2021.05.14 09:35:28 -04'00'

Kevin M. Sedlak
RVAAP Restoration Program Manager
Army National Guard Directorate

cc: Bob Princic, Ohio EPA, NEDO, DERR
Tom Schneider, Ohio EPA, SWDO
Natalie Oryshkewych, Ohio EPA, NEDO
Mark Leeper, ARNG
Katie Tait, OHARNG, Camp James A. Garfield
Steven Kvaal, USACE Louisville
Nathaniel Peters, USACE Louisville
Jennifer Tierney, Vista Sciences Corporation
Pat Ryan, Leidos - REIMS

Ohio Environmental Protection Agency

**Mike DeWine**, Governor
**Jon Husted**, Lt. Governor
**Laurie A. Stevenson**, Director

April 29, 2021

**TRANSMITTED ELECTRONICALLY**

Mr. Kevin M. Sedlak
Army National Guard
Installations & Environment
Cleanup Branch IPA Designation
1438 State Route 534 SW
Newton Falls, OH 44444

RE: US Army Ravenna Ammunition Plt RVAAP
Remediation Response
Project Records
Remedial Response
Portage County
ID # 267000859087

**Subject: Review of Draft Removal Action Completion Report For RVAAP-67 Facility-wide Sewers and CC RVAAP-75 George Rd Sewage Treatment Plant**

Dear Mr. Sedlak:

The Ohio Environmental Protection Agency (Ohio EPA), Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR) has received and reviewed the "Draft Removal Action Completion Report For RVAAP-67 Facility-wide Sewers and CC RVAAP-75 George Rd Sewage Treatment Plant", dated February 22, 2021. The document was prepared by Parsons and Gannett Fleming.

Ohio EPA has no comments.

As a precautionary response to COVID-19, Ohio EPA is currently operating with most staff working remotely. During this time, we will not be issuing hard-copy mail. This letter is an official response from Ohio EPA that will be maintained as a public record.

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APR 30 2021

If you have any questions or concerns related to this review or would like to schedule a meeting or conference call, please contact me at (330) 963-1170.

Sincerely,

Edward J D'Amato

Edward J. D'Amato
Project Coordinator
Division of Environmental Response and Revitalization

ED/sc

ec: Katie Tait, OHARNG RTLS
Nat Peters, USACE
Steven Kvaal, USACE
Mark Leeper, ARNG
Rebecca Shreffler, Chenega
Natalie Oryshkewych, Ohio EPA, NEDO, DERR
Megan Oravec, Ohio EPA, NEDO, DERR
Bob Princic, Ohio EPA, NEDO, DERR
Tom Schneider, Ohio EPA, SWDO, DERR
Carrie Rasik, Ohio EPA, CO, DERR
Brian Tucker, Ohio EPA, CO, DERR

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

April 27, 2021

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

Subject: Ravenna Army Ammunition Plant Restoration Program
Comment Response Letter for the *DRAFT 2020 Annual Land Use Control Monitoring Report, RVAAP-01 Ramsdell Quarry Landfill, RVAAP-05 Winklepeck Burning Grounds, RVAAP-08 – 11 Load Lines 1 – 4, RVAAP-12 Load Line 12 and RVAAP-51 Dump Along Paris-Windham Road*, Camp James A. Garfield (CJAG), Portage/Trumbull Counties, Ohio (Ohio EPA ID No. 267-000859-029)

Dear Mr. Roope:

This letter presents the Army National Guard's (ARNG) response to your April 19, 2021 comment on the *Draft 2020 Annual Land Use Control Monitoring Report, RVAAP-01 Ramsdell Quarry Landfill, RVAAP-05 Winklepeck Burning Grounds, RVAAP-08 – 11 Load Lines 1 – 4, RVAAP-12 Load Line 12 and RVAAP-51 Dump Along Paris-Windham Road*.

Ohio EPA comment:

Open Demolition Area #2 (RVAAP-04) The Final Record of Decision for Soil and Dry Sediment at the Open Demolition Area #2 (RV AAP-04) states, "The human health risk assessment at ODA2 evaluated risks and hazards for one potential human receptor (Security Guard/Maintenance Worker) exposed to shallow surface soil (0 to 1 ft deep). The extensive presence of MEC prevents most activities at ODA2, including OHARNG training activities, and precludes unrestricted (residential) land use." Consequently, the risk assessment did not evaluate OHARNG training and residential land use receptors. The Record of Decision also states, "The Army will maintain current interim use restrictions [emphasis added] at ODA2 until such time that final actions are completed under the [Military Munitions Response Program] MMRP."

Action Item

Ohio EPA is requesting additional information be provided in the Project Management Plan (PMP) and future annual LUC reports to include the following Site, and any other Sites that do not meet Unrestricted Use/Unlimited Exposure.

ARNG response:

The Final ROD for Soil and Dry Sediment at ODA#2 states "No further action under CERCLA is necessary for soil and dry sediment at ODA2. Groundwater and surface water at ODA2 will be addressed under future CERCLA decisions. Land use controls will not be implemented as part of this decision because chemicals in soil and dry sediment do not exceed cleanup goals for the intended land use. Land use is currently restricted at ODA2 because of the documented presence of munitions and explosives of concern (MEC). ODA2 will be maintained as restricted access under intended future land use. The Army will address land use controls for ODA2 under the Military Munitions Response Program (MMRP), as

part of future response actions for MEC. The Army will maintain current interim use restrictions at ODA2 until such time that final actions are completed under the MMRP." This AOC and specifically the No Further Action ROD and determination for RVAAP-04 has been previously discussed with the Ohio EPA. The Final ROD was reviewed, approved, and signed by the Ohio EPA. The ROD specifically indicates that LUCs will not be implemented as part of the decision because COCs do not exceed cleanup goals for the intended land use. The ARNG and OHARNG are currently maintaining interim use restrictions at this site while actions are being completed under the MMRP. The land use has remained the same as when this ROD was approved and signed (restricted access). At this time, there is no mechanism, driver, or funding to include or implement formal LUCs at this AOC based on the NFA determination in the ROD. However, due to ongoing investigations at this site, the site remains restricted access which is maintained by interim restrictions such as a Seibert Stakes, range signage, a locked access gate and the location of the site within a range complex and Safety Danger Zone for range use. At this time, there is no requirement to include or track the management of the interim restrictions at this site in the annual LUC report and inspection.

Also note that interim restrictions are currently being used and implemented at AOCs and MRSs currently under investigation and/or remedial action until such time when they reach final remedy and close out or require formal LUCs to manage residual contamination and risk. Many of these were implemented at the request of the Ohio EPA by BRAC and the OHARNG in the early phases of the CERLCA process to protect the sites and the trainees and employees at the facility. The ARNG and OHARNG maintain these interim restrictions (such as Seibert Stakes, restricted access, training, etc.) but do not track or report on these as it is not currently required under CERCLA.

This comment response was prepared in support of the restoration program at the former Ravenna Army Ammunition Plant.

Please contact the undersigned at (614) 336-2053 or kevin.m.sedlak.ctr@mail.mil if there are issues or concerns with this submission.

Sincerely,

SEDLAK.KEVIN.MICHAEL.1254440171 Digitally signed by SEDLAK.KEVIN.MICHAEL.1254440171 Date: 2021.04.27 10:10:39 -04'00'

Kevin M. Sedlak
RVAAP Restoration Program Manager
Army National Guard Directorate

cc: Tom Schneider, Ohio EPA, DERR (one [1] electronic copy)
Bob Princic, Ohio EPA, NEDO (one [1] electronic copy)
Natalie Oryshkewych, Ohio EPA, NEDO, DERR (one [1] electronic copy)
Kevin Sedlak, ARNG, (one [1] electronic copy)
Katie Tait, OHARNG, (one [1] electronic copy)
Nathaniel Peters, USACE – Louisville (one [1] electronic copy)
Steve Kvaal, USACE – Louisville (one [1] electronic copy)
Susan Oliver, Management Solutions, LLC (one [1] electronic copy)
Jennifer Tierney, Vista Sciences Corp. (one [1] electronic copy, one [1] hard copy)

Ohio Environmental Protection Agency

**Mike DeWine,** Governor
**Jon Husted,** Lt. Governor
**Laurie A. Stevenson,** Director

April 19, 2021

**TRANSMITTED ELECTRONICALLY**

Mr. Kevin M. Sedlak
Restoration Program Manager
ARNG-ILE Clean up
Camp James A. Garfield JTC
1438 State Route 534
Newton Falls, OH 44444

RE: US Army Ravenna Ammunition Plt RVAAP
Remediation Response
Project Records
Remedial Response
Portage County
ID # 267000859029

**Subject: Ohio EPA Comment Letter - "Draft 2020 Annual Land Use Control Monitoring Report, RVAAP-01 Ramsdell Quarry Landfill, RVAAP-05 Winklepeck Burning Grounds, RVAAP-08 through RVAAP-11 (Load Lines 1 through 4), RVAAP-12 (Load Line 12) and RVAAP-51 (Dump Along Paris-Windham Road)" Dated March 30, 2021**

Dear Mr. Sedlak:

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 2020 Annual Land Use Control [LUC] Monitoring Report, RVAAP-01 Ramsdell Quarry Landfill, RVAAP-05 Winklepeck Burning Grounds, RVAAP-08 through RVAAP-11 (Load Lines 1 through 4), RVAAP-12 (Load Line 12) and RVAAP-51 (Dump Along Paris-Windham Road)", dated March 30, 2021. This report was prepared for the U.S. Army Corps of Engineers Louisville District, by Chenega Tri-Services, LLC.

The Draft 2020 LUC report states, "If residual contamination is left in place after the [Comprehensive Environmental Response, Compensation and Liability Act] CERCLA remediation process is complete (does not meet unrestricted/residential use standards) and the contamination still poses a potential for unacceptable risks or exceeds cleanup standards, then the Areas of Concern/Munitions Response Sites (AOCs/MRSs) will require LUCs."

Open Demolition Area #2 (RVAAP-04)

The Final Record of Decision for Soil and Dry Sediment at the Open Demolition Area #2 (RVAAP-04) states, "The human health risk assessment at ODA2 evaluated risks and hazards for one potential human receptor (Security Guard/Maintenance Worker) exposed to shallow surface soil (0 to 1 ft deep). The extensive presence of MEC prevents most

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APR 19 2021

activities at ODA2, including OHARNG training activities, and precludes unrestricted (residential) land use." Consequently, the risk assessment did not evaluate OHARNG training and residential land use receptors. The Record of Decision also states, "The Army will maintain current interim use restrictions [emphasis added] at ODA2 until such time that final actions are completed under the [Military Munitions Response Program] MMRP."

Action Item

Ohio EPA is requesting additional information be provided in the Project Management Plan (PMP) and future annual LUC reports to include the following Site, and any other Sites that do not meet Unrestricted Use/Unlimited Exposure.

As a precautionary response to COVID-19, Ohio EPA is currently operating with most staff working remotely. During this time, we will not be issuing hard-copy mail. This letter is an official response from Ohio EPA that will be maintained as a public record.

Please address the comment above prior to submitting the final version of the document. If you have any questions or concerns, please do not hesitate to contact me at (330) 963-1235.

Sincerely,

Nicholas Roope
Site Coordinator
Division of Environmental Response and Revitalization

NCR/sc

ec: Katie Tait, OHARNG RTLS, CJAG
Steve Kvaal, USACE Louisville
Nathaniel Peters, USACE Louisville
Rebecca Shreffler, Chenega
Bob Princic, Ohio EPA, NEDO, DERR
Natalie Oryshkewych, Ohio EPA, NEDO, DERR
Thomas Schneider, Ohio EPA, SWDO, DERR

**NATIONAL GUARD BUREAU**
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ARLINGTON VA 22204-1373

March 30, 2021

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

Subject: Ravenna Army Ammunition Plant Restoration Program
DRAFT 2020 Annual Land Use Control Monitoring Report, RVAAP-01 Ramsdell Quarry Landfill, RVAAP-05 Winklepeck Burning Grounds, RVAAP-08 - 11 Load Lines 1 through 4, RVAAP-12 Load Line 12, RVAAP-51 Dump Along Paris Windham Road, Camp James A. Garfield, Portage/Trumbull Counties, Ohio
(Ohio EPA ID No. 267-000859-029)

Dear Mr. Roope:

An electronic version of the Draft 2020 Annual Land Use Control Monitoring Report, RVAAP-01 Ramsdell Quarry Landfill, RVAAP-05 Winklepeck Burning Grounds, RVAAP-08 through 11 Load Lines 1 through 4, RVAAP-12 Load Line 12 and RVAAP-51 Dump Along Paris Windham Road will be sent using the Ohio EPA LiquidFile system. A hard copy and CD will be sent when they are able to be received by Ohio EPA.

This report was prepared for the Army National Guard in support of the RVAAP Restoration Program. Please contact the undersigned at (614) 336-2053 or kevin.m.sedlak.ctr@mail.mil if there are issues or concerns with this submission.

Sincerely,

SEDLAK.KEVIN.MICHAEL.1254440171 Digitally signed by SEDLAK.KEVIN.MICHAEL.1254440171 Date: 2021.03.31 11:50:44 -04'00'

Kevin Sedlak
RVAAP Restoration Program Manager
Army National Guard Directorate

cc: Tom Schneider, Ohio EPA (cover letter via email only)
Bob Princic, Ohio EPA (cover letter via email only)
Natalie Oryshkewych, Ohio EPA (cover letter via email only)
Megan Oravec, Ohio EPA (cover letter via email only)
Mark Leeper, ARNG (one [1] electronic copy)
Katie Tait, OHARNG (one [1] electronic copy)
Nathaniel Peters, USACE – Louisville (one [1] electronic copy)
Steve Kvaal Coombs, USACE – Louisville (cover letter via email only)
Susan Oliver, Management Solutions, LLC (cover letter via email only)
Jennifer Tierney, Vista Sciences Corp. (one [1] electronic copy, one [1] hard copy)

**DEPARTMENT OF THE ARMY**
**OFFICE OF THE DEPUTY CHIEF OF STAFF, G-9**
**600 ARMY PENTAGON**
**WASHINGTON, DC 20310-0600**

DAIN-ISE 16 March 2020

MEMORANDUM FOR Chief, Army National Guard Installations and Environment Directorate (ARNG-IEZ), 111 South George Mason Drive, Arlington, VA 22204

SUBJECT: Summary of Results, Decision Document In-Progress Review, 31 January 2020

1. References:

a. Army Decision Document Guidance, DAIM-ZB, 1 Jun 18.

b. Department of Defense Manual 4715.20, DERP Management, 9 Mar 12.

c. Memorandum, ASA IEE, SAIE, 18 Jan 17, subject: Decision Document Policy.

d. Department of Defense Instruction 4715.07, 21 May 13, subject: Defense Environmental Restoration Program (DERP), Incorporating Change 1, 25 Oct 17

e. Memorandum, ACSIM, DAIM-ZA, subject: Redelegation of Decision Document Signature Authority, 26 Oct 17.

2. On 31 January 2020, the Deputy Chief of Staff (DCS) G-9, Installation Services Directorate, Environmental Division conducted a decision document (DD) in-progress review (IPR) in accordance with Reference 1a.

3. Enclosure 1 presents a list of ARNG DDs which were determined to be routine. Signature authority for these actions is delegated to the Chief, Army National Guard (ARNG) Installations and Environment (I&E) Directorate. Delegation below the Chief, ARNG I&E Directorate level is not authorized.

4. The point of contact for this action is Mr. Patrick Shaw, 571-256-9717; e-mail: Patrick.p.shaw2.civ@mail.mil.

KELLY.MICHAEL.JOHN.1243408675

Digitally signed by KELLY.MICHAEL.JOHN.1243408675
Date: 2020.03.24 14:24:15 -04'00'

Encl
as

MICHAEL J. KELLY
Chief, Enterprise and Restoration Branch

CF:
ODASA(ESOH) (SAIE-ESOH, Mr. Dick Ramsdell)
ARNG-IEZ (ARNG-IED, LTC James Crowley)

## ENCLOSURE 1.
## ARNG DECISION DOCUMENTS DETERMINED TO BE ROUTINE DURING 31 JANUARY 2020 IN-PROGRESS REVIEW

| Site Name | Fund Source | Legacy Site No. | HQAES Site No. |
|---|---|---|---|
| CJAG/Ravenna C-Block Quarry | DERP | RVAAP-06 | 39747.1006 |
| CJAG/Ravenna Sand Creek Disposal Road Landfill | DERP | RVAAP-34 | 39747.1034 |
| CJAG/Ravenna Bldg 1034 Motor Pool Hydraulic Lift | DERP | RVAAP-74 | 39747.1081 |
| CJAG/Ravenna Quarry Pond Surface Dump | DERP | RVAAP-78 | 39747.1086 |
| Waiawa Gulch UTES Washrack | DERP | WG-001 | 1083A.1003 |
| Savoonga FSA Spill Remediation Site | CC | CCAK290941 | 2512A.1009 |
| Gambell FSA Spill Remediation Site | CC | CCAK120109 | 2491A.1010 |
| Camp Minden Final Test Area 7 | DERP | LAAP-004-R-01 | 22505.1014 |
| Camp Withycombe West MRS | DERP | WITH-001-R-01 | 4533A.1001 |
| Camp George West Artillery Range | CC | COA90-002-R-01 | 6878A.1015 |
| Hartville Uplift Artillery Range | CC | WYHQ-041-R-01 | 6926A.1050 |
| NDNODS Camp William Moore/Camp Styx | CC | SCHQ-001-R-01 | 6915A.1004 |
| NDNODS Idler Range | CC | COHQ-004-R-01 | 6878A.1014 |
| NDNODS Manti SAR | CC | UTHQ-008-R-01 | 6919A.1027 |
| Williston Training Area | DERP | NDHQ-008-R-01 | 6902A.1008 |
| Craig Small Arms Range (SAR) | CC | COHQ-002-R-01 | 6878A.1009 |

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

February 23, 2021

Ohio Environmental Protection Agency
DERR-NEDO
Attn: Mr. Ed D'Amato
2110 East Aurora Road
Twinsburg, OH 44087-1924

Subject: Ravenna Army Ammunition Plant (RVAAP) Restoration Program, Portage/Trumbull Counties, Draft Removal Action Completion Report for RVAAP-67 Facility-Wide Sewers and CC RVAAP-75 George Road Sewage Treatment Plant. (Ohio EPA Work Flow Activity 267000859257)

Dear Mr. D'Amato:

An electronic version of the *Draft RACR for RVAAP-67 Facility-Wide Sewers and CC RVAAP-75 George Road Sewage Treatment Plant, Ravenna Army Ammunition Plant Restoration Program* will be sent using the Ohio EPA Liquid File system. A hard copy and CDs will be sent when they are able to be received by the Ohio EPA by request. This document was prepared for the Army National Guard in support of the RVAAP Restoration Program.

Please contact the undersigned at (330) 235-2153 or ***kevin.m.sedlak.ctr@mail.mil*** if there are issues or concerns with this submission.

Sincerely,

SEDLAK.KEVIN.MICHAEL.1254440171
Digitally signed by SEDLAK.KEVIN.MICHAEL.1254440171
Date: 2021.02.23 14:08:15 -05'00'

Kevin M. Sedlak
RVAAP Restoration Program Manager
Army National Guard Directorate

cc: Bob Princic, Ohio EPA, NEDO, DERR
Tom Schneider, Ohio EPA, SWDO
Natalie Oryshkewych, Ohio EPA, NEDO
Mark Leeper, ARNG
Katie Tait, OHARNG, Camp James A. Garfield
Steven Kvaal, USACE Louisville
Nathaniel Peters, USACE Louisville
Jennifer Tierney, Vista Sciences Corporation
Pat Ryan, Leidos - REIMS

# Excavation Confirmation Sample Results

Excavation Confirmation Report No. 8 DATE INITIATED: 2/22021

PROJECT RVAAP Load Lines 1-4 and 12 (RVAAP-08 to 12)

CONTRACT NO W912QR-12-D-0005

REQUESTOR IDENTIFICATION

NAME_ORGANIZATION PHONE Sarah Meyers, CH2M, 703-376-5338

TITLE Project Manager SIGNATURE *Sarah L. Meyers*

BASELINE IDENTIFICATION

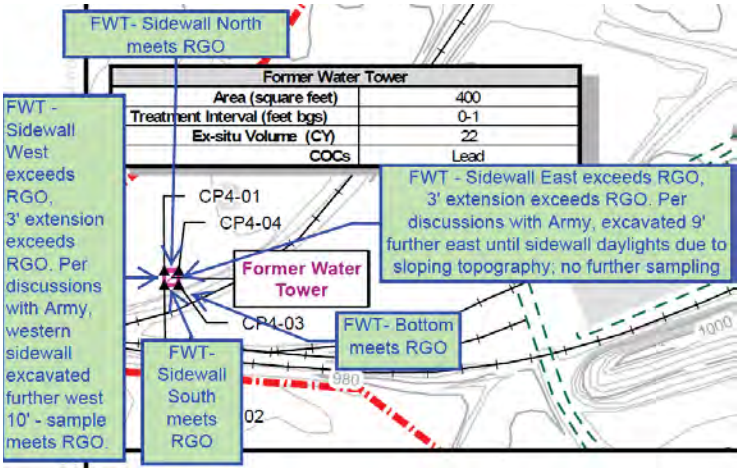
BASELINE(S) AFFECTED ☐ Cost ☐ Scope ☐ Milestone ☐ Method of Accomplishment

AFFECTED DOCUMENTS (TITLE, NUMBER AND SECTION):

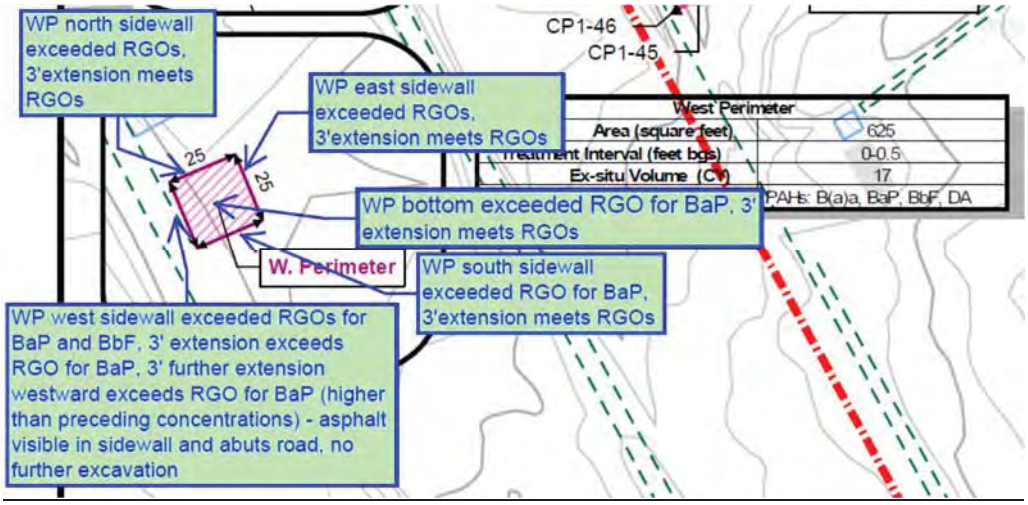
Not applicable

DESCRIPTION OF CHANGE:

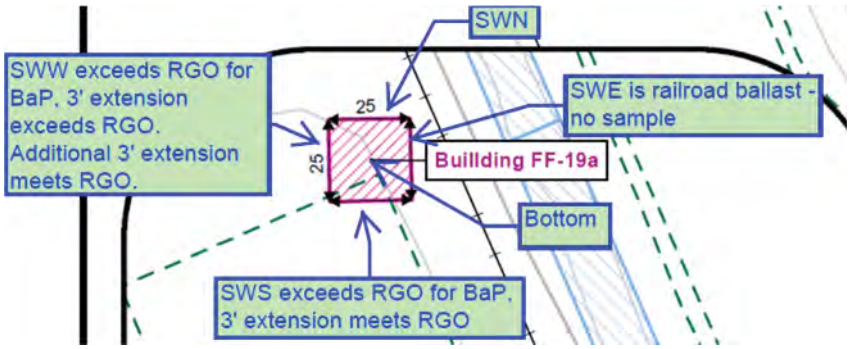
1. Additional analytical results for excavation confirmation samples are attached. Results previously concurred by the Army and Ohio EPA are identified on the table.
2. This memo provides data for excavation confirmation samples for the second step of extensions for 5 decision units (DUs) that exceeded at least one associated remedial goal option (RGO) after the first step of extensions beyond the initial footprints.
3. Load Line 4, Former Water Tower excavation is shown below.
   a. The east and west sidewalls initially exceeded the RGO for lead (see Excavation Confirmation Report No. 4 dated 12/30/2020).
   b. The excavation was extended 3 feet in each direction and additional ISM samples collected, both of which still exceeded the RGO for lead (see Excavation Confirmation Report No. 7 dated 1/25/2021).
   c. Per discussions with the Army, the eastern sidewall was excavated further to the east until it daylights due to the sloping topography (additional excavation 9' to the east).
   d. Per discussions with the Army, the western sidewall was excavated further to the west approximately 10 feet, beyond which large trees are present, and an additional ISM sample for lead was collected for the further extended Sidewall West.
   e. The sample for the further extended west sidewall meets the RGO for lead (117 mg/kg is less than the RGO of 800 mg/kg).
   f. Therefore, remedial action at the Former Water Tower excavation is complete.



5. Load Line 3, excavation West Perimeter is shown below. All DUs initially exceeded at least one applicable RGO (see Excavation Confirmation Report No. 6 dated 1/11/2021). After the first step of extensions beyond the initial footprint, the bottom, north sidewall, east sidewall and south sidewall samples met the RGOs (see Excavation Confirmation Report No. 7 dated 1/25/2021); however, the west sidewall continued to exceed the RGO for benzo(a)pyrene (BaP).
   a. As presented in Excavation Confirmation Report No. 6 dated 1/11/2021, the west sidewall initially exceeded the RGOs for BaP and benzo(b)fluoranthene (BbF).
   b. The excavation was extended 3 feet in this direction and an additional ISM sample for BaP and BbF was collected in triplicate for the extended Sidewall West. As reported in Excavation Confirmation Report No. 7 dated 1/25/2021, one of the replicates exceeded the RGO for BaP. The RSDs were less than 35%; therefore, in accordance with the work plan, the maximum replicate concentration of 2.93 mg/kg was compared to the RGO of 2.9 mg/kg.
   c. Therefore, additional soil was excavated (another 3 feet westward) and an additional ISM sample for BaP was collected for the further extended Sidewall West.
   d. The sample for the further extended west sidewall continues to exceed the RGO for BaP (4.48 mg/kg). This concentration is higher than the preceding result (see above).
   e. The west side of this excavation abuts a road. An asphalt layer is visible in the extended sidewall. As discussed with the Army, the continuing BaP exceedance is likely due to the asphalt road and no further excavation is this direction is warranted.




6. Load Line 12, excavation FF-19(a) is shown below. The south and west sidewalls initially exceeded the RGO for BaP (see Excavation Confirmation Report No. 5 dated 1/6/2021). The excavation was extended 3 feet in each of these directions and the additional ISM sample for the extended Sidewall South met the RGO. but the extended sidewall west continued to exceed (see Excavation Confirmation Report No. 7 dated 1/25/2021).
   a. The west sidewall was extended another 3 feet in this direction and the additional ISM sample for BaP meets the RGO.
   b. Therefore, remedial action at the FF-19(a) excavation is complete.



JUSTIFICATION:
As detailed above and in the attached table, the 24 excavations included in this remedial action are complete.

IMPACT OF NOT IMPLEMENTING REQUEST

Not applicable.

PARTICIPANTS AFFECTED BY IMPLEMENTING REQUEST

Not applicable.

COST ESTIMATE: NA ESTIMATOR SIGNATURE _____

PHONE: DATE _____

USACE COTR PETERS.NATHANIEL.II.1248279466 Digitally signed by PETERS.NATHANIEL.II.1248279466 Date: 2021.02.02 15:02:57 -05'00' DATE February 2, 2021

OHIO EPA PROJECT MANAGER _____ DATE _____

MANAGER SIGNATURE N/A DATE _____

**LL 1-4 & 12 Remedial Action**
**Excavation Confirmation Sample Results (unvalidated)**

| | | | | | | | | | Analyte/Units/Remedial Goal Option (RGO)/Result | | | | | | | | |

**LL 1-4 & 12 Remedial Action**
**Excavation Confirmation Sample Results (unvalidated)**

| Load Line | Remediation Area | COCs | Description/ Rationale | Location | Sample Date | Lab | Lab SDG # | Sample ID/Location | Analyte/Units/Remedial Goal Option (RGO)/Result: Antimony mg/kg 470 | Lead mg/kg 800 | PCB-1254 mg/kg 9.7 | PCB-1260 mg/kg 9.9 | B[a]a mg/kg 29 | BaP mg/kg 2.9 | BbF mg/kg 29 | DA mg/kg 2.9 | RDX mg/kg 280 | TNT mg/kg 510 | 2,6-DNT mg/kg 15 | Notes | Action | Submitted to Army | Approved by Army | Submitted to Ohio EPA | OhioEPA Concurrence |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | CB-4A | RDX, TNT | Excavation Sample - ISM TRIPLICATE set1 | Sidewall South | 11/20/2020 | CT | 158141 | LL1CB4Acs-738-001-SO (SW South) | - | - | - | - | - | - | - | - | 0.2 U | 2.2 Q | - | Q qualifier - LCS outside acceptance limits:<br>- LCS spiked no grinding - acceptable recovery<br>- LCS spiked and grinding - 11% recovery for TNT = bias low (RDX okay) | | 12/8/2020 | 12/9/2020 | 12/11/2020 | 12/14/2020 |
| 1 | CB-4A | RDX, TNT | Excavation Sample - ISM TRIPLICATE set1 | Sidewall South | 11/20/2020 | CT | 158141 | LL1CB4Acs-738-002-SO (SW South) | - | - | - | - | - | - | - | - | 2.6 P | 480 Q | - | - All but one concentration are substantially lower than RGO so there is confidence that the true concentrations are less than RGO (note that although one TNT concentration is closer to the RGO, the protocol in the QAPP is being followed to calculate 95% UCL to compare to the RGO and this has resulted in conclusion that this DU exceeds the RGO, so more soil will be excavated and the extension will be resampled for TNT)<br>- Laboratory Subsample RSD data is in control | | 12/8/2020 | 12/9/2020 | 12/11/2020 | 12/14/2020 |
| 1 | CB-4A | RDX, TNT | Excavation Sample - ISM TRIPLICATE set1 | Sidewall South | 11/20/2020 | CT | 158141 | LL1CB4Acs-738-003-SO (SW South) | - | - | - | - | - | - | - | - | 7.6 | 44 Q | - | P qualifier - Concentration of analyte differs more than 40% between primary and confirmation analysis.<br>- The higher of the two values is reported. | - RGOs met in each individual replicate sample;<br>- RSD >100% for RDX and TNT;<br>- 95% UCL (Chebyshev method) is less than RGO for RDX but greater than RGO for TNT; | 12/8/2020 | 12/9/2020 | 12/11/2020 | 12/14/2020 |
| 1 | CB-4A | RDX, TNT | Excavation Sample - ISM TRIPLICATE set1 | | | | | **arithmetic mean** | | | | | | | | | 3.467 | 175.400 | | | - additional excavation 5' in this direction (south) for TNT and resample as ISM triplicate - see below. | 12/17/2020 | 12/28/2020 | 12/30/2020 | |
| 1 | CB-4A | RDX, TNT | Excavation Sample - ISM TRIPLICATE set1 | | | | | **standard deviation** | | | | | | | | | 3.775 | 264.618 | | | | 12/17/2020 | 12/28/2020 | 12/30/2020 | |
| 1 | CB-4A | RDX, TNT | Excavation Sample - ISM TRIPLICATE set1 | | | | | **CV = SD / mean** | | | | | | | | | 109% | 151% | | lab subsample triplicate 14.9% RSD RDX and 8.7% TNT, shows good control | | 12/17/2020 | 12/28/2020 | 12/30/2020 | |
| 1 | CB-4A | RDX, TNT | Excavation Sample - ISM TRIPLICATE set1 | | | | | **count (r)** | | | | | | | | | 3 | 3 | | | | 12/17/2020 | 12/28/2020 | 12/30/2020 | |
| 1 | CB-4A | RDX, TNT | Excavation Sample - ISM TRIPLICATE set1 | | | | | **alpha (95% = 0.05)** | | | | | | | | | 0.05 | 0.05 | | | | 12/17/2020 | 12/28/2020 | 12/30/2020 | |
| 1 | CB-4A | RDX, TNT | Excavation Sample - ISM TRIPLICATE set1 | | | | | **t(alpha, df=r-1)** | | | | | | | | | 2.92 | 2.92 | | | | 12/17/2020 | 12/28/2020 | 12/30/2020 | |
| 1 | CB-4A | RDX, TNT | Excavation Sample - ISM TRIPLICATE set1 | | | | | **Student's t UCL** | | | | | | | | | 9.83 | 621.51 | | | | 12/17/2020 | 12/28/2020 | 12/30/2020 | |
| 1 | CB-4A | RDX, TNT | Excavation Sample - ISM TRIPLICATE set1 | | | | | **Chebyshev UCL** | | | | | | | | | 12.97 | 841.34 | | | | 12/17/2020 | 12/28/2020 | 12/30/2020 | |
| 1 | CB-4A | TNT | Excavation Sample | Sidewall South EASTERN END | 1/14/2021 | CT | 159240 | LL1CB4Acs-765-001-SO (SWS1) | - | - | - | - | - | - | - | - | - | 330 | - | | Extends 50 feet from SE corner<br>- One replicate exceeds the RGO<br>- RSD<35%, per work plan compare the maximum field replicate concentration to the RGO<br>- Additional soil has been excavated 5 feet in this direction for this 50-foot length of wall (the rest of the wall was sampled as separate DUs that meet the RGO - see below). As discussed with the Army, there is no soil in the treatment interval (1 to 5'bgs) for the further extended sidewall, therefore no additional samples can be collected.<br>- Pending the post-excavation survey the excavation can be backfilled. | 1/25/2021 | 1/26/2021 | 1/26/2021 | |
| 1 | CB-4A | TNT | Excavation Sample - ISM TRIPLICATE set13 | Sidewall South EASTERN END | 1/14/2021 | CT | 159240 | LL1CB4Acs-765-002-SO (SWS1) | - | - | - | - | - | - | - | - | - | 460 | - | | | 1/25/2021 | 1/26/2021 | 1/26/2021 | |
| 1 | CB-4A | TNT | Excavation Sample - ISM TRIPLICATE set13 | Sidewall South EASTERN END | 1/14/2021 | CT | 159240 | LL1CB4Acs-765-003-SO (SWS1) | - | - | - | - | - | - | - | - | - | 550 | - | | | 1/25/2021 | 1/26/2021 | 1/26/2021 | |
| 1 | CB-4A | TNT | Excavation Sample - ISM TRIPLICATE set13 | | | | | **arithmetic mean** | | | | | | | | | | 447 | | | | 1/25/2021 | 1/26/2021 | 1/26/2021 | |
| 1 | CB-4A | TNT | Excavation Sample - ISM TRIPLICATE set13 | | | | | **standard deviation** | | | | | | | | | | 110.604 | | | | 1/25/2021 | 1/26/2021 | 1/26/2021 | |
| 1 | CB-4A | TNT | Excavation Sample - ISM TRIPLICATE set13 | | | | | **CV = SD / mean** | | | | | | | | | | 25% | | | | 1/25/2021 | 1/26/2021 | 1/26/2021 | |
| 1 | CB-4A | TNT | Excavation Sample - ISM TRIPLICATE set13 | | | | | **count (r)** | | | | | | | | | | 3 | | | | 1/25/2021 | 1/26/2021 | 1/26/2021 | |
| 1 | CB-4A | TNT | Excavation Sample - ISM TRIPLICATE set13 | | | | | **alpha (95% = 0.05)** | | | | | | | | | | 0.05 | | | | 1/25/2021 | 1/26/2021 | 1/26/2021 | |
| 1 | CB-4A | TNT | Excavation Sample - ISM TRIPLICATE set13 | | | | | **t(alpha, df=r-1)** | | | | | | | | | | 2.92 | | | | 1/25/2021 | 1/26/2021 | 1/26/2021 | |
| 1 | CB-4A | TNT | Excavation Sample - ISM TRIPLICATE set13 | | | | | **Student's t UCL** | | | | | | | | | | 633.13 | | | | 1/25/2021 | 1/26/2021 | 1/26/2021 | |
| 1 | CB-4A | TNT | Excavation Sample - ISM TRIPLICATE set13 | | | | | **Chebyshev UCL** | | | | | | | | | | 725.01 | | | | 1/25/2021 | 1/26/2021 | 1/26/2021 | |
| 1 | CB-4A | TNT | Excavation Sample | Sidewall South MID PORTION | 1/14/2021 | CT | 159240 | LL1CB4Acs-766-001-SO (SWS2) | - | - | | - | - | - | - | - | - | 3.8 | - | | Starts 50' from SE corner and extends 50' long<br>- RGOs met in each individual replicate sample;<br>- RSD >50% but <100%;<br>- 95% UCL (Chebyshev method) is less than the RGO;<br>- no further excavation for this portion of the SWS | 1/25/2021 | 1/26/2021 | 1/26/2021 | |
| 1 | CB-4A | TNT | Excavation Sample - ISM TRIPLICATE set14 | Sidewall South MID PORTION | 1/14/2021 | CT | 159240 | LL1CB4Acs-766-002-SO (SWS2) | - | - | | - | - | - | - | - | - | 0.88 | - | | | 1/25/2021 | 1/26/2021 | 1/26/2021 | |
| 1 | CB-4A | TNT | Excavation Sample - ISM TRIPLICATE set14 | Sidewall South MID PORTION | 1/14/2021 | CT | 159240 | LL1CB4Acs-766-003-SO (SWS2) | - | - | | - | - | - | - | - | - | 0.8 | - | | | 1/25/2021 | 1/26/2021 | 1/26/2021 | |
| 1 | CB-4A | TNT | Excavation Sample - ISM TRIPLICATE set14 | | | | | **arithmetic mean** | | | | | | | | | | 1.827 | | | | 1/25/2021 | 1/26/2021 | 1/26/2021 | |
| 1 | CB-4A | TNT | Excavation Sample - ISM TRIPLICATE set14 | | | | | **standard deviation** | | | | | | | | | | 1.709 | | | | 1/25/2021 | 1/26/2021 | 1/26/2021 | |
| 1 | CB-4A | TNT | Excavation Sample - ISM TRIPLICATE set14 | | | | | **CV = SD / mean** | | | | | | | | | | 94% | | lab subsample triplicate 2.13% RSD TNT, shows good control | | 1/25/2021 | 1/26/2021 | 1/26/2021 | |
| 1 | CB-4A | TNT | Excavation Sample - ISM TRIPLICATE set14 | | | | | **count (r)** | | | | | | | | | | 3 | | | | 1/25/2021 | 1/26/2021 | 1/26/2021 | |
| 1 | CB-4A | TNT | Excavation Sample - ISM TRIPLICATE set14 | | | | | **alpha (95% = 0.05)** | | | | | | | | | | 0.05 | | | | 1/25/2021 | 1/26/2021 | 1/26/2021 | |
| 1 | CB-4A | TNT | Excavation Sample - ISM TRIPLICATE set14 | | | | | **t(alpha, df=r-1)** | | | | | | | | | | 2.92 | | | | 1/25/2021 | 1/26/2021 | 1/26/2021 | |
| 1 | CB-4A | TNT | Excavation Sample - ISM TRIPLICATE set14 | | | | | **Student's t UCL** | | | | | | | | | | 4.71 | | | | 1/25/2021 | 1/26/2021 | 1/26/2021 | |
| 1 | CB-4A | TNT | Excavation Sample - ISM TRIPLICATE set14 | | | | | **Chebyshev UCL** | | | | | | | | | | 6.13 | | | | 1/25/2021 | 1/26/2021 | 1/26/2021 | |
| 1 | CB-4A | TNT | Excavation Sample | Sidewall South WEST END | 1/14/2021 | CT | 159240 | LL1CB4Acs-767-001-SO (SWS3) | - | - | - | - | - | - | - | - | - | 0.47 | - | | Westernmost 16' of the SWS RGO has been met for this portion of the SWS, no further excavation | 1/25/2021 | 1/26/2021 | 1/26/2021 | |

**LL 1-4 & 12 Remedial Action**
**Excavation Confirmation Sample Results (unvalidated)**

| | | | | | | | | | Analyte/Units/Remedial Goal Option (RGO)/Result | | | | | | | | |

**LL 1-4 & 12 Remedial Action**
**Excavation Confirmation Sample Results (unvalidated)**

| | | | | | | | | | Analyte/Units/Remedial Goal Option (RGO)/Result | | | | | | | | |

**LL 1-4 & 12 Remedial Action**
**Excavation Confirmation Sample Results (unvalidated)**

| | | | | | | | | | Analyte/Units/Remedial Goal Option (RGO)/Result | | | | | | | | |

**LL 1-4 & 12 Remedial Action**
**Excavation Confirmation Sample Results (unvalidated)**

| | | | | | | | | | Analyte/Units/Remedial Goal Option (RGO)/Result | | | | | | | | |

**LL 1-4 & 12 Remedial Action**
**Excavation Confirmation Sample Results (unvalidated)**

| Load Line | Remediation Area | COCs | Description/ Rationale | Location | Sample Date | Lab | Lab SDG # | Sample ID/Location | Analyte/Units/Remedial Goal Option (RGO)/Result | | | | | | | | | | | | | | | | Notes | Action | Submitted to Army | Approved by Army | Submitted to Ohio EPA | OhioEPA Concurrence |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | Antimony | | Lead | | PCB-1254 | | PCB-1260 | | B(a)a | | BaP | | BbF | | DA | | RDX | | TNT | | 2,6-DNT | | | | | | | |
| | | | | | | | | | mg/kg | | mg/kg | | mg/kg | | mg/kg | | mg/kg | | mg/kg | | mg/kg | | mg/kg | | mg/kg | | mg/kg | | mg/kg | | | | | | | |
| | | | | | | | | | 470 | | 800 | | 9.7 | | 9.9 | | 29 | | 2.9 | | 29 | | 2.9 | | 280 | | 510 | | 15 | | | | | | | |
| 3 | EB-10 (b) | PCB-1254 | Excavation Sample | No Samples | NA | NA | NA | no samples | - | | - | | - | | - | | NA | | NA | | NA | | NA | | - | | - | | - | | Excavation is within EB-10(a). Soils within EB-10(b) 0-2'bgs treatment interval excavated and treated with Cell 1B-3. East sidewall is concrete- no sample. With associated concrete removal, sidewalls of EB-10(b) collapsed into surrounding EB-10(a). Therefore, no EB-10(b) sidewall samples. Excavated to EB-10(a) depth (bedrock encountered) and all soils underlying and surrounding EB-10(b) were added to Cell 2A-6; treatment verification samples will include the COC for EB-10(b) PCB-1254.<br><br>Pending post-excavation survey, excavation can be backfilled. | 12/22/2020 | 12/28/2020 | 12/30/2020 | |
| 3 | West Perimeter | B(a)a, BaP, BbF, DA | Excavation Sample | Bottom | 12/21/2020 | CT | 158799 | LL3WPcs-581-001-SO (Bottom) | - | | - | | - | | - | | 15.5 | | 12 | | 15.9 | | 1.3 | | - | | - | | - | | Additional soil excavated 3' in this direction for treatment, and an additional ISM sample collected from the new bottom for BaP. | 1/11/2021 | 1/12/2021 | 1/12/2021 | |
| 3 | West Perimeter | BaP | Excavation Sample | Bottom | 1/13/2021 | CT | 159189 | LL3WPcs-587-001-SO (Bottom) | - | | - | | - | | - | | - | | 1.18 | | - | | - | | - | | - | | - | | RGOs have been met, no further excavation in this direction. | 1/25/2021 | 1/26/2021 | 1/26/2021 | |
| 3 | West Perimeter | B(a)a, BaP, BbF, DA | Excavation Sample - ISM TRIPLICATE set 10 | Sidewall North | 12/21/2020 | CT | 158799 | LL3WPcs-582-001-SO (SWN) | - | | - | | - | | - | | 69.3 | | 73.7 | | 101 | | 10.7 | | - | | - | | - | | | 1/11/2021 | 1/12/2021 | 1/12/2021 | |
| 3 | West Perimeter | B(a)a, BaP, BbF, DA | Excavation Sample - ISM TRIPLICATE set 10 | Sidewall North | 12/21/2020 | CT | 158799 | LL3WPcs-582-002-SO (SWN) | - | | - | | - | | - | | 63.6 | | 67 | | 86 | | 9.89 | | - | | - | | - | | | 1/11/2021 | 1/12/2021 | 1/12/2021 | |
| 3 | West Perimeter | B(a)a, BaP, BbF, DA | Excavation Sample - ISM TRIPLICATE set 10 | Sidewall North | 12/21/2020 | CT | 158799 | LL3WPcs-582-003-SO (SWN) | - | | - | | - | | - | | 67.7 | | 68.6 | | 95.7 | | 10.5 | | - | | - | | - | | | 1/11/2021 | 1/12/2021 | 1/12/2021 | |
| 3 | West Perimeter | B(a)a, BaP, BbF, DA | Excavation Sample - ISM TRIPLICATE set 10 | | | | | **arithmetic mean** | | | | | | | | | 66.867 | | 69.767 | | 94.233 | | 10.363 | | | | | | | | - RGOs exceeded for all PAHs (B(a)a, BaP, BbF, DA);<br><br>- RSDs <35%;<br><br>- Additional soil excavated 3' in this direction for treatment, and an additional ISM sample collected in triplicate from the new sidewall north for B(a)a, BaP, BbF, DA - see below. | 1/11/2021 | 1/12/2021 | 1/12/2021 | |
| 3 | West Perimeter | B(a)a, BaP, BbF, DA | Excavation Sample - ISM TRIPLICATE set 10 | | | | | **standard deviation** | | | | | | | | | 2.940 | | 3.499 | | 7.607 | | 0.422 | | | | | | | | | 1/11/2021 | 1/12/2021 | 1/12/2021 | |
| 3 | West Perimeter | B(a)a, BaP, BbF, DA | Excavation Sample - ISM TRIPLICATE set 10 | | | | | **CV = SD / mean** | | | | | | | | | 4% | | 5% | | 8% | | 4% | | | | | | | | | 1/11/2021 | 1/12/2021 | 1/12/2021 | |
| 3 | West Perimeter | B(a)a, BaP, BbF, DA | Excavation Sample - ISM TRIPLICATE set 10 | | | | | **count (r)** | | | | | | | | | 3 | | 3 | | 3 | | 3 | | | | | | | | | 1/11/2021 | 1/12/2021 | 1/12/2021 | |
| 3 | West Perimeter | B(a)a, BaP, BbF, DA | Excavation Sample - ISM TRIPLICATE set 10 | | | | | **alpha (95% = 0.05)** | | | | | | | | | 0.05 | | 0.05 | | 0.05 | | 0.05 | | | | | | | | | 1/11/2021 | 1/12/2021 | 1/12/2021 | |
| 3 | West Perimeter | B(a)a, BaP, BbF, DA | Excavation Sample - ISM TRIPLICATE set 10 | | | | | **t(alpha, df=r-1)** | | | | | | | | | 2.92 | | 2.92 | | 2.92 | | 2.92 | | | | | | | | | 1/11/2021 | 1/12/2021 | 1/12/2021 | |
| 3 | West Perimeter | B(a)a, BaP, BbF, DA | Excavation Sample - ISM TRIPLICATE set 10 | | | | | **Student's t UCL** | | | | | | | | | 71.82 | | 75.67 | | 107.06 | | 11.07 | | | | | | | | | 1/11/2021 | 1/12/2021 | 1/12/2021 | |
| 3 | West Perimeter | B(a)a, BaP, BbF, DA | Excavation Sample - ISM TRIPLICATE set 10 | | | | | **Chebyshev UCL** | | | | | | | | | 74.27 | | 78.57 | | 113.38 | | 11.43 | | | | | | | | | 1/11/2021 | 1/12/2021 | 1/12/2021 | |
| 3 | West Perimeter | B(a)a, BaP, BbF, DA | Excavation Sample | Sidewall North | 1/12/2021 | CT | 159157 | LL3WPcs-588-001-SO (SWN) | - | | - | | - | | - | | 1.4 | | 1.23 | | 1.62 | | 0.15 | | - | | - | | - | | | 1/25/2021 | 1/26/2021 | 1/26/2021 | |
| 3 | West Perimeter | B(a)a, BaP, BbF, DA | Excavation Sample - ISM TRIPLICATE set 14 | Sidewall North | 1/12/2021 | CT | 159157 | LL3WPcs-588-002-SO (SWN) | - | | - | | - | | - | | 1.91 | | 1.59 | | 2.24 | | 0.202 | | - | | - | | - | | | 1/25/2021 | 1/26/2021 | 1/26/2021 | |
| 3 | West Perimeter | B(a)a, BaP, BbF, DA | Excavation Sample - ISM TRIPLICATE set 14 | Sidewall North | 1/12/2021 | CT | 159157 | LL3WPcs-588-003-SO (SWN) | - | | - | | - | | - | | 1.88 | M | 1.53 | M | 2.03 | M | 0.186 | M | - | | - | | - | | M qualifier - Matrix spike and/or Matrix Spike Duplicate recovery outside acceptance limits.<br>- therefore data manually integrated, no concern with data usability<br>- moderately low bias | 1/25/2021 | 1/26/2021 | 1/26/2021 | |
| 3 | West Perimeter | B(a)a, BaP, BbF, DA | Excavation Sample - ISM TRIPLICATE set 14 | | | | | **arithmetic mean** | | | | | | | | | 1.730 | | 1.450 | | 1.963 | | 0.179 | | | | | | | | - RGOs met in each individual replicate sample;<br><br>- RSDs <35%<br><br>- no further excavation in this direction | 1/25/2021 | 1/26/2021 | 1/26/2021 | |
| 3 | West Perimeter | B(a)a, BaP, BbF, DA | Excavation Sample - ISM TRIPLICATE set 14 | | | | | **standard deviation** | | | | | | | | | 0.286 | | 0.193 | | 0.315 | | 0.027 | | | | | | | | | 1/25/2021 | 1/26/2021 | 1/26/2021 | |
| 3 | West Perimeter | B(a)a, BaP, BbF, DA | Excavation Sample - ISM TRIPLICATE set 14 | | | | | **CV = SD / mean** | | | | | | | | | 17% | | 13% | | 16% | | 15% | | | | | | | | | 1/25/2021 | 1/26/2021 | 1/26/2021 | |
| 3 | West Perimeter | B(a)a, BaP, BbF, DA | Excavation Sample - ISM TRIPLICATE set 14 | | | | | **count (r)** | | | | | | | | | 3 | | 3 | | 3 | | 3 | | | | | | | | | 1/25/2021 | 1/26/2021 | 1/26/2021 | |
| 3 | West Perimeter | B(a)a, BaP, BbF, DA | Excavation Sample - ISM TRIPLICATE set 14 | | | | | **alpha (95% = 0.05)** | | | | | | | | | 0.05 | | 0.05 | | 0.05 | | 0.05 | | | | | | | | | 1/25/2021 | 1/26/2021 | 1/26/2021 | |
| 3 | West Perimeter | B(a)a, BaP, BbF, DA | Excavation Sample - ISM TRIPLICATE set 14 | | | | | **t(alpha, df=r-1)** | | | | | | | | | 2.92 | | 2.92 | | 2.92 | | 2.92 | | | | | | | | | 1/25/2021 | 1/26/2021 | 1/26/2021 | |
| 3 | West Perimeter | B(a)a, BaP, BbF, DA | Excavation Sample - ISM TRIPLICATE set 14 | | | | | **Student's t UCL** | | | | | | | | | 2.21 | | 1.78 | | 2.49 | | 0.22 | | | | | | | | | 1/25/2021 | 1/26/2021 | 1/26/2021 | |
| 3 | West Perimeter | B(a)a, BaP, BbF, DA | Excavation Sample - ISM TRIPLICATE set 14 | | | | | **Chebyshev UCL** | | | | | | | | | 2.45 | | 1.94 | | 2.76 | | 0.25 | | | | | | | | | 1/25/2021 | 1/26/2021 | 1/26/2021 | |

**LL 1-4 & 12 Remedial Action**
**Excavation Confirmation Sample Results (unvalidated)**

| Load Line | Remediation Area | COCs | Description/ Rationale | Location | Sample Date | Lab | Lab SDG # | Sample ID/Location | Antimony mg/kg 470 | Lead mg/kg 800 | PCB-1254 mg/kg 9.7 | PCB-1260 mg/kg 9.9 | B(a)a mg/kg 29 | BaP mg/kg 2.9 | BbF mg/kg 29 | DA mg/kg 2.9 | RDX mg/kg 280 | TNT mg/kg 510 | 2,6-DNT mg/kg 15 | Notes | Action | Submitted to Army | Approved by Army | Submitted to Ohio EPA | OhioEPA Concurrence |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3 | West Perimeter | B(a)a, BaP, BbF, DA | Excavation Sample - ISM TRIPLICATE set 11 | Sidewall West | 12/21/2020 | CT | 158799 | LL3WPcs-583-001-SO (SWW) | - | - | - | - | 24.9 | 24.3 | 27.9 | 2.54 | - | - | - | | | 1/11/2021 | 1/12/2021 | 1/12/2021 | |
| 3 | West Perimeter | B(a)a, BaP, BbF, DA | Excavation Sample - ISM TRIPLICATE set 11 | Sidewall West | 12/21/2020 | CT | 158799 | LL3WPcs-583-002-SO (SWW) | - | - | - | - | 26.6 | 25.7 | 32.6 | 2.63 | - | - | - | | | 1/11/2021 | 1/12/2021 | 1/12/2021 | |
| 3 | West Perimeter | B(a)a, BaP, BbF, DA | Excavation Sample - ISM TRIPLICATE set 11 | Sidewall West | 12/21/2020 | CT | 158799 | LL3WPcs-583-003-SO (SWW) | - | - | - | - | 22.2 | 21.6 | 25.5 | 1.97 | - | - | - | | | 1/11/2021 | 1/12/2021 | 1/12/2021 | |
| 3 | West Perimeter | B(a)a, BaP, BbF, DA | Excavation Sample - ISM TRIPLICATE set 11 | | | | | **arithmetic mean** | | | | | 24.567 | 23.867 | 28.667 | 2.380 | | | | | - RGOs exceeded for BaP and BbF; | 1/11/2021 | 1/12/2021 | 1/12/2021 | |
| 3 | West Perimeter | B(a)a, BaP, BbF, DA | Excavation Sample - ISM TRIPLICATE set 11 | | | | | **standard deviation** | | | | | 2.219 | 2.084 | 3.612 | 0.358 | | | | | - RSDs<35%; | 1/11/2021 | 1/12/2021 | 1/12/2021 | |
| 3 | West Perimeter | B(a)a, BaP, BbF, DA | Excavation Sample - ISM TRIPLICATE set 11 | | | | | **CV = SD / mean** | | | | | 9% | 9% | 13% | 15% | | | | | - Additional soil excavated 3' in this direction for treatment, and an additional ISM sample collected in triplicate from the new sidewall west for BaP and BbF - see below. | 1/11/2021 | 1/12/2021 | 1/12/2021 | |
| 3 | West Perimeter | B(a)a, BaP, BbF, DA | Excavation Sample - ISM TRIPLICATE set 11 | | | | | **count (r)** | | | | | 3 | 3 | 3 | 3 | | | | | | 1/11/2021 | 1/12/2021 | 1/12/2021 | |
| 3 | West Perimeter | B(a)a, BaP, BbF, DA | Excavation Sample - ISM TRIPLICATE set 11 | | | | | **alpha (95% = 0.05)** | | | | | 0.05 | 0.05 | 0.05 | 0.05 | | | | | | 1/11/2021 | 1/12/2021 | 1/12/2021 | |
| 3 | West Perimeter | B(a)a, BaP, BbF, DA | Excavation Sample - ISM TRIPLICATE set 11 | | | | | **t(alpha, df=r-1)** | | | | | 2.92 | 2.92 | 2.92 | 2.92 | | | | | | 1/11/2021 | 1/12/2021 | 1/12/2021 | |
| 3 | West Perimeter | B(a)a, BaP, BbF, DA | Excavation Sample - ISM TRIPLICATE set 11 | | | | | **Student's t UCL** | | | | | 28.31 | 27.38 | 34.76 | 2.98 | | | | | | 1/11/2021 | 1/12/2021 | 1/12/2021 | |
| 3 | West Perimeter | B(a)a, BaP, BbF, DA | Excavation Sample - ISM TRIPLICATE set 11 | | | | | **Chebyshev UCL** | | | | | 30.15 | 29.11 | 37.76 | 3.28 | | | | | | 1/11/2021 | 1/12/2021 | 1/12/2021 | |
| 3 | West Perimeter | BaP, BbF - add B(a)a, DA | Excavation Sample | Sidewall West | 1/12/2021 | CT | 159157 | LL3WPcs-589-001-SO (SWW) | - | - | - | - | 2.84 | 2.53 | 3.33 | 0.252 | - | - | - | | | 1/25/2021 | 1/26/2021 | 1/26/2021 | |
| 3 | West Perimeter | BaP, BbF - add B(a)a, DA | Excavation Sample - ISM TRIPLICATE set 15 | Sidewall West | 1/12/2021 | CT | 159157 | LL3WPcs-589-002-SO (SWW) | - | - | - | - | 3.12 | 2.93 | 3.96 | 0.323 | - | - | - | | | 1/25/2021 | 1/26/2021 | 1/26/2021 | |
| 3 | West Perimeter | BaP, BbF - add B(a)a, DA | Excavation Sample - ISM TRIPLICATE set 15 | Sidewall West | 1/12/2021 | CT | 159157 | LL3WPcs-589-003-SO (SWW) | - | - | - | - | 1.84 | 1.76 | 2.5 | 0.228 | - | - | - | | | 1/25/2021 | 1/26/2021 | 1/26/2021 | |
| 3 | West Perimeter | BaP, BbF - add B(a)a, DA | Excavation Sample - ISM TRIPLICATE set 15 | | | | | **arithmetic mean** | | | | | 2.600 | 2.407 | 3.263 | 0.268 | | | | | - One replicate slightly exceeds the RGO | 1/25/2021 | 1/26/2021 | 1/26/2021 | |
| 3 | West Perimeter | BaP, BbF - add B(a)a, DA | Excavation Sample - ISM TRIPLICATE set 15 | | | | | **standard deviation** | | | | | 0.673 | 0.595 | 0.732 | 0.049 | | | | | - RSD<35%, per work plan compare the maximum field replicate concentration to the RGO | 1/25/2021 | 1/26/2021 | 1/26/2021 | |
| 3 | West Perimeter | BaP, BbF - add B(a)a, DA | Excavation Sample - ISM TRIPLICATE set 15 | | | | | **CV = SD / mean** | | | | | 26% | 25% | 22% | 18% | | | | | - Additional soil excavated 3' in this direction for treatment, and an additional ISM sample collected from the new sidewall west for BaP - see below. | 1/25/2021 | 1/26/2021 | 1/26/2021 | |
| 3 | West Perimeter | BaP, BbF - add B(a)a, DA | Excavation Sample - ISM TRIPLICATE set 15 | | | | | **count (r)** | | | | | 3 | 3 | 3 | 3 | | | | | | 1/25/2021 | 1/26/2021 | 1/26/2021 | |
| 3 | West Perimeter | BaP, BbF - add B(a)a, DA | Excavation Sample - ISM TRIPLICATE set 15 | | | | | **alpha (95% = 0.05)** | | | | | 0.05 | 0.05 | 0.05 | 0.05 | | | | | | 1/25/2021 | 1/26/2021 | 1/26/2021 | |
| 3 | West Perimeter | BaP, BbF - add B(a)a, DA | Excavation Sample - ISM TRIPLICATE set 15 | | | | | **t(alpha, df=r-1)** | | | | | 2.92 | 2.92 | 2.92 | 2.92 | | | | | | 1/25/2021 | 1/26/2021 | 1/26/2021 | |
| 3 | West Perimeter | BaP, BbF - add B(a)a, DA | Excavation Sample - ISM TRIPLICATE set 15 | | | | | **Student's t UCL** | | | | | 3.73 | 3.41 | 4.50 | 0.35 | | | | | | 1/25/2021 | 1/26/2021 | 1/26/2021 | |
| 3 | West Perimeter | BaP, BbF - add B(a)a, DA | Excavation Sample - ISM TRIPLICATE set 15 | | | | | **Chebyshev UCL** | | | | | 4.29 | 3.90 | 5.11 | 0.39 | | | | | | 1/25/2021 | 1/26/2021 | 1/26/2021 | |
| 3 | West Perimeter | BaP | Excavation Sample | Sidewall West | 1/22/2021 | CT | 159381 | LL3WPcs-592-001-SO (SWW) | - | - | - | - | - | 4.48 | - | - | - | - | - | | Asphalt present in sidewall, excavation abuts road. As discussed with Army, no further excavation or sampling. | 2/2/2021 | | | |
| 3 | West Perimeter | B(a)a, BaP, BbF, DA | Excavation Sample | Sidewall South | 12/21/2020 | CT | 158799 | LL3WPcs-584-001-SO (SWS) | - | - | - | - | 3.22 | 3.14 | 4.15 | 0.369 M,Y | - | - | - | M qualifier - Matrix spike and/or Matrix Spike Duplicate recovery outside acceptance limits - therefore data manually integrated, no concern with data usability<br>Y qualifier - Replicate/Duplicate precision outside acceptance limits. - Primary sample result is reported with data flagging | Additional soil excavated 3' in this direction for treatment, and an additional ISM sample collected from the new sidewall south for BaP - see below. | 1/11/2021 | 1/12/2021 | 1/12/2021 | |
| 3 | West Perimeter | BaP | Excavation Sample | Sidewall South | 1/13/2021 | CT | 159189 | LL3WPcs-590-001-SO (SWS) | - | - | - | - | - | 0.364 | - | - | - | - | - | | RGOs have been met, no further excavation in this direction. | 1/25/2021 | 1/26/2021 | 1/26/2021 | |
| 3 | West Perimeter | B(a)a, BaP, BbF, DA | Excavation Sample | Sidewall East | 12/21/2020 | CT | 158799 | LL3WPcs-585-001-SO (SWE) | - | - | - | - | 37.1 | 32.1 | 41.4 | 4.65 | - | - | - | | Additional soil excavated 3' in this direction for treatment, and an additional ISM sample collected from the new sidewall east for B(a)a, BaP, BbF, DA - see below. | 1/11/2021 | 1/12/2021 | 1/12/2021 | |
| 3 | West Perimeter | B(a)a, BaP, BbF, DA | Excavation Sample | Sidewall East | 1/13/2021 | CT | 159189 | LL3WPcs-591-001-SO (SWE) | - | - | - | - | 0.489 | 0.413 | 0.601 | 0.0485 | - | - | - | | RGOs have been met, no further excavation in this direction. | 1/25/2021 | 1/26/2021 | 1/26/2021 | |
| 4 | Building G-8 (a) | B(a)a, BaP, BbF, DA | Excavation Sample | Sidewall West | 12/9/2020 | CT | 158521 | LL4G8ACS-522-001-SO (SWW) | - | - | - | - | 0.025 | 0.025 | 0.883 | 0.0696 | - | - | - | | | 12/22/2020 | 12/28/2020 | 12/30/2020 | |
| 4 | Building G-8 (a) | B(a)a, BaP, BbF, DA | Excavation Sample | Sidewall East | 12/9/2020 | CT | 158521 | LL4G8ACS-523-001-SO (SWE) | - | - | - | - | 0.0051 J | 0.0051 J | 0.00622 | 0.0025 U | - | - | - | | | 12/22/2020 | 12/28/2020 | 12/30/2020 | |
| 4 | Building G-8 (a) | B(a)a, BaP, BbF, DA | Excavation Sample | Sidewall North | 12/9/2020 | CT | 158521 | LL4G8ACS-524-001-SO (SWN) | - | - | - | - | 0.0049 J | 0.0049 J | 0.00263 J | 0.0025 U | - | - | - | | RGOs have been met. Pending post-excavation survey, excavation can be backfilled. | 12/22/2020 | 12/28/2020 | 12/30/2020 | |
| 4 | Building G-8 (a) | B(a)a, BaP, BbF, DA | Excavation Sample | Bottom 1 | 12/10/2020 | CT | 158584 | LL4G8ACS-525-001-SO (Bottom) | - | - | - | - | 0.00168 JY | 0.00157 JY | 0.00264 JY | 0.0024 U | - | - | - | Y qualifier - Replicate/Duplicate precision outside acceptance limits. - Primary sample result is reported with data flagging | | 12/22/2020 | 12/28/2020 | 12/30/2020 | |
| 4 | Building G-8 (a) | B(a)a, BaP, BbF, DA | Excavation Sample | Sidewall South | 12/10/2020 | CT | 158584 | LL4G8ACS-526-001-SO (SWS) | - | - | - | - | 0.00168 | 0.0157 | 0.0214 | 0.00195 J | - | - | - | | | 12/22/2020 | 12/28/2020 | 12/30/2020 | |

**LL 1-4 & 12 Remedial Action**
**Excavation Confirmation Sample Results (unvalidated)**

| Load Line | Remediation Area | COCs | Description/ Rationale | Location | Sample Date | Lab | Lab SDG # | Sample ID/Location | Analyte/Units/Remedial Goal Option (RGO)/Result | | | | | | | | | | | | | | | | | | | | | | | | | | | | Notes | Action | Submitted to Army | Approved by Army | Submitted to Ohio EPA | OhioEPA Concurrence |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | Antimony mg/kg 470 | | Lead mg/kg 800 | | PCB-1254 mg/kg 9.7 | | PCB-1260 mg/kg 9.9 | | B[a]a mg/kg 29 | | BaP mg/kg 2.9 | | BbF mg/kg 29 | | DA mg/kg 2.9 | | RDX mg/kg 280 | | TNT mg/kg 510 | | 2,6-DNT mg/kg 15 | | | | | | | | | | | |
| 4 | Building G-8 (b) | B(a)a, BaP, BbF, DA | Excavation Sample | Bottom 1 | 12/14/2020 | CT | 158622 | LL4G8Bcs-532-001-SO (Bottom1) | - | | - | | - | | - | | 0.00197 | J | 0.00207 | P | 0.00476 | J | 0.0026 | U | - | | - | | - | | | | | | | | P qualifier - Concentration of analyte differs more than 40% between primary and confirmation analysis. - The higher of the two values is reported. | RGOs have been met, no further excavation in this direction | 12/29/2020 | 12/30/2020 | 12/30/2020 | |
| 4 | Building G-8 (b) | B(a)a, BaP, BbF, DA | Excavation Sample | Bottom 2 | 12/14/2020 | CT | 158622 | LL4G8Bcs-533-001-SO (Bottom2) | - | | - | | - | | - | | 0.0297 | | 0.0257 | | 0.0346 | | 0.00277 | J | - | | - | | - | | | | | | | | | RGOs have been met, no further excavation in this direction | 12/29/2020 | 12/30/2020 | 12/30/2020 | |
| 4 | Building G-8 (b) | B(a)a, BaP, BbF, DA | Excavation Sample | Sidewall West | 12/14/2020 | CT | 158622 | LL4G8Bcs-534-001-SO (SWW) | - | | - | | - | | - | | 0.00399 | J | 0.00459 | J | 0.00774 | | 0.0025 | U | - | | - | | - | | | | | | | | | RGOs have been met, no further excavation in this direction | 12/29/2020 | 12/30/2020 | 12/30/2020 | |
| 4 | Building G-8 (b) | B(a)a, BaP, BbF, DA | Excavation Sample | Sidewall North | 12/14/2020 | CT | 158622 | LL4G8Bcs-535-001-SO (SWN) | - | | - | | - | | - | | 8.03 | | 6.69 | | 8.37 | | 0.519 | | - | | - | | - | | | | | | | | | Additional soil excavated 3' in this direction for treatment, and an additional ISM sample collected from the new northern sidewall for BaP - see below. | 12/29/2020 | 12/30/2020 | 12/30/2020 | |
| 4 | Building G-8 (b) | BaP | Excavation Sample | Sidewall North | 1/13/2021 | CT | 159189 | LL4G8Bcs-543-001-SO (SWN) | - | | - | | - | | - | | - | | 2.02 | | - | | - | | - | | - | | - | | | | | | | | | RGOs have been met, no further excavation in this direction. Excavation can be backfilled. | 1/25/2021 | 1/26/2021 | 1/26/2021 | |
| 4 | Building G-8 (b) | B(a)a, BaP, BbF, DA | Excavation Sample | Sidewall South | 12/14/2020 | CT | 158622 | LL4G8Bcs-536-001-SO (SWS) | - | | - | | - | | - | | 0.0116 | | 0.0125 | | 0.0209 | | 0.00193 | J | - | | - | | - | | | | | | | | | RGOs have been met, no further excavation in this direction | 12/29/2020 | 12/30/2020 | 12/30/2020 | |
| 4 | Building G-8 (b) | B(a)a, BaP, BbF, DA | Excavation Sample | Sidewall East | 12/14/2020 | CT | 158622 | LL4G8Bcs-537-001-SO (SWE) | - | | - | | - | | - | | 0.021 | | 0.0185 | | 0.0265 | | 0.00244 | J | - | | - | | - | | | | | | | | | RGOs have been met, no further excavation in this direction | 12/29/2020 | 12/30/2020 | 12/30/2020 | |
| 4 | Building G-16 | PCB-1260 | Excavation Sample | Bottom | 12/11/2020 | CT | 158590 | LL4G16cs-527-001-SO (Bottom) | - | | - | | - | | 0.0232 | | - | | - | | - | | - | | - | | - | | - | | | | | | | | | RGOs have been met. Pending post-excavation survey, excavation can be backfilled. | 12/22/2020 | 12/28/2020 | 12/30/2020 | |
| 4 | Building G-16 | PCB-1260 | Excavation Sample | Sidewall West | 12/11/2020 | CT | 158590 | LL4G16cs-528-001-SO (SWW) | - | | - | | - | | 0.0965 | | - | | - | | - | | - | | - | | - | | - | | | | | | | | | | 12/22/2020 | 12/28/2020 | 12/30/2020 | |
| 4 | Building G-16 | PCB-1260 | Excavation Sample | Sidewall North | 12/11/2020 | CT | 158590 | LL4G16cs-529-001-SO (SWN) | - | | - | | - | | 0.0395 | | - | | - | | - | | - | | - | | - | | - | | | | | | | | | | 12/22/2020 | 12/28/2020 | 12/30/2020 | |
| 4 | Building G-16 | PCB-1260 | Excavation Sample | Sidewall South | 12/14/2020 | CT | 158622 | LL4G16cs-530-001-SO (SWS) | - | | - | | - | | 0.02 | U | - | | - | | - | | - | | - | | - | | - | | | | | | | | | | 12/29/2020 | 12/30/2020 | 12/30/2020 | |
| 4 | Building G-16 | PCB-1260 | Excavation Sample | Sidewall East | 12/14/2020 | CT | 158622 | LL4G16cs-531-001-SO (SWE) | - | | - | | - | | 0.0581 | P | - | | - | | - | | - | | - | | - | | - | | | | | | | | | P qualifier - Concentration of analyte differs more than 40% between primary and confirmation analysis. - The higher of the two values is reported. | | 12/29/2020 | 12/30/2020 | 12/30/2020 | |
| 4 | Former Water Tower | Lead | Excavation Sample | Bottom | 12/15/2020 | CT | 158721 | LL4FWTcs-538-001-SO (Bottom) | - | | 203 | | - | | - | | - | | - | | - | | - | | - | | - | | - | | | | | | | | | RGOs have been met, no further excavation in this direction | 12/29/2020 | 12/30/2020 | 12/30/2020 | |
| 4 | Former Water Tower | Lead | Excavation Sample | Sidewall South | 12/15/2020 | CT | 158721 | LL4FWTcs-539-001-SO (SWS) | - | | 147 | | - | | - | | - | | - | | - | | - | | - | | - | | - | | | | | | | | | RGOs have been met, no further excavation in this direction | 12/29/2020 | 12/30/2020 | 12/30/2020 | |
| 4 | Former Water Tower | Lead | Excavation Sample | Sidewall North | 12/15/2020 | CT | 158721 | LL4FWTcs-541-001-SO (SWN) | - | | 442 | | - | | - | | - | | - | | - | | - | | - | | - | | - | | | | | | | | | RGOs have been met, no further excavation in this direction | 12/29/2020 | 12/30/2020 | 12/30/2020 | |
| 4 | Former Water Tower | Lead | Excavation Sample | Sidewall East | 12/15/2020 | CT | 158721 | LL4FWTcs-540-001-SO (SWE) | - | | 843 | | - | | - | | - | | - | | - | | - | | - | | - | | - | | | | | | | | | Additional soil excavated 3' in this direction for off-site disposal, and an additional ISM sample collected from the new western sidewall for lead - see below. | 12/29/2020 | 12/30/2020 | 12/30/2020 | |
| 4 | Former Water Tower | Lead | Excavation Sample | Sidewall East | 1/12/2021 | CT | 159157 | LL4FWTcs-544-001-SO (SWE) | - | | 1120 | M | - | | - | | - | | - | | - | | - | | - | | - | | - | | | | | | | | | Per discussions with the Army, the eastern sidewall will be excavated further to the east until it daylights due to the sloping topography. No additional sampling. | 1/25/2021 | 1/26/2021 | 1/26/2021 | |
| 4 | Former Water Tower | Lead | Excavation Sample | Sidewall West | 12/15/2020 | CT | 158721 | LL4FWTcs-542-001-SO (SWW) | - | | 1110 | | - | | - | | - | | - | | - | | - | | - | | - | | - | | | | | | | | | Additional soil excavated 3' in this direction for off-site disposal, and an additional ISM sample collected from the new western sidewall for lead - see below. | 12/29/2020 | 12/30/2020 | 12/30/2020 | |
| 4 | Former Water Tower | Lead | Excavation Sample | Sidewall West | 1/12/2021 | CT | 159157 | LL4FWTcs-545-001-SO (SWW) | - | | 2120 | | - | | - | | - | | - | | - | | - | | - | | - | | - | | | | | | | | | Per discussions with the Army, the western sidewall was excavated further to the west approximately 10 feet, beyond which large trees are present, and an additional ISM sample for lead was collected for the further extended Sidewall West. | 1/25/2021 | 1/26/2021 | 1/26/2021 | |
| 4 | Former Water Tower | Lead | Excavation Sample | Sidewall West | 1/26/2021 | CT | 159436 | LL4FWTcs-546-001-SO (SWW) | - | | 117 | | - | | - | | - | | - | | - | | - | | - | | - | | - | | | | | | | | | RGOs have been met. Pending post-excavation survey, excavation can be backfilled. | 2/2/2021 | | | |
| 12 | Active Area Channel | TNT, 2,6-DNT, BaP | Excavation Sample | Bottom | 12/18/2020 | CT | 158762 | LL12AACcs-340-001-SO (Bottom) | - | | - | | - | | - | | - | | 0.0172 | | - | | - | | - | | 0.65 | | 0.2 | U | | | | | | | | | 1/6/2021 | 1/7/2021 | 1/7/2021 | |
| 12 | Active Area Channel | TNT, 2,6-DNT, BaP | Excavation Sample | Sidewall West | 12/18/2020 | CT | 158762 | LL12AACcs-341-001-SO (SWW) | - | | - | | - | | - | | - | | 0.00398 | J | - | | - | | - | | 2 | | 0.1 | J | | | | | | | | | 1/6/2021 | 1/7/2021 | 1/7/2021 | |
| 12 | Active Area Channel | TNT, 2,6-DNT, BaP | Excavation Sample | Sidewall South | 12/18/2020 | CT | 158762 | LL12AACcs-342-001-SO (SWS) | - | | - | | - | | - | | - | | 0.015 | J | - | | - | | - | | 0.71 | | 0.091 | J | | | | | | | | RGOs have been met. Pending post-excavation survey, excavation can be backfilled. | 1/6/2021 | 1/7/2021 | 1/7/2021 | |
| 12 | Active Area Channel | TNT, 2,6-DNT, BaP | Excavation Sample | Sidewall East | 12/18/2020 | CT | 158762 | LL12AACcs-343-001-SO (SWE) | - | | - | | - | | - | | - | | 0.00654 | | - | | - | | - | | 0.88 | | 0.2 | U | | | | | | | | | 1/6/2021 | 1/7/2021 | 1/7/2021 | |
| 12 | Active Area Channel | TNT, 2,6-DNT, BaP | Excavation Sample | Sidewall North | 12/18/2020 | CT | 158762 | LL12AACcs-344-001-SO (SWN) | - | | - | | - | | - | | - | | 0.015 | | - | | - | | - | | 0.35 | | 0.2 | U | | | | | | | | | 1/6/2021 | 1/7/2021 | 1/7/2021 | |

**LL 1-4 & 12 Remedial Action**
**Excavation Confirmation Sample Results (unvalidated)**

| Load Line | Remediation Area | COCs | Description/ Rationale | Location | Sample Date | Lab | Lab SDG # | Sample ID/Location | Antimony mg/kg 470 | Lead mg/kg 800 | PCB-1254 mg/kg 9.7 | PCB-1260 mg/kg 9.9 | B(a)a mg/kg 29 | BaP mg/kg 2.9 | BbF mg/kg 29 | DA mg/kg 2.9 | RDX mg/kg 280 | TNT mg/kg 510 | 2,6-DNT mg/kg 15 | Notes | Action | Submitted to Army | Approved by Army | Submitted to Ohio EPA | OhioEPA Concurrence |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 12 | FF-19 A | B(a)a, BaP, BbF, DA | Excavation Sample | Bottom | 12/18/2020 | CT | 158762 | LL12FF19Acs-336-001-SO (Bottom) | - | - | - | - | 0.605 | 0.496 | 0.65 | 0.0898 | - | - | - | | RGOs have been met, no further excavation in this direction | 1/6/2021 | 1/7/2021 | 1/7/2021 | |
| 12 | FF-19 A | B(a)a, BaP, BbF, DA | Excavation Sample - ISM TRIPLICATE set 9 | Sidewall South | 12/18/2020 | CT | 158762 | LL12FF19Acs-337-001-SO (SWS) | - | - | - | - | 6.68 | 5.35 | 6.07 | 0.864 | - | - | - | | | 1/6/2021 | 1/7/2021 | 1/7/2021 | |
| 12 | FF-19 A | B(a)a, BaP, BbF, DA | Excavation Sample - ISM TRIPLICATE set 9 | Sidewall South | 12/18/2020 | CT | 158762 | LL12FF19Acs-337-002-SO (SWS) | - | - | - | - | 4.82 | 3.65 | 4.95 | 0.619 | - | - | - | | | 1/6/2021 | 1/7/2021 | 1/7/2021 | |
| 12 | FF-19 A | B(a)a, BaP, BbF, DA | Excavation Sample - ISM TRIPLICATE set 9 | Sidewall South | 12/18/2020 | CT | 158762 | LL12FF19Acs-337-003-SO (SWS) | - | - | - | - | 4.96 | 3.72 | 4.55 | 0.629 | - | - | - | | | 1/6/2021 | 1/7/2021 | 1/7/2021 | |
| 12 | FF-19 A | B(a)a, BaP, BbF, DA | Excavation Sample - ISM TRIPLICATE set 9 | | | | | **arithmetic mean** | | | | | 5.487 | 4.240 | 5.190 | 0.704 | | | | | - RGO exceeded for BaP in each individual replicate sample; | 1/6/2021 | 1/7/2021 | 1/7/2021 | |
| 12 | FF-19 A | B(a)a, BaP, BbF, DA | Excavation Sample - ISM TRIPLICATE set 9 | | | | | **standard deviation** | | | | | 1.036 | 0.962 | 0.788 | 0.139 | | | | | - RSD <35% for all analytes | 1/6/2021 | 1/7/2021 | 1/7/2021 | |
| 12 | FF-19 A | B(a)a, BaP, BbF, DA | Excavation Sample - ISM TRIPLICATE set 9 | | | | | **CV = SD / mean** | | | | | 19% | 23% | 15% | 20% | | | | | - Additional soil excavated 3' in this direction for treatment, and an additional ISM sample collected for the new southern sidewall and resampled as ISM triplicate for BaP - see below. | 1/6/2021 | 1/7/2021 | 1/7/2021 | |
| 12 | FF-19 A | B(a)a, BaP, BbF, DA | Excavation Sample - ISM TRIPLICATE set 9 | | | | | **count (r)** | | | | | 3 | 3 | 3 | 3 | | | | | | 1/6/2021 | 1/7/2021 | 1/7/2021 | |
| 12 | FF-19 A | B(a)a, BaP, BbF, DA | Excavation Sample - ISM TRIPLICATE set 9 | | | | | **alpha (95% = 0.05)** | | | | | 0.05 | 0.05 | 0.05 | 0.05 | | | | | | 1/6/2021 | 1/7/2021 | 1/7/2021 | |
| 12 | FF-19 A | B(a)a, BaP, BbF, DA | Excavation Sample - ISM TRIPLICATE set 9 | | | | | **t(alpha, df=r-1)** | | | | | 2.92 | 2.92 | 2.92 | 2.92 | | | | | | 1/6/2021 | 1/7/2021 | 1/7/2021 | |
| 12 | FF-19 A | B(a)a, BaP, BbF, DA | Excavation Sample - ISM TRIPLICATE set 9 | | | | | **Student's t UCL** | | | | | 7.23 | 5.86 | 6.52 | 0.94 | | | | | | 1/6/2021 | 1/7/2021 | 1/7/2021 | |
| 12 | FF-19 A | B(a)a, BaP, BbF, DA | Excavation Sample - ISM TRIPLICATE set 9 | | | | | **Chebyshev UCL** | | | | | 8.09 | 6.66 | 7.17 | 1.05 | | | | | | 1/6/2021 | 1/7/2021 | 1/7/2021 | |
| 12 | FF-19 A | BaP | Excavation Sample | Sidewall South | 1/12/2021 | CT | 159157 | LL12FF19Acs-345-001-SO (SWS) | - | - | - | - | - | 1.72 | - | - | - | - | - | | | 1/25/2021 | 1/26/2021 | 1/26/2021 | |
| 12 | FF-19 A | BaP | Excavation Sample - ISM TRIPLICATE set 16 | Sidewall South | 1/12/2021 | CT | 159157 | LL12FF19Acs-345-002-SO (SWS) | - | - | - | - | - | 0.559 | - | - | - | - | - | | | 1/25/2021 | 1/26/2021 | 1/26/2021 | |
| 12 | FF-19 A | BaP | Excavation Sample - ISM TRIPLICATE set 16 | Sidewall South | 1/12/2021 | CT | 159157 | LL12FF19Acs-345-003-SO (SWS) | - | - | - | - | - | 1.55 | - | - | - | - | - | | | 1/25/2021 | 1/26/2021 | 1/26/2021 | |
| 12 | FF-19 A | BaP | Excavation Sample - ISM TRIPLICATE set 16 | | | | | **arithmetic mean** | | | | | | 1.276 | | | | | | | | 1/25/2021 | 1/26/2021 | 1/26/2021 | |
| 12 | FF-19 A | BaP | Excavation Sample - ISM TRIPLICATE set 16 | | | | | **standard deviation** | | | | | | 0.627 | | | | | | | - All replicates meet the RGO | 1/25/2021 | 1/26/2021 | 1/26/2021 | |
| 12 | FF-19 A | BaP | Excavation Sample - ISM TRIPLICATE set 16 | | | | | **CV = SD / mean** | | | | | | 49% | | | | | | | - RSD >35% but <50%, per work plan compare the maximum field replicate concentration to the RGO | 1/25/2021 | 1/26/2021 | 1/26/2021 | |
| 12 | FF-19 A | BaP | Excavation Sample - ISM TRIPLICATE set 16 | | | | | **count (r)** | | | | | | 3 | | | | | | | - no further excavation in this direction | 1/25/2021 | 1/26/2021 | 1/26/2021 | |
| 12 | FF-19 A | BaP | Excavation Sample - ISM TRIPLICATE set 16 | | | | | **alpha (95% = 0.05)** | | | | | | 0.05 | | | | | | | | 1/25/2021 | 1/26/2021 | 1/26/2021 | |
| 12 | FF-19 A | BaP | Excavation Sample - ISM TRIPLICATE set 16 | | | | | **t(alpha, df=r-1)** | | | | | | 2.92 | | | | | | | | 1/25/2021 | 1/26/2021 | 1/26/2021 | |
| 12 | FF-19 A | BaP | Excavation Sample - ISM TRIPLICATE set 16 | | | | | **Student's t UCL** | | | | | | 2.33 | | | | | | | | 1/25/2021 | 1/26/2021 | 1/26/2021 | |
| 12 | FF-19 A | BaP | Excavation Sample - ISM TRIPLICATE set 16 | | | | | **Chebyshev UCL** | | | | | | 2.85 | | | | | | | | 1/25/2021 | 1/26/2021 | 1/26/2021 | |
| 12 | FF-19 A | B(a)a, BaP, BbF, DA | Excavation Sample | Sidewall North | 12/18/2020 | CT | 158762 | LL12FF19Acs-338-001-SO (SWN) | - | - | - | - | 1.69 MY | 1.28 MY | 1.63 MY | 0.237 M | - | - | - | M qualifier - Matrix spike and/or Matrix Spike Duplicate recovery outside acceptance limits. - therefore data manually integrated, no concern with data usability<br>Y qualifier - Replicate/Duplicate precision outside acceptance limits. - Primary sample result is reported with data flagging | RGOs have been met, no further excavation in this direction | 1/6/2021 | 1/7/2021 | 1/7/2021 | |
| 12 | FF-19 A | B(a)a, BaP, BbF, DA | Excavation Sample | Sidewall West | 12/18/2020 | CT | 158762 | LL12FF19Acs-339-001-SO (SWW) | - | - | - | - | 3.73 | 3.09 | 4.26 | 0.54 | - | - | - | | Additional soil excavated 3' in this direction for treatment, and an additional ISM sample collected from the new western sidewall for BaP - see below. | 1/6/2021 | 1/7/2021 | 1/7/2021 | |
| 12 | FF-19 A | BaP | Excavation Sample | Sidewall West | 1/12/2021 | CT | 159157 | LL12FF19Acs-346-001-SO (SWW) | - | - | - | - | - | 3.56 | - | - | - | - | - | | Additional soil has been excavated 3' in this direction for treatment, and an additional ISM sample has been collected from the new western sidewall for BaP - see below. | 1/25/2021 | 1/26/2021 | 1/26/2021 | |
| 12 | FF-19 A | BaP | Excavation Sample | Sidewall West | 1/22/2021 | CT | 159381 | LL12FF19Acs-350-001-SO (SWW) | - | - | - | - | - | 0.543 | - | - | - | - | - | | RGOs have been met, no further excavation in this direction | 2/2/2021 | | | |

**LL 1-4 & 12 Remedial Action**
**Excavation Confirmation Sample Results (unvalidated)**

| Load Line | Remediation Area | COCs | Description/ Rationale | Location | Sample Date | Lab | Lab SDG # | Sample ID/Location | Antimony mg/kg 470 | Lead mg/kg 800 | PCB-1254 mg/kg 9.7 | PCB-1260 mg/kg 9.9 | B(a)a mg/kg 29 | BaP mg/kg 2.9 | BbF mg/kg 29 | DA mg/kg 2.9 | RDX mg/kg 280 | TNT mg/kg 510 | 2,6-DNT mg/kg 15 | Notes | Action | Submitted to Army | Approved by Army | Submitted to Ohio EPA | OhioEPA Concurrence |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 12 | FF-19 B | B(a)a, BaP, BbF, DA | Excavation Sample | Bottom | 12/17/2020 | CT | 158760 | LL12FF19bcs-331-001-SO (Bottom) | - | - | - | - | 0.734 | 0.691 | 0.976 | 0.0746 | - | - | - | | RGOs have been met, no further excavation in this direction | 1/6/2021 | 1/7/2021 | 1/7/2021 | |
| 12 | FF-19 B | B(a)a, BaP, BbF, DA | Excavation Sample | Sidewall North | 12/17/2020 | CT | 158760 | LL12FF19bcs-332-001-SO (SWN) | - | - | - | - | 1.36 | 1.13 | 1.49 | 0.156 | - | - | - | | RGOs have been met, no further excavation in this direction | 1/6/2021 | 1/7/2021 | 1/7/2021 | |
| 12 | FF-19 B | B(a)a, BaP, BbF, DA | Excavation Sample - ISM TRIPLICATE set 8 | Sidewall South | 12/17/2020 | CT | 158760 | LL12FF19bcs-333-001-SO (SWS) | - | - | - | - | 2.38 | 1.94 | 2.59 | 0.259 | - | - | - | | | 1/6/2021 | 1/7/2021 | 1/7/2021 | |
| 12 | FF-19 B | B(a)a, BaP, BbF, DA | Excavation Sample - ISM TRIPLICATE set 8 | Sidewall South | 12/17/2020 | CT | 158760 | LL12FF19bcs-333-002-SO (SWS) | - | - | - | - | 1.47 | 1.29 | 1.71 | 0.122 | - | - | - | | | 1/6/2021 | 1/7/2021 | 1/7/2021 | |
| 12 | FF-19 B | B(a)a, BaP, BbF, DA | Excavation Sample - ISM TRIPLICATE set 8 | Sidewall South | 12/17/2020 | CT | 158760 | LL12FF19bcs-333-003-SO (SWS) | - | - | - | - | 1.89 | 1.54 | 1.82 | 0.204 | - | - | - | | | 1/6/2021 | 1/7/2021 | 1/7/2021 | |
| 12 | FF-19 B | B(a)a, BaP, BbF, DA | Excavation Sample - ISM TRIPLICATE set 8 | | | | | **arithmetic mean** | | | | | 1.913 | 1.590 | 2.040 | 0.195 | | | | | - RGOs met for all analytes in each individual replicate sample; | 1/6/2021 | 1/7/2021 | 1/7/2021 | |
| 12 | FF-19 B | B(a)a, BaP, BbF, DA | Excavation Sample - ISM TRIPLICATE set 8 | | | | | **standard deviation** | | | | | 0.455 | 0.328 | 0.479 | 0.069 | | | | | | 1/6/2021 | 1/7/2021 | 1/7/2021 | |
| 12 | FF-19 B | B(a)a, BaP, BbF, DA | Excavation Sample - ISM TRIPLICATE set 8 | | | | | **CV = SD / mean** | | | | | 24% | 21% | 24% | 35% | | | | | - RSD <35% for all analytes; | 1/6/2021 | 1/7/2021 | 1/7/2021 | |
| 12 | FF-19 B | B(a)a, BaP, BbF, DA | Excavation Sample - ISM TRIPLICATE set 8 | | | | | **count (r)** | | | | | 3 | 3 | 3 | 3 | | | | | - no further excavation in this direction; pending post-excavation survey, excavation can be backfilled. | 1/6/2021 | 1/7/2021 | 1/7/2021 | |
| 12 | FF-19 B | B(a)a, BaP, BbF, DA | Excavation Sample - ISM TRIPLICATE set 8 | | | | | **alpha (95% = 0.05)** | | | | | 0.05 | 0.05 | 0.05 | 0.05 | | | | | | 1/6/2021 | 1/7/2021 | 1/7/2021 | |
| 12 | FF-19 B | B(a)a, BaP, BbF, DA | Excavation Sample - ISM TRIPLICATE set 8 | | | | | **t(alpha, df=r-1)** | | | | | 2.92 | 2.92 | 2.92 | 2.92 | | | | | | 1/6/2021 | 1/7/2021 | 1/7/2021 | |
| 12 | FF-19 B | B(a)a, BaP, BbF, DA | Excavation Sample - ISM TRIPLICATE set 8 | | | | | **Student's t UCL** | | | | | 2.68 | 2.14 | 2.85 | 0.31 | | | | | | 1/6/2021 | 1/7/2021 | 1/7/2021 | |
| 12 | FF-19 B | B(a)a, BaP, BbF, DA | Excavation Sample - ISM TRIPLICATE set 8 | | | | | **Chebyshev UCL** | | | | | 3.06 | 2.42 | 3.25 | 0.37 | | | | | | 1/6/2021 | 1/7/2021 | 1/7/2021 | |
| 12 | FF-19 B | B(a)a, BaP, BbF, DA | Excavation Sample | Sidewall West | 12/17/2020 | CT | 158760 | LL12FF19bcs-334-001-SO (SWW) | - | - | - | - | 1.45 | 1.19 | 1.48 | 0.148 | - | - | - | | RGOs have been met, no further excavation in this direction | 1/6/2021 | 1/7/2021 | 1/7/2021 | |
| 12 | FF-19 B | B(a)a, BaP, BbF, DA | Excavation Sample - ISM TRIPLICATE set 7 | Sidewall East | 12/17/2020 | CT | 158760 | LL12FF19bcs-335-001-SO (SWE) | - | - | - | - | 2.64 | 1.66 | 2 | 0.23 | - | - | - | | | 1/6/2021 | 1/7/2021 | 1/7/2021 | |
| 12 | FF-19 B | B(a)a, BaP, BbF, DA | Excavation Sample - ISM TRIPLICATE set 7 | Sidewall East | 12/17/2020 | CT | 158760 | LL12FF19bcs-335-002-SO (SWE) | - | - | - | - | 2.69 | 2.38 | 2.95 | 0.472 | - | - | - | | | 1/6/2021 | 1/7/2021 | 1/7/2021 | |
| 12 | FF-19 B | B(a)a, BaP, BbF, DA | Excavation Sample - ISM TRIPLICATE set 7 | Sidewall East | 12/17/2020 | CT | 158760 | LL12FF19bcs-335-003-SO (SWE) | - | - | - | - | 3.33 | 2.6 | 3.23 | 0.494 | - | - | - | | | 1/6/2021 | 1/7/2021 | 1/7/2021 | |
| 12 | FF-19 B | B(a)a, BaP, BbF, DA | Excavation Sample - ISM TRIPLICATE set 7 | | | | | **arithmetic mean** | | | | | 2.887 | 2.213 | 2.727 | 0.399 | | | | | - RGOs met for all analytes in each individual replicate sample; | 1/6/2021 | 1/7/2021 | 1/7/2021 | |
| 12 | FF-19 B | B(a)a, BaP, BbF, DA | Excavation Sample - ISM TRIPLICATE set 7 | | | | | **standard deviation** | | | | | 0.385 | 0.492 | 0.645 | 0.146 | | | | | | 1/6/2021 | 1/7/2021 | 1/7/2021 | |
| 12 | FF-19 B | B(a)a, BaP, BbF, DA | Excavation Sample - ISM TRIPLICATE set 7 | | | | | **CV = SD / mean** | | | | | 13% | 22% | 24% | 37% | | | | Lab subsample duplicate RPD in control <20% , LCS data in control. | - RSD <35% for B(a)a, BaP, BbF<br>- RSD>35% but <50% DA<br>- Results are <RGO | 1/6/2021 | 1/7/2021 | 1/7/2021 | |
| 12 | FF-19 B | B(a)a, BaP, BbF, DA | Excavation Sample - ISM TRIPLICATE set 7 | | | | | **count (r)** | | | | | 3 | 3 | 3 | 3 | | | | | | 1/6/2021 | 1/7/2021 | 1/7/2021 | |
| 12 | FF-19 B | B(a)a, BaP, BbF, DA | Excavation Sample - ISM TRIPLICATE set 7 | | | | | **alpha (95% = 0.05)** | | | | | 0.05 | 0.05 | 0.05 | 0.05 | | | | | - no further excavation in this direction; pending post-excavation survey, excavation can be backfilled. | 1/6/2021 | 1/7/2021 | 1/7/2021 | |
| 12 | FF-19 B | B(a)a, BaP, BbF, DA | Excavation Sample - ISM TRIPLICATE set 7 | | | | | **t(alpha, df=r-1)** | | | | | 2.92 | 2.92 | 2.92 | 2.92 | | | | | | 1/6/2021 | 1/7/2021 | 1/7/2021 | |
| 12 | FF-19 B | B(a)a, BaP, BbF, DA | Excavation Sample - ISM TRIPLICATE set 7 | | | | | **Student's t UCL** | | | | | 3.54 | 3.04 | 3.81 | 0.65 | | | | | | 1/6/2021 | 1/7/2021 | 1/7/2021 | |
| 12 | FF-19 B | B(a)a, BaP, BbF, DA | Excavation Sample - ISM TRIPLICATE set 7 | | | | | **Chebyshev UCL** | | | | | 3.85 | 3.45 | 4.35 | 0.77 | | | | | | 1/6/2021 | 1/7/2021 | 1/7/2021 | |

**LL 1-4 & 12 Remedial Action**
**Excavation Confirmation Sample Results (unvalidated)**

| | | | | | | | | | Analyte/Units/Remedial Goal Option (RGO)/Result | | | | | | | | |

# Excavation Confirmation Sample Results

Excavation Confirmation Report No. 7 DATE INITIATED: 1/25/2021

PROJECT RVAAP Load Lines 1-4 and 12 (RVAAP-08 to 12)

CONTRACT NO W912QR-12-D-0005

REQUESTOR IDENTIFICATION

NAME_ORGANIZATION PHONE Sarah Meyers, CH2M, 703-376-5338

TITLE Project Manager SIGNATURE *Sarah L. Meyers*

BASELINE IDENTIFICATION

BASELINE(S) AFFECTED ☐ Cost ☐ Scope ☐ Milestone ☐ Method of Accomplishment

AFFECTED DOCUMENTS (TITLE, NUMBER AND SECTION):

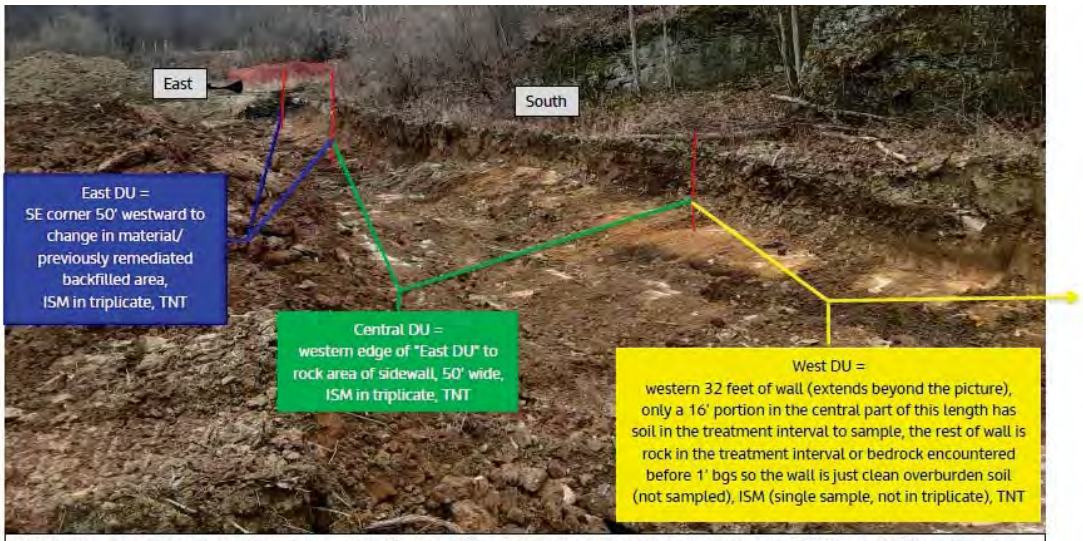
Not applicable

DESCRIPTION OF CHANGE:

1. Additional analytical results for excavation confirmation samples are attached. Results previously concurred by the Army and Ohio EPA are identified on the table.
2. Excavation confirmation sampling of the initial excavation footprints concluded on 12/21/20.
3. This memo provides data for the excavation confirmation sample results for the extensions of 15 decision units (DUs) that initially exceeded at least one associated remedial goal option (RGO).
4. Samples from five DUs in this data set exceed an associated RGO. Additional soil will be excavated and additional ISM samples will be collected:
    - LL1, CB-4A, Sidewall South – Eastern End (5-foot extension)
        - TNT concentration in one replicate of 550 mg/kg exceeds the RGO of 510 mg/kg;
    - LL3, West Perimeter, Sidewall West (3-foot extension) –
        - BaP concentration of 2.93 mg/kg in one replicate exceeds the RGO of 2.9 mg/kg;
    - LL4, Former Water Tower, Sidewall West (3-foot extension) –
        - Lead concentration of 1,120 mg/kg exceeds the RGO of 800 mg/kg;
    - LL4, Former Water Tower, Sidewall West (3-foot extension) –
        - Lead concentration of 2,120 mg/kg exceeds the RGO of 800 mg/kg;
    - LL12, FF-19(a), Sidewall West (3-foot extension) –
        - BaP concentration of 3.56 mg/kg exceeds the RGO of 2.9 mg/kg.

5. Load Line 1, excavation CB-4A is shown below. The initial south sidewall DU was collected in triplicate and all three replicates met the RGOs for TNT and RDX; however, the relative standard deviations (RSDs) were greater than 100%. Based on the work plan and as discussed with the Army and Ohio EPA on 12/14/2020, the 95% upper confidence limit (UCL) was calculated using the Chebyshev method and then compared to the RGOs. As shown in the attached table, the 95% UCL for RDX (12.97 mg/kg) was below the RGO (280 mg/kg). The 95% UCL for TNT (841 mg/kg) exceeded the RGO (510 mg/kg). Therefore, the excavation was extended 5 feet in this direction and then additional ISM samples collected as discussed below.

   a. The extended southern sidewall was sampled for TNT as three DUs based on field observations of the type of material in the sidewall, the location of previous remedial actions and discussion with the Army. The markup below illustrates how the extended southern sidewall was split into three DUs.




LL1, CB-4A – Photo of southern sidewall after excavating an additional 5 feet along the southern sidewall of the initial footprint, illustrating the three decision units sampled on 1/14/2021.

   b. The eastern 50 feet of the extended southern sidewall was sampled in triplicate. As shown in the attached table, the RSD was 25% which meets the DQO of RSD ≤35%. Based on the work plan, the maximum replicate value was compared to the RGO. One of the replicates had a TNT concentration of 550 mg/kg, exceeding the RGO of 510 mg/kg. Therefore, additional soil was excavated at this portion of the extended southern sidewall (another 5 feet southward) and bedrock was encountered in the further extended sidewall. As discussed with the Army, there is no soil in the treatment interval (1 to 5 feet below ground surface) therefore no additional samples will be collected, and pending the post-excavation survey the excavation can be backfilled.



c. The next 50 feet of the CB-4A extended southern sidewall was also sampled in triplicate. As shown in the attached table, the RSD was 94%. The lab subsampling triplicates had an RSD of 2.31% for TNT, showing good control. Based on the work plan, the 95% UCL was calculated using the Chebyshev method and compared to the RGOs. As shown in the attached table, the 95% UCL for TNT (6.13 mg/kg) is well below the RGO (510 mg/kg). Therefore, this portion of the wall meets the RGO and no further excavation is warranted for this portion.

d. The westernmost 32 feet of the extended southern sidewall had limited soil in the treatment interval due to the presence of bedrock in the sidewall and shallow bedrock limiting depth as well. A single ISM sample was collected and the TNT concentration was 0.47 mg/kg, just above the level of detection (0.2 mg/kg) and well below the RGO. Therefore, this portion of the wall meets the RGO and no further excavation is warranted for this portion.

6. Load Line 3, excavation West Perimeter is shown below. All DUs initially exceeded at least one applicable RGO.

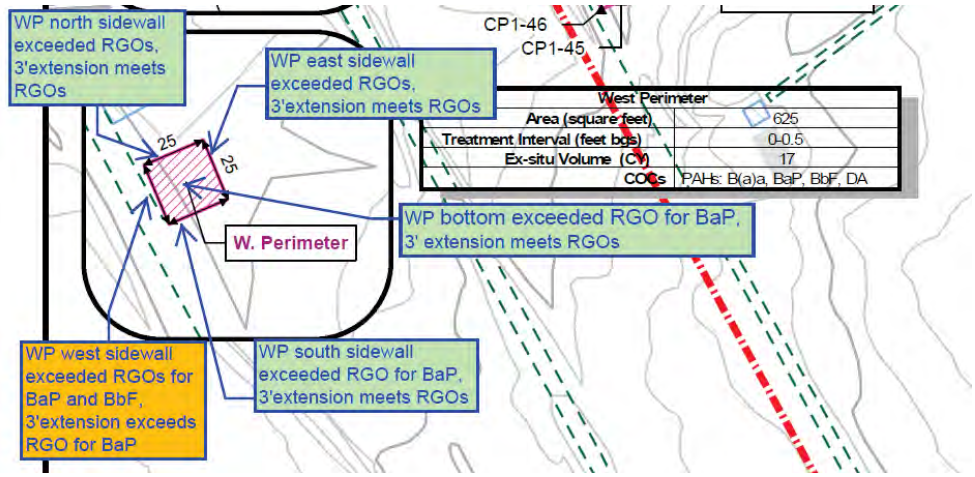
a. The west sidewall initially exceeded the RGOs for BaP and BbF. The excavation was extended 3 feet in this direction and an additional ISM sample for BaP and BbF was collected in triplicate for the extended Sidewall West. One of the replicates exceeded the RGO for BaP. The RSDs were less than 35%; therefore, in accordance with the work plan, the maximum replicate concentration of 2.93 mg/kg was compared to the RGO of 2.9 mg/kg. Therefore, additional soil was excavated (another 3 feet westward) and an additional ISM sample for BaP was collected for the further extended Sidewall West (results pending).

b. The bottom initially exceeded the RGO for BaP. The bottom was excavated an additional 3 feet to a total depth of 3.5 feet and the additional ISM sample for BaP for the extended Bottom meets the RGOs.

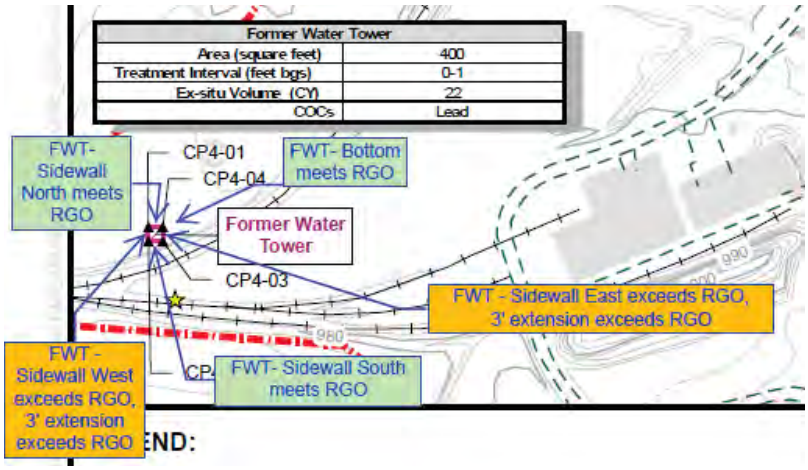
c. The north sidewall initially exceeded the RGOs for B(a)A, BaP, BbF, and DA. The excavation was extended 3 feet in this direction and the additional ISM sample from the extended Sidewall North for B(a)A, BaP, BbF, and DA meets the RGOs.

d. The south sidewall initially exceeded the RGO for BaP. The excavation was extended 3 feet in this direction and the additional ISM sample from the extended Sidewall South for BaP meets the RGOs.

e. The east sidewall initially exceeded the RGOs for B(a)A, BaP, BbF, and DA. The excavation was extended 3 feet in this direction and the additional ISM sample from the extended Sidewall East for B(a)A, BaP, BbF, and DA meets the RGOs.



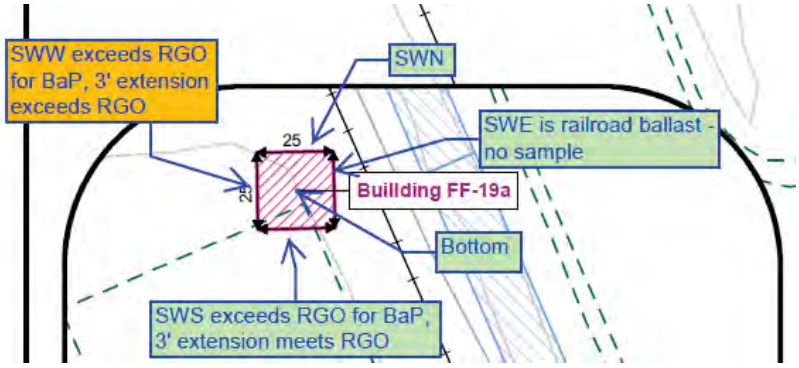
7. Load Line 4, Former Water Tower excavation is shown below. The east and west sidewalls initially exceeded the RGO for lead. The excavation was extended 3 feet in each direction and additional ISM samples collected, both of which still exceed the RGO for lead. Per discussions with the Army, the eastern sidewall will be excavated further to the east until it daylights due to the sloping topography. Per discussions with the Army, the western sidewall will be excavated further to the west approximately 10 feet, beyond which large trees are present, and an additional ISM sample for lead will be collected for the further extended Sidewall West.




8. Load Line 12, excavation FF-19(a) is shown below.

   a. The south sidewall initially exceeded the RGO for BaP. The excavation was extended 3 feet in this direction and the additional ISM sample for BaP for the extended Sidewall South meets the RGOs.

   b. The west sidewall initially exceeded the RGOs for BaP. The excavation was extended 3 feet in this direction and the additional ISM sample for BaP exceeds the RGO. Therefore, the excavation was extended another 3 feet in this direction and an additional ISM sample for BaP was collected from the further extended Sidewall West (results are pending).




9. Samples from 12 DUs in this data set meet the associated RGOs and no further excavation is warranted:

- LL1, CB-4A, SWS Central/Mid Portion (extended 5 feet)
- LL1, CB-4A, SWS West Portion (extended 5 feet)
- LL3, EB-4, SWN for PCB-1254 (extended 3 feet)
- LL3, WP, Bottom for BaP (extended 3 feet)
- LL3, WP, SWN for B(a)A, BaP, BbF, and DA (extended 3 feet)
- LL3, WP, SWS for BaP (extended 3 feet)
- LL3, WP, SWE for B(a)A, BaP, BbF, and DA (extended 3 feet)
- LL4, Building G-8(b), SWN for BaP (extended 3 feet)
- LL12, FF-19(a), SWS for BaP (extended 3 feet)
- LL12, FF-19(c), Bottom1 for BaP (extended 3 feet)
- LL12, FF-19(c), SWE1 for BaP (extended 3 feet)
- LL12, FF-19(c), SWW1 for BaP (extended 3 feet)

JUSTIFICATION:

As detailed above and in the attached table, additional excavation is indicated for five DUs in four excavations in this data set that continue to exceed an associated RGO:

- LL1, CB-4A, SWS East Portion
- LL3, WP, SWW for BaP
- LL4, FWT, SWE for lead
- LL4, FWT, SWW for lead
- LL12, FF-19(a), SWW for BaP

There are now 20 excavations that meet the associated RGOs or have been excavated to bedrock and can be backfilled:

- LL1, CB-2
- LL1, CB-4
- LL1, CB-13B
- LL1, Outlet Channel D
- LL2, DB-4A
- LL3, EA-6(a)
- LL3, EA-6(b)
- LL3, EA-6(c)
- LL3, EA-7
- LL3, EB-4
- LL3, EB-9A
- LL3, EB-10(a)
- LL3, EB-10(b)
- LL3, EB-803
- LL4, Building G-8(a)
- LL4, Building G-8(b)
- LL4, Building G-16
- LL12, Active Area Channel
- LL12, FF-19(b)
- LL12, FF-19(c)

IMPACT OF NOT IMPLEMENTING REQUEST

Not applicable.

PARTICIPANTS AFFECTED BY IMPLEMENTING REQUEST

Not applicable.

COST ESTIMATE: NA ESTIMATOR SIGNATURE _____

PHONE: DATE _____

USACE COTR PETERS.NATHANIEL.II.1248279466 Digitally signed by PETERS.NATHANIEL.II.1248279466 Date: 2021.01.26 09:43:59 -05'00' DATE January 26, 2021

OHIO EPA PROJECT MANAGER _____ DATE _____

MANAGER SIGNATURE N/A DATE _____

**LL 1-4 & 12 Remedial Action**
**Excavation Confirmation Sample Results (unvalidated)**

| | | | | | | | | | Analyte/Units/Remedial Goal Option (RGO)/Result | | | | | | | | |

**LL 1-4 & 12 Remedial Action**
**Excavation Confirmation Sample Results (unvalidated)**

| Load Line | Remediation Area | COCs | Description/ Rationale | Location | Sample Date | Lab | Lab SDG # | Sample ID/Location | Analyte/Units/Remedial Goal Option (RGO)/Result: Antimony mg/kg 470 | Lead mg/kg 800 | PCB-1254 mg/kg 9.7 | PCB-1260 mg/kg 9.9 | B[a]a mg/kg 29 | BaP mg/kg 2.9 | BbF mg/kg 29 | DA mg/kg 2.9 | RDX mg/kg 280 | TNT mg/kg 510 | 2,6-DNT mg/kg 15 | Notes | Action | Submitted to Army | Approved by Army | Submitted to Ohio EPA | OhioEPA Concurrence |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | CB-4A | RDX, TNT | Excavation Sample - ISM TRIPLICATE set1 | Sidewall South | 11/20/2020 | CT | 158141 | LL1CB4Acs-738-001-SO (SW South) | - | - | - | - | - | - | - | - | 0.2 U | 2.2 Q | - | Q qualifier - LCS outside acceptance limits:<br>- LCS spiked no grinding - acceptable recovery<br>- LCS spiked and grinding - 11% recovery for TNT = bias low (RDX okay)<br>- All but one concentration are substantially lower than RGO so there is confidence that the true concentrations are less than RGO (note that although one TNT concentration is closer to the RGO, the protocol in the QAPP is being followed to calculate 95% UCL to compare to the RGO and this has resulted in conclusion that this DU exceeds the RGO, so more soil will be excavated and the extension will be resampled for TNT)<br>- Laboratory Subsample RSD data is in control<br><br>P qualifier - Concentration of analyte differs more than 40% between primary and confirmation analysis.<br>- The higher of the two values is reported. | - RGOs met in each individual replicate sample;<br><br>- RSD >100% for RDX and TNT;<br><br>- 95% UCL (Chebyshev method) is less than RGO for RDX but greater than RGO for TNT; | 12/8/2020 | 12/9/2020 | 12/11/2020 | 12/14/2020 |
| 1 | CB-4A | RDX, TNT | Excavation Sample - ISM TRIPLICATE set1 | Sidewall South | 11/20/2020 | CT | 158141 | LL1CB4Acs-738-002-SO (SW South) | - | - | - | - | - | - | - | - | 2.6 P | 480 Q | - | | | 12/8/2020 | 12/9/2020 | 12/11/2020 | 12/14/2020 |
| 1 | CB-4A | RDX, TNT | Excavation Sample - ISM TRIPLICATE set1 | Sidewall South | 11/20/2020 | CT | 158141 | LL1CB4Acs-738-003-SO (SW South) | - | - | - | - | - | - | - | - | 7.6 | 44 Q | - | | | 12/8/2020 | 12/9/2020 | 12/11/2020 | 12/14/2020 |
| 1 | CB-4A | RDX, TNT | Excavation Sample - ISM TRIPLICATE set1 | | | | | **arithmetic mean** | | | | | | | | | 3.467 | 175.400 | | | - additional excavation 5' in this direction (south) for TNT and resample as ISM triplicate - see below. | 12/17/2020 | 12/28/2020 | 12/30/2020 | |
| 1 | CB-4A | RDX, TNT | Excavation Sample - ISM TRIPLICATE set1 | | | | | **standard deviation** | | | | | | | | | 3.775 | 264.618 | | | | 12/17/2020 | 12/28/2020 | 12/30/2020 | |
| 1 | CB-4A | RDX, TNT | Excavation Sample - ISM TRIPLICATE set1 | | | | | **CV = SD / mean** | | | | | | | | | 109% | 151% | | lab subsample triplicate 14.9% RSD RDX and 8.7% TNT, shows good control | | 12/17/2020 | 12/28/2020 | 12/30/2020 | |
| 1 | CB-4A | RDX, TNT | Excavation Sample - ISM TRIPLICATE set1 | | | | | **count (r)** | | | | | | | | | 3 | 3 | | | | 12/17/2020 | 12/28/2020 | 12/30/2020 | |
| 1 | CB-4A | RDX, TNT | Excavation Sample - ISM TRIPLICATE set1 | | | | | **alpha (95% = 0.05)** | | | | | | | | | 0.05 | 0.05 | | | | 12/17/2020 | 12/28/2020 | 12/30/2020 | |
| 1 | CB-4A | RDX, TNT | Excavation Sample - ISM TRIPLICATE set1 | | | | | **t(alpha, df=r-1)** | | | | | | | | | 2.92 | 2.92 | | | | 12/17/2020 | 12/28/2020 | 12/30/2020 | |
| 1 | CB-4A | RDX, TNT | Excavation Sample - ISM TRIPLICATE set1 | | | | | **Student's t UCL** | | | | | | | | | 9.83 | 621.51 | | | | 12/17/2020 | 12/28/2020 | 12/30/2020 | |
| 1 | CB-4A | RDX, TNT | Excavation Sample - ISM TRIPLICATE set1 | | | | | **Chebyshev UCL** | | | | | | | | | 12.97 | 841.34 | | | | 12/17/2020 | 12/28/2020 | 12/30/2020 | |
| 1 | CB-4A | TNT | Excavation Sample | Sidewall South EASTERN END | 1/14/2021 | CT | 159240 | LL1CB4Acs-765-001-SO (SWS1) | - | - | - | - | - | - | - | - | - | 330 | - | | | 1/25/2021 | 1/26/2021 | 1/26/2021 | |
| 1 | CB-4A | TNT | Excavation Sample - ISM TRIPLICATE set13 | Sidewall South EASTERN END | 1/14/2021 | CT | 159240 | LL1CB4Acs-765-002-SO (SWS1) | - | - | - | - | - | - | - | - | - | 460 | - | | Extends 50 feet from SE corner<br><br>- One replicate exceeds the RGO<br><br>- RSD<35%, per work plan compare the maximum field replicate concentration to the RGO<br><br>- Additional soil has been excavated 5 feet in this direction for this 50-foot length of wall (the rest of the wall was sampled as separate DUs that meet the RGO - see below). As discussed with the Army, there is no soil in the treatment interval (1 to 5'bgs) for the further extended sidewall, therefore no additional samples can be collected.<br><br>- Pending the post-excavation survey the excavation can be backfilled. | 1/25/2021 | 1/26/2021 | 1/26/2021 | |
| 1 | CB-4A | TNT | Excavation Sample - ISM TRIPLICATE set13 | Sidewall South EASTERN END | 1/14/2021 | CT | 159240 | LL1CB4Acs-765-003-SO (SWS1) | - | - | - | - | - | - | - | - | - | 550 | - | | | 1/25/2021 | 1/26/2021 | 1/26/2021 | |
| 1 | CB-4A | TNT | Excavation Sample - ISM TRIPLICATE set13 | | | | | **arithmetic mean** | | | | | | | | | | 447 | | | | 1/25/2021 | 1/26/2021 | 1/26/2021 | |
| 1 | CB-4A | TNT | Excavation Sample - ISM TRIPLICATE set13 | | | | | **standard deviation** | | | | | | | | | | 110.604 | | | | 1/25/2021 | 1/26/2021 | 1/26/2021 | |
| 1 | CB-4A | TNT | Excavation Sample - ISM TRIPLICATE set13 | | | | | **CV = SD / mean** | | | | | | | | | | 25% | | | | 1/25/2021 | 1/26/2021 | 1/26/2021 | |
| 1 | CB-4A | TNT | Excavation Sample - ISM TRIPLICATE set13 | | | | | **count (r)** | | | | | | | | | | 3 | | | | 1/25/2021 | 1/26/2021 | 1/26/2021 | |
| 1 | CB-4A | TNT | Excavation Sample - ISM TRIPLICATE set13 | | | | | **alpha (95% = 0.05)** | | | | | | | | | | 0.05 | | | | 1/25/2021 | 1/26/2021 | 1/26/2021 | |
| 1 | CB-4A | TNT | Excavation Sample - ISM TRIPLICATE set13 | | | | | **t(alpha, df=r-1)** | | | | | | | | | | 2.92 | | | | 1/25/2021 | 1/26/2021 | 1/26/2021 | |
| 1 | CB-4A | TNT | Excavation Sample - ISM TRIPLICATE set13 | | | | | **Student's t UCL** | | | | | | | | | | 633.13 | | | | 1/25/2021 | 1/26/2021 | 1/26/2021 | |
| 1 | CB-4A | TNT | Excavation Sample - ISM TRIPLICATE set13 | | | | | **Chebyshev UCL** | | | | | | | | | | 725.01 | | | | 1/25/2021 | 1/26/2021 | 1/26/2021 | |
| 1 | CB-4A | TNT | Excavation Sample | Sidewall South MID PORTION | 1/14/2021 | CT | 159240 | LL1CB4Acs-766-001-SO (SWS2) | - | - | | - | - | - | - | - | - | 3.8 | - | | | 1/25/2021 | 1/26/2021 | 1/26/2021 | |
| 1 | CB-4A | TNT | Excavation Sample - ISM TRIPLICATE set14 | Sidewall South MID PORTION | 1/14/2021 | CT | 159240 | LL1CB4Acs-766-002-SO (SWS2) | - | - | | - | - | - | - | - | - | 0.88 | - | | | 1/25/2021 | 1/26/2021 | 1/26/2021 | |
| 1 | CB-4A | TNT | Excavation Sample - ISM TRIPLICATE set14 | Sidewall South MID PORTION | 1/14/2021 | CT | 159240 | LL1CB4Acs-766-003-SO (SWS2) | - | - | | - | - | - | - | - | - | 0.8 | - | | Starts 50' from SE corner and extends 50' long<br><br>- RGOs met in each individual replicate sample;<br><br>- RSD >50% but <100%;<br><br>- 95% UCL (Chebyshev method) is less than the RGO;<br><br>- no further excavation for this portion of the SWS | 1/25/2021 | 1/26/2021 | 1/26/2021 | |
| 1 | CB-4A | TNT | Excavation Sample - ISM TRIPLICATE set14 | | | | | **arithmetic mean** | | | | | | | | | | 1.827 | | | | 1/25/2021 | 1/26/2021 | 1/26/2021 | |
| 1 | CB-4A | TNT | Excavation Sample - ISM TRIPLICATE set14 | | | | | **standard deviation** | | | | | | | | | | 1.709 | | | | 1/25/2021 | 1/26/2021 | 1/26/2021 | |
| 1 | CB-4A | TNT | Excavation Sample - ISM TRIPLICATE set14 | | | | | **CV = SD / mean** | | | | | | | | | | 94% | | lab subsample triplicate 2.13% RSD TNT, shows good control | | 1/25/2021 | 1/26/2021 | 1/26/2021 | |
| 1 | CB-4A | TNT | Excavation Sample - ISM TRIPLICATE set14 | | | | | **count (r)** | | | | | | | | | | 3 | | | | 1/25/2021 | 1/26/2021 | 1/26/2021 | |
| 1 | CB-4A | TNT | Excavation Sample - ISM TRIPLICATE set14 | | | | | **alpha (95% = 0.05)** | | | | | | | | | | 0.05 | | | | 1/25/2021 | 1/26/2021 | 1/26/2021 | |
| 1 | CB-4A | TNT | Excavation Sample - ISM TRIPLICATE set14 | | | | | **t(alpha, df=r-1)** | | | | | | | | | | 2.92 | | | | 1/25/2021 | 1/26/2021 | 1/26/2021 | |
| 1 | CB-4A | TNT | Excavation Sample - ISM TRIPLICATE set14 | | | | | **Student's t UCL** | | | | | | | | | | 4.71 | | | | 1/25/2021 | 1/26/2021 | 1/26/2021 | |
| 1 | CB-4A | TNT | Excavation Sample - ISM TRIPLICATE set14 | | | | | **Chebyshev UCL** | | | | | | | | | | 6.13 | | | | 1/25/2021 | 1/26/2021 | 1/26/2021 | |
| 1 | CB-4A | TNT | Excavation Sample | Sidewall South WEST END | 1/14/2021 | CT | 159240 | LL1CB4Acs-767-001-SO (SWS3) | - | - | - | - | - | - | - | - | - | 0.47 | - | | Westernmost 16' of the SWS RGO has been met for this portion of the SWS, no further excavation | 1/25/2021 | 1/26/2021 | 1/26/2021 | |

**LL 1-4 & 12 Remedial Action**
**Excavation Confirmation Sample Results (unvalidated)**

| | | | | | | | | | Analyte/Units/Remedial Goal Option (RGO)/Result | | | | | | | | |

**LL 1-4 & 12 Remedial Action**
**Excavation Confirmation Sample Results (unvalidated)**

| | | | | | | | | | Analyte/Units/Remedial Goal Option (RGO)/Result | | | | | | | | |

**LL 1-4 & 12 Remedial Action**
**Excavation Confirmation Sample Results (unvalidated)**

| | | | | | | | | | Analyte/Units/Remedial Goal Option (RGO)/Result | | | | | | | | |

**LL 1-4 & 12 Remedial Action**
**Excavation Confirmation Sample Results (unvalidated)**

| | | | | | | | | | Analyte/Units/Remedial Goal Option (RGO)/Result | | | | | | | | |

**LL 1-4 & 12 Remedial Action**
**Excavation Confirmation Sample Results (unvalidated)**

| | | | | | | | | | Analyte/Units/Remedial Goal Option (RGO)/Result | | | | | | | | |

**LL 1-4 & 12 Remedial Action**
**Excavation Confirmation Sample Results (unvalidated)**

| Load Line | Remediation Area | COCs | Description/ Rationale | Location | Sample Date | Lab | Lab SDG # | Sample ID/Location | Antimony mg/kg 470 | Lead mg/kg 800 | PCB-1254 mg/kg 9.7 | PCB-1260 mg/kg 9.9 | B(a)a mg/kg 29 | BaP mg/kg 2.9 | BbF mg/kg 29 | DA mg/kg 2.9 | RDX mg/kg 280 | TNT mg/kg 510 | 2,6-DNT mg/kg 15 | Notes | Action | Submitted to Army | Approved by Army | Submitted to Ohio EPA | OhioEPA Concurrence |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3 | West Perimeter | B(a)a, BaP, BbF, DA | Excavation Sample - ISM TRIPLICATE set 11 | Sidewall West | 12/21/2020 | CT | 158799 | LL3WPcs-583-001-SO (SWW) | - | - | - | - | 24.9 | 24.3 | 27.9 | 2.54 | - | - | - | | | 1/11/2021 | 1/12/2021 | 1/12/2021 | |
| 3 | West Perimeter | B(a)a, BaP, BbF, DA | Excavation Sample - ISM TRIPLICATE set 11 | Sidewall West | 12/21/2020 | CT | 158799 | LL3WPcs-583-002-SO (SWW) | - | - | - | - | 26.6 | 25.7 | 32.6 | 2.63 | - | - | - | | | 1/11/2021 | 1/12/2021 | 1/12/2021 | |
| 3 | West Perimeter | B(a)a, BaP, BbF, DA | Excavation Sample - ISM TRIPLICATE set 11 | Sidewall West | 12/21/2020 | CT | 158799 | LL3WPcs-583-003-SO (SWW) | - | - | - | - | 22.2 | 21.6 | 25.5 | 1.97 | - | - | - | | | 1/11/2021 | 1/12/2021 | 1/12/2021 | |
| 3 | West Perimeter | B(a)a, BaP, BbF, DA | Excavation Sample - ISM TRIPLICATE set 11 | | | | | **arithmetic mean** | | | | | 24.567 | 23.867 | 28.667 | 2.380 | | | | | - RGOs exceeded for BaP and BbF; | 1/11/2021 | 1/12/2021 | 1/12/2021 | |
| 3 | West Perimeter | B(a)a, BaP, BbF, DA | Excavation Sample - ISM TRIPLICATE set 11 | | | | | **standard deviation** | | | | | 2.219 | 2.084 | 3.612 | 0.358 | | | | | - RSDs<35%; | 1/11/2021 | 1/12/2021 | 1/12/2021 | |
| 3 | West Perimeter | B(a)a, BaP, BbF, DA | Excavation Sample - ISM TRIPLICATE set 11 | | | | | **CV = SD / mean** | | | | | 9% | 9% | 13% | 15% | | | | | - Additional soil excavated 3' in this direction for treatment, and an additional ISM sample collected in triplicate from the new sidewall west for BaP and BbF - see below. | 1/11/2021 | 1/12/2021 | 1/12/2021 | |
| 3 | West Perimeter | B(a)a, BaP, BbF, DA | Excavation Sample - ISM TRIPLICATE set 11 | | | | | **count (r)** | | | | | 3 | 3 | 3 | 3 | | | | | | 1/11/2021 | 1/12/2021 | 1/12/2021 | |
| 3 | West Perimeter | B(a)a, BaP, BbF, DA | Excavation Sample - ISM TRIPLICATE set 11 | | | | | **alpha (95% = 0.05)** | | | | | 0.05 | 0.05 | 0.05 | 0.05 | | | | | | 1/11/2021 | 1/12/2021 | 1/12/2021 | |
| 3 | West Perimeter | B(a)a, BaP, BbF, DA | Excavation Sample - ISM TRIPLICATE set 11 | | | | | **t(alpha, df=r-1)** | | | | | 2.92 | 2.92 | 2.92 | 2.92 | | | | | | 1/11/2021 | 1/12/2021 | 1/12/2021 | |
| 3 | West Perimeter | B(a)a, BaP, BbF, DA | Excavation Sample - ISM TRIPLICATE set 11 | | | | | **Student's t UCL** | | | | | 28.31 | 27.38 | 34.76 | 2.98 | | | | | | 1/11/2021 | 1/12/2021 | 1/12/2021 | |
| 3 | West Perimeter | B(a)a, BaP, BbF, DA | Excavation Sample - ISM TRIPLICATE set 11 | | | | | **Chebyshev UCL** | | | | | 30.15 | 29.11 | 37.76 | 3.28 | | | | | | 1/11/2021 | 1/12/2021 | 1/12/2021 | |
| 3 | West Perimeter | BaP, BbF - add B(a)a, DA | Excavation Sample | Sidewall West | 1/12/2021 | CT | 159157 | LL3WPcs-589-001-SO (SWW) | - | - | - | - | 2.84 | 2.53 | 3.33 | 0.252 | - | - | - | | | 1/25/2021 | 1/26/2021 | 1/26/2021 | |
| 3 | West Perimeter | BaP, BbF - add B(a)a, DA | Excavation Sample - ISM TRIPLICATE set 15 | Sidewall West | 1/12/2021 | CT | 159157 | LL3WPcs-589-002-SO (SWW) | - | - | - | - | 3.12 | 2.93 | 3.96 | 0.323 | - | - | - | | | 1/25/2021 | 1/26/2021 | 1/26/2021 | |
| 3 | West Perimeter | BaP, BbF - add B(a)a, DA | Excavation Sample - ISM TRIPLICATE set 15 | Sidewall West | 1/12/2021 | CT | 159157 | LL3WPcs-589-003-SO (SWW) | - | - | - | - | 1.84 | 1.76 | 2.5 | 0.228 | - | - | - | | | 1/25/2021 | 1/26/2021 | 1/26/2021 | |
| 3 | West Perimeter | BaP, BbF - add B(a)a, DA | Excavation Sample - ISM TRIPLICATE set 15 | | | | | **arithmetic mean** | | | | | 2.600 | 2.407 | 3.263 | 0.268 | | | | | - One replicate slightly exceeds the RGO | 1/25/2021 | 1/26/2021 | 1/26/2021 | |
| 3 | West Perimeter | BaP, BbF - add B(a)a, DA | Excavation Sample - ISM TRIPLICATE set 15 | | | | | **standard deviation** | | | | | 0.673 | 0.595 | 0.732 | 0.049 | | | | | - RSD<35%, per work plan compare the maximum field replicate concentration to the RGO | 1/25/2021 | 1/26/2021 | 1/26/2021 | |
| 3 | West Perimeter | BaP, BbF - add B(a)a, DA | Excavation Sample - ISM TRIPLICATE set 15 | | | | | **CV = SD / mean** | | | | | 26% | 25% | 22% | 18% | | | | | | 1/25/2021 | 1/26/2021 | 1/26/2021 | |
| 3 | West Perimeter | BaP, BbF - add B(a)a, DA | Excavation Sample - ISM TRIPLICATE set 15 | | | | | **count (r)** | | | | | 3 | 3 | 3 | 3 | | | | | - Additional soil excavated 3' in this direction for treatment, and an additional ISM sample collected from the new sidewall west for BaP - see below. | 1/25/2021 | 1/26/2021 | 1/26/2021 | |
| 3 | West Perimeter | BaP, BbF - add B(a)a, DA | Excavation Sample - ISM TRIPLICATE set 15 | | | | | **alpha (95% = 0.05)** | | | | | 0.05 | 0.05 | 0.05 | 0.05 | | | | | | 1/25/2021 | 1/26/2021 | 1/26/2021 | |
| 3 | West Perimeter | BaP, BbF - add B(a)a, DA | Excavation Sample - ISM TRIPLICATE set 15 | | | | | **t(alpha, df=r-1)** | | | | | 2.92 | 2.92 | 2.92 | 2.92 | | | | | | 1/25/2021 | 1/26/2021 | 1/26/2021 | |
| 3 | West Perimeter | BaP, BbF - add B(a)a, DA | Excavation Sample - ISM TRIPLICATE set 15 | | | | | **Student's t UCL** | | | | | 3.73 | 3.41 | 4.50 | 0.35 | | | | | | 1/25/2021 | 1/26/2021 | 1/26/2021 | |
| 3 | West Perimeter | BaP, BbF - add B(a)a, DA | Excavation Sample - ISM TRIPLICATE set 15 | | | | | **Chebyshev UCL** | | | | | 4.29 | 3.90 | 5.11 | 0.39 | | | | | | 1/25/2021 | 1/26/2021 | 1/26/2021 | |
| 3 | West Perimeter | BaP | Excavation Sample | Sidewall West | 1/22/2021 | CT | | LL3WPcs-592-001-SO (SWW) | - | - | - | - | - | | - | - | - | - | - | | Sample analysis is underway. | | | | |
| 3 | West Perimeter | B(a)a, BaP, BbF, DA | Excavation Sample | Sidewall South | 12/21/2020 | CT | 158799 | LL3WPcs-584-001-SO (SWS) | - | - | - | - | 3.22 | 3.14 | 4.15 | 0.369 M,Y | - | - | - | M qualifier - Matrix spike and/or Matrix Spike Duplicate recovery outside acceptance limits<br>- therefore data manually integrated, no concern with data usability<br><br>Y qualifier - Replicate/Duplicate precision outside acceptance limits.<br>- Primary sample result is reported with data flagging | Additional soil excavated 3' in this direction for treatment, and an additional ISM sample collected from the new sidewall south for BaP - see below. | 1/11/2021 | 1/12/2021 | 1/12/2021 | |
| 3 | West Perimeter | BaP | Excavation Sample | Sidewall South | 1/13/2021 | CT | 159189 | LL3WPcs-590-001-SO (SWS) | - | - | - | - | - | 0.364 | - | - | - | - | - | | RGOs have been met, no further excavation in this direction. | 1/25/2021 | 1/26/2021 | 1/26/2021 | |
| 3 | West Perimeter | B(a)a, BaP, BbF, DA | Excavation Sample | Sidewall East | 12/21/2020 | CT | 158799 | LL3WPcs-585-001-SO (SWE) | - | - | - | - | 37.1 | 32.1 | 41.4 | 4.65 | - | - | - | | Additional soil excavated 3' in this direction for treatment, and an additional ISM sample collected from the new sidewall east for B(a)a, BaP, BbF, DA - see below. | 1/11/2021 | 1/12/2021 | 1/12/2021 | |
| 3 | West Perimeter | B(a)a, BaP, BbF, DA | Excavation Sample | Sidewall East | 1/13/2021 | CT | 159189 | LL3WPcs-591-001-SO (SWE) | - | - | - | - | 0.489 | 0.413 | 0.601 | 0.0485 | - | - | - | | RGOs have been met, no further excavation in this direction. | 1/25/2021 | 1/26/2021 | 1/26/2021 | |
| 4 | Building G-8 (a) | B(a)a, BaP, BbF, DA | Excavation Sample | Sidewall West | 12/9/2020 | CT | 158521 | LL4G8ACS-522-001-SO (SWW) | - | - | - | - | 0.025 | 0.025 | 0.883 | 0.0696 | - | - | - | | | 12/22/2020 | 12/28/2020 | 12/30/2020 | |
| 4 | Building G-8 (a) | B(a)a, BaP, BbF, DA | Excavation Sample | Sidewall East | 12/9/2020 | CT | 158521 | LL4G8ACS-523-001-SO (SWE) | - | - | - | - | 0.0051 J | 0.0051 J | 0.00622 | 0.0025 U | - | - | - | | | 12/22/2020 | 12/28/2020 | 12/30/2020 | |
| 4 | Building G-8 (a) | B(a)a, BaP, BbF, DA | Excavation Sample | Sidewall North | 12/9/2020 | CT | 158521 | LL4G8ACS-524-001-SO (SWN) | - | - | - | - | 0.0049 J | 0.0049 J | 0.00263 J | 0.0025 U | - | - | - | | RGOs have been met. Pending post-excavation survey, excavation can be backfilled. | 12/22/2020 | 12/28/2020 | 12/30/2020 | |
| 4 | Building G-8 (a) | B(a)a, BaP, BbF, DA | Excavation Sample | Bottom 1 | 12/10/2020 | CT | 158584 | LL4G8ACS-525-001-SO (Bottom) | - | - | - | - | 0.00168 JY | 0.00157 JY | 0.00264 JY | 0.0024 U | - | - | - | Y qualifier - Replicate/Duplicate precision outside acceptance limits.<br>- Primary sample result is reported with data flagging | | 12/22/2020 | 12/28/2020 | 12/30/2020 | |
| 4 | Building G-8 (a) | B(a)a, BaP, BbF, DA | Excavation Sample | Sidewall South | 12/10/2020 | CT | 158584 | LL4G8ACS-526-001-SO (SWS) | - | - | - | - | 0.00168 | 0.0157 | 0.0214 | 0.00195 J | - | - | - | | | 12/22/2020 | 12/28/2020 | 12/30/2020 | |

**LL 1-4 & 12 Remedial Action**
**Excavation Confirmation Sample Results (unvalidated)**

| Load Line | Remediation Area | COCs | Description/ Rationale | Location | Sample Date | Lab | Lab SDG # | Sample ID/Location | Analyte/Units/Remedial Goal Option (RGO)/Result | | | | | | | | | | | | | | | | | | | | | | | | | | | | Notes | Action | Submitted to Army | Approved by Army | Submitted to Ohio EPA | OhioEPA Concurrence |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | Antimony | | | Lead | | | PCB-1254 | | | PCB-1260 | | | B[a]a | | | BaP | | | BbF | | | DA | | | RDX | | | TNT | | | 2,6-DNT | | | | | | | |
| | | | | | | | | | mg/kg | | | mg/kg | | | mg/kg | | | mg/kg | | | mg/kg | | | mg/kg | | | mg/kg | | | mg/kg | | | mg/kg | | | mg/kg | | | | | | | |
| | | | | | | | | | 470 | | | 800 | | | 9.7 | | | 9.9 | | | 29 | | | 2.9 | | | 29 | | | 2.9 | | | 280 | | | 510 | | | 15 | | | | | | | |
| 4 | Building G-8 (b) | B(a)a, BaP, BbF, DA | Excavation Sample | Bottom 1 | 12/14/2020 | CT | 158622 | LL4G8Bcs-532-001-SO (Bottom1) | - | | | - | | | - | | | - | | | 0.00197 | | J | 0.00207 | | P | 0.00476 | | J | 0.0026 | | U | - | | | - | | | - | | | P qualifier - Concentration of analyte differs more than 40% between primary and confirmation analysis. - The higher of the two values is reported. | RGOs have been met, no further excavation in this direction | 12/29/2020 | 12/30/2020 | 12/30/2020 | |
| 4 | Building G-8 (b) | B(a)a, BaP, BbF, DA | Excavation Sample | Bottom 2 | 12/14/2020 | CT | 158622 | LL4G8Bcs-533-001-SO (Bottom2) | - | | | - | | | - | | | - | | | 0.0297 | | | 0.0257 | | | 0.0346 | | | 0.00277 | | J | - | | | - | | | - | | | | RGOs have been met, no further excavation in this direction | 12/29/2020 | 12/30/2020 | 12/30/2020 | |
| 4 | Building G-8 (b) | B(a)a, BaP, BbF, DA | Excavation Sample | Sidewall West | 12/14/2020 | CT | 158622 | LL4G8Bcs-534-001-SO (SWW) | - | | | - | | | - | | | - | | | 0.00399 | | J | 0.00459 | | J | 0.00774 | | | 0.0025 | | U | - | | | - | | | - | | | | RGOs have been met, no further excavation in this direction | 12/29/2020 | 12/30/2020 | 12/30/2020 | |
| 4 | Building G-8 (b) | B(a)a, BaP, BbF, DA | Excavation Sample | Sidewall North | 12/14/2020 | CT | 158622 | LL4G8Bcs-535-001-SO (SWN) | - | | | - | | | - | | | - | | | 8.03 | | | 6.69 | | | 8.37 | | | 0.519 | | | - | | | - | | | - | | | | Additional soil excavated 3' in this direction for treatment, and an additional ISM sample collected from the new northern sidewall for BaP - see below. | 12/29/2020 | 12/30/2020 | 12/30/2020 | |
| 4 | Building G-8 (b) | BaP | Excavation Sample | Sidewall North | 1/13/2021 | CT | 159189 | LL4G8Bcs-543-001-SO (SWN) | - | | | - | | | - | | | - | | | - | | | 2.02 | | | - | | | - | | | - | | | - | | | - | | | | RGOs have been met, no further excavation in this direction. Excavation can be backfilled. | 1/25/2021 | 1/26/2021 | 1/26/2021 | |
| 4 | Building G-8 (b) | B(a)a, BaP, BbF, DA | Excavation Sample | Sidewall South | 12/14/2020 | CT | 158622 | LL4G8Bcs-536-001-SO (SWS) | - | | | - | | | - | | | - | | | 0.0116 | | | 0.0125 | | | 0.0209 | | | 0.00193 | | J | - | | | - | | | - | | | | RGOs have been met, no further excavation in this direction | 12/29/2020 | 12/30/2020 | 12/30/2020 | |
| 4 | Building G-8 (b) | B(a)a, BaP, BbF, DA | Excavation Sample | Sidewall East | 12/14/2020 | CT | 158622 | LL4G8Bcs-537-001-SO (SWE) | - | | | - | | | - | | | - | | | 0.021 | | | 0.0185 | | | 0.0265 | | | 0.00244 | | J | - | | | - | | | - | | | | RGOs have been met, no further excavation in this direction | 12/29/2020 | 12/30/2020 | 12/30/2020 | |
| 4 | Building G-16 | PCB-1260 | Excavation Sample | Bottom | 12/11/2020 | CT | 158590 | LL4G16cs-527-001-SO (Bottom) | - | | | - | | | - | | | 0.0232 | | | - | | | - | | | - | | | - | | | - | | | - | | | - | | | | | 12/22/2020 | 12/28/2020 | 12/30/2020 | |
| 4 | Building G-16 | PCB-1260 | Excavation Sample | Sidewall West | 12/11/2020 | CT | 158590 | LL4G16cs-528-001-SO (SWW) | - | | | - | | | - | | | 0.0965 | | | - | | | - | | | - | | | - | | | - | | | - | | | - | | | | | 12/22/2020 | 12/28/2020 | 12/30/2020 | |
| 4 | Building G-16 | PCB-1260 | Excavation Sample | Sidewall North | 12/11/2020 | CT | 158590 | LL4G16cs-529-001-SO (SWN) | - | | | - | | | - | | | 0.0395 | | | - | | | - | | | - | | | - | | | - | | | - | | | - | | | RGOs have been met. Pending post-excavation survey, excavation can be backfilled. | | 12/22/2020 | 12/28/2020 | 12/30/2020 | |
| 4 | Building G-16 | PCB-1260 | Excavation Sample | Sidewall South | 12/14/2020 | CT | 158622 | LL4G16cs-530-001-SO (SWS) | - | | | - | | | - | | | 0.02 | | U | - | | | - | | | - | | | - | | | - | | | - | | | - | | | | | 12/29/2020 | 12/30/2020 | 12/30/2020 | |
| 4 | Building G-16 | PCB-1260 | Excavation Sample | Sidewall East | 12/14/2020 | CT | 158622 | LL4G16cs-531-001-SO (SWE) | - | | | - | | | - | | | 0.0581 | | P | - | | | - | | | - | | | - | | | - | | | - | | | - | | | P qualifier - Concentration of analyte differs more than 40% between primary and confirmation analysis. - The higher of the two values is reported. | | 12/29/2020 | 12/30/2020 | 12/30/2020 | |
| 4 | Former Water Tower | Lead | Excavation Sample | Bottom | 12/15/2020 | CT | 158721 | LL4FWTcs-538-001-SO (Bottom) | - | | | 203 | | | - | | | - | | | - | | | - | | | - | | | - | | | - | | | - | | | - | | | | RGOs have been met, no further excavation in this direction | 12/29/2020 | 12/30/2020 | 12/30/2020 | |
| 4 | Former Water Tower | Lead | Excavation Sample | Sidewall South | 12/15/2020 | CT | 158721 | LL4FWTcs-539-001-SO (SWS) | - | | | 147 | | | - | | | - | | | - | | | - | | | - | | | - | | | - | | | - | | | - | | | | RGOs have been met, no further excavation in this direction | 12/29/2020 | 12/30/2020 | 12/30/2020 | |
| 4 | Former Water Tower | Lead | Excavation Sample | Sidewall North | 12/15/2020 | CT | 158721 | LL4FWTcs-541-001-SO (SWN) | - | | | 442 | | | - | | | - | | | - | | | - | | | - | | | - | | | - | | | - | | | - | | | | RGOs have been met, no further excavation in this direction | 12/29/2020 | 12/30/2020 | 12/30/2020 | |
| 4 | Former Water Tower | Lead | Excavation Sample | Sidewall East | 12/15/2020 | CT | 158721 | LL4FWTcs-540-001-SO (SWE) | - | | | 843 | | | - | | | - | | | - | | | - | | | - | | | - | | | - | | | - | | | - | | | | Additional soil excavated 3' in this direction for off-site disposal, and an additional ISM sample collected from the new western sidewall for lead - see below. | 12/29/2020 | 12/30/2020 | 12/30/2020 | |
| 4 | Former Water Tower | Lead | Excavation Sample | Sidewall East | 1/12/2021 | CT | 159157 | LL4FWTcs-544-001-SO (SWE) | - | | | 1120 | | M | - | | | - | | | - | | | - | | | - | | | - | | | - | | | - | | | - | | | | Per discussions with the Army, the eastern sidewall will be excavated further to the east until it daylights due to the sloping topography. No additional sampling. | 1/25/2021 | 1/26/2021 | 1/26/2021 | |
| 4 | Former Water Tower | Lead | Excavation Sample | Sidewall West | 12/15/2020 | CT | 158721 | LL4FWTcs-542-001-SO (SWW) | - | | | 1110 | | | - | | | - | | | - | | | - | | | - | | | - | | | - | | | - | | | - | | | | Additional soil excavated 3' in this direction for off-site disposal, and an additional ISM sample collected from the new western sidewall for lead - see below. | 12/29/2020 | 12/30/2020 | 12/30/2020 | |
| 4 | Former Water Tower | Lead | Excavation Sample | Sidewall West | 1/12/2021 | CT | 159157 | LL4FWTcs-545-001-SO (SWW) | - | | | 2120 | | | - | | | - | | | - | | | - | | | - | | | - | | | - | | | - | | | - | | | | Per discussions with the Army, the western sidewall will be excavated further to the west approximately 10 feet, beyond which large trees are present, and an additional ISM sample for lead will be collected for the further extended Sidewall West. | 1/25/2021 | 1/26/2021 | 1/26/2021 | |
| 4 | Former Water Tower | Lead | Excavation Sample | Sidewall West | | CT | | LL4FWTcs-547-001-SO (SWW) | - | | | 2120 | | | - | | | - | | | - | | | - | | | - | | | - | | | - | | | - | | | - | | | | ISM sample will be collected for lead pending further excavation in this direction. | | | | |
| 12 | Active Area Channel | TNT, 2,6-DNT, BaP | Excavation Sample | Bottom | 12/18/2020 | CT | 158762 | LL12AACcs-340-001-SO (Bottom) | - | | | - | | | - | | | - | | | - | | | 0.0172 | | | - | | | - | | | - | | | 0.65 | | | 0.2 | | U | | | 1/6/2021 | 1/7/2021 | 1/7/2021 | |
| 12 | Active Area Channel | TNT, 2,6-DNT, BaP | Excavation Sample | Sidewall West | 12/18/2020 | CT | 158762 | LL12AACcs-341-001-SO (SWW) | - | | | - | | | - | | | - | | | - | | | 0.00398 | | J | - | | | - | | | - | | | 2 | | | 0.1 | | J | | | 1/6/2021 | 1/7/2021 | 1/7/2021 | |
| 12 | Active Area Channel | TNT, 2,6-DNT, BaP | Excavation Sample | Sidewall South | 12/18/2020 | CT | 158762 | LL12AACcs-342-001-SO (SWS) | - | | | - | | | - | | | - | | | - | | | 0.015 | | J | - | | | - | | | - | | | 0.71 | | | 0.091 | | J | | RGOs have been met. Pending post-excavation survey, excavation can be backfilled. | 1/6/2021 | 1/7/2021 | 1/7/2021 | |
| 12 | Active Area Channel | TNT, 2,6-DNT, BaP | Excavation Sample | Sidewall East | 12/18/2020 | CT | 158762 | LL12AACcs-343-001-SO (SWE) | - | | | - | | | - | | | - | | | - | | | 0.00654 | | | - | | | - | | | - | | | 0.88 | | | 0.2 | | U | | | 1/6/2021 | 1/7/2021 | 1/7/2021 | |
| 12 | Active Area Channel | TNT, 2,6-DNT, BaP | Excavation Sample | Sidewall North | 12/18/2020 | CT | 158762 | LL12AACcs-344-001-SO (SWN) | - | | | - | | | - | | | - | | | - | | | 0.015 | | | - | | | - | | | - | | | 0.35 | | | 0.2 | | U | | | 1/6/2021 | 1/7/2021 | 1/7/2021 | |

**LL 1-4 & 12 Remedial Action**
**Excavation Confirmation Sample Results (unvalidated)**

| Load Line | Remediation Area | COCs | Description/ Rationale | Location | Sample Date | Lab | Lab SDG # | Sample ID/Location | Antimony mg/kg 470 | Lead mg/kg 800 | PCB-1254 mg/kg 9.7 | PCB-1260 mg/kg 9.9 | B(a)a mg/kg 29 | BaP mg/kg 2.9 | BbF mg/kg 29 | DA mg/kg 2.9 | RDX mg/kg 280 | TNT mg/kg 510 | 2,6-DNT mg/kg 15 | Notes | Action | Submitted to Army | Approved by Army | Submitted to Ohio EPA | OhioEPA Concurrence |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 12 | FF-19 A | B(a)a, BaP, BbF, DA | Excavation Sample | Bottom | 12/18/2020 | CT | 158762 | LL12FF19Acs-336-001-SO (Bottom) | - | - | - | - | 0.605 | 0.496 | 0.65 | 0.0898 | - | - | - | | RGOs have been met, no further excavation in this direction | 1/6/2021 | 1/7/2021 | 1/7/2021 | |
| 12 | FF-19 A | B(a)a, BaP, BbF, DA | Excavation Sample - ISM TRIPLICATE set 9 | Sidewall South | 12/18/2020 | CT | 158762 | LL12FF19Acs-337-001-SO (SWS) | - | - | - | - | 6.68 | 5.35 | 6.07 | 0.864 | - | - | - | | | 1/6/2021 | 1/7/2021 | 1/7/2021 | |
| 12 | FF-19 A | B(a)a, BaP, BbF, DA | Excavation Sample - ISM TRIPLICATE set 9 | Sidewall South | 12/18/2020 | CT | 158762 | LL12FF19Acs-337-002-SO (SWS) | - | - | - | - | 4.82 | 3.65 | 4.95 | 0.619 | - | - | - | | | 1/6/2021 | 1/7/2021 | 1/7/2021 | |
| 12 | FF-19 A | B(a)a, BaP, BbF, DA | Excavation Sample - ISM TRIPLICATE set 9 | Sidewall South | 12/18/2020 | CT | 158762 | LL12FF19Acs-337-003-SO (SWS) | - | - | - | - | 4.96 | 3.72 | 4.55 | 0.629 | - | - | - | | | 1/6/2021 | 1/7/2021 | 1/7/2021 | |
| 12 | FF-19 A | B(a)a, BaP, BbF, DA | Excavation Sample - ISM TRIPLICATE set 9 | | | | | **arithmetic mean** | | | | | 5.487 | 4.240 | 5.190 | 0.704 | | | | | - RGO exceeded for BaP in each individual replicate sample; | 1/6/2021 | 1/7/2021 | 1/7/2021 | |
| 12 | FF-19 A | B(a)a, BaP, BbF, DA | Excavation Sample - ISM TRIPLICATE set 9 | | | | | **standard deviation** | | | | | 1.036 | 0.962 | 0.788 | 0.139 | | | | | - RSD <35% for all analytes | 1/6/2021 | 1/7/2021 | 1/7/2021 | |
| 12 | FF-19 A | B(a)a, BaP, BbF, DA | Excavation Sample - ISM TRIPLICATE set 9 | | | | | **CV = SD / mean** | | | | | 19% | 23% | 15% | 20% | | | | | - Additional soil excavated 3' in this direction for treatment, and an additional ISM sample collected for the new southern sidewall and resampled as ISM triplicate for BaP - see below. | 1/6/2021 | 1/7/2021 | 1/7/2021 | |
| 12 | FF-19 A | B(a)a, BaP, BbF, DA | Excavation Sample - ISM TRIPLICATE set 9 | | | | | **count (r)** | | | | | 3 | 3 | 3 | 3 | | | | | | 1/6/2021 | 1/7/2021 | 1/7/2021 | |
| 12 | FF-19 A | B(a)a, BaP, BbF, DA | Excavation Sample - ISM TRIPLICATE set 9 | | | | | **alpha (95% = 0.05)** | | | | | 0.05 | 0.05 | 0.05 | 0.05 | | | | | | 1/6/2021 | 1/7/2021 | 1/7/2021 | |
| 12 | FF-19 A | B(a)a, BaP, BbF, DA | Excavation Sample - ISM TRIPLICATE set 9 | | | | | **t(alpha, df=r-1)** | | | | | 2.92 | 2.92 | 2.92 | 2.92 | | | | | | 1/6/2021 | 1/7/2021 | 1/7/2021 | |
| 12 | FF-19 A | B(a)a, BaP, BbF, DA | Excavation Sample - ISM TRIPLICATE set 9 | | | | | **Student's t UCL** | | | | | 7.23 | 5.86 | 6.52 | 0.94 | | | | | | 1/6/2021 | 1/7/2021 | 1/7/2021 | |
| 12 | FF-19 A | B(a)a, BaP, BbF, DA | Excavation Sample - ISM TRIPLICATE set 9 | | | | | **Chebyshev UCL** | | | | | 8.09 | 6.66 | 7.17 | 1.05 | | | | | | 1/6/2021 | 1/7/2021 | 1/7/2021 | |
| 12 | FF-19 A | BaP | Excavation Sample | Sidewall South | 1/12/2021 | CT | 159157 | LL12FF19Acs-345-001-SO (SWS) | - | - | - | - | - | 1.72 | - | - | - | - | - | | | 1/25/2021 | 1/26/2021 | 1/26/2021 | |
| 12 | FF-19 A | BaP | Excavation Sample - ISM TRIPLICATE set 16 | Sidewall South | 1/12/2021 | CT | 159157 | LL12FF19Acs-345-002-SO (SWS) | - | - | - | - | - | 0.559 | - | - | - | - | - | | | 1/25/2021 | 1/26/2021 | 1/26/2021 | |
| 12 | FF-19 A | BaP | Excavation Sample - ISM TRIPLICATE set 16 | Sidewall South | 1/12/2021 | CT | 159157 | LL12FF19Acs-345-003-SO (SWS) | - | - | - | - | - | 1.55 | - | - | - | - | - | | | 1/25/2021 | 1/26/2021 | 1/26/2021 | |
| 12 | FF-19 A | BaP | Excavation Sample - ISM TRIPLICATE set 16 | | | | | **arithmetic mean** | | | | | | 1.276 | | | | | | | | 1/25/2021 | 1/26/2021 | 1/26/2021 | |
| 12 | FF-19 A | BaP | Excavation Sample - ISM TRIPLICATE set 16 | | | | | **standard deviation** | | | | | | 0.627 | | | | | | | - All replicates meet the RGO | 1/25/2021 | 1/26/2021 | 1/26/2021 | |
| 12 | FF-19 A | BaP | Excavation Sample - ISM TRIPLICATE set 16 | | | | | **CV = SD / mean** | | | | | | 49% | | | | | | | - RSD >35% but <50%, per work plan compare the maximum field replicate concentration to the RGO | 1/25/2021 | 1/26/2021 | 1/26/2021 | |
| 12 | FF-19 A | BaP | Excavation Sample - ISM TRIPLICATE set 16 | | | | | **count (r)** | | | | | | 3 | | | | | | | | 1/25/2021 | 1/26/2021 | 1/26/2021 | |
| 12 | FF-19 A | BaP | Excavation Sample - ISM TRIPLICATE set 16 | | | | | **alpha (95% = 0.05)** | | | | | | 0.05 | | | | | | | - no further excavation in this direction | 1/25/2021 | 1/26/2021 | 1/26/2021 | |
| 12 | FF-19 A | BaP | Excavation Sample - ISM TRIPLICATE set 16 | | | | | **t(alpha, df=r-1)** | | | | | | 2.92 | | | | | | | | 1/25/2021 | 1/26/2021 | 1/26/2021 | |
| 12 | FF-19 A | BaP | Excavation Sample - ISM TRIPLICATE set 16 | | | | | **Student's t UCL** | | | | | | 2.33 | | | | | | | | 1/25/2021 | 1/26/2021 | 1/26/2021 | |
| 12 | FF-19 A | BaP | Excavation Sample - ISM TRIPLICATE set 16 | | | | | **Chebyshev UCL** | | | | | | 2.85 | | | | | | | | 1/25/2021 | 1/26/2021 | 1/26/2021 | |
| 12 | FF-19 A | B(a)a, BaP, BbF, DA | Excavation Sample | Sidewall North | 12/18/2020 | CT | 158762 | LL12FF19Acs-338-001-SO (SWN) | - | - | - | - | 1.69 MY | 1.28 MY | 1.63 MY | 0.237 M | - | - | - | M qualifier - Matrix spike and/or Matrix Spike Duplicate recovery outside acceptance limits. - therefore data manually integrated, no concern with data usability<br>Y qualifier - Replicate/Duplicate precision outside acceptance limits. - Primary sample result is reported with data flagging | RGOs have been met, no further excavation in this direction | 1/6/2021 | 1/7/2021 | 1/7/2021 | |
| 12 | FF-19 A | B(a)a, BaP, BbF, DA | Excavation Sample | Sidewall West | 12/18/2020 | CT | 158762 | LL12FF19Acs-339-001-SO (SWW) | - | - | - | - | 3.73 | 3.09 | 4.26 | 0.54 | - | - | - | | Additional soil excavated 3' in this direction for treatment, and an additional ISM sample collected from the new western sidewall for BaP - see below. | 1/6/2021 | 1/7/2021 | 1/7/2021 | |
| 12 | FF-19 A | BaP | Excavation Sample | Sidewall West | 1/12/2021 | CT | 159157 | LL12FF19Acs-346-001-SO (SWW) | - | - | - | - | - | 3.56 | - | - | - | - | - | | Additional soil has been excavated 3' in this direction for treatment, and an additional ISM sample has been collected from the new western sidewall for BaP - see below. | 1/25/2021 | 1/26/2021 | 1/26/2021 | |
| 12 | FF-19 A | BaP | Excavation Sample | Sidewall West | 1/22/2021 | CT | | LL12FF19Acs-350-001-SO (SWW) | - | - | - | - | - | | - | - | - | - | - | | Sample analysis is underway. | | | | |

**LL 1-4 & 12 Remedial Action**
**Excavation Confirmation Sample Results (unvalidated)**

| | | | | | | | | | Analyte/Units/Remedial Goal Option (RGO)/Result | | | | | | | | |

**LL 1-4 & 12 Remedial Action**
**Excavation Confirmation Sample Results (unvalidated)**

| | | | | | | | | | Analyte/Units/Remedial Goal Option (RGO)/Result | | | | | | | | |

## Shreffler, Rebecca M

**From:** Sedlak, Kevin M CTR NG OHARNG (USA) <kevin.m.sedlak.ctr@mail.mil>
**Sent:** Friday, January 15, 2021 10:32 AM
**To:** Susan.Netzly-Watkins@epa.ohio.gov; Tait, Kathryn S NFG NG OHARNG (USA)
**Cc:** Brian.Tucker@epa.ohio.gov; Thomas.Schneider@epa.ohio.gov; bob.princic@epa.ohio.gov; Leeper, Mark S CIV NG NGB (USA); Peters, Nathaniel II CIV USARMY CELRL (USA); Kvaal, Steven LRL; Shreffler, Rebecca M
**Subject:** [External] RE: [Non-DoD Source] LL 1-4 and 12 RD: January 7th meeting notes and action items.

Susan: The Army response to the action items is below. Thanks and if you have any comments and/or questions please contact me.

Action Items:

- Ohio EPA requested RVAAP and its contractor include a brief note with the data to help both Ohio EPA and the public understand the cause for the data variability and elevated RSDs and the rational that was applied using the Hawaii ISM Guidance to determine that RGO were met. A more thorough explanation and discussion of the elevated RSDs will be included in any appropriate completion report(s).

Army Response: the Army concurs and a complete explanation of all sampling activities and results will be included in the RACR report.

- In addition, a simple an inexpensive method to verify the reliability of the ISM sampling results and one that Ohio EPA can use for both transparency and potential inquiry by the public, Ohio EPA requests the next three ISM triplicate samples for explosives also be analyzed for antimony and lead (alternatively, nickel and zinc could be used). The RSD values for the metals should meet the goal and provide support of the acceptance of the explosive results from the same triplicate samples. These results would also verify the quality of the sampling and sub-sampling while providing additional evidence of the loss and variability (e.g., elevated RSD values) of the explosive compounds.

Army Response: As always, the Army appreciates the input from the Ohio EPA help, to complete this project successfully. The area in question CB4A located at Load Line 1 has been re excavated five additional feet to the south where the ISM sample results exceeded the 95% UCL and RSDs were greater than 35%. The sidewall was separated into three sections for ISM sampling. Due to the heterogeneity of this sidewall encountered during the first triplicate sampling round, the Army is dividing the wall into three ISM samples two of the ISM samples will be collected in triplicate, and one sidewall sample will be collected as a single ISM sample. The area on the east end of the south wall is composed of fill material thought to be from the construction of the building. The area to the west of this area is apparent back fill from remediation activities from the 2010-2011 period. The third area west of the previously remediated area is also composed of fill material from the original construction of the building. This area is very shallow as the bedrock surface is rising to the west and leaves a very small one foot of material to sample. This area also has a bedrock outcropping into it that cannot be sampled. This will have the single ISM sample collected. The other two areas to the east will be sampled in triplicate.

The Army feels that by separating this wall and attempting to avoid the heterogeneity problem believed to be a factor in the RSD being out of acceptable range may provide acceptable results. The inclusion of metals analysis in the ISM samples will not be done at this late point in the sampling of the ISMs. The metals may also have differing properties when ground and analyzed as ISM analytes, and this would need to be researched. Additionally, this technique was not included in the approved work plan and no DQOs or QA/QC procedures were established for these metal analysis. At this time, the Army will continue to follow the approved work plan and will report the results of the additional triplicate ISM samples and the single ISM sample when the results are received from the laboratory.

***NOTE: NEW EMAIL ADDRESS kevin.m.sedlak.ctr@mail.mil***
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****Please note, any communication generated through this correspondence does not coincide with any contract modifications, specifications, clarifications, or corrections unless a formal document is attached designating the like.****

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**From:** Susan.Netzly-Watkins@epa.ohio.gov <Susan.Netzly-Watkins@epa.ohio.gov>
**Sent:** Tuesday, January 12, 2021 4:12 PM
**To:** Sedlak, Kevin M CTR NG OHARNG (USA) <kevin.m.sedlak.ctr@mail.mil>; Tait, Kathryn S NFG NG OHARNG (USA) <kathryn.s.tait.nfg@mail.mil>
**Cc:** Brian.Tucker@epa.ohio.gov; Thomas.Schneider@epa.ohio.gov; bob.princic@epa.ohio.gov
**Subject:** [Non-DoD Source] LL 1-4 and 12 RD: January 7th meeting notes and action items.

On January 7th, Ohio EPA and RVAAP Team had a discussion on the Load Line 1-4 and 12 RD project and several questions we had regarding the results. If you'd like to discuss further let us know.

- Thermal Treatment Unit data appear to be meeting the remediation goals.
- Verification Data: Verification data- RSDs for explosive compounds are not in the range that reflect quality data and may signal either lab or field issues need to be addressed. We'd like to hear how the lab is processing the ISM sample and how it does sub-sampling.
- Lab qualifiers: CT Lab had many "Q" qualified data results as well as Z and Y flags, and we'd like to understand more about this.
- Change Order Request Narratives: The summary info seems inconsistent with the data included.

Doug Scott provided some explanation on why the RSD results, in particular for TNT and RDX are outside the desired goal of 35%, usually over 100%. Our understanding is that the variability in the data are being attributed to the lab

processing the ISM sample. Specifically, the thermal instability and degradation of explosives that occurs during the milling of the soil sample prior to subsampling in the laboratory. The lab is following the appropriate ISM sample SOP. Doug noted that the act of milling the soil creates heat that causes a loss of explosives. Thus, all the explosive data is then assumed biased low by approximately 25%.

Shane Lowe and Doug explained the lab qualifiers: Q= LCS errors; Y= RSD fail; Z = calibration errors

Sarah Myers noted they are following the Hawaii ISM Sample Guide table and are taking actions in accordance with this guidance.

Sara Myers also explained that the Change Order reports is a rolling reporting of the field activities. This may be why the summaries are not consistent with the reported data and figures.

Ohio EPA understands the challenge of following the SOP and the possible loss of sensitive contaminants during the process. Ohio EPA also notes that the areas where the data that have had RSDs above the goal of 35% are relatively small and are targeted to a sidewall of an excavation. Ohio EPA discussed how these limited areas may not have a significant effect on possible future exposure or risk at the AOCs. Ohio EPA also appreciates the reporting on the LL 1-4 and 12 RD activities. However, the Change Order #3 summary noted that RGOs had been met, but it did not seem to be supported by the data included with this Change Order that noted additional excavation was underway due to an exceedance of an RGO.

**Action Items**:

- Ohio EPA requested RVAAP and its contractor include a brief note with the data to help both Ohio EPA and the public understand the cause for the data variability and elevated RSDs and the rational that was applied using the Hawaii ISM Guidance to determine that RGO were met. A more thorough explanation and discussion of the elevated RSDs will be included in any appropriate completion report(s).
- In addition, a simple an inexpensive method to verify the reliability of the ISM sampling results and one that Ohio EPA can use for both transparency and potential inquiry by the public, Ohio EPA requests the next three ISM triplicate samples for explosives also be analyzed for antimony and lead (alternatively, nickel and zinc could be used). The RSD values for the metals should meet the goal and provide support of the acceptance of the explosive results from the same triplicate samples. These results would also verify the quality of the sampling and sub-sampling while providing additional evidence of the loss and variability (*e.g.*, elevated RSD values) of the explosive compounds.
- When reporting that RGOs have been met in the Change Order Summary, please include which decision unit/remediation area of the Load Line that statement applies to so we can understand where the area that has been verified is located. The table provided in Change Order Summary #5 is improved.

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# Excavation Confirmation Sample Results

Excavation Confirmation Report No. 6 DATE INITIATED: 1/11/2021

PROJECT RVAAP Load Lines 1-4 and 12 (RVAAP-08 to 12)

CONTRACT NO W912QR-12-D-0005

REQUESTOR IDENTIFICATION

NAME_ORGANIZATION PHONE Sarah Meyers, CH2M, 703-376-5338

TITLE Project Manager SIGNATURE *Sarah L. Meyers*

BASELINE IDENTIFICATION

BASELINE(S) AFFECTED ☐ Cost ☐ Scope ☐ Milestone ☐ Method of Accomplishment

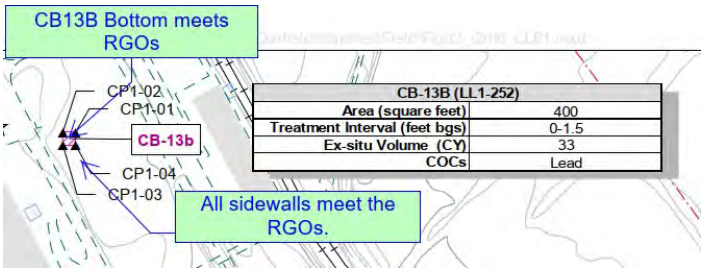
AFFECTED DOCUMENTS (TITLE, NUMBER AND SECTION):

Not applicable

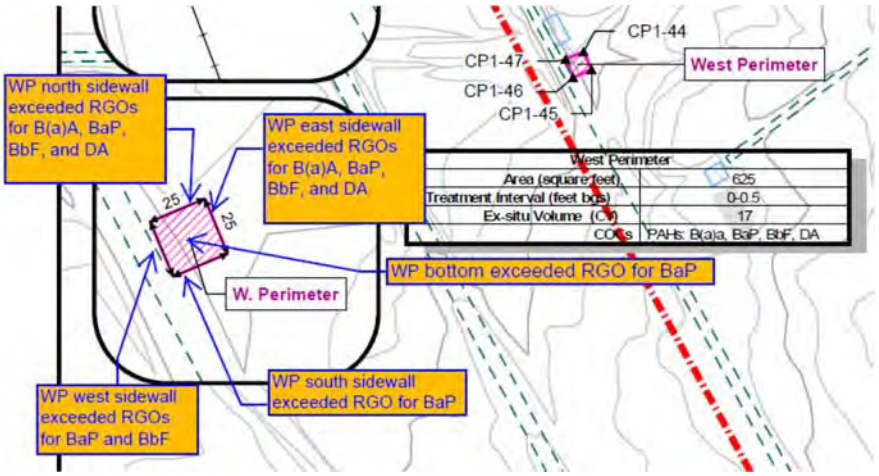
DESCRIPTION OF CHANGE:

1. Additional analytical results for excavation confirmation samples are attached. Results previously concurred by the Army and Ohio EPA are identified on the table.
2. Excavation confirmation sampling of the initial excavation footprints concluded on 12/21/20. This memo completes the excavation confirmation sample results for the initial excavation footprints.
3. Samples from five decision units in this data set exceed an associated remedial goal option (RGO):
    - LL3, West Perimeter, Bottom - benzo(a)pyrene (BaP) concentration of 12.0 mg/kg exceeds the RGO of 2.9 mg/kg
    - LL3, West Perimeter, Sidewall North –
        - Benz(a)anthracene [B(a)A] concentrations of 69.3 mg/kg, 63.6 mg/kg, and 67.7 mg/kg in the triplicate samples exceed the RGO of 29 mg/kg;
        - BaP concentrations of 73.7 mg/kg, 67 mg/kg and 68.6 mg/kg in the triplicate samples exceed the RGO of 2.9 mg/kg;
        - Benzo(b)fluoranthene (BbF) concentrations of 101 mg/kg, 86 mg/kg, and 95.7 mg/kg in the triplicate samples exceed the RGO of 29 mg/kg;
        - Dibenz(a,h)anthracene (DA) concentrations of 10.7 mg/kg, 9.89 mg/kg, and 10.5 mg/kg in the triplicate sample exceed the RGO of 2.9 mg/kg
    - LL3, West Perimeter, Sidewall West –
        - BaP concentrations of 24.3 mg/kg, 25.7 mg/kg and 21.6 mg/kg in the triplicate samples exceed the RGO of 2.9 mg/kg;
        - BbF concentration of 32.6 mg/kg for one of the triplicate samples exceeds the RGO of 29 mg/kg
    - LL3, West Perimeter Sidewall South - BaP concentration of 3.14 mg/kg exceeds the RGO of 2.9 mg/kg
    - LL3, West Perimeter Sidewall East –
        - B(a)A concentration of 37.1 mg/kg exceeds the RGO of 29 mg/kg;
        - BaP concentration of 32.1 mg/kg exceeds the RGO of 2.9 mg/kg;
        - BbF concentration of 41.4 mg/kg exceeds the RGO of 29 mg/kg; and
        - DA concentration of 4.65 mg/kg exceeds the RGO of 2.9 mg/kg

4. Load Line 1, excavation CB-13B is shown below. The applicable RGOs have been met and the excavation can be backfilled pending the post-excavation survey.




5. Load Line 3, excavation West Perimeter is shown below.
   a. The bottom exceeded the RGO for BaP. Additional soil will be excavated from the bottom and an additional ISM sample for BaP will be collected for the extended Bottom.
   b. The north sidewall exceeded the RGOs for B(a)A, BaP, BbF, and DA. Additional soil will be excavated in this direction and an additional ISM sample for B(a)A, BaP, BbF, and DA will be collected for the extended Sidewall North.
   c. The west sidewall exceeded the RGOs for BaP and BbF. Additional soil will be excavated in this direction and an additional ISM sample for BaP and BbF will be collected for the extended Sidewall West.
   d. The south sidewall exceeded the RGO for BaP. Additional soil will be excavated in this direction and an additional ISM sample for BaP will be collected for the extended Sidewall South.
   e. The east sidewall exceeded the RGOs for B(a)A, BaP, BbF, and DA. Additional soil will be excavated in this direction and an additional ISM sample for B(a)A, BaP, BbF, and DA will be collected for the extended Sidewall East.



JUSTIFICATION:

As detailed above and in the attached table, additional excavation is indicated for five decision units in this data set that exceed an associated RGO:

- LL3, West Perimeter, Bottom for BaP
- LL3, West Perimeter, Sidewall North for B(a)A, BaP, BbF, and DA
- LL3, West Perimeter, Sidewall West for BaP and BbF
- LL3, West Perimeter, Sidewall South for BaP
- LL3, West Perimeter, Sidewall East for B(a)A, BaP, BbF, and DA

Overall, additional excavation is indicated for 15 decision units in 7 excavations:

- LL1, CB4A, South Sidewall for TNT
- LL3, EB-4, North Sidewall for PCB-1254
- LL3, West Perimeter, Bottom for BaP
- LL3, West Perimeter, Sidewall North for B(a)A, BaP, BbF, and DA
- LL3, West Perimeter, Sidewall West for BaP and BbF
- LL3, West Perimeter, Sidewall South for BaP
- LL3, West Perimeter, Sidewall East for B(a)A, BaP, BbF, and DA
- LL4, G-8(b), North Sidewall for benzo(a)pyrene (BaP)
- LL4, Former Water Tower, East Sidewall for lead
- LL4, Former Water Tower, West Sidewall for lead
- LL12, FF-19(a), South Sidewall for BaP
- LL12, FF-19(a), West Sidewall for BaP
- LL12, FF-19(c), Bottom 1 for BaP
- LL12, FF-19(c), East Sidewall 1 for BaP
- LL12, FF-19(c), West Sidewall 1 for BaP

There are 17 excavations that meet the associated RGOs or have been excavated to bedrock and can be backfilled pending the post-excavation survey:

- LL1, CB-2
- LL1, CB-4
- LL1, CB-13B
- LL1, Outlet Channel D
- LL2, DB-4A
- LL3, EA-6(a)
- LL3, EA-6(b)
- LL3, EA-6(c)
- LL3, EA-7
- LL3, EB-9A
- LL3, EB-10(a)
- LL3, EB-10(b)
- LL3, EB-803
- LL4, Building G-8(a)
- LL4, Building G-16
- LL12, Active Area Channel
- LL12, FF-19(b)

IMPACT OF NOT IMPLEMENTING REQUEST

Not applicable.

PARTICIPANTS AFFECTED BY IMPLEMENTING REQUEST

Not applicable.

COST ESTIMATE: NA ESTIMATOR SIGNATURE _____

PHONE: DATE _____

USACE COTR PETERS.NATHANIEL.II.1248279466 Digitally signed by PETERS.NATHANIEL.II.1248279466 Date: 2021.01.12 09:32:25 -05'00' DATE January 12, 2021

OHIO EPA PROJECT MANAGER _____ DATE _____

MANAGER SIGNATURE N/A DATE _____

**LL 1-4 & 12 Remedial Action**
**Excavation Confirmation Sample Results (unvalidated)**

| Load Line | Remediation Area | COCs | Description/ Rationale | Location | Sample Date | Lab | Lab SDG # | Sample ID/Location | Analyte/Units/Remedial Goal Option (RGO)/Result | | | | | | | | | | | | | | | | | | | | Action | Submitted to Army | Approved by Army | Submitted to Ohio EPA | OhioEPA Concurrence |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | Antimony mg/kg | | Lead mg/kg | | PCB-1254 mg/kg | | PCB-1260 mg/kg | | B(a)a mg/kg | | BaP mg/kg | | BbF mg/kg | | DA mg/kg | | RDX mg/kg | | TNT mg/kg | | 2,6-DNT mg/kg | | | | | |
| | | | | | | | | | 470 | | 800 | | 9.7 | | 9.9 | | 29 | | 2.9 | | 29 | | 2.9 | | 280 | | 610 | | 65 | | | | | |
| 1 | CB-4A | RDX, TNT | Excavation Sample - ISM TRIPLICATE set2 | Sidewall East 1 | 11/20/2020 | CT | 158141 | LL1CB4Acs-737-001-SO (SW East 1) | - | | - | | - | | - | | - | | - | | - | | - | | 5.4 | | 71 | Q | - | | | 12/8/2020 | 12/9/2020 | 12/11/2020 | |
| 1 | CB-4A | RDX, TNT | Excavation Sample - ISM TRIPLICATE set2 | Sidewall East 1 | 11/20/2020 | CT | 158141 | LL1CB4Acs-737-002-SO (SW East 1) | - | | - | | - | | - | | - | | - | | - | | - | | 0.21 | P | 270 | Q | - | | | 12/8/2020 | 12/9/2020 | 12/11/2020 | |
| 1 | CB-4A | RDX, TNT | Excavation Sample - ISM TRIPLICATE set2 | Sidewall East 1 | 11/20/2020 | CT | 158141 | LL1CB4Acs-737-003-SO (SW East 1) | - | | - | | - | | - | | - | | - | | - | | - | | 0.2 | U | 1.2 | Q | - | | | 12/8/2020 | 12/9/2020 | 12/11/2020 | |
| 1 | CB-4A | RDX, TNT | Excavation Sample - ISM TRIPLICATE set2 | | | | | **arithmetic mean** | | | | | | | | | | | | | | | | | 1.937 | | 114.067 | | | | - RGOs met in each individual replicate sample;<br>- RSD >100% for RDX and TNT;<br>- 95% UCL (Chebychev method) is less than RGOs;<br>- no further excavation in this direction | 12/17/2020 | 12/28/2020 | 12/30/2020 | |
| 1 | CB-4A | RDX, TNT | Excavation Sample - ISM TRIPLICATE set2 | | | | | **standard deviation** | | | | | | | | | | | | | | | | | 2.999 | | 139.479 | | | | | 12/17/2020 | 12/28/2020 | 12/30/2020 | |
| 1 | CB-4A | RDX, TNT | Excavation Sample - ISM TRIPLICATE set2 | | | | | **CV = SD / mean** | | | | | | | | | | | | | | | | | 155% | | 122% | | | | | 12/17/2020 | 12/28/2020 | 12/30/2020 | |
| 1 | CB-4A | RDX, TNT | Excavation Sample - ISM TRIPLICATE set2 | | | | | **count (r)** | | | | | | | | | | | | | | | | | 3 | | 3 | | | | | 12/17/2020 | 12/28/2020 | 12/30/2020 | |
| 1 | CB-4A | RDX, TNT | Excavation Sample - ISM TRIPLICATE set2 | | | | | **alpha (95% = 0.05)** | | | | | | | | | | | | | | | | | 0.05 | | 0.05 | | | | | 12/17/2020 | 12/28/2020 | 12/30/2020 | |
| 1 | CB-4A | RDX, TNT | Excavation Sample - ISM TRIPLICATE set2 | | | | | **t(alpha, df=r-1)** | | | | | | | | | | | | | | | | | 2.92 | | 2.92 | | | | | 12/17/2020 | 12/28/2020 | 12/30/2020 | |
| 1 | CB-4A | RDX, TNT | Excavation Sample - ISM TRIPLICATE set2 | | | | | **Student's t UCL** | | | | | | | | | | | | | | | | | 6.99 | | 349.21 | | | | | 12/17/2020 | 12/28/2020 | 12/30/2020 | |
| 1 | CB-4A | RDX, TNT | Excavation Sample - ISM TRIPLICATE set2 | | | | | **Chebychev UCL** | | | | | | | | | | | | | | | | | 9.48 | | 465.08 | | | | | 12/17/2020 | 12/28/2020 | 12/30/2020 | |
| 1 | CB-4A | RDX, TNT | Excavation Sample - ISM TRIPLICATE set1 | Sidewall South | 11/20/2020 | CT | 158141 | LL1CB4Acs-738-001-SO (SW South) | - | | - | | - | | - | | - | | - | | - | | - | | 0.2 | U | 2.2 | Q | - | | | 12/8/2020 | 12/9/2020 | 12/11/2020 | |
| 1 | CB-4A | RDX, TNT | Excavation Sample - ISM TRIPLICATE set1 | Sidewall South | 11/20/2020 | CT | 158141 | LL1CB4Acs-738-002-SO (SW South) | - | | - | | - | | - | | - | | - | | - | | - | | 2.6 | P | 480 | Q | - | | | 12/8/2020 | 12/9/2020 | 12/11/2020 | |
| 1 | CB-4A | RDX, TNT | Excavation Sample - ISM TRIPLICATE set1 | Sidewall South | 11/20/2020 | CT | 158141 | LL1CB4Acs-738-003-SO (SW South) | - | | - | | - | | - | | - | | - | | - | | - | | 7.6 | | 44 | Q | - | | | 12/8/2020 | 12/9/2020 | 12/11/2020 | |
| 1 | CB-4A | RDX, TNT | Excavation Sample - ISM TRIPLICATE set1 | | | | | **arithmetic mean** | | | | | | | | | | | | | | | | | 3.467 | | 175.400 | | | | - RGOs met in each individual replicate sample;<br>- RSD >100% for RDX and TNT;<br>- 95% UCL (Chebychev method) is less than RGO for RDX but greater than RGO for TNT;<br>- additional excavation in this direction (south) for TNT and resample as ISM triplicate. | 12/17/2020 | 12/28/2020 | 12/30/2020 | |
| 1 | CB-4A | RDX, TNT | Excavation Sample - ISM TRIPLICATE set1 | | | | | **standard deviation** | | | | | | | | | | | | | | | | | 3.775 | | 264.618 | | | | | 12/17/2020 | 12/28/2020 | 12/30/2020 | |
| 1 | CB-4A | RDX, TNT | Excavation Sample - ISM TRIPLICATE set1 | | | | | **CV = SD / mean** | | | | | | | | | | | | | | | | | 109% | | 151% | | | | | 12/17/2020 | 12/28/2020 | 12/30/2020 | |
| 1 | CB-4A | RDX, TNT | Excavation Sample - ISM TRIPLICATE set1 | | | | | **count (r)** | | | | | | | | | | | | | | | | | 3 | | 3 | | | | | 12/17/2020 | 12/28/2020 | 12/30/2020 | |
| 1 | CB-4A | RDX, TNT | Excavation Sample - ISM TRIPLICATE set1 | | | | | **alpha (95% = 0.05)** | | | | | | | | | | | | | | | | | 0.05 | | 0.05 | | | | | 12/17/2020 | 12/28/2020 | 12/30/2020 | |
| 1 | CB-4A | RDX, TNT | Excavation Sample - ISM TRIPLICATE set1 | | | | | **t(alpha, df=r-1)** | | | | | | | | | | | | | | | | | 2.92 | | 2.92 | | | | | 12/17/2020 | 12/28/2020 | 12/30/2020 | |
| 1 | CB-4A | RDX, TNT | Excavation Sample - ISM TRIPLICATE set1 | | | | | **Student's t UCL** | | | | | | | | | | | | | | | | | 9.83 | | 621.51 | | | | | 12/17/2020 | 12/28/2020 | 12/30/2020 | |
| 1 | CB-4A | RDX, TNT | Excavation Sample - ISM TRIPLICATE set1 | | | | | **Chebychev UCL** | | | | | | | | | | | | | | | | | 12.97 | | 841.34 | | | | | 12/17/2020 | 12/28/2020 | 12/30/2020 | |

**LL 1-4 & 12 Remedial Action**
**Excavation Confirmation Sample Results (unvalidated)**

| Load Line | Remediation Area | COCs | Description/ Rationale | Location | Sample Date | Lab | Lab SDG # | Sample ID/Location | Analyte/Units/Remedial Goal Option (RGO)/Result | | | | | | | | | | | | | | | | | | | | Action | Submitted to Army | Approved by Army | Submitted to Ohio EPA | OhioEPA Concurrence |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | Antimony | | Lead | | PCB-1254 | | PCB-1260 | | B(a)a | | BaP | | BbF | | DA | | RDX | | TNT | | 2,6-DNT | | | | | |
| | | | | | | | | | mg/kg | | mg/kg | | mg/kg | | mg/kg | | mg/kg | | mg/kg | | mg/kg | | mg/kg | | mg/kg | | mg/kg | | mg/kg | | | | | |
| | | | | | | | | | 470 | | 800 | | 9.7 | | 9.9 | | 29 | | 2.9 | | 29 | | 2.9 | | 280 | | 610 | | 15 | | | | | |
| 1 | CB-4A | RDX, TNT | Excavation Sample - ISM TRIPLICATE set3 | Sidewall North 1 | 11/24/2020 | CT | 158211 | LL1CB4ACS-739-001-SO (SWN1) | - | | - | | - | | - | | - | | - | | - | | - | | 0.2 | U | 13 | | 0.113 | | | 12/8/2020 | 12/9/2020 | 12/11/2020 | |
| 1 | CB-4A | RDX, TNT | Excavation Sample - ISM TRIPLICATE set3 | Sidewall North 1 | 11/24/2020 | CT | 158211 | LL1CB4ACS-739-002-SO (SWN1) | - | | - | | - | | - | | - | | - | | - | | - | | 0.2 | U | 0.2 | UQ | 0.119 | | | 12/8/2020 | 12/9/2020 | 12/11/2020 | |
| 1 | CB-4A | RDX, TNT | Excavation Sample - ISM TRIPLICATE set3 | Sidewall North 1 | 11/24/2020 | CT | 158211 | LL1CB4ACS-739-003-SO (SWN1) | - | | - | | - | | - | | - | | - | | - | | - | | 0.2 | U | 0.2 | UQ | 0.107 | | | 12/8/2020 | 12/9/2020 | 12/11/2020 | |
| 1 | CB-4A | RDX, TNT | Excavation Sample - ISM TRIPLICATE set3 | | | | | **arithmetic mean** | | | | | | | | | | | | | | | | | 0.200 | | 4.467 | | | | - RGOs met in each individual replicate sample; | 12/17/2020 | 12/28/2020 | 12/30/2020 | |
| 1 | CB-4A | RDX, TNT | Excavation Sample - ISM TRIPLICATE set3 | | | | | **standard deviation** | | | | | | | | | | | | | | | | | 0.000 | | 7.390 | | | | - RSD >100% for TNT; | 12/17/2020 | 12/28/2020 | 12/30/2020 | |
| 1 | CB-4A | RDX, TNT | Excavation Sample - ISM TRIPLICATE set3 | | | | | **CV = SD / mean** | | | | | | | | | | | | | | | | | 0% | | 165% | | | | - 95% UCL (Chebychev method) is less than RGO; | 12/17/2020 | 12/28/2020 | 12/30/2020 | |
| 1 | CB-4A | RDX, TNT | Excavation Sample - ISM TRIPLICATE set3 | | | | | **count (r)** | | | | | | | | | | | | | | | | | 3 | | 3 | | | | - no further excavation in this direction | 12/17/2020 | 12/28/2020 | 12/30/2020 | |
| 1 | CB-4A | RDX, TNT | Excavation Sample - ISM TRIPLICATE set3 | | | | | **alpha (95% = 0.05)** | | | | | | | | | | | | | | | | | 0.05 | | 0.05 | | | | | 12/17/2020 | 12/28/2020 | 12/30/2020 | |
| 1 | CB-4A | RDX, TNT | Excavation Sample - ISM TRIPLICATE set3 | | | | | **t(alpha, df=r-1)** | | | | | | | | | | | | | | | | | 2.92 | | 2.92 | | | | | 12/17/2020 | 12/28/2020 | 12/30/2020 | |
| 1 | CB-4A | RDX, TNT | Excavation Sample - ISM TRIPLICATE set3 | | | | | **Student's t UCL** | | | | | | | | | | | | | | | | | 0.20 | | 16.93 | | | | | 12/17/2020 | 12/28/2020 | 12/30/2020 | |
| 1 | CB-4A | RDX, TNT | Excavation Sample - ISM TRIPLICATE set3 | | | | | **Chebychev UCL** | | | | | | | | | | | | | | | | | 0.20 | | 23.06 | | | | | 12/17/2020 | 12/28/2020 | 12/30/2020 | |
| 1 | CB-4A | RDX, TNT | Excavation Sample | Sidewall North 2 (bumpout) | 11/24/2020 | CT | 158211 | LL1CB4ACS-740-001-SO (SWN2) | - | | - | | - | | - | | - | | - | | - | | - | | 0.2 | U | 1 | JQ | - | | RGOs have been met, no further excavation in this direction, Army and OEPA concur | 12/14/2020 | 12/16/2020 | 12/17/2020 | 12/18/2020 |
| 1 | CB-4A | RDX, TNT | Excavation Sample | Sidewall North 3 | 11/30/2020 | CT | 158269 | LL1CB4ACS-741-001-SO (SWN3) | - | | - | | - | | - | | - | | - | | - | | - | | 0.2 | U | 14 | M,Q | - | | RGOs have been met, no further excavation in this direction | 12/17/2020 | 12/28/2020 | 12/30/2020 | |
| 1 | CB-4A | RDX, TNT | Excavation Sample | Sidewall East 2 (Bumpout) | 11/30/2020 | CT | 158269 | LL1CB4ACS-742-001-SO (SWE2, bumpout) | - | | - | | - | | - | | - | | - | | - | | - | | 0.2 | U | 0.2 | UQ | - | | RGOs have been met, no further excavation in this direction | 12/17/2020 | 12/28/2020 | 12/30/2020 | |
| 1 | CB-4A | RDX, TNT | Excavation Sample | Sidewall West 2 (bumpout) | 11/19/2020 | CT | 158139 | LL1CB4Acs-736-001-SO (SW West 2) | - | | - | | - | | - | | - | | - | | - | | - | | 0.2 | U | 0.32 | Q | - | | RGOs have been met, no further excavation in this direction, Army and OEPA concur | 12/14/2020 | 12/16/2020 | 12/17/2020 | 12/18/2020 |
| 1 | CB-4A | RDX, TNT | Excavation Sample | Sidewall West 1 | 12/1/2020 | CT | 158323 | LL1CB4ACS-743-001-SO (SWW1) | - | | - | | - | | - | | - | | - | | - | | - | | 8.3 | | 2.1 | Q | - | | RGOs have been met, no further excavation in this direction, Army and OEPA concur | 12/14/2020 | 12/16/2020 | 12/17/2020 | 12/18/2020 |
| 1 | CB-4A | RDX, TNT | Excavation Sample | Bottom | NA | | | no sample | | | | | | | | | | | | | | | | | NA | | NA | | | | No sample due to shallow bedrock throughout excavation | 12/14/2020 | 12/16/2020 | 12/17/2020 | 12/18/2020 |
| 1 | CB-4 | PCB-1254 | Excavation Sample | No Samples | NA | NA | NA | no samples | - | | - | | - | | - | | NA | | NA | | NA | | NA | | - | | - | | - | | Overburden removed to bedrock encountered throughout at 2 feet bgs (treatment interval 2-3'bgs). Per Army direction document excavation and backfill, no samples.<br><br>RGOs have been met. Pending post-excavation survey, excavation can be backfilled. | 12/22/2020 | 12/28/2020 | 12/30/2020 | |

**LL 1-4 & 12 Remedial Action**
**Excavation Confirmation Sample Results (unvalidated)**

| | | | | | | | | | Analyte/Units/Remedial Goal Option (RGO)/Result | | | | | | | | |

**LL 1-4 & 12 Remedial Action**
**Excavation Confirmation Sample Results (unvalidated)**

| Load Line | Remediation Area | COCs | Description/ Rationale | Location | Sample Date | Lab | Lab SDG # | Sample ID/Location | Analyte/Units/Remedial Goal Option (RGO)/Result | | | | | | | | | | | | | | | | | | | | | | | | | | | | Action | Submitted to Army | Approved by Army | Submitted to Ohio EPA | OhioEPA Concurrence |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | Antimony | | Lead | | PCB-1254 | | PCB-1260 | | B(a)a | | BaP | | BbF | | DA | | RDX | | TNT | | 2,6-DNT | | | | | | | | | | |
| | | | | | | | | | mg/kg | | mg/kg | | mg/kg | | mg/kg | | mg/kg | | mg/kg | | mg/kg | | mg/kg | | mg/kg | | mg/kg | | mg/kg | | | | | | | | | | |
| | | | | | | | | | 470 | | 800 | | 9.7 | | 9.9 | | 29 | | 2.9 | | 29 | | 2.9 | | 280 | | 610 | | 15 | | | | | | | | | | |
| 3 | EA-7 | PCB-1254 | Excavation Sample - ISM TRIPLICATE set 4 | Sidewall North | 12/3/2020 | CT | 158405 | LL3EA7CS-556-001-SO (SWN) | - | | - | | 0.229 | | - | | - | | - | | - | | - | | - | | - | | - | | | | | | | | | 12/14/2020 | 12/16/2020 | 12/17/2020 | 12/18/2020 |
| 3 | EA-7 | PCB-1254 | Excavation Sample - ISM TRIPLICATE set 4 | | | | | LL3EA7CS-556-002-SO (SWN) | - | | - | | 0.395 | | - | | - | | - | | - | | - | | - | | - | | - | | | | | | | | | 12/14/2020 | 12/16/2020 | 12/17/2020 | 12/18/2020 |
| 3 | EA-7 | PCB-1254 | Excavation Sample - ISM TRIPLICATE set 4 | | | | | LL3EA7CS-556-003-SO (SWN) | - | | - | | 0.27 | | - | | - | | - | | - | | - | | - | | - | | - | | | | | | | | | 12/14/2020 | 12/16/2020 | 12/17/2020 | 12/18/2020 |
| 3 | EA-7 | PCB-1254 | Excavation Sample - ISM TRIPLICATE set 4 | | | | | **arithmetic mean** | | | | | 0.298 | | | | | | | | | | | | | | | | | | | | | | | | | 12/17/2020 | 12/28/2020 | 12/30/2020 | |
| 3 | EA-7 | PCB-1254 | Excavation Sample - ISM TRIPLICATE set 4 | | | | | **standard deviation** | | | | | 0.086 | | | | | | | | | | | | | | | | | | | | | | | | | 12/17/2020 | 12/28/2020 | 12/30/2020 | |
| 3 | EA-7 | PCB-1254 | Excavation Sample - ISM TRIPLICATE set 4 | | | | | **CV = SD / mean** | | | | | 29% | | | | | | | | | | | | | | | | | | | | | | | | | 12/17/2020 | 12/28/2020 | 12/30/2020 | |
| 3 | EA-7 | PCB-1254 | Excavation Sample - ISM TRIPLICATE set 4 | | | | | **count (r)** | | | | | 3 | | | | | | | | | | | | | | | | | | | | | | | | | 12/17/2020 | 12/28/2020 | 12/30/2020 | |
| 3 | EA-7 | PCB-1254 | Excavation Sample | Sidewall East | 12/4/2020 | CT | 158423 | LL3EA7CS-557-001-SO (SWE) | - | | - | | 1.27 | | - | | - | | - | | - | | - | | - | | - | | - | | | | | | | | | 12/17/2020 | 12/28/2020 | 12/30/2020 | |
| 3 | EA-7 | PCB-1254 | Excavation Sample | Sidewall South | 12/4/2020 | CT | 158423 | LL3EA7CS-558-001-SO (SWS) | - | | - | | 0.622 | | - | | - | | - | | - | | - | | - | | - | | - | | | | | | | | RGOs have been met. Pending post-excavation survey, excavation can be backfilled. | 12/17/2020 | 12/28/2020 | 12/30/2020 | |
| 3 | EA-7 | PCB-1254 | Excavation Sample | Sidewall West | 12/4/2020 | CT | 158423 | LL3EA7CS-559-001-SO (SWW) | - | | - | | 0.716 | | - | | - | | - | | - | | - | | - | | - | | - | | | | | | | | | 12/17/2020 | 12/28/2020 | 12/30/2020 | |
| 3 | EA-7 | PCB-1254 | Excavation Sample | Bottom | 12/4/2020 | CT | 158423 | LL3EA7CS-560-001-SO (Bottom) | - | | - | | 0.429 | | - | | - | | - | | - | | - | | - | | - | | - | | | | | | | | | 12/17/2020 | 12/28/2020 | 12/30/2020 | |
| 3 | EB-803 | PCB-1254 | Excavation Sample | Bottom | 12/11/2020 | CT | 158590 | LL3EB803cs-578-001-SO (Bottom) | - | | - | | 0.0729 | | - | | - | | - | | - | | - | | - | | - | | - | | | | | | | | | 12/22/2020 | 12/28/2020 | 12/30/2020 | |
| 3 | EB-803 | PCB-1254 | Excavation Sample | Sidewall North | 12/11/2020 | CT | 158590 | LL3EB803cs-579-001-SO (SWN) | - | | - | | 0.0355 | | - | | - | | - | | - | | - | | - | | - | | - | | | | | | | | | 12/22/2020 | 12/28/2020 | 12/30/2020 | |
| 3 | EB-803 | PCB-1254 | Excavation Sample | Sidewall East | 12/11/2020 | CT | 158590 | LL3EB803cs-580-001-SO (SWE) | - | | - | | 0.04 | | - | | - | | - | | - | | - | | - | | - | | - | | | | | | | | RGOs have been met. Pending post-excavation survey, excavation can be backfilled. | 12/22/2020 | 12/28/2020 | 12/30/2020 | |
| 3 | EB-803 | PCB-1254 | Excavation Sample | Sidewall West | NA | NA | NA | no sample - railroad ballast | - | | - | | NA | | - | | - | | - | | - | | - | | - | | - | | - | | | | | | | | | 12/22/2020 | 12/28/2020 | 12/30/2020 | |
| 3 | EB-803 | PCB-1254 | Excavation Sample | Sidewall South | NA | NA | NA | no sample - railroad ballast | - | | - | | NA | | - | | - | | - | | - | | - | | - | | - | | - | | | | | | | | | 12/22/2020 | 12/28/2020 | 12/30/2020 | |
| 3 | EB-9A | TNT | Excavation Sample | Bottom | 12/10/2020 | CT | 158584 | LL3EB9ACS-573-001-SO (Bottom) | - | | - | | - | | - | | - | | - | | - | | - | | - | | 11 | Q | - | | | | | | | | | 12/22/2020 | 12/28/2020 | 12/30/2020 | |
| 3 | EB-9A | TNT | Excavation Sample | Sidewall South | 12/10/2020 | CT | 158584 | LL3EB9ACS-574-001-SO (SWS) | - | | - | | - | | - | | - | | - | | - | | - | | - | | 0.34 | Q | - | | | | | | | | | 12/22/2020 | 12/28/2020 | 12/30/2020 | |
| 3 | EB-9A | TNT | Excavation Sample | Sidewall North | 12/10/2020 | CT | 158584 | LL3EB9ACS-575-001-SO (SWN) | - | | - | | - | | - | | - | | - | | - | | - | | - | | 0.1 | Q | - | | | | | | | | RGOs have been met. Pending post-excavation survey, excavation can be backfilled. | 12/22/2020 | 12/28/2020 | 12/30/2020 | |
| 3 | EB-9A | TNT | Excavation Sample | Sidewall East | 12/10/2020 | CT | 158584 | LL3EB9acs-576-001-SO (SWE) | - | | - | | - | | - | | - | | - | | - | | - | | - | | 0.15 | | - | | | | | | | | | 12/22/2020 | 12/28/2020 | 12/30/2020 | |
| 3 | EB-9A | TNT | Excavation Sample | Sidewall West | 12/10/2020 | CT | 158584 | LL3EB9acs-577-001-SO (SWW) | - | | - | | - | | - | | - | | - | | - | | - | | - | | 0.2 | | - | | | | | | | | | 12/22/2020 | 12/28/2020 | 12/30/2020 | |
| 3 | EB-10 (a) | B(a)a, BaP, BbF, DA | Excavation Sample | No Samples | NA | NA | NA | no samples | - | | - | | - | | - | | NA | | NA | | NA | | NA | | - | | - | | - | | | | | | | | Bedrock encountered - bedrock throughout bottom of excavation, no soil on sidewalls in treatment interval 3-5'bgs, no samples. Per Army direction document excavation and backfill, no samples.<br><br>Pending post-excavation survey, excavation can be backfilled. | 12/22/2020 | 12/28/2020 | 12/30/2020 | |
| 3 | EB-10 (b) | PCB-1254 | Excavation Sample | No Samples | NA | NA | NA | no samples | - | | - | | - | | - | | NA | | NA | | NA | | NA | | - | | - | | - | | | | | | | | Excavation is within EB-10(a). Soils within EB-10(b) 0-2'bgs treatment interval excavated and treated with Cell 1B-3. East sidewall is concrete- no sample. With associated concrete removal, sidewalls of EB-10(b) collapsed into surrounding EB-10(a). Therefore, no EB-10(b) sidewall samples. Excavated to EB-10(a) depth (bedrock encountered) and all soils underlying and surrounding EB-10(b) were added to Cell 2A-6; treatment verification samples will include the COC for EB-10(b) PCB-1254.<br><br>Pending post-excavation survey, excavation can be backfilled. | 12/22/2020 | 12/28/2020 | 12/30/2020 | |
| 4 | Building G-8 (a) | B(a)a, BaP, BbF, DA | Excavation Sample | Sidewall West | 12/9/2020 | CT | 158521 | LL4G8ACS-522-001-SO (SWW) | - | | - | | - | | - | | 0.025 | | 0.025 | | 0.883 | | 0.0696 | | - | | - | | - | | | | | | | | | 12/22/2020 | 12/28/2020 | 12/30/2020 | |
| 4 | Building G-8 (a) | B(a)a, BaP, BbF, DA | Excavation Sample | Sidewall East | 12/9/2020 | CT | 158521 | LL4G8ACS-523-001-SO (SWE) | - | | - | | - | | - | | 0.0051 | J | 0.0051 | J | 0.00622 | | 0.0025 | U | - | | - | | - | | | | | | | | | 12/22/2020 | 12/28/2020 | 12/30/2020 | |
| 4 | Building G-8 (a) | B(a)a, BaP, BbF, DA | Excavation Sample | Sidewall North | 12/9/2020 | CT | 158521 | LL4G8ACS-524-001-SO (SWN) | - | | - | | - | | - | | 0.0049 | J | 0.0049 | J | 0.00263 | J | 0.0025 | U | - | | - | | - | | | | | | | | RGOs have been met. Pending post-excavation survey, excavation can be backfilled. | 12/22/2020 | 12/28/2020 | 12/30/2020 | |
| 4 | Building G-8 (a) | B(a)a, BaP, BbF, DA | Excavation Sample | Bottom 1 | 12/10/2020 | CT | 158584 | LL4G8ACS-525-001-SO (Bottom) | - | | - | | - | | - | | 0.00168 | JY | 0.00157 | JY | 0.00264 | JY | 0.0024 | U | - | | - | | - | | | | | | | | | 12/22/2020 | 12/28/2020 | 12/30/2020 | |
| 4 | Building G-8 (a) | B(a)a, BaP, BbF, DA | Excavation Sample | Sidewall South | 12/10/2020 | CT | 158584 | LL4G8ACS-526-001-SO (SWS) | - | | - | | - | | - | | 0.00168 | | 0.0157 | | 0.0214 | | 0.00195 | J | - | | - | | - | | | | | | | | | 12/22/2020 | 12/28/2020 | 12/30/2020 | |

**LL 1-4 & 12 Remedial Action**
**Excavation Confirmation Sample Results (unvalidated)**

| Load Line | Remediation Area | COCs | Description/ Rationale | Location | Sample Date | Lab | Lab SDG # | Sample ID/Location | Analyte/Units/Remedial Goal Option (RGO)/Result | | | | | | | | | | | | | | | | | | | | | | | | | | | | Action | Submitted to Army | Approved by Army | Submitted to Ohio EPA | OhioEPA Concurrence |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | Antimony | | Lead | | PCB-1254 | | PCB-1260 | | B(a)a | | BaP | | BbF | | DA | | RDX | | TNT | | 2,6-DNT | | | | | | | | | | |
| | | | | | | | | | mg/kg | | mg/kg | | mg/kg | | mg/kg | | mg/kg | | mg/kg | | mg/kg | | mg/kg | | mg/kg | | mg/kg | | mg/kg | | | | | | | | | | |
| | | | | | | | | | 470 | | 800 | | 9.7 | | 9.9 | | 29 | | 2.9 | | 29 | | 2.9 | | 280 | | 610 | | 15 | | | | | | | | | | |
| 4 | Building G-16 | PCB-1260 | Excavation Sample | Bottom | 12/11/2020 | CT | 158590 | LL4G16cs-527-001-SO (Bottom) | - | | - | | - | | 0.0232 | | - | | - | | - | | - | | - | | - | | - | | | | | | | | | 12/22/2020 | 12/28/2020 | 12/30/2020 | |
| 4 | Building G-16 | PCB-1260 | Excavation Sample | Sidewall West | 12/11/2020 | CT | 158590 | LL4G16cs-528-001-SO (SWW) | - | | - | | - | | 0.0965 | | - | | - | | - | | - | | - | | - | | - | | | | | | | | | 12/22/2020 | 12/28/2020 | 12/30/2020 | |
| 4 | Building G-16 | PCB-1260 | Excavation Sample | Sidewall North | 12/11/2020 | CT | 158590 | LL4G16cs-529-001-SO (SWN) | - | | - | | - | | 0.0395 | | - | | - | | - | | - | | - | | - | | - | | | | | | | | RGOs have been met. Pending post-excavation survey, excavation can be backfilled. | 12/22/2020 | 12/28/2020 | 12/30/2020 | |
| 4 | Building G-16 | PCB-1260 | Excavation Sample | Sidewall South | 12/14/2020 | CT | 158622 | LL4G16cs-530-001-SO (SWS) | - | | - | | - | | 0.02 | U | - | | - | | - | | - | | - | | - | | - | | | | | | | | | 12/29/2020 | 12/30/2020 | 12/30/2020 | |
| 4 | Building G-16 | PCB-1260 | Excavation Sample | Sidewall East | 12/14/2020 | CT | 158622 | LL4G16cs-531-001-SO (SWE) | - | | - | | - | | 0.0581 | P | - | | - | | - | | - | | - | | - | | - | | | | | | | | | 12/29/2020 | 12/30/2020 | 12/30/2020 | |
| 1 | CB-2 | Antimony, Lead | Excavation Sample | Sidewall East/ North/ South | 12/16/2020 | CT | 158721 | LL1CB2cs-759-001-SO (SWE) | 9 | | 115 | | - | | - | | - | | - | | - | | - | | - | | - | | - | | | | | | | | Bedrock throughout at approximately 0.5' to 1'bgs - no bottom sample. Railroad ballast in two-thirds of the excavation. Sampled east sidewall that is soil, and wrap around to portions of north and south that are soil to make one sidewall DU. | 12/29/2020 | 12/30/2020 | 12/30/2020 | |
| 1 | CB-2 | Antimony, Lead | Excavation Sample | Sidewall West | NA | NA | NA | no sample - railroad ballast | NA | | NA | | - | | - | | - | | - | | - | | - | | - | | - | | - | | | | | | | | | 12/29/2020 | 12/30/2020 | 12/30/2020 | |
| 1 | CB-2 | Antimony, Lead | Excavation Sample | Bottom | NA | NA | NA | no sample - bedrock | NA | | NA | | - | | - | | - | | - | | - | | - | | - | | - | | - | | | | | | | | RGOs have been met, no further excavation in this direction. Pending post excavation survey, excavation can be backfilled. | 12/29/2020 | 12/30/2020 | 12/30/2020 | |
| 1 | Outlet Channel D | Antimony, Lead | Excavation Sample - ISM TRIPLICATE set 5 | Bottom | 12/16/2020 | CT | 158721 | LL1OCDcs-754-001-so (Bottom) | 0.42 | U | 66.2 | | - | | - | | - | | - | | - | | - | | - | | - | | - | | | | | | | | | 12/29/2020 | 12/30/2020 | 12/30/2020 | |
| 1 | Outlet Channel D | Antimony, Lead | Excavation Sample - ISM TRIPLICATE set 5 | Bottom | 12/16/2020 | CT | 158721 | LL1OCDcs-754-002-so (Bottom) | 0.43 | U | 19.1 | | - | | - | | - | | - | | - | | - | | - | | - | | - | | | | | | | | | 12/29/2020 | 12/30/2020 | 12/30/2020 | |
| 1 | Outlet Channel D | Antimony, Lead | Excavation Sample - ISM TRIPLICATE set 5 | Bottom | 12/16/2020 | CT | 158721 | LL1OCDcs-754-003-so (Bottom) | 0.43 | U | 18.9 | | - | | - | | - | | - | | - | | - | | - | | - | | - | | | | | | | | | 12/29/2020 | 12/30/2020 | 12/30/2020 | |
| 1 | Outlet Channel D | Antimony, Lead | Excavation Sample - ISM TRIPLICATE set 5 | | | | | **arithmetic mean** | 0.427 | | 34.733 | | | | | | | | | | | | | | | | | | | | | | | | | | | | 12/29/2020 | 12/30/2020 | 12/30/2020 | |
| 1 | Outlet Channel D | Antimony, Lead | Excavation Sample - ISM TRIPLICATE set 5 | | | | | **standard deviation** | 0.006 | | 27.251 | | | | | | | | | | | | | | | | | | | | | | | | | | | | - RGOs met in each individual replicate sample; | 12/29/2020 | 12/30/2020 | 12/30/2020 | |
| 1 | Outlet Channel D | Antimony, Lead | Excavation Sample - ISM TRIPLICATE set 5 | | | | | **CV = SD / mean** | 1% | | 78% | | | | | | | | | | | | | | | | | | | | | | | | | | | | - RSD >50% but <100% for Lead;<br>- 95% UCL (Chebychev method) is less than the RGO; | 12/29/2020 | 12/30/2020 | 12/30/2020 | |
| 1 | Outlet Channel D | Antimony, Lead | Excavation Sample - ISM TRIPLICATE set 5 | | | | | **count (r)** | 3 | | 3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | - no further excavation in this direction; pending post-excavation survey, excavation can be backfilled. | 12/29/2020 | 12/30/2020 | 12/30/2020 | |
| 1 | Outlet Channel D | Antimony, Lead | Excavation Sample - ISM TRIPLICATE set 5 | | | | | **alpha (95% = 0.05)** | 0.05 | | 0.05 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 12/29/2020 | 12/30/2020 | 12/30/2020 | |
| 1 | Outlet Channel D | Antimony, Lead | Excavation Sample - ISM TRIPLICATE set 5 | | | | | **t(alpha, df=r-1)** | 2.92 | | 2.92 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 12/29/2020 | 12/30/2020 | 12/30/2020 | |
| 1 | Outlet Channel D | Antimony, Lead | Excavation Sample - ISM TRIPLICATE set 5 | | | | | **Student's t UCL** | 0.44 | | 80.67 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 12/29/2020 | 12/30/2020 | 12/30/2020 | |
| 1 | Outlet Channel D | Antimony, Lead | Excavation Sample - ISM TRIPLICATE set 5 | | | | | **Chebychev UCL** | 0.44 | | 103.31 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 12/29/2020 | 12/30/2020 | 12/30/2020 | |
| 1 | Outlet Channel D | Antimony, Lead | Excavation Sample | Sidewall West | 12/16/2020 | CT | 158721 | LL1OCDcs-755-001-so (SWW) | 0.43 | U | 19.5 | | - | | - | | - | | - | | - | | - | | | | | | - | | | | | | | | | 12/29/2020 | 12/30/2020 | 12/30/2020 | |
| 1 | Outlet Channel D | Antimony, Lead | Excavation Sample | Sidewall South | 12/16/2020 | CT | 158721 | LL1OCDcs-756-001-so (SWS) | 0.42 | U | 14 | | - | | - | | - | | - | | - | | - | | - | | - | | - | | | | | | | | | 12/29/2020 | 12/30/2020 | 12/30/2020 | |
| 1 | Outlet Channel D | Antimony, Lead | Excavation Sample | Sidewall East | 12/16/2020 | CT | 158721 | LL1OCDcs-757-001-so (SWE) | 0.41 | U | 18.1 | | - | | - | | - | | - | | - | | - | | - | | - | | - | | | | | | | | RGOs have been met. Pending post-excavation survey, excavation can be backfilled. | 12/29/2020 | 12/30/2020 | 12/30/2020 | |
| 1 | Outlet Channel D | Antimony, Lead | Excavation Sample | Sidewall North | 12/16/2020 | CT | 158721 | LL1OCDcs-758-001-so (SWN) | 0.41 | U | 22.8 | | - | | - | | - | | - | | - | | - | | - | | - | | - | | | | | | | | | 12/29/2020 | 12/30/2020 | 12/30/2020 | |
| 2 | DB-4A | TNT | Excavation Sample | Bottom | 12/15/2020 | CT | 158721 | LL2DB4acs-681-001-so (Bottom) | - | | - | | - | | - | | - | | - | | - | | - | | - | | 0.2 | U | - | | | | | | | | | 12/29/2020 | 12/30/2020 | 12/30/2020 | |
| 2 | DB-4A | TNT | Excavation Sample | Sidewall East | 12/15/2020 | CT | 158721 | LL2DB4acs-682-001-so (SWE) | - | | - | | - | | - | | - | | - | | - | | - | | - | | 0.2 | U | - | | | | | | | | | 12/29/2020 | 12/30/2020 | 12/30/2020 | |
| 2 | DB-4A | TNT | Excavation Sample | Sidewall North | 12/15/2020 | CT | 158721 | LL2DB4acs-683-001-so (SWN) | - | | - | | - | | - | | - | | - | | - | | - | | - | | 0.2 | U | - | | | | | | | | RGOs have been met. Pending post-excavation survey, excavation can be backfilled. | 12/29/2020 | 12/30/2020 | 12/30/2020 | |
| 2 | DB-4A | TNT | Excavation Sample | Sidewall South | 12/15/2020 | CT | 158721 | LL2DB4acs-684-001-so (SWS) | - | | - | | - | | - | | - | | - | | - | | - | | - | | 0.2 | U | - | | | | | | | | | 12/29/2020 | 12/30/2020 | 12/30/2020 | |
| 2 | DB-4A | TNT | Excavation Sample | Sidewall West | 12/15/2020 | CT | 158721 | LL2DB4acs-685-001-so (SWW) | - | | - | | - | | - | | - | | - | | - | | - | | - | | 0.2 | U | - | | | | | | | | | 12/29/2020 | 12/30/2020 | 12/30/2020 | |
| 4 | Building G-8 (b) | B(a)a, BaP, BbF, DA | Excavation Sample | Bottom 1 | 12/14/2020 | CT | 158622 | LL4G8Bcs-532-001-SO (Bottom1) | - | | - | | - | | - | | 0.00197 | J | 0.00207 | P | 0.00476 | J | 0.0026 | U | - | | - | | - | | | | | | | | RGOs have been met, no further excavation in this direction | 12/29/2020 | 12/30/2020 | 12/30/2020 | |
| 4 | Building G-8 (b) | B(a)a, BaP, BbF, DA | Excavation Sample | Bottom 2 | 12/14/2020 | CT | 158622 | LL4G8Bcs-533-001-SO (Bottom2) | - | | - | | - | | - | | 0.0297 | | 0.0257 | | 0.0346 | | 0.00277 | J | - | | - | | - | | | | | | | | RGOs have been met, no further excavation in this direction | 12/29/2020 | 12/30/2020 | 12/30/2020 | |
| 4 | Building G-8 (b) | B(a)a, BaP, BbF, DA | Excavation Sample | Sidewall West | 12/14/2020 | CT | 158622 | LL4G8Bcs-534-001-SO (SWW) | - | | - | | - | | - | | 0.00399 | J | 0.00459 | J | 0.00774 | | 0.0025 | U | - | | - | | - | | | | | | | | RGOs have been met, no further excavation in this direction | 12/29/2020 | 12/30/2020 | 12/30/2020 | |
| 4 | Building G-8 (b) | B(a)a, BaP, BbF, DA | Excavation Sample | Sidewall North | 12/14/2020 | CT | 158622 | LL4G8Bcs-535-001-SO (SWN) | - | | - | | - | | - | | 8.03 | | 6.69 | | 8.37 | | 0.519 | | - | | - | | - | | | | | | | | Additional soil will be excavated in this direction for treatment, and an additional ISM sample will be collected from the new northern sidewall for BaP. | 12/29/2020 | 12/30/2020 | 12/30/2020 | |
| 4 | Building G-8 (b) | B(a)a, BaP, BbF, DA | Excavation Sample | Sidewall South | 12/14/2020 | CT | 158622 | LL4G8Bcs-536-001-SO (SWS) | - | | - | | - | | - | | 0.0116 | | 0.0125 | | 0.0209 | | 0.00193 | J | - | | - | | - | | | | | | | | RGOs have been met, no further excavation in this direction | 12/29/2020 | 12/30/2020 | 12/30/2020 | |
| 4 | Building G-8 (b) | B(a)a, BaP, BbF, DA | Excavation Sample | Sidewall East | 12/14/2020 | CT | 158622 | LL4G8Bcs-537-001-SO (SWE) | - | | - | | - | | - | | 0.021 | | 0.0185 | | 0.0265 | | 0.00244 | J | - | | - | | - | | | | | | | | RGOs have been met, no further excavation in this direction | 12/29/2020 | 12/30/2020 | 12/30/2020 | |

**LL 1-4 & 12 Remedial Action**
**Excavation Confirmation Sample Results (unvalidated)**

| Load Line | Remediation Area | COCs | Description/ Rationale | Location | Sample Date | Lab | Lab SDG # | Sample ID/Location | Antimony mg/kg 470 | Lead mg/kg 800 | PCB-1254 mg/kg 9.7 | PCB-1260 mg/kg 9.9 | B(a)a mg/kg 29 | BaP mg/kg 2.9 | BbF mg/kg 29 | DA mg/kg 2.9 | RDX mg/kg 280 | TNT mg/kg 510 | 2,6-DNT mg/kg 15 | Action | Submitted to Army | Approved by Army | Submitted to Ohio EPA | OhioEPA Concurrence |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4 | Former Water Tower | Lead | Excavation Sample | Bottom | 12/15/2020 | CT | 158721 | LL4FWTcs-538-001-SO (Bottom) | - | 203 | - | - | - | - | - | - | - | - | - | RGOs have been met, no further excavation in this direction | 12/29/2020 | 12/30/2020 | 12/30/2020 | |
| 4 | Former Water Tower | Lead | Excavation Sample | Sidewall South | 12/15/2020 | CT | 158721 | LL4FWTcs-539-001-SO (SWS) | - | 147 | - | - | - | - | - | - | - | - | - | RGOs have been met, no further excavation in this direction | 12/29/2020 | 12/30/2020 | 12/30/2020 | |
| 4 | Former Water Tower | Lead | Excavation Sample | Sidewall East | 12/15/2020 | CT | 158721 | LL4FWTcs-540-001-SO (SWE) | - | 843 | - | - | - | - | - | - | - | - | - | Additional soil will be excavated in this direction for treatment, and an additional ISM sample will be collected from the new eastern sidewall for lead. | 12/29/2020 | 12/30/2020 | 12/30/2020 | |
| 4 | Former Water Tower | Lead | Excavation Sample | Sidewall North | 12/15/2020 | CT | 158721 | LL4FWTcs-541-001-SO (SWN) | - | 442 | - | - | - | - | - | - | - | - | - | RGOs have been met, no further excavation in this direction | 12/29/2020 | 12/30/2020 | 12/30/2020 | |
| 4 | Former Water Tower | Lead | Excavation Sample | Sidewall West | 12/15/2020 | CT | 158721 | LL4FWTcs-542-001-SO (SWW) | - | 1110 | - | - | - | - | - | - | - | - | - | Additional soil will be excavated in this direction for treatment, and an additional ISM sample will be collected from the new western sidewall for lead. | 12/29/2020 | 12/30/2020 | 12/30/2020 | |
| 12 | Active Area Channel | TNT, 2,6-DNT, BaP | Excavation Sample | Bottom | 12/18/2020 | CT | 158762 | LL12AACcs-340-001-SO (Bottom) | - | - | - | - | - | 0.0172 | - | - | - | 0.65 | 0.2 U | | 1/6/2021 | 1/7/2021 | | |
| 12 | Active Area Channel | TNT, 2,6-DNT, BaP | Excavation Sample | Sidewall West | 12/18/2020 | CT | 158762 | LL12AACcs-341-001-SO (SWW) | - | - | - | - | - | 0.00398 J | - | - | - | 2 | 0.1 J | | 1/6/2021 | 1/7/2021 | | |
| 12 | Active Area Channel | TNT, 2,6-DNT, BaP | Excavation Sample | Sidewall South | 12/18/2020 | CT | 158762 | LL12AACcs-342-001-SO (SWS) | - | - | - | - | - | 0.015 J | - | - | - | 0.71 | 0.091 J | RGOs have been met. Pending post-excavation survey, excavation can be backfilled. | 1/6/2021 | 1/7/2021 | | |
| 12 | Active Area Channel | TNT, 2,6-DNT, BaP | Excavation Sample | Sidewall East | 12/18/2020 | CT | 158762 | LL12AACcs-343-001-SO (SWE) | - | - | - | - | - | 0.00654 | - | - | - | 0.88 | 0.2 U | | 1/6/2021 | 1/7/2021 | | |
| 12 | Active Area Channel | TNT, 2,6-DNT, BaP | Excavation Sample | Sidewall North | 12/18/2020 | CT | 158762 | LL12AACcs-344-001-SO (SWN) | - | - | - | - | - | 0.015 | - | - | - | 0.35 | 0.2 U | | 1/6/2021 | 1/7/2021 | | |
| 12 | FF-19 A | B(a)a, BaP, BbF, DA | Excavation Sample | Bottom | 12/18/2020 | CT | 158762 | LL12FF19Acs-336-001-SO (Bottom) | - | - | - | - | 0.605 | 0.496 | 0.65 | 0.0898 | - | - | - | RGOs have been met, no further excavation in this direction | 1/6/2021 | 1/7/2021 | | |
| 12 | FF-19 A | B(a)a, BaP, BbF, DA | Excavation Sample - ISM TRIPLICATE set 9 | Sidewall South | 12/18/2020 | CT | 158762 | LL12FF19Acs-337-001-SO (SWS) | - | - | - | - | 6.68 | 5.35 | 6.07 | 0.864 | - | - | - | | 1/6/2021 | 1/7/2021 | | |
| 12 | FF-19 A | B(a)a, BaP, BbF, DA | Excavation Sample - ISM TRIPLICATE set 9 | Sidewall South | 12/18/2020 | CT | 158762 | LL12FF19Acs-337-002-SO (SWS) | - | - | - | - | 4.82 | 3.65 | 4.95 | 0.619 | - | - | - | | 1/6/2021 | 1/7/2021 | | |
| 12 | FF-19 A | B(a)a, BaP, BbF, DA | Excavation Sample - ISM TRIPLICATE set 9 | Sidewall South | 12/18/2020 | CT | 158762 | LL12FF19Acs-337-003-SO (SWS) | - | - | - | - | 4.96 | 3.72 | 4.55 | 0.629 | - | - | - | | 1/6/2021 | 1/7/2021 | | |
| 12 | FF-19 A | B(a)a, BaP, BbF, DA | Excavation Sample - ISM TRIPLICATE set 9 | | | | | **arithmetic mean** | | | | | 5.487 | 4.240 | 5.190 | 0.704 | | | | - RGO exceeded for BaP in each individual replicate sample; | 1/6/2021 | 1/7/2021 | | |
| 12 | FF-19 A | B(a)a, BaP, BbF, DA | Excavation Sample - ISM TRIPLICATE set 9 | | | | | **standard deviation** | | | | | 1.036 | 0.962 | 0.788 | 0.139 | | | | - RSD <35% for all analytes | 1/6/2021 | 1/7/2021 | | |
| 12 | FF-19 A | B(a)a, BaP, BbF, DA | Excavation Sample - ISM TRIPLICATE set 9 | | | | | **CV = SD / mean** | | | | | 19% | 23% | 15% | 20% | | | | - Additional soil will be excavated in this direction for treatment, and an additional ISM sample will be collected for the new southern sidewall and resampled as ISM triplicate for BaP. | 1/6/2021 | 1/7/2021 | | |
| 12 | FF-19 A | B(a)a, BaP, BbF, DA | Excavation Sample - ISM TRIPLICATE set 9 | | | | | **count (r)** | | | | | 3 | 3 | 3 | 3 | | | | | 1/6/2021 | 1/7/2021 | | |
| 12 | FF-19 A | B(a)a, BaP, BbF, DA | Excavation Sample - ISM TRIPLICATE set 9 | | | | | **alpha (95% = 0.05)** | | | | | 0.05 | 0.05 | 0.05 | 0.05 | | | | | 1/6/2021 | 1/7/2021 | | |
| 12 | FF-19 A | B(a)a, BaP, BbF, DA | Excavation Sample - ISM TRIPLICATE set 9 | | | | | **t(alpha, df=r-1)** | | | | | 2.92 | 2.92 | 2.92 | 2.92 | | | | | 1/6/2021 | 1/7/2021 | | |
| 12 | FF-19 A | B(a)a, BaP, BbF, DA | Excavation Sample - ISM TRIPLICATE set 9 | | | | | **Student's t UCL** | | | | | 7.23 | 5.86 | 6.52 | 0.94 | | | | | 1/6/2021 | 1/7/2021 | | |
| 12 | FF-19 A | B(a)a, BaP, BbF, DA | Excavation Sample - ISM TRIPLICATE set 9 | | | | | **Chebychev UCL** | | | | | 8.09 | 6.66 | 7.17 | 1.05 | | | | | 1/6/2021 | 1/7/2021 | | |
| 12 | FF-19 A | B(a)a, BaP, BbF, DA | Excavation Sample | Sidewall North | 12/18/2020 | CT | 158762 | LL12FF19Acs-338-001-SO (SWN) | - | - | - | - | 1.69 MY | 1.28 MY | 1.63 MY | 0.237 M | - | - | - | RGOs have been met, no further excavation in this direction | 1/6/2021 | 1/7/2021 | | |
| 12 | FF-19 A | B(a)a, BaP, BbF, DA | Excavation Sample | Sidewall West | 12/18/2020 | CT | 158762 | LL12FF19Acs-339-001-SO (SWW) | - | - | - | - | 3.73 | 3.09 | 4.26 | 0.54 | - | - | - | Additional soil will be excavated in this direction for treatment, and an additional ISM sample will be collected from the new western sidewall for BaP. | 1/6/2021 | 1/7/2021 | | |

**LL 1-4 & 12 Remedial Action**
**Excavation Confirmation Sample Results (unvalidated)**

| Load Line | Remediation Area | COCs | Description/ Rationale | Location | Sample Date | Lab | Lab SDG # | Sample ID/Location | Analyte/Units/Remedial Goal Option (RGO)/Result | | | | | | | | | | | | | | | | | | | | Action | Submitted to Army | Approved by Army | Submitted to Ohio EPA | OhioEPA Concurrence |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | Antimony | | Lead | | PCB-1254 | | PCB-1260 | | B(a)a | | BaP | | BbF | | DA | | RDX | | TNT | | 2,6-DNT | | | | | |
| | | | | | | | | | mg/kg | | mg/kg | | mg/kg | | mg/kg | | mg/kg | | mg/kg | | mg/kg | | mg/kg | | mg/kg | | mg/kg | | mg/kg | | | | | |
| | | | | | | | | | 470 | | 800 | | 9.7 | | 9.9 | | 29 | | 2.9 | | 29 | | 2.9 | | 280 | | 510 | | 15 | | | | | |
| 12 | FF-19 B | B(a)a, BaP, BbF, DA | Excavation Sample | Bottom | 12/17/2020 | CT | 158760 | LL12FF19bcs-331-001-SO (Bottom) | - | | - | | - | | - | | 0.734 | | 0.691 | | 0.976 | | 0.0746 | | - | | - | | - | | RGOs have been met, no further excavation in this direction | 1/6/2021 | 1/7/2021 | | |
| 12 | FF-19 B | B(a)a, BaP, BbF, DA | Excavation Sample | Sidewall North | 12/17/2020 | CT | 158760 | LL12FF19bcs-332-001-SO (SWN) | - | | - | | - | | - | | 1.36 | | 1.13 | | 1.49 | | 0.156 | | - | | - | | - | | RGOs have been met, no further excavation in this direction | 1/6/2021 | 1/7/2021 | | |
| 12 | FF-19 B | B(a)a, BaP, BbF, DA | Excavation Sample - ISM TRIPLICATE set 8 | Sidewall South | 12/17/2020 | CT | 158760 | LL12FF19bcs-333-001-SO (SWS) | - | | - | | - | | - | | 2.38 | | 1.94 | | 2.59 | | 0.259 | | - | | - | | - | | | 1/6/2021 | 1/7/2021 | | |
| 12 | FF-19 B | B(a)a, BaP, BbF, DA | Excavation Sample - ISM TRIPLICATE set 8 | Sidewall South | 12/17/2020 | CT | 158760 | LL12FF19bcs-333-002-SO (SWS) | - | | - | | - | | - | | 1.47 | | 1.29 | | 1.71 | | 0.122 | | - | | - | | - | | | 1/6/2021 | 1/7/2021 | | |
| 12 | FF-19 B | B(a)a, BaP, BbF, DA | Excavation Sample - ISM TRIPLICATE set 8 | Sidewall South | 12/17/2020 | CT | 158760 | LL12FF19bcs-333-003-SO (SWS) | - | | - | | - | | - | | 1.89 | | 1.54 | | 1.82 | | 0.204 | | - | | - | | - | | | 1/6/2021 | 1/7/2021 | | |
| 12 | FF-19 B | B(a)a, BaP, BbF, DA | Excavation Sample - ISM TRIPLICATE set 8 | | | | | **arithmetic mean** | | | | | | | | | 1.913 | | 1.590 | | 2.040 | | 0.195 | | | | | | | | - RGOs met for all analytes in each individual replicate sample; | 1/6/2021 | 1/7/2021 | | |
| 12 | FF-19 B | B(a)a, BaP, BbF, DA | Excavation Sample - ISM TRIPLICATE set 8 | | | | | **standard deviation** | | | | | | | | | 0.455 | | 0.328 | | 0.479 | | 0.069 | | | | | | | | | 1/6/2021 | 1/7/2021 | | |
| 12 | FF-19 B | B(a)a, BaP, BbF, DA | Excavation Sample - ISM TRIPLICATE set 8 | | | | | **CV = SD / mean** | | | | | | | | | 24% | | 21% | | 24% | | 35% | | | | | | | | - RSD <35% for all analytes; | 1/6/2021 | 1/7/2021 | | |
| 12 | FF-19 B | B(a)a, BaP, BbF, DA | Excavation Sample - ISM TRIPLICATE set 8 | | | | | **count (r)** | | | | | | | | | 3 | | 3 | | 3 | | 3 | | | | | | | | - no further excavation in this direction; pending post-excavation survey, excavation can be backfilled. | 1/6/2021 | 1/7/2021 | | |
| 12 | FF-19 B | B(a)a, BaP, BbF, DA | Excavation Sample - ISM TRIPLICATE set 8 | | | | | **alpha (95% = 0.05)** | | | | | | | | | 0.05 | | 0.05 | | 0.05 | | 0.05 | | | | | | | | | 1/6/2021 | 1/7/2021 | | |
| 12 | FF-19 B | B(a)a, BaP, BbF, DA | Excavation Sample - ISM TRIPLICATE set 8 | | | | | **t(alpha, df=r-1)** | | | | | | | | | 2.92 | | 2.92 | | 2.92 | | 2.92 | | | | | | | | | 1/6/2021 | 1/7/2021 | | |
| 12 | FF-19 B | B(a)a, BaP, BbF, DA | Excavation Sample - ISM TRIPLICATE set 8 | | | | | **Student's t UCL** | | | | | | | | | 2.68 | | 2.14 | | 2.85 | | 0.31 | | | | | | | | | 1/6/2021 | 1/7/2021 | | |
| 12 | FF-19 B | B(a)a, BaP, BbF, DA | Excavation Sample - ISM TRIPLICATE set 8 | | | | | **Chebychev UCL** | | | | | | | | | 3.06 | | 2.42 | | 3.25 | | 0.37 | | | | | | | | | 1/6/2021 | 1/7/2021 | | |
| 12 | FF-19 B | B(a)a, BaP, BbF, DA | Excavation Sample | Sidewall West | 12/17/2020 | CT | 158760 | LL12FF19bcs-334-001-SO (SWW) | - | | - | | - | | - | | 1.45 | | 1.19 | | 1.48 | | 0.148 | | - | | - | | - | | RGOs have been met, no further excavation in this direction | 1/6/2021 | 1/7/2021 | | |
| 12 | FF-19 B | B(a)a, BaP, BbF, DA | Excavation Sample - ISM TRIPLICATE set 7 | Sidewall East | 12/17/2020 | CT | 158760 | LL12FF19bcs-335-001-SO (SWE) | - | | - | | - | | - | | 2.64 | | 1.66 | | 2 | | 0.23 | | - | | - | | - | | | 1/6/2021 | 1/7/2021 | | |
| 12 | FF-19 B | B(a)a, BaP, BbF, DA | Excavation Sample - ISM TRIPLICATE set 7 | Sidewall East | 12/17/2020 | CT | 158760 | LL12FF19bcs-335-002-SO (SWE) | - | | - | | - | | - | | 2.69 | | 2.38 | | 2.95 | | 0.472 | | - | | - | | - | | | 1/6/2021 | 1/7/2021 | | |
| 12 | FF-19 B | B(a)a, BaP, BbF, DA | Excavation Sample - ISM TRIPLICATE set 7 | Sidewall East | 12/17/2020 | CT | 158760 | LL12FF19bcs-335-003-SO (SWE) | - | | - | | - | | - | | 3.33 | | 2.6 | | 3.23 | | 0.494 | | - | | - | | - | | | 1/6/2021 | 1/7/2021 | | |
| 12 | FF-19 B | B(a)a, BaP, BbF, DA | Excavation Sample - ISM TRIPLICATE set 7 | | | | | **arithmetic mean** | | | | | | | | | 2.887 | | 2.213 | | 2.727 | | 0.399 | | | | | | | | | 1/6/2021 | 1/7/2021 | | |
| 12 | FF-19 B | B(a)a, BaP, BbF, DA | Excavation Sample - ISM TRIPLICATE set 7 | | | | | **standard deviation** | | | | | | | | | 0.385 | | 0.492 | | 0.645 | | 0.146 | | | | | | | | - RGOs met for all analytes in each individual replicate sample; | 1/6/2021 | 1/7/2021 | | |
| 12 | FF-19 B | B(a)a, BaP, BbF, DA | Excavation Sample - ISM TRIPLICATE set 7 | | | | | **CV = SD / mean** | | | | | | | | | 13% | | 22% | | 24% | | 37% | | | | | | | | - RSD <35% for B(a)a, BaP, BbF<br>- RSD>35% but <50% DA<br>- Results are <RGO | 1/6/2021 | 1/7/2021 | | |
| 12 | FF-19 B | B(a)a, BaP, BbF, DA | Excavation Sample - ISM TRIPLICATE set 7 | | | | | **count (r)** | | | | | | | | | 3 | | 3 | | 3 | | 3 | | | | | | | | - no further excavation in this direction; pending post-excavation survey, excavation can be backfilled. | 1/6/2021 | 1/7/2021 | | |
| 12 | FF-19 B | B(a)a, BaP, BbF, DA | Excavation Sample - ISM TRIPLICATE set 7 | | | | | **alpha (95% = 0.05)** | | | | | | | | | 0.05 | | 0.05 | | 0.05 | | 0.05 | | | | | | | | | 1/6/2021 | 1/7/2021 | | |
| 12 | FF-19 B | B(a)a, BaP, BbF, DA | Excavation Sample - ISM TRIPLICATE set 7 | | | | | **t(alpha, df=r-1)** | | | | | | | | | 2.92 | | 2.92 | | 2.92 | | 2.92 | | | | | | | | | 1/6/2021 | 1/7/2021 | | |
| 12 | FF-19 B | B(a)a, BaP, BbF, DA | Excavation Sample - ISM TRIPLICATE set 7 | | | | | **Student's t UCL** | | | | | | | | | 3.54 | | 3.04 | | 3.81 | | 0.65 | | | | | | | | | 1/6/2021 | 1/7/2021 | | |
| 12 | FF-19 B | B(a)a, BaP, BbF, DA | Excavation Sample - ISM TRIPLICATE set 7 | | | | | **Chebychev UCL** | | | | | | | | | 3.85 | | 3.45 | | 4.35 | | 0.77 | | | | | | | | | 1/6/2021 | 1/7/2021 | | |
| 12 | FF-19 C | B(a)a, BaP, BbF, DA | Excavation Sample | Bottom 1 | 12/16/2020 | CT | 158721 | LL12FF19ccs-321-001-SO (Bottom1) | - | | - | | - | | - | | 5.41 | | 4.04 | | 4.94 | | 0.391 | | - | | - | | - | | Additional soil will be excavated in this direction for treatment, and an additional ISM sample will be collected from the new bottom1 for BaP. | 1/6/2021 | 1/7/2021 | | |
| 12 | FF-19 C | B(a)a, BaP, BbF, DA | Excavation Sample | Sidewall East 1 | 12/16/2020 | CT | 158721 | LL12FF19ccs-322-001-SO (SWE1) | - | | - | | - | | - | | 4.16 | | 3.58 | | 6.14 | | 0.438 | | - | | - | | - | | Additional soil will be excavated in this direction for treatment, and an additional ISM sample will be collected from the new eastern1 sidewall for BaP. | 1/6/2021 | 1/7/2021 | | |
| 12 | FF-19 C | B(a)a, BaP, BbF, DA | Excavation Sample | Bottom 2 | 12/16/2020 | CT | 158721 | LL12FF19ccs-323-001-SO (Bottom2) | - | | - | | - | | - | | 1.81 | | 1.34 | | 1.65 | | 0.185 | | - | | - | | - | | RGOs have been met, no further excavation in this direction | 1/6/2021 | 1/7/2021 | | |
| 12 | FF-19 C | B(a)a, BaP, BbF, DA | Excavation Sample | Sidewall South 1 | 12/17/2020 | CT | 158760 | LL12FF19ccs-324-001-SO (SWS1) | - | | - | | - | | - | | 1.16 | | 0.863 | | 1.07 | | 0.108 | | - | | - | | - | | RGOs have been met, no further excavation in this direction | 1/6/2021 | 1/7/2021 | | |
| 12 | FF-19 C | B(a)a, BaP, BbF, DA | Excavation Sample | Sidewall West 1 | 12/17/2020 | CT | 158760 | LL12FF19ccs-325-001-SO (SWW1) | - | | - | | - | | - | | 4.96 | | 3.96 | | 4.85 | | 0.368 | | - | | - | | - | | Additional soil will be excavated in this direction for treatment, and an additional ISM sample will be collected for the new western1 sidewall for BaP. | 1/6/2021 | 1/7/2021 | | |
| 12 | FF-19 C | B(a)a, BaP, BbF, DA | Excavation Sample | Sidewall North 1 | 12/17/2020 | CT | 158760 | LL12FF19ccs-326-001-SO (SWN1) | - | | - | | - | | - | | 2.11 | | 1.45 | | 1.93 | | 0.198 | | - | | - | | - | | RGOs have been met, no further excavation in this direction | 1/6/2021 | 1/7/2021 | | |
| 12 | FF-19 C | B(a)a, BaP, BbF, DA | Excavation Sample | Sidewall South 2 | 12/17/2020 | CT | 158760 | LL12FF19ccs-327-001-SO (SWS2) | - | | - | | - | | - | | 0.388 | | 0.265 | | 0.363 | | 0.0361 | | - | | - | | - | | RGOs have been met, no further excavation in this direction | 1/6/2021 | 1/7/2021 | | |
| 12 | FF-19 C | B(a)a, BaP, BbF, DA | Excavation Sample | Sidewall West 2 | 12/17/2020 | CT | 158760 | LL12FF19ccs-328-001-SO (SWW2) | - | | - | | - | | - | | 0.371 | | 0.335 | | 1.07 | | 0.0821 | | - | | - | | - | | RGOs have been met, no further excavation in this direction | 1/6/2021 | 1/7/2021 | | |

**LL 1-4 & 12 Remedial Action**
**Excavation Confirmation Sample Results (unvalidated)**

| | | | | | | | | | Analyte/Units/Remedial Goal Option (RGO)/Result | | | | | | | | |

**LL 1-4 & 12 Remedial Action**
**Excavation Confirmation Sample Results (unvalidated)**

| Load Line | Remediation Area | COCs | Description/ Rationale | Location | Sample Date | Lab | Lab SDG # | Sample ID/Location | Analyte/Units/Remedial Goal Option (RGO)/Result | | | | | | | | | | | | | | | | | | | | | | | | | | Action | Submitted to Army | Approved by Army | Submitted to Ohio EPA | OhioEPA Concurrence |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | Antimony | | Lead | | PCB-1254 | | PCB-1260 | | B(a)a | | BaP | | BbF | | DA | | RDX | | TNT | | 2,6-DNT | | | | | | | | |
| | | | | | | | | | mg/kg | | mg/kg | | mg/kg | | mg/kg | | mg/kg | | mg/kg | | mg/kg | | mg/kg | | mg/kg | | mg/kg | | mg/kg | | | | | | | | |
| | | | | | | | | | 470 | | 800 | | 9.7 | | 9.9 | | 29 | | 2.9 | | 29 | | 2.9 | | 280 | | 510 | | 15 | | | | | | | | |
| 3 | West Perimeter | B(a)a, BaP, BbF, DA | Excavation Sample | Bottom | 12/21/2020 | CT | 158799 | LL3WPcs-581-001-SO (Bottom) | - | | - | | - | | - | | 15.5 | | 12 | | 15.9 | | 1.3 | | - | | - | | - | | | | | | | Additional soil will be excavated in this direction for treatment, and an additional ISM sample will be collected from the new bottom for BaP. | 1/11/2021 | | | |
| 3 | West Perimeter | B(a)a, BaP, BbF, DA | Excavation Sample - ISM TRIPLICATE set 10 | Sidewall North | 12/21/2020 | CT | 158799 | LL3WPcs-582-001-SO (SWN) | - | | - | | - | | - | | 69.3 | | 73.7 | | 101 | | 10.7 | | - | | - | | - | | | | | | | | 1/11/2021 | | | |
| 3 | West Perimeter | B(a)a, BaP, BbF, DA | Excavation Sample - ISM TRIPLICATE set 10 | Sidewall North | 12/21/2020 | CT | 158799 | LL3WPcs-582-002-SO (SWN) | - | | - | | - | | - | | 63.6 | | 67 | | 86 | | 9.89 | | - | | - | | - | | | | | | | | 1/11/2021 | | | |
| 3 | West Perimeter | B(a)a, BaP, BbF, DA | Excavation Sample - ISM TRIPLICATE set 10 | Sidewall North | 12/21/2020 | CT | 158799 | LL3WPcs-582-003-SO (SWN) | - | | - | | - | | - | | 67.7 | | 68.6 | | 95.7 | | 10.5 | | - | | - | | - | | | | | | | | 1/11/2021 | | | |
| 12 | West Perimeter | B(a)a, BaP, BbF, DA | Excavation Sample - ISM TRIPLICATE set 10 | | | | | **arithmetic mean** | | | | | | | | | 66.867 | | 69.767 | | 94.233 | | 10.363 | | | | | | | | | | | | | - RGOs exceeded for all PAHs (B(a)a, BaP, BbF, DA); | 1/11/2021 | | | |
| 12 | West Perimeter | B(a)a, BaP, BbF, DA | Excavation Sample - ISM TRIPLICATE set 10 | | | | | **standard deviation** | | | | | | | | | 2.940 | | 3.499 | | 7.607 | | 0.422 | | | | | | | | | | | | | - RSDs <35%; | 1/11/2021 | | | |
| 12 | West Perimeter | B(a)a, BaP, BbF, DA | Excavation Sample - ISM TRIPLICATE set 10 | | | | | **CV = SD / mean** | | | | | | | | | 4% | | 5% | | 8% | | 4% | | | | | | | | | | | | | - Additional soil will be excavated in this direction for treatment, and an additional ISM sample will be collected from the new sidewall north for B(a)a, BaP, BbF, DA | 1/11/2021 | | | |
| 12 | West Perimeter | B(a)a, BaP, BbF, DA | Excavation Sample - ISM TRIPLICATE set 10 | | | | | **count (r)** | | | | | | | | | 3 | | 3 | | 3 | | 3 | | | | | | | | | | | | | | 1/11/2021 | | | |
| 12 | West Perimeter | B(a)a, BaP, BbF, DA | Excavation Sample - ISM TRIPLICATE set 10 | | | | | **alpha (95% = 0.05)** | | | | | | | | | 0.05 | | 0.05 | | 0.05 | | 0.05 | | | | | | | | | | | | | | 1/11/2021 | | | |
| 12 | West Perimeter | B(a)a, BaP, BbF, DA | Excavation Sample - ISM TRIPLICATE set 10 | | | | | **t(alpha, df=r-1)** | | | | | | | | | 2.92 | | 2.92 | | 2.92 | | 2.92 | | | | | | | | | | | | | | 1/11/2021 | | | |
| 12 | West Perimeter | B(a)a, BaP, BbF, DA | Excavation Sample - ISM TRIPLICATE set 10 | | | | | **Student's t UCL** | | | | | | | | | 71.82 | | 75.67 | | 107.06 | | 11.07 | | | | | | | | | | | | | | 1/11/2021 | | | |
| 12 | West Perimeter | B(a)a, BaP, BbF, DA | Excavation Sample - ISM TRIPLICATE set 10 | | | | | **Chebychev UCL** | | | | | | | | | 74.27 | | 78.57 | | 113.38 | | 11.43 | | | | | | | | | | | | | | 1/11/2021 | | | |
| 3 | West Perimeter | B(a)a, BaP, BbF, DA | Excavation Sample - ISM TRIPLICATE set 11 | Sidewall West | 12/21/2020 | CT | 158799 | LL3WPcs-583-001-SO (SWW) | - | | - | | - | | - | | 24.9 | | 24.3 | | 27.9 | | 2.54 | | - | | - | | - | | | | | | | | 1/11/2021 | | | |
| 3 | West Perimeter | B(a)a, BaP, BbF, DA | Excavation Sample - ISM TRIPLICATE set 11 | Sidewall West | 12/21/2020 | CT | 158799 | LL3WPcs-583-002-SO (SWW) | - | | - | | - | | - | | 26.6 | | 25.7 | | 32.6 | | 2.63 | | - | | - | | - | | | | | | | | 1/11/2021 | | | |
| 3 | West Perimeter | B(a)a, BaP, BbF, DA | Excavation Sample - ISM TRIPLICATE set 11 | Sidewall West | 12/21/2020 | CT | 158799 | LL3WPcs-583-003-SO (SWW) | - | | - | | - | | - | | 22.2 | | 21.6 | | 25.5 | | 1.97 | | - | | - | | - | | | | | | | | 1/11/2021 | | | |
| 3 | West Perimeter | B(a)a, BaP, BbF, DA | Excavation Sample - ISM TRIPLICATE set 11 | | | | | **arithmetic mean** | | | | | | | | | 24.567 | | 23.867 | | 28.667 | | 2.380 | | | | | | | | | | | | | - RGOs exceeded for BaPand BbF; | 1/11/2021 | | | |
| 3 | West Perimeter | B(a)a, BaP, BbF, DA | Excavation Sample - ISM TRIPLICATE set 11 | | | | | **standard deviation** | | | | | | | | | 2.219 | | 2.084 | | 3.612 | | 0.358 | | | | | | | | | | | | | - RSDs<35%; | 1/11/2021 | | | |
| 3 | West Perimeter | B(a)a, BaP, BbF, DA | Excavation Sample - ISM TRIPLICATE set 11 | | | | | **CV = SD / mean** | | | | | | | | | 9% | | 9% | | 13% | | 15% | | | | | | | | | | | | | - Additional soil will be excavated in this direction for treatment, and an additional ISM sample will be collected from the new sidewall west for BaP and BbF | 1/11/2021 | | | |
| 3 | West Perimeter | B(a)a, BaP, BbF, DA | Excavation Sample - ISM TRIPLICATE set 11 | | | | | **count (r)** | | | | | | | | | 3 | | 3 | | 3 | | 3 | | | | | | | | | | | | | | 1/11/2021 | | | |
| 3 | West Perimeter | B(a)a, BaP, BbF, DA | Excavation Sample - ISM TRIPLICATE set 11 | | | | | **alpha (95% = 0.05)** | | | | | | | | | 0.05 | | 0.05 | | 0.05 | | 0.05 | | | | | | | | | | | | | | 1/11/2021 | | | |
| 3 | West Perimeter | B(a)a, BaP, BbF, DA | Excavation Sample - ISM TRIPLICATE set 11 | | | | | **t(alpha, df=r-1)** | | | | | | | | | 2.92 | | 2.92 | | 2.92 | | 2.92 | | | | | | | | | | | | | | 1/11/2021 | | | |
| 3 | West Perimeter | B(a)a, BaP, BbF, DA | Excavation Sample - ISM TRIPLICATE set 11 | | | | | **Student's t UCL** | | | | | | | | | 28.31 | | 27.38 | | 34.76 | | 2.98 | | | | | | | | | | | | | | 1/11/2021 | | | |
| 3 | West Perimeter | B(a)a, BaP, BbF, DA | Excavation Sample - ISM TRIPLICATE set 11 | | | | | **Chebychev UCL** | | | | | | | | | 30.15 | | 29.11 | | 37.76 | | 3.28 | | | | | | | | | | | | | | 1/11/2021 | | | |
| 3 | West Perimeter | B(a)a, BaP, BbF, DA | Excavation Sample | Sidewall South | 12/21/2020 | CT | 158799 | LL3WPcs-584-001-SO (SWS) | - | | - | | - | | - | | 3.22 | | 3.14 | | 4.15 | | 0.369 | M,Y | - | | - | | - | | | | | | | Additional soil will be excavated in this direction for treatment, and an additional ISM sample will be collected from the new sidewall south for BaP. | 1/11/2021 | | | |
| 3 | West Perimeter | B(a)a, BaP, BbF, DA | Excavation Sample | Sidewall East | 12/21/2020 | CT | 158799 | LL3WPcs-585-001-SO (SWE) | - | | - | | - | | - | | 37.1 | | 32.1 | | 41.4 | | 4.65 | | - | | - | | - | | | | | | | Additional soil will be excavated in this direction for treatment, and an additional ISM sample will be collected from the new sidewall east for B(a)a, BaP, BbF, DA. | 1/11/2021 | | | |

B(a)a = Benz(a)anthracene
BaP = Benzo(a)pyrene
BbF = Benzo(b)fluoranthene
COCs = contaminants of concern
DA = Dibenz(a,h)anthracene
2,6-DNT = 2,6-dinitrotoluene
mg/kg = milligrams per kilogram
RDX = hexahydro-1,3,5-trinitro-1,3,5-triazine
RGO = remedial goal option
SDG = sample delivery group
TNT = 2,4,6-trinitrotoluene

RGO exceeded, further action needed

parameter exceeded, no further action as noted (e.g., due to additional data evaluation or additional excavation)

CT Laboratory QC Qualifiers
J Estimated value.
M Matrix spike and/or Matrix Spike Duplicate recovery outside acceptance limits.
P Concentration of analyte differs more than 40% between primary and confirmation analysis.
Q Laboratory Control Sample outside acceptance limits.
U Analyte concentration was below detection limit.
Y Replicate/Duplicate precision outside acceptance limits.
Z Specified calibration criteria was not met.

GEL Laboratory QC Qualifiers
J Indicates an estimated value. The result was greater than the detection limit, but less than the reporting limit or indicates that the analyte recovery in the MS or MSD is outside of specified acceptance criteria or the response between the confirmation column and the primary column is >40%D.

# Treatment Verification Sample Results

Treatment Verification Report No. 4 DATE INITIATED: 1/06/2021

PROJECT RVAAP Load Lines 1-4 and 12 (RVAAP-08 to 12)

CONTRACT NO W912QR-12-D-0005

REQUESTOR IDENTIFICATION

NAME_ORGANIZATION PHONE Sarah Meyers, CH2M, 703-376-5338

TITLE Project Manager SIGNATURE Sarah L. Meyers

BASELINE IDENTIFICATION

BASELINE(S) AFFECTED ☐ Cost ☐ Scope ☐ Milestone ☐ Method of Accomplishment

AFFECTED DOCUMENTS (TITLE, NUMBER AND SECTION):

Not applicable

DESCRIPTION OF CHANGE:

1. Analytical results are attached for treatment verification samples from cell 1A-5 for soil from Buildings G-8(a) and G-8(b) with the COCs: PAHs B(a)a, BaP, BbF and DA.

   Treatment cell 1A-5 was treated from 12/9 to 12/18/2020 (9 days) and had an average soil temperature of 541 degrees Fahrenheit at the end of treatment.

2. Analytical results are attached for treatment verification samples from cell 2A-6 for soil from excavations EB-10(b), EB-803, , Building G-8(a), Building G-16, and Active Area Channel, as soil as surrounding and underlying EB-10(a), with the COCs polychlorinated biphenyls (PCBs): Aroclor 1254 [PCB 1254]; Aroclor 1260 [PCB 1260]; PAHs B(a)a, BaP, BbF and DA; and explosives: 2,4,6-trinitrotoluene [TNT]; and 2,6-DNT [2,6-dinitrotoluene].

   Treatment cell 2A-6 was treated from 12/13 to 12/21/2020 (8 days) and had an average soil temperature of 624 degrees Fahrenheit at the end of treatment.

3. The analytical results indicate that the soil meets the remedial goal options (RGOs) and will be used as backfill.

JUSTIFICATION:

The analytical results indicate that the soil meets the RGOs. The soil will be used as backfill in the excavated areas once excavation confirmation samples (sidewalls and bottoms) are confirmed to meet RGOs.

IMPACT OF NOT IMPLEMENTING REQUEST

Not applicable

PARTICIPANTS AFFECTED BY IMPLEMENTING REQUEST

Not applicable

COST ESTIMATE: NA ESTIMATOR SIGNATURE _____

PHONE: DATE___

USACE COTR PETERS.NATHANIEL.II.1248279466 Digitally signed by PETERS.NATHANIEL.II.1248279466 Date: 2021.01.07 10:32:04 -05'00' DATE January 7, 2021

OHIO EPA PROJECT MANAGER N/A DATE _____

MANAGER SIGNATURE N/A DATE _____

**LL 1-4 & 12 Remedial Action**
**Treatment Verification Sample Results (unvalidated)**

| Treatment Start Date | Treatment End Date | Remediation Area | Contaminants of Concern (COCs), based on source of soil | Description | Sample Date | Lab | Lab SDG # | Sample ID | Analyte/units/RGO/Result | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | Antimony | | Lead | | PCB-1254 | | PCB-1260 | | B(a)a | | BaP | | BbF | | DA | | RDX | | TNT | | 2,6-DNT | |
| | | | | | | | | | mg/kg | | mg/kg | | mg/kg | | mg/kg | | mg/kg | | mg/kg | | mg/kg | | mg/kg | | mg/kg | | mg/kg | | mg/kg | |
| | | | | | | | | | 470 | | 800 | | 9.7 | | 9.9 | | 29 | | 2.9 | | 29 | | 2.9 | | 280 | | 510 | | 15 | |
| 12/9/2020 | 12/18/2020 | G8b, G8a | PAHs: B(a)a, BaP, BbF, DA | G8b, G8a Cell 1A-5 | 12/18/2020 | Chemtech | L5160 | LLEXSITUtv-017-001-SO | - | | - | | - | | - | | 0.13 | U | 0.13 | U | 0.13 | U | 0.13 | U | - | | - | | - | |
| 12/9/2020 | 12/18/2020 | G8b, G8a | PAHs: B(a)a, BaP, BbF, DA | G8b, G8a Cell 1A-5 | 12/18/2020 | Chemtech | L5160 | LLEXSITUtv-018-001-SO | - | | - | | - | | - | | 0.13 | U | 0.13 | U | 0.13 | U | 0.13 | U | - | | - | | - | |
| 12/9/2020 | 12/18/2020 | G8b, G8a | PAHs: B(a)a, BaP, BbF, DA | G8b, G8a Cell 1A-5 | 12/18/2020 | Chemtech | L5160 | LLEXSITUtv-019-001-SO | - | | - | | - | | - | | 0.13 | U | 0.13 | U | 0.13 | U | 0.13 | U | - | | - | | - | |
| 12/9/2020 | 12/18/2020 | G8b, G8a | PAHs: B(a)a, BaP, BbF, DA | G8b, G8a Cell 1A-5 | 12/18/2020 | Chemtech | L5160 | LLEXSITUtv-020-001-SO | - | | - | | - | | - | | 0.13 | U | 0.13 | U | 0.13 | U | 0.13 | U | - | | - | | - | |
| 12/13/2020 | 12/21/2020 | EB10a/b, EB803, AAC, G8a, G16, EA6c | PAHs: B(a)a, BaP, BbF, DA | EB10a/b, EB803, AAC, G8a, G16, EA6c Cell 2A-6 | 12/21/2020 | Chemtech | L5193 | LLEXSITUtv-021-001-SO | - | | - | | 0.013 | U | 0.0083 | U | 0.13 | U | 0.13 | U | 0.13 | U | 0.13 | U | - | | - | | - | |
| | | | | | | CT | 158800 | | - | | - | | - | | - | | - | | - | | - | | - | | - | | 0.19 | U | 0.19 | UQ |
| 12/13/2020 | 12/21/2020 | EB10a/b, EB803, AAC, G8a, G16, EA6c | PAHs: B(a)a, BaP, BbF, DA | EB10a/b, EB803, AAC, G8a, G16, EA6c Cell 2A-6 | 12/21/2020 | Chemtech | L5193 | LLEXSITUtv-022-001-SO | - | | - | | 0.013 | U | 0.0083 | U | 0.13 | U | 0.13 | U | 0.13 | U | 0.13 | U | - | | - | | - | |
| | | | | | | CT | 158800 | | - | | - | | - | | - | | - | | - | | - | | - | | - | | 0.2 | U | 0.2 | UQ |
| 12/13/2020 | 12/21/2020 | EB10a/b, EB803, AAC, G8a, G16, EA6c | PAHs: B(a)a, BaP, BbF, DA | EB10a/b, EB803, AAC, G8a, G16, EA6c Cell 2A-6 | 12/21/2020 | Chemtech | L5193 | LLEXSITUtv-023-001-SO | - | | - | | 0.0131 | U | 0.0083 | U | 0.13 | U | 0.13 | U | 0.13 | U | 0.13 | U | - | | - | | - | |
| | | | | | | CT | 158800 | | - | | - | | - | | - | | - | | - | | - | | - | | - | | 0.2 | U | 0.2 | UQ |
| 12/13/2020 | 12/21/2020 | EB10a/b, EB803, AAC, G8a, G16, EA6c | PAHs: B(a)a, BaP, BbF, DA | EB10a/b, EB803, AAC, G8a, G16, EA6c Cell 2A-6 | 12/21/2020 | Chemtech | L5193 | LLEXSITUtv-024-001-SO | - | | - | | 0.0131 | U | 0.0084 | U | 0.13 | U | 0.13 | U | 0.13 | U | 0.13 | U | - | | - | | - | |
| | | | | | | CT | 158800 | | - | | - | | - | | - | | - | | - | | - | | - | | - | | 0.2 | U | 0.2 | UQ |

BaP = Benzo(a)pyrene
BbF = Benzo(b)fluoranthene
COCs = contaminants of concern
DA = Dibenz(a,h)anthracene
2,6-DNT = 2,6-dinitrotoluene
mg/kg = milligrams per kilogram
RDX = hexahydro-1,3,5-trinitro-1,3,5-triazine
RGO = remedial goal option
TNT = 2,4,6-trinitrotoluene

**Laboratory QC Qualifiers**
J Estimated value.
U Analyte concentration was below detection limit.
P Concentration of analyte differs more than 40% between primary and confirmation analysis.
Q Laboratory Control Sample outside acceptance limits.

# Excavation Confirmation Sample Results

Excavation Confirmation Report No. 5 DATE INITIATED: 1/6/2021

PROJECT RVAAP Load Lines 1-4 and 12 (RVAAP-08 to 12)

CONTRACT NO W912QR-12-D-0005

REQUESTOR IDENTIFICATION

NAME_ORGANIZATION PHONE Sarah Meyers, CH2M, 703-376-5338

TITLE Project Manager SIGNATURE *Sarah L. Meyers*

BASELINE IDENTIFICATION

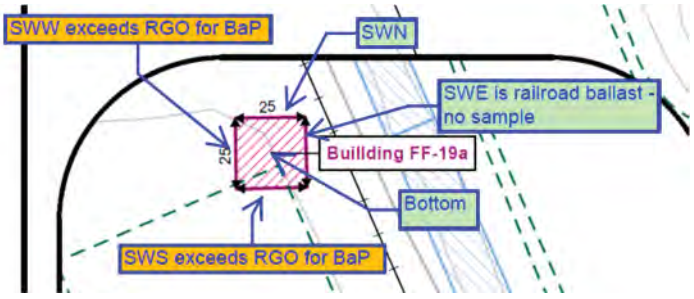
BASELINE(S) AFFECTED ☐ Cost ☐ Scope ☐ Milestone ☐ Method of Accomplishment

AFFECTED DOCUMENTS (TITLE, NUMBER AND SECTION):

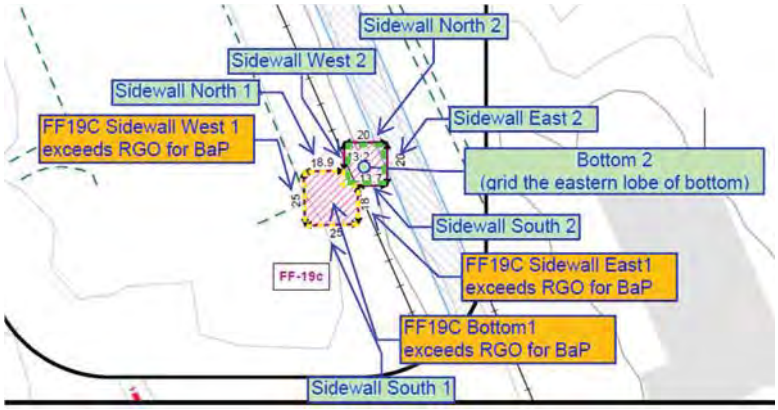
Not applicable

DESCRIPTION OF CHANGE:

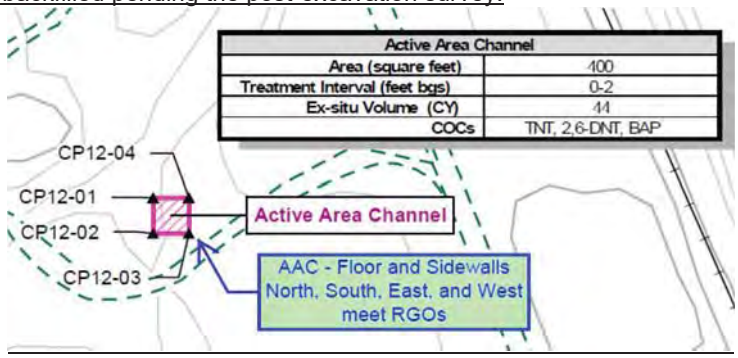
1. Additional analytical results for excavation confirmation samples are attached. Results previously concurred by the Army and Ohio EPA are identified on the table.
2. Excavation confirmation sampling of the initial excavation footprints concluded on 12/21/20 and analysis is ongoing; additional results will be provided as they become available.
3. Samples from five decision units in this data set exceed an associated remedial goal option (RGO):
   - LL12, FF-19(a), South Sidewall - benzo(a)pyrene (BaP) concentrations of 5.35 mg/kg, 3.65 mg/kg and 3.72 mg/kg in the triplicate samples exceed the RGO of 2.9 mg/kg
   - LL12, FF-19(a), West Sidewall - BaP concentration of 53.09 mg/kg exceeds the RGO of 2.9 mg/kg
   - LL12, FF-19(c), Bottom 1 -BaP concentration of 4.04 mg/kg exceeds the RGO of 2.9 mg/kg
   - LL12, FF-19(c), East Sidewall 1 - BaP concentration of 3.58 mg/kg exceeds the RGO of 2.9 mg/kg
   - LL12, FF-19(c), West Sidewall 1 - BaP concentration of 3.96 mg/kg exceeds the RGO of 2.9 mg/kg
4. Load Line 12, excavation FF-19(a) is shown below. The RGO for BaP was exceeded in the western and southern sidewalls. Additional soil will be excavated at SWS and SWW for treatment, and an additional ISM sample for BaP will be collected for the new southern sidewall and an additional ISM sample for BaP will be collected for the new western sidewall.



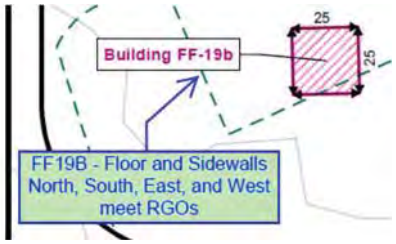
5. Load Line 12, excavation FF-19(c) is shown below. The RGO for BaP was exceeded in Sidewall West 1, Sidewall East 1 and Bottom 1. Additional soil will be excavated at SWW1, SWE1 and Bottom1 for treatment, an additional ISM sample for BaP will be collected for the extended SWW1, an additional ISM sample for BaP will be collected for the extended SWE1, and an additional ISM sample for BaP will be collected for the extended Bottom1.



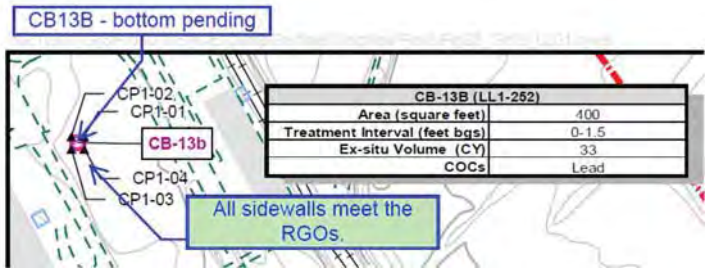

6. Load Line 12, Active Area Channel is shown below. The applicable RGOs have been met and the excavation can be backfilled pending the post-excavation survey.




7. Load Line 12, excavation FF-19(b) is shown below. The applicable RGOs have been met and the excavation can be backfilled pending the post-excavation survey.




8. Load Line 1, excavation CB-13B is shown below. The sidewalls meet the RGO. The results from the bottom sample are pending.



JUSTIFICATION:

As detailed above and in the attached table, additional excavation is indicated for five decision units in this data set that exceed an associated RGO:

- LL12, FF-19(a), South Sidewall for BaP
- LL12, FF-19(a), West Sidewall for BaP
- LL12, FF-19(c), Bottom 1 for BaP
- LL12, FF-19(c), East Sidewall 1 for BaP
- LL12, FF-19(c), West Sidewall 1 for BaP

Overall, additional excavation is indicated for ten decision units in six excavations to date:

- LL1, CB4A, South Sidewall for TNT
- LL3, EB-4, North Sidewall for PCB-1254
- LL4, G-8(b), North Sidewall for benzo(a)pyrene (BaP)
- LL4, Former Water Tower, East Sidewall for lead
- LL4, Former Water Tower, West Sidewall for lead
- LL12, FF-19(a), South Sidewall for BaP
- LL12, FF-19(a), West Sidewall for BaP
- LL12, FF-19(c), Bottom 1 for BaP
- LL12, FF-19(c), East Sidewall 1 for BaP
- LL12, FF-19(c), West Sidewall 1 for BaP

As detailed above and in the attached table, to date there are 16 excavations that meet the associated RGOs or have been excavated to bedrock and can be backfilled pending the post-excavation survey:

- LL1, CB-2
- LL1, CB-4
- LL1, Outlet Channel D
- LL2, DB-4A
- LL3, EA-6(a)
- LL3, EA-6(b)
- LL3, EA-6(c)
- LL3, EA-7
- LL3, EB-9A
- LL3, EB-10(a)
- LL3, EB-10(b)
- LL3, EB-803
- LL4, Building G-8(a)
- LL4, Building G-16
- LL12, Active Area Channel
- LL12, FF-19(b)

Analytical results are pending for two excavations: bottom sample from LL1 CB-13B and samples from LL3 West Perimeter.

IMPACT OF NOT IMPLEMENTING REQUEST

Not applicable.

PARTICIPANTS AFFECTED BY IMPLEMENTING REQUEST

Not applicable.

COST ESTIMATE: NA ESTIMATOR SIGNATURE _____

PHONE: DATE _____

USACE COTR PETERS.NATHANIEL.II.1248279466 Digitally signed by PETERS.NATHANIEL.II.1248279466 Date: 2021.01.07 13:30:48 -05'00' DATE January 7,2021

OHIO EPA PROJECT MANAGER _____ DATE _____

MANAGER SIGNATURE N/A DATE _____

**LL 1-4 & 12 Remedial Action**
**Excavation Confirmation Sample Results (unvalidated)**

| | | | | | | | | | Analyte/Units/Remedial Goal Option (RGO)/Result | | | | | | | | |

**LL 1-4 & 12 Remedial Action**
**Excavation Confirmation Sample Results (unvalidated)**

| | | | | | | | | | Analyte/Units/Remedial Goal Option (RGO)/Result | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | Antimony | Lead | PCB-1254 | PCB-1260 | B(a)a | BaP | BbF | DA | RDX | TNT | 2,6-DNT | |
| | | | | | | | | | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | |
| Load Line | Remediation Area | COCs | Description/ Rationale | Location | Sample Date | Lab | Lab SDG # | Sample ID/Location | 470 | 800 | 9.7 | 9.9 | 29 | 2.9 | 29 | 2.9 | 280 | 510 | 15 | Action |
| 3 | EA-6 (a) | B(a)a, BaP, BbF, DA | Excavation Sample | Sidewall West | 12/2/2020 | CT | 158363 | LL3EA6ACS-749-001-SO (SWW) | - | - | - | - | 6.37 | 4.42 | 5.86 | 0.374 | - | - | - | Additional excavation removed approximately 20 feet additional to the west and down to bedrock at approximately 2'bgs, coincides with footprint of EA6c. Soil added to treatment cell. Beyond that 20 feet had already been excavated for EA6c. No additional samples collected. |
| 3 | EA-6 (a) | B(a)a, BaP, BbF, DA | Excavation Sample | Sidewall North | 12/2/2020 | CT | 158363 | LL3EA6ACS-750-001-SO (SWN) | - | - | - | - | 0.445 | 0.308 | 0.391 | 0.0331 | - | - | - | RGOs have been met. Pending post-excavation survey, excavation can be backfilled. Army and OEPA concur. |
| 3 | EA-6 (a) | B(a)a, BaP, BbF, DA | Excavation Sample | Sidewall South | 12/2/2020 | CT | 158363 | LL3EA6ACS-751-001-SO (SWS) | - | - | - | - | 1.72 | 1.24 | 1.56 | 0.128 | - | - | - | |
| 3 | EA-6 (a) | B(a)a, BaP, BbF, DA | Excavation Sample | Sidewall East | NA | CT | 158363 | No sample (due to topography there is not an eastern sidewall for this excavation) | | | | | | | | | | | | |
| 3 | EA-6 (a) | B(a)a, BaP, BbF, DA | Excavation Sample | Bottom | 12/2/2020 | CT | 158363 | LL3EA6ACS-752-001-SO (BOTTOM) | - | - | - | - | 0.801 | 0.576 | 0.707 | 0.0552 | - | - | - | |
| 3 | EA-6 (b) | BaP, DA | Excavation Sample | Sidewall West | 12/1/2020 | CT | 158323 | LL3EA6Bcs-744-001-SO (SWW) | - | - | - | - | 0.162 | 0.114 | 0.174 | 0.015 M | - | - | - | RGOs have been met. Pending post-excavation survey, excavation can be backfilled. Army and OEPA concur. |
| 3 | EA-6 (b) | BaP, DA | Excavation Sample | Sidewall North | 12/1/2020 | CT | 158323 | LL3EA6Bcs-745-001-SO (SWN) | - | - | - | - | 1.51 | 1.01 | 1.45 | 0.0839 | - | - | - | |
| 3 | EA-6 (b) | BaP, DA | Excavation Sample | Sidewall South | 12/1/2020 | CT | 158323 | LL3EA6Bcs-746-001-SO (SWS) | - | - | - | - | 0.29 | 0.168 | 0.267 | 0.0227 | - | - | - | |
| 3 | EA-6 (b) | BaP, DA | Excavation Sample | Sidewall East | 12/1/2020 | CT | 158323 | LL3EA6Bcs-747-001-SO (SWE) | - | - | - | - | 0.235 | 0.156 | 0.18 | 0.02 | - | - | - | |
| 3 | EA-6 (b) | BaP, DA | Excavation Sample | Bottom | 12/1/2020 | CT | 158323 | LL3EA6Bcs-748-001-SO (Bottom) | - | - | - | - | 1.39 | 0.925 | 1.32 | 0.0822 | - | - | - | |
| 3 | EA-6 (c) | B(a)a, BaP, BbF, DA | Excavation Sample | No Samples | NA | NA | NA | no samples | - | - | - | - | NA | NA | NA | NA | - | - | - | Bedrock encountered - one pocket had soils in the treatment interval (approximately 10CY of impacted soils from an area just south of EA6b excavated to bedrock and added to treatment cell ETC 2A-6). Bedrock throughout bottom of excavation, no soil on sidewalls in treatment interval 4.5-6'bgs, no samples. Per Army direction document excavation and backfill, no samples.<br><br>Pending post-excavation survey, excavation can be backfilled. |
| 3 | EB-4 | PCB-1254 | Excavation Sample | Sidewall West 4 | 12/2/2020 | CT | 158363 | LL3EB4CS-753-001-SO (SWW4) | - | - | 0.348 | - | - | - | - | - | - | - | - | RGOs have been met, no further excavation in this direction. Army and OEPA concur. |
| 3 | EB-4 | PCB-1254 | Excavation Sample | Sidewall North 1 | 12/3/2020 | CT | 158405 | LL3EB4CS-555-001-SO (SWN1) | - | - | 11.3 | - | - | - | - | - | - | - | - | Additional soil will be excavated in this direction for treatment, and an additional ISM sample will be collected for the new north1 sidewall for PCB-1254. |
| 3 | EB-4 | PCB-1254 | Excavation Sample | Sidewall South 1 | 12/7/2020 | CT | 158449 | LL3EB4cs-561-001-SO (SWS1) | - | - | 1.68 | - | - | - | - | - | - | - | - | RGOs have been met, no further excavation in this direction |
| 3 | EB-4 | PCB-1254 | Excavation Sample | Sidewall West 1 | 12/7/2020 | CT | 158449 | LL3EB4cs-562-001-SO (SWW1) | - | - | 1.13 | - | - | - | - | - | - | - | - | RGOs have been met, no further excavation in this direction |
| 3 | EB-4 | PCB-1254 | Excavation Sample | Sidewall East 3 | 12/7/2020 | CT | 158449 | LL3EB4cs-563-001-SO (SWE3) | - | - | 1.33 | - | - | - | - | - | - | - | - | RGOs have been met, no further excavation in this direction |
| 3 | EB-4 | PCB-1254 | Excavation Sample | Sidewall West 2 | 12/7/2020 | CT | 158449 | LL3EB4cs-564-001-SO (SWW2) | - | - | 0.0943 | - | - | - | - | - | - | - | - | RGOs have been met, no further excavation in this direction |
| 3 | EB-4 | PCB-1254 | Excavation Sample | Sidewall South 2 | 12/7/2020 | CT | 158449 | LL3EB4cs-565-001-SO (SWS2) | - | - | 0.041 | - | - | - | - | - | - | - | - | RGOs have been met, no further excavation in this direction |
| 3 | EB-4 | PCB-1254 | Excavation Sample | Sidewall North 2 | 12/8/2020 | CT | 158489 | LL3EB4CS-566-001-SO (SWN2) | - | - | 0.0573 | - | - | - | - | - | - | - | - | RGOs have been met, no further excavation in this direction |
| 3 | EB-4 | PCB-1254 | Excavation Sample | Sidewall West 3 | 12/8/2020 | CT | 158489 | LL3EB4CS-567-001-SO (SWW3) | - | - | 2.16 | - | - | - | - | - | - | - | - | RGOs have been met, no further excavation in this direction |
| 3 | EB-4 | PCB-1254 | Excavation Sample | Bottom 1 | 12/8/2020 | CT | 158489 | LL3EB4CS-568-001-SO (Bottom1) | - | - | 9 | - | - | - | - | - | - | - | - | RGOs have been met, no further excavation in this direction |
| 3 | EB-4 | PCB-1254 | Excavation Sample | Sidewall East 1 | 12/8/2020 | CT | 158489 | LL3EB4CS-569-001-SO (SWE1) | - | - | 0.487 | - | - | - | - | - | - | - | - | RGOs have been met, no further excavation in this direction |
| 3 | EB-4 | PCB-1254 | Excavation Sample | Sidewall South 3 | 12/8/2020 | CT | 158489 | LL3EB4CS-570-001-SO (SWS3) | - | - | 0.571 | - | - | - | - | - | - | - | - | RGOs have been met, no further excavation in this direction |
| 3 | EB-4 | PCB-1254 | Excavation Sample | Bottom 3 | 12/10/2020 | CT | 158584 | LL3EB4CS-571-001-SO (Bottom3) | - | - | 0.752 | - | - | - | - | - | - | - | - | RGOs have been met, no further excavation in this direction |
| 3 | EB-4 | PCB-1254 | Excavation Sample | Sidewall North 3 | 12/10/2020 | CT | 158584 | LL3EB4CS-572-001-SO (SWN3) | - | - | 1.37 | - | - | - | - | - | - | - | - | RGOs have been met, no further excavation in this direction |

**LL 1-4 & 12 Remedial Action**
**Excavation Confirmation Sample Results (unvalidated)**

| | | | | | | | | | Analyte/Units/Remedial Goal Option (RGO)/Result | | | | | | | | |

**LL 1-4 & 12 Remedial Action**
**Excavation Confirmation Sample Results (unvalidated)**

| | | | | | | | | | Analyte/Units/Remedial Goal Option (RGO)/Result | | | | | | | | |

**LL 1-4 & 12 Remedial Action**
**Excavation Confirmation Sample Results (unvalidated)**

| | | | | | | | | | Analyte/Units/Remedial Goal Option (RGO)/Result | | | | | | | | |

**LL 1-4 & 12 Remedial Action**
**Excavation Confirmation Sample Results (unvalidated)**

| | | | | | | | | | Analyte/Units/Remedial Goal Option (RGO)/Result | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | Antimony | | Lead | | PCB-1254 | | PCB-1260 | | B(a)a | | BaP | | BbF | | DA | | RDX | | TNT | | 2,6-DNT | | |
| | | | | | | | | | mg/kg | | mg/kg | | mg/kg | | mg/kg | | mg/kg | | mg/kg | | mg/kg | | mg/kg | | mg/kg | | mg/kg | | mg/kg | | |
| Load Line | Remediation Area | COCs | Description/ Rationale | Location | Sample Date | Lab | Lab SDG # | Sample ID/Location | 470 | | 800 | | 9.7 | | 9.9 | | 29 | | 2.9 | | 29 | | 2.9 | | 280 | | 510 | | 15 | | Action |
| 12 | FF-19 B | B(a)a, BaP, BbF, DA | Excavation Sample | Bottom | 12/17/2020 | CT | 158760 | LL12FF19bcs-331-001-SO (Bottom) | - | | - | | - | | - | | 0.734 | | 0.691 | | 0.976 | | 0.0746 | | - | | - | | - | | RGOs have been met, no further excavation in this direction |
| 12 | FF-19 B | B(a)a, BaP, BbF, DA | Excavation Sample | Sidewall North | 12/17/2020 | CT | 158760 | LL12FF19bcs-332-001-SO (SWN) | - | | - | | - | | - | | 1.36 | | 1.13 | | 1.49 | | 0.156 | | - | | - | | - | | RGOs have been met, no further excavation in this direction |
| 12 | FF-19 B | B(a)a, BaP, BbF, DA | Excavation Sample | Sidewall South | 12/17/2020 | CT | 158760 | LL12FF19bcs-333-001-SO (SWS) | - | | - | | - | | - | | 2.38 | | 1.94 | | 2.59 | | 0.259 | | - | | - | | - | | |
| 12 | FF-19 B | B(a)a, BaP, BbF, DA | Excavation Sample - ISM TRIPLICATE set 8 | Sidewall South | 12/17/2020 | CT | 158760 | LL12FF19bcs-333-002-SO (SWS) | - | | - | | - | | - | | 1.47 | | 1.29 | | 1.71 | | 0.122 | | - | | - | | - | | |
| 12 | FF-19 B | B(a)a, BaP, BbF, DA | Excavation Sample - ISM TRIPLICATE set 8 | Sidewall South | 12/17/2020 | CT | 158760 | LL12FF19bcs-333-003-SO (SWS) | - | | - | | - | | - | | 1.89 | | 1.54 | | 1.82 | | 0.204 | | - | | - | | - | | |
| 12 | FF-19 B | B(a)a, BaP, BbF, DA | | | | | | **arithmetic mean** | | | | | | | | | 1.913 | | 1.590 | | 2.040 | | 0.195 | | | | | | | | - RGOs met for all analytes in each individual replicate sample;<br>- RSD ≤35% for all analytes;<br>- no further excavation in this direction; pending post-excavation survey, excavation can be backfilled. |
| 12 | FF-19 B | B(a)a, BaP, BbF, DA | | | | | | **standard deviation** | | | | | | | | | 0.455 | | 0.328 | | 0.479 | | 0.069 | | | | | | | | |
| 12 | FF-19 B | B(a)a, BaP, BbF, DA | | | | | | **CV = SD / mean** | | | | | | | | | 24% | | 21% | | 24% | | 35% | | | | | | | | |
| 12 | FF-19 B | B(a)a, BaP, BbF, DA | | | | | | **count (r)** | | | | | | | | | 3 | | 3 | | 3 | | 3 | | | | | | | | |
| 12 | FF-19 B | B(a)a, BaP, BbF, DA | | | | | | **alpha (95% = 0.05)** | | | | | | | | | 0.05 | | 0.05 | | 0.05 | | 0.05 | | | | | | | | |
| 12 | FF-19 B | B(a)a, BaP, BbF, DA | | | | | | **t(alpha, df=r-1)** | | | | | | | | | 2.92 | | 2.92 | | 2.92 | | 2.92 | | | | | | | | |
| 12 | FF-19 B | B(a)a, BaP, BbF, DA | | | | | | **Student's t UCL** | | | | | | | | | 2.68 | | 2.14 | | 2.85 | | 0.31 | | | | | | | | |
| 12 | FF-19 B | B(a)a, BaP, BbF, DA | | | | | | **Chebychev UCL** | | | | | | | | | 3.06 | | 2.42 | | 3.25 | | 0.37 | | | | | | | | |
| 12 | FF-19 B | B(a)a, BaP, BbF, DA | Excavation Sample | Sidewall West | 12/17/2020 | CT | 158760 | LL12FF19bcs-334-001-SO (SWW) | - | | - | | - | | - | | 1.45 | | 1.19 | | 1.48 | | 0.148 | | - | | - | | - | | RGOs have been met, no further excavation in this direction |
| 12 | FF-19 B | B(a)a, BaP, BbF, DA | Excavation Sample | Sidewall East | 12/17/2020 | CT | 158760 | LL12FF19bcs-335-001-SO (SWE) | - | | - | | - | | - | | 2.64 | | 1.66 | | 2 | | 0.23 | | - | | - | | - | | |
| 12 | FF-19 B | B(a)a, BaP, BbF, DA | Excavation Sample - ISM TRIPLICATE set 7 | Sidewall East | 12/17/2020 | CT | 158760 | LL12FF19bcs-335-002-SO (SWE) | - | | - | | - | | - | | 2.69 | | 2.38 | | 2.95 | | 0.472 | | - | | - | | - | | |
| 12 | FF-19 B | B(a)a, BaP, BbF, DA | Excavation Sample - ISM TRIPLICATE set 7 | Sidewall East | 12/17/2020 | CT | 158760 | LL12FF19bcs-335-003-SO (SWE) | - | | - | | - | | - | | 3.33 | | 2.6 | | 3.23 | | 0.494 | | - | | - | | - | | |
| 12 | FF-19 B | B(a)a, BaP, BbF, DA | | | | | | **arithmetic mean** | | | | | | | | | 2.887 | | 2.213 | | 2.727 | | 0.399 | | | | | | | | - RGOs met for all analytes in each individual replicate sample;<br>- RSD <35% for B(a)a, BaP, BbF<br>- RSD>35% but <50% DA<br>- Results are <RGO<br>- no further excavation in this direction; pending post-excavation survey, excavation can be backfilled. |
| 12 | FF-19 B | B(a)a, BaP, BbF, DA | | | | | | **standard deviation** | | | | | | | | | 0.385 | | 0.492 | | 0.645 | | 0.146 | | | | | | | | |
| 12 | FF-19 B | B(a)a, BaP, BbF, DA | | | | | | **CV = SD / mean** | | | | | | | | | 13% | | 22% | | 24% | | 37% | | | | | | | | |
| 12 | FF-19 B | B(a)a, BaP, BbF, DA | | | | | | **count (r)** | | | | | | | | | 3 | | 3 | | 3 | | 3 | | | | | | | | |
| 12 | FF-19 B | B(a)a, BaP, BbF, DA | | | | | | **alpha (95% = 0.05)** | | | | | | | | | 0.05 | | 0.05 | | 0.05 | | 0.05 | | | | | | | | |
| 12 | FF-19 B | B(a)a, BaP, BbF, DA | | | | | | **t(alpha, df=r-1)** | | | | | | | | | 2.92 | | 2.92 | | 2.92 | | 2.92 | | | | | | | | |
| 12 | FF-19 B | B(a)a, BaP, BbF, DA | | | | | | **Student's t UCL** | | | | | | | | | 3.54 | | 3.04 | | 3.81 | | 0.65 | | | | | | | | |
| 12 | FF-19 B | B(a)a, BaP, BbF, DA | | | | | | **Chebychev UCL** | | | | | | | | | 3.85 | | 3.45 | | 4.35 | | 0.77 | | | | | | | | |
| 12 | FF-19 C | B(a)a, BaP, BbF, DA | Excavation Sample | Bottom 1 | 12/16/2020 | CT | 158721 | LL12FF19ccs-321-001-SO (Bottom1) | - | | - | | - | | - | | 5.41 | | 4.04 | | 4.94 | | 0.391 | | - | | - | | - | | Additional soil will be excavated in this direction for treatment, and an additional ISM sample will be collected for the new bottom1 sidewall for BaP. |
| 12 | FF-19 C | B(a)a, BaP, BbF, DA | Excavation Sample | Sidewall East 1 | 12/16/2020 | CT | 158721 | LL12FF19ccs-322-001-SO (SWE1) | - | | - | | - | | - | | 4.16 | | 3.58 | | 6.14 | | 0.438 | | - | | - | | - | | Additional soil will be excavated in this direction for treatment, and an additional ISM sample will be collected for the new eastern1 sidewall for BaP. |
| 12 | FF-19 C | B(a)a, BaP, BbF, DA | Excavation Sample | Bottom 2 | 12/16/2020 | CT | 158721 | LL12FF19ccs-323-001-SO (Bottom2) | - | | - | | - | | - | | 1.81 | | 1.34 | | 1.65 | | 0.185 | | - | | - | | - | | RGOs have been met, no further excavation in this direction |
| 12 | FF-19 C | B(a)a, BaP, BbF, DA | Excavation Sample | Sidewall South 1 | 12/17/2020 | CT | 158760 | LL12FF19ccs-324-001-SO (SWS1) | - | | - | | - | | - | | 1.16 | | 0.863 | | 1.07 | | 0.108 | | - | | - | | - | | RGOs have been met, no further excavation in this direction |
| 12 | FF-19 C | B(a)a, BaP, BbF, DA | Excavation Sample | Sidewall West 1 | 12/17/2020 | CT | 158760 | LL12FF19ccs-325-001-SO (SWW1) | - | | - | | - | | - | | 4.96 | | 3.96 | | 4.85 | | 0.368 | | - | | - | | - | | Additional soil will be excavated in this direction for treatment, and an additional ISM sample will be collected for the new western1 sidewall for BaP. |
| 12 | FF-19 C | B(a)a, BaP, BbF, DA | Excavation Sample | Sidewall North 1 | 12/17/2020 | CT | 158760 | LL12FF19ccs-326-001-SO (SWN1) | - | | - | | - | | - | | 2.11 | | 1.45 | | 1.93 | | 0.198 | | - | | - | | - | | RGOs have been met, no further excavation in this direction |
| 12 | FF-19 C | B(a)a, BaP, BbF, DA | Excavation Sample | Sidewall South 2 | 12/17/2020 | CT | 158760 | LL12FF19ccs-327-001-SO (SWS2) | - | | - | | - | | - | | 0.388 | | 0.265 | | 0.363 | | 0.0361 | | - | | - | | - | | RGOs have been met, no further excavation in this direction |
| 12 | FF-19 C | B(a)a, BaP, BbF, DA | Excavation Sample | Sidewall West 2 | 12/17/2020 | CT | 158760 | LL12FF19ccs-328-001-SO (SWW2) | - | | - | | - | | - | | 0.371 | | 0.335 | | 1.07 | | 0.0821 | | - | | - | | - | | RGOs have been met, no further excavation in this direction |

**LL 1-4 & 12 Remedial Action**
**Excavation Confirmation Sample Results (unvalidated)**

| | | | | | | | | | Analyte/Units/Remedial Goal Option (RGO)/Result | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | Antimony | | Lead | | PCB-1254 | | PCB-1260 | | B(a)a | | BaP | | BbF | | DA | | RDX | | TNT | | 2,6-DNT | | Action |
| | | | | | | | | | mg/kg | | mg/kg | | mg/kg | | mg/kg | | mg/kg | | mg/kg | | mg/kg | | mg/kg | | mg/kg | | mg/kg | | mg/kg | | |
| Load Line | Remediation Area | COCs | Description/ Rationale | Location | Sample Date | Lab | Lab SDG # | Sample ID/Location | 470 | | 800 | | 9.7 | | 9.9 | | 29 | | 2.9 | | 29 | | 2.9 | | 280 | | 510 | | 15 | | |
| 12 | FF-19 C | B(a)a, BaP, BbF, DA | Excavation Sample | Sidewall East 2 | 12/17/2020 | CT | 158760 | LL12FF19ccs-329-001-SO (SWE2) | - | | - | | - | | - | | 0.0504 | | 0.0275 | | 0.0469 | | 0.00649 | | - | | - | | - | | |
| 12 | FF-19 C | B(a)a, BaP, BbF, DA | Excavation Sample - ISM TRIPLICATE set 6 | Sidewall East 2 | 12/17/2020 | CT | 158760 | LL12FF19ccs-329-002-SO (SWE2) | - | | - | | - | | - | | 0.276 | | 0.164 | | 0.199 | | 0.0213 | | - | | - | | - | | |
| 12 | FF-19 C | B(a)a, BaP, BbF, DA | Excavation Sample - ISM TRIPLICATE set 6 | Sidewall East 2 | 12/17/2020 | CT | 158760 | LL12FF19ccs-329-003-SO (SWE2) | - | | - | | - | | - | | 0.0482 | | 0.0341 | | 0.0676 | | 0.00573 | | - | | - | | - | | - RGOs met for all analytes in each individual replicate sample; |
| 12 | FF-19 C | B(a)a, BaP, BbF, DA | | | | | | **arithmetic mean** | | | | | | | | | 0.125 | | 0.075 | | 0.105 | | 0.011 | | | | | | | | - RSD >100% for B(a)a and BaP - 95% UCL (Chebychev method) is less than RGO; |
| 12 | FF-19 C | B(a)a, BaP, BbF, DA | | | | | | **standard deviation** | | | | | | | | | 0.131 | | 0.077 | | 0.082 | | 0.009 | | | | | | | | |
| 12 | FF-19 C | B(a)a, BaP, BbF, DA | | | | | | **CV = SD / mean** | | | | | | | | | 105% | | 102% | | 79% | | 79% | | | | | | | | - RSD >50% but <100% for BbF and DA: - 95% UCL (Chebychev method) is less than the RGO; |
| 12 | FF-19 C | B(a)a, BaP, BbF, DA | | | | | | **count (r)** | | | | | | | | | 3 | | 3 | | 3 | | 3 | | | | | | | | |
| 12 | FF-19 C | B(a)a, BaP, BbF, DA | | | | | | **alpha (95% = 0.05)** | | | | | | | | | 0.05 | | 0.05 | | 0.05 | | 0.05 | | | | | | | | - no further excavation in this direction; pending post-excavation survey, excavation can be backfilled. |
| 12 | FF-19 C | B(a)a, BaP, BbF, DA | | | | | | **t(alpha, df=r-1)** | | | | | | | | | 2.92 | | 2.92 | | 2.92 | | 2.92 | | | | | | | | |
| 12 | FF-19 C | B(a)a, BaP, BbF, DA | | | | | | **Student's t UCL** | | | | | | | | | 0.35 | | 0.20 | | 0.24 | | 0.03 | | | | | | | | |
| 12 | FF-19 C | B(a)a, BaP, BbF, DA | | | | | | **Chebychev UCL** | | | | | | | | | 0.45 | | 0.27 | | 0.31 | | 0.03 | | | | | | | | |
| 12 | FF-19 C | B(a)a, BaP, BbF, DA | Excavation Sample | Sidewall North 2 | 12/17/2020 | CT | 158760 | LL12FF19ccs-330-001-SO (SWN2) | - | | - | | - | | - | | 0.243 | | 0.158 | | 0.248 | | 0.0229 | | - | | - | | - | | RGOs have been met, no further excavation in this direction |
| 1 | CB-13B | Lead | Excavation Sample | Sidewall North | 12/21/2020 | CT | 158799 | LL1CB13Bcs-761-001-SO (SWN) | - | | 20.1 | | - | | - | | - | | - | | - | | - | | - | | - | | - | | RGOs have been met, no further excavation in this direction |
| 1 | CB-13B | Lead | Excavation Sample | Sidewall East | 12/21/2020 | CT | 158799 | LL1CB13Bcs-762-001-SO (SWE) | - | | 15.8 | | - | | - | | - | | - | | - | | - | | - | | - | | - | | RGOs have been met, no further excavation in this direction |
| 1 | CB-13B | Lead | Excavation Sample | Sidewall South | 12/21/2020 | CT | 158799 | LL1CB13Bcs-763-001-SO (SWS) | - | | 23.2 | | - | | - | | - | | - | | - | | - | | - | | - | | - | | RGOs have been met, no further excavation in this direction |
| 1 | CB-13B | Lead | Excavation Sample | Sidewall West | 12/21/2020 | CT | 158799 | LL1CB13Bcs-764-001-SO (SWW) | - | | 23.1 | | - | | - | | - | | - | | - | | - | | - | | - | | - | | RGOs have been met, no further excavation in this direction |

**LL 1-4 & 12 Remedial Action**
**Excavation Confirmation Sample Results (unvalidated)**

| | | | | | | | | | Analyte/Units/Remedial Goal Option (RGO)/Result | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | Antimony | Lead | PCB-1254 | PCB-1260 | B(a)a | BaP | BbF | DA | RDX | TNT | 2,6-DNT | |
| | | | | | | | | | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | |
| Load Line | Remediation Area | COCs | Description/ Rationale | Location | Sample Date | Lab | Lab SDG # | Sample ID/Location | 470 | 800 | 9.7 | 9.9 | 29 | 2.9 | 29 | 2.9 | 280 | 510 | 15 | Action |

B(a)a = Benz(a)anthracene
BaP = Benzo(a)pyrene
BbF = Benzo(b)fluoranthene
COCs = contaminants of concern
DA = Dibenz(a,h)anthracene
2,6-DNT = 2,6-dinitrotoluene
mg/kg = milligrams per kilogram
RDX = hexahydro-1,3,5-trinitro-1,3,5-triazine
RGO = remedial goal option
SDG = sample delivery group
TNT = 2,4,6-trinitrotoluene

RGO exceeded, further action needed

parameter exceeded, no further action as noted (e.g., due to additional data evaluation or additional excavation)

Pending

CT Laboratory QC Qualifiers
J Estimated value.
M Matrix spike and/or Matrix Spike Duplicate recovery outside acceptance limits.
P Concentration of analyte differs more than 40% between primary and confirmation analysis.
Q Laboratory Control Sample outside acceptance limits.
U Analyte concentration was below detection limit.
Y Replicate/Duplicate precision outside acceptance limits.
Z Specified calibration criteria was not met.

GEL Laboratory QC Qualifiers
J Indicates an estimated value. The result was greater than the detection limit, but less than the reporting limit or indicates that the analyte recovery in the MS or MSD is outside of specified acceptance criteria or the response between the confirmation column and the primary column is >40%D.