

**APPENDIX I**  
**Ohio EPA Comments**

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

May 27, 2020

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

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

**TRANSMITTED ELECTRONICALLY**

**Subject: Response to Ohio EPA Comments on the “Draft Facility-wide Groundwater Monitoring Program Plan RVAAP-66 Facility-wide Groundwater Annual Report for 2019” Dated May 1, 2020**

Dear Mr. Connolly:

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 Plan RVAAP-66 Facility-wide Groundwater Annual Report for 2019”. This document was received via email at Ohio EPA’s Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR), on May 6, 2020. The response was prepared for the U.S. Army Corps of Engineers on behalf of the National Guard Bureau by Leidos under Contract Number W912QR-16-D-0003.

Ohio EPA finds that the comments from Ohio EPA’s April 13, 2020 comment letter have been adequately addressed and are resolved with no further comments warranted. Please finalize the document with the changes agreed to according to this correspondence.

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**MAY 27 2020**

MR. DAVID CONNOLLY  
RVAAP-66 FWGW  
MAY 27, 2020  
PAGE 2 OF 2

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

Sincerely,



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

KP/sc

ec: David Connolly, ARNGD  
Katie Tait, OHARNG RTLS  
Kevin Sedlak, ARNG  
Rebecca Shreffler, Chenega Tri-Services  
Craig Coombs, USACE Louisville  
Nat Peters, USACE Louisville  
Natalie Oryshkewych, Ohio EPA, NEDO, DERR  
Bob Princic, Ohio EPA, NEDO, DERR  
Thomas Schneider, Ohio EPA, SWDO, DERR  
Liam McEvoy, Ohio EPA, NEDO, DERR  
Carrie Rasik, Ohio EPA, CO, DERR



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

May 1, 2020

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 2019 (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 2019. 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 (703) 607-7589 or david.m.connolly8.civ@mail.mil if there are issues or concerns with this submission.

Sincerely,

A handwritten signature in blue ink that reads "David Connolly".

Date: 2020.05.05  
14:57:24 -04'00'

David Connolly  
RVAAP Restoration Program Manager  
Army National Guard Directorate

cc: Natalie Oryshkewych, Ohio EPA, NEDO, DERR  
Bob Princic, Ohio EPA, NEDO, DERR  
Liam Envoy, Ohio EPA, NEDO, DERR  
Thomas Schneider, Ohio EPA, SWDO, DERR  
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Kevin Sedlak, ARNG, Camp James A. Garfield  
Katie Tait, OHARNG, Camp James A. Garfield  
Craig Coombs, USACE Louisville  
Jay Trumble, USACE Louisville  
Vasu Peterson, Leidos  
Jed Thomas, Leidos  
Jennifer Tierney, Vista Sciences Corporation

Subject: Former Ravenna Army Ammunition Plant (RVAAP) Restoration Program, Portage/Trumbull Counties, Facility-Wide Groundwater Annual Report for 2019 (Work Activity No. 267-000-859-036)

## Comments

### **Ohio EPA Comment 1: Well Abandonments Conducted during 2019**

As stated in Section 4.9, production well abandonment activities in 2019 generated eight 55-gallon drums of liquid IDW, however no mention or explanation of production well abandonment was included in this Draft FWGWMP Annual Report for 2019. Please explain this discrepancy and describe the production well abandonments (and any other non-FWGWMP related well abandonment activities, such as old domestic wells or other water supply wells) or describe if they will be addressed under separate cover.

Army Response: Clarification. The production well abandonment IDW management, documentation, and disposal was performed along with the IDW generated during the October 2019 FWGWMP sampling event. As a result, the IDW from the production well abandonment was discussed in the 2019 Annual Report.

The monitoring wells abandoned in 2019 that were within the FWGWMP monitoring well network are summarized in Section 4.2.2. These wells are DA1tw-001, ES3tw-001, ES3tw-002, and ES3tw-003. The production well abandonment activities conducted in 2019 were summarized in the RVAAP-66 Facility-wide Groundwater Production Well Abandonment Report, submitted to Ohio EPA on April 16, 2020.

### **Ohio EPA Comment 2: Proposed Well Redevelopment Activities**

Section 4.4 Sedimentation and Turbidity indicated that three wells had turbidity readings in excess of 20 NTUs during 2019 sampling events. These wells (LL1mw-086, LL12mw-242, and FWGmw-002) were recommended for redevelopment in 2020.

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 and clarify if these activities will be added to the 2020 Addendum, as it is not believed they were addressed in that document.

Army Response: Monitoring well LL1mw-086 is planned for sampling in 2020. Therefore this well will be 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.

Monitoring wells LL12mw-242 and FWGmw-002 are not planned for sampling in 2020, and consequently are not planned for redevelopment in 2020. If these two wells are sampled in the future, it is expected that these wells will be redeveloped prior to sampling.

Subject: Former Ravenna Army Ammunition Plant (RVAAP) Restoration Program, Portage/Trumbull Counties, Facility-Wide Groundwater Annual Report for 2019 (Work Activity No. 267-000-859-036)

**Ohio EPA Comment 3: 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).

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.



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

MR. DAVID CONNOLLY  
RVAAP FWGW  
APRIL 14, 2020  
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April 14, 2020

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

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

**TRANSMITTED ELECTRONICALLY**

**Subject: Ohio EPA Comments on the "Draft Facility-Wide Groundwater Monitoring Annual Report for 2019" at the Former Ravenna Army Ammunition Plant, Portage and Trumbull Counties, Ohio, Dated February 11, 2020**

Dear Mr. Connolly:

The Ohio Environmental Protection Agency (Ohio EPA) has received and reviewed the "Draft Facility-Wide Groundwater Monitoring Annual Report for 2019" at the former Ravenna Army Ammunition Plant (RVAAP), Portage and Trumbull Counties, Ohio. This document was received at Ohio EPA's Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR), on February 13, 2019. The report was prepared for the U.S. Army Corps of Engineers on behalf of the National Guard Bureau by Leidos. 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.

The Draft Facility-wide Groundwater Monitoring Program (FWGWMP) Annual Report for 2019 summarizes ground water monitoring results for the two major sampling events conducted for the year. The highlights of these annual events include the following:

**Highlights from the 2019 Sampling Events**

Ground water samples were analyzed for: volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), organochlorinated pesticides, polychlorinated biphenyls (PCBs), explosives/propellants, cyanide, nitrate/nitrite, and metals (total and field filtered) including hexavalent chromium. Ground water results were screened in part according to the 2012 EQM FWGMP Addendum using background data, facility-wide cleanup goals (FWCUGs), Ohio EPA Drinking Water maximum contaminant levels (MCLs) and U.S. EPA Regional Screening Levels (RSLs) for tap water. Updated metals

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background concentrations used for this report were generated from the Background Study for Metals for RVAAP-66 Facility-wide Ground Water (Leidos 2019b) completed in 2019 and approved by Ohio EPA on September 9, 2019. 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. Ground water results are summarized in Table 6-2 and Table 6-3 of the Draft FWGWMP Annual Report for 2019.

- **VOCs:** A total of six wells were analyzed for VOCs. No constituents were detected above VOC screening criteria in any of the six wells sampled and analyzed for VOCs.
- **SVOCs:** A total of seven wells were analyzed for SVOCs. No constituents were detected above SVOC screening criteria in any of the seven wells sampled and analyzed for SVOCs.
- **Explosives and propellants:** A total of 38 wells were analyzed for explosives and propellants. These constituents were detected above screening criteria in 10 of the 38 monitoring wells sampled and analyzed for explosives and propellants. At least one of the following: RDX, 2-amino-4,6-dinitrotoluene, 4-amino-2,6-dinitrotoluene, 2,4,6-trinitrotoluene (TNT), 1,3-dinitrobenzene (1,3-DNB), and/or 2,4-dinitrotoluene (DNT) were detected in Unconsolidated Aquifer wells WBGmw-006, WBGmw-009, DETmw-004, and LL1mw-063, in Homewood Aquifer Well FBQmw-174, and in Upper Sharon Sandstone Aquifer wells LL1mw-080, LL1mw-083, LL1mw-084, LL2mw-059, and LL3mw-237.
- **Pesticides/PCBs:** A total of five wells were analyzed for pesticide/PCB constituents: No pesticide/PCB constituents were detected above screening criteria in any of the five wells sampled and analyzed during 2019.
- **Inorganics (dissolved metals):** A total of 41 wells were analyzed for dissolved metals. Other than the essential nutrient metal iron, one or more of these constituents were detected above screening criteria in 31 of the 41 monitoring wells sampled during the 2019 sampling events: aluminum, arsenic, manganese, and nickel. These 41 wells included wells completed in all of the monitored hydrostratigraphic units except the Basal Sharon Aquifer.
- **Hexavalent chromium:** A total of one well (from the Homewood Sandstone) was sampled for hexavalent chrome, and none was detected in this well.
- **Cyanide:** A total of 25 wells were analyzed for cyanide. Cyanide was not detected above screening criteria in any of the 25 wells sampled and analyzed during 2019.
- **pH:** A total of 17 wells were analyzed for VOCs. Unconsolidated Aquifer wells LL1mw-086, LL1mw-089, LL10mw-005, FWGmw-002, FWGmw-010, FWGmw-011,

BKGmw-016, Homewood Sandstone Aquifer wells CBLmw-001 and CBLmw-002, FBQmw-171, FBQmw-174, FBQmw-175 and Upper Sharon Sandstone Aquifer wells LL1mw-083, LL1mw-084, RQLmw-011, RQLmw-012 and RQLmw-013 had pH levels outside the typical pH range for naturally occurring ground water (i.e., >9 and < 5) during at least one of the 2019 sampling events (or had pH levels outside the range when tested last).

**Remedial Investigation (RI) Boundary Monitoring Wells.** The report also summarizes analytical results from four monitoring wells installed in 2016 along Camp Ravenna southern property boundary south of State Route 5 (the fifth well, FWGmw-017, had been screened in the Basal Sharon Conglomerate Aquifer but was abandoned during 2018 due to property access issues). The four remaining monitoring wells are: FWGmw-020, FWGmw-021, and FWGmw-024 screened in the Upper Sharon Sandstone Aquifer and FWGmw-018 screened in the Basal Sharon Conglomerate Aquifer. Wells that had detections of organic (i.e., explosives and/or VOCs) or inorganic (i.e., metals and cyanide) COCs are summarized below.

- **Organics:** 2-amino-4,6-dinitrotoluene (FWGmw-021) and 4-amino-2,6-dinitrotoluene (FWGmw-021), however, these concentrations were below the RSLs.
- **Inorganics:** arsenic (FWGmw-020) exceeded MCL, manganese (FWGmw-024) exceeded background concentrations.

Total cyanide was not detected in the two off-site wells sampled in 2019. In both wells, pH levels were found to be within the typical pH ground water range (>5 to <9).

**Time Series Graphs.** The report presents times-series for graphs (Section 7.0 and Appendix G) by monitoring well for each constituent (with sufficient data) found to exceed screening criteria during the 2019 sampling events. The times-series graphs indicate that in most of the monitoring wells where exceedances were detected in 2019, the concentration trend is decreasing or flat. The following summarizes parameters and wells with visibly recognizable best fit linearly increasing trends:

- **Explosives and propellants:** Explosives exceeded screening levels in 10 of the 41 wells sampled. Increasing concentration trends have been noted in monitoring wells FBQmw-174 (2,4-dinitrotoluene), LL1mw-083 (1,3-dinitrobenzene), LL1mw-084 (1,3-dinitrobenzene), and LL2mw-059 (2,4-dinitrotoluene). However, some of these increasing trends may be attributed to a non-detect result that had a reporting concentration that skewed the trend line.
- **SVOCs:** SVOCs were detected in one of the seven wells sampled, but concentrations were below screening levels.

- **VOCs:** VOCs were detected in five of the eight wells sampled, but concentrations were below screening levels.
- **Pesticides and PCBS:** No Pesticides or PCBs were detected in any of the five ground water samples collected.
- **Cyanide:** Cyanide was detected in 12 of the 30 wells sampled, but concentrations were below MCLs.

**Scheduled FWGWMP Sampling for 2020.** Semiannual FWGWMP sampling events are scheduled for April 2020 and September 2020.

## COMMENTS

### 1. Well abandonments conducted during 2019:

As stated in Section 4.9, production well abandonment activities in 2019 generated eight 55-gallon drums of liquid IDW, however no mention or explanation of production well abandonment was included in this Draft FWGWMP Annual Report for 2019. Please explain this discrepancy and describe the production well abandonments (and any other non-FWGWMP related well abandonment activities, such as old domestic wells or other water supply wells) or describe if they will be addressed under separate cover.

### 2. Proposed well redevelopment activities:

Section 4.4 Sedimentation and Turbidity indicated that three wells had turbidity readings in excess of 20 NTUs during 2019 sampling events. These wells (LL1mw-086, LL12mw-242, and FWGmw-002) were recommended for redevelopment in 2020.

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 and clarify if these activities will be added to the 2020 Addendum, as it is not believed they were addressed in that document.

### 3. 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

MR. DAVID CONNOLLY  
RVAAP FWGW  
APRIL 14, 2020  
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increasing trend lines in the data (utilizing Sanitas or some other acceptable form of statistical evaluation program).

This Draft Facility-wide Groundwater Monitoring Annual Report for 2019 was reviewed by personnel from Ohio EPA, DERR. Additional information is necessary to approve the document. If you have questions or would like to set up a meeting to discuss these comments, please call me at (330) 963-1292 or email me at [Kevin.Palombo@epa.ohio.gov](mailto:Kevin.Palombo@epa.ohio.gov).

Sincerely,



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

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ec: David Connolly, ARNG  
Katie Tait, OHARNG RTLS  
Kevin Sedlak, ARNG  
Craig Coombs, USACE Louisville  
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Bob Prinic, Ohio EPA, NEDO, DERR  
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Thomas Schneider, Ohio EPA, SWDO, DERR  
Carrie Rasik, Ohio EPA, CO, DERR