FINAL

Ravenna Army Ammunition Plant
Restoration Advisory Board (RAB) Meeting
9 November 2022

1. Call to Order

The Ravenna Army Ammunition Plant (RVAAP) Restoration Advisory Board (RAB) meeting for the Installation Restoration Program was called to order by the Community Co-Chair Ms. Sarah Lock, of Paris Township at 6:05 p.m. Wednesday, November 9, 2022, at the Shearer Community Center, Paris Township, 9355 Newton Falls Road, Ravenna, OH 44266. Additionally, several members joined virtually using Microsoft TEAMS.

Of the current 23 RAB members, meeting attendance was recorded as sixteen members present, one excused absence and six unexcused absences. Three members of the public were recorded as being present. Please note, attendance includes those who joined virtually.

The meeting minutes for the April 20, 2022, meeting are not available for discussion and approval due to logistical issues. The reasons for this will be discussed later in the meeting.

Ms. Sarah Lock, of Paris Township introduced the speakers, Mr. Jed Thomas (in person) and Ms. Vasu Peterson (virtually) of Leidos, to present on the Facility-Wide Groundwater Monitoring Program, Additional Well Installation to Support the Upcoming Feasibility Study. She also reminded members to hold all questions to the end of the presentation.

2. Presentation – Facility-Wide Groundwater Monitoring Program, Additional Well Installation to Support the Upcoming Feasibility Study, Jed Thomas, and Vasu Peterson, Leidos

Mr. Jed Thomas (in person) and Ms. Vasu Peterson (virtually) of Leidos, presented on the Facility-Wide Groundwater Monitoring Program, Additional Well Installation to Support the Upcoming Feasibility Study. To request a copy of the formal presentation, please contact the RVAAP RAB Administrator at Rebecca.shreffler@chenegars.com or visit the Public Participation tab at www.rvaap.org.

Following the presentation, Ms. Sarah Lock (Paris TWP) thanked the speaker and opened the discussion for questions by RAB Members. Public members were asked to hold any questions until after all member questions.

Adam Eskridge, Charlestown Township, asked for a description of what the wells looked like. Mr. Jed Thomas, Leidos, explained the wells themselves are 2-inch PVC pipes that are driven in the ground that you can drop down to a desired level and collect samples. The wells are screened at intervals in zones that the team wishes to evaluate based on background information. Using the wells that are visible from State Route 5 as a typical set up, he further explained 3 to 4 yellow bollards are placed around each protective metal well casing.

Mr. Eskridge then asked how long the wells can stay in place. Mr. Thomas explained some wells on site were installed as far back as the 1990's. It does vary. There are temporary wells that are not fully constructed, since there is only a need for a quick data point. Most of the wells on post are very well constructed and are built to last the duration of the program.

Brad King, Newton Falls City, noted that in the presentation it was mentioned that the well locations take into account any wetland disturbance and avoid it where possible. He asked if any monitoring of the wetlands themselves or the subsoils had been done to identify possible contaminants. Mr. Thomas explained there has been quite a bit of wildlife and biological assessment done on the facility. He then explained, specific to groundwater monitoring, they do an evaluation of whether the groundwater gets to the surface water pathway and effectively how that would impact wetlands or other biological features. Ms. Katie Tait, Environmental Specialist with the OHARNG, added there have also been surface water and sediment sampling and analysis on these sites.

Mr. King then asked if there have been any constituents that have migrated off site, for example the wells across State Route 5 associated with Load Line 12. And if they do, is there an intent to follow that moving further away? Mr. Thomas noted as part of the semi-annual Groundwater Monitoring sampling, those perimeter wells are always included in the testing to ensure they have a good understanding of what potentially is coming off base or what is not. To date, they have not seen any significant exceedances with those perimeter wells.

Tom Tadsen, Franklin Township, then added as previous commander of the facility, and a participant in the Restoration Advisory Board, he was witness to the Army stating that they would follow the evidence regardless of where it went. Whether the water trailed off to the northwest, or northeast, or went south off the facility. Regardless of where it went, they would take care of the issue. It is a matter of record, if there were explosives or other contaminants left at the facility, they would address it.

Mr. Tadsen then asked if Mr. Thomas could clarify the particular layers of bedrock being discussed. Using the map on slide 6, Mr. Thomas stated this map explains the different types of wells and strata (depth) they are looking to evaluate. He explained that the blue wells are considered unconsolidated wells that are evaluating the overburden, or what is above the bedrock. The orange/yellow wells are considered bedrock wells and those are in the Upper Sharon. The pink wells are screened within the Homewood bedrock. Mr. Tadsen clarified the Upper Sharon is sandstone and Sharon conglomerate, and asked what kind of stone composes the Homewood. Kevin Palombo, Ohio EPA Representative, stated the Homewood is sandstone and further clarified that the Homewood is on top of the Sharon, which is on top of the Basal Sharon Conglomerate. The Homewood is the youngest, followed by the Sharon then the Sharon Conglomerate.

Dan Spicer, Paris Township, noted the well pairs at Load Line 1 and Fuze and Booster Area appear to be close together and asked about how far apart the wells within the pair would be. Mr. Thomas explained it would depend on how close they can get them in relation to the equipment. The goal is to get them as close as possible, and he estimated it would be less than 10 yards.

Ms. Denise Smith, Paris Township, asked for clarification regarding where the Main Gate to the facility was located on the maps. Using the map on slide 10, Mr. Thomas pointed out State Route 5 and the location of the Main Gate where George Road intersects Route 5.

In reference to the proposed wells at Fuze and Booster, Mr. Bill Irons, Newton Township, asked if there were any known contaminants at the depth (140-155ft bgs) of the proposed wells, or if they are just screening to see if anything had reached that zone. Mr. Thomas explained they do not currently have wells in that area; however, the proposed wells are down-gradient from a well where explosives were detected in the groundwater (FBQmw-174). The intent is to refine the extent to determine the best remedial recommendations.

Ryan Shackelford, Portage County Representative, asked if any contamination were detected above acceptable screening levels, would that drastically change the approach to the site. Would that change the focus back to the main area because the groundwater is showing it is expanding outside the main site? Vasu Peterson, Leidos, stated that Fuze and Booster well number 174 (slide 19) has an exceedance. This well is immediately to the east of the northernmost pond and is the only well with an exceedance. There is a lot of sampling data from all the wells surrounding that northern pond and they are continually sampled. There are years of data showing downward trends. There is also an existing well to the east (well ID FWGmw-023) at a deeper location. This is a facility-wide groundwater well to help monitor anything moving east and to help characterize that deeper aquifer, the upper Sharon (Slide number 19 or Attachment 7). The location of the well pair (nested wells) is intended to characterize the known exceedance in the Homewood. The nested well pair will have one well in the shallower bedrock and one well in the Homewood. The deeper well will also indicate if there is any vertical migration.

Ms. Peterson continued by explaining that judging by the topographic lines this location occurs on the top of a high mound. It is likely that the bedrock follows the same pattern, and this mound could have groundwater moving off it. There are other monitoring wells covering the west and northwest, but another nested pair of wells is proposed to the southwest as an added measure to account for any migration that could be moving around that mound. The team decided to focus directly to the east and southeast to complete the coverage and ensure contaminated groundwater is not migrating off site.

Dan Spicer, Paris Township, asked what the depth of well number 174 was. Jed Thomas, Leidos, stated he was not sure of the exact depth, but he and Kevin Palombo, Ohio EPA representative, agreed the estimated depth was 50 to 60 feet and the well is in the Homewood. Mr. Spicer then asked what the depths of the new proposed wells would be. Vasu Peterson, Leidos, stated the proposed well depths were listed in the table on slide 14. The shallower wells will be approximately between 75 feet and 90 feet. Mr. Thomas further explained there are other considerations with respect to topography when determining how deep a well is screened.

Adam Eskridge, Charlestown Township, followed by asking about screening groundwater to the south. Mr. Thomas explained the only exceedance detected was in well 174, and there are quite a few wells in and around the area that have not shown any signs of contamination. With the estimated groundwater flow and the data from the other wells, the

proposed well locations are where the team feels the need to refine the extent for the Feasibility Study (FS).

Mr. Eskridge asked for further clarification as to how a constituent would settle down into or reach the groundwater. Mr. Thomas explained the bedrock itself is usually confined. There are different layers of the overburden, the soil on top of bedrock, and then the wells will be installed in the bedrock to target groundwater aquifers within the bedrock. He went back to Ms. Peterson's comment about having site geologists on site while the actual drilling is occurring to make the determination as to where that bedrock zone is. There are models that give decent estimated target depths, but the exact depth is determined by geologists on site when the well is drilled.

Ms. Sarah Lock, Paris Township, requested clarification as to how the topography relates to the bedrock layers and well depths. She stated to her knowledge the bedrock in this area inherently has a natural two-to-three-degree tilt as part of the edge of the Appalachians. Kevin Palombo, Ohio EPA representative, explained the groundwater will reach an equilibrium, regardless of the tilt. For example, you may see in the unconsolidated aquifer, you will hit groundwater at 10 feet in one area, then 12 feet in another area, and 14 feet in another area. With this, a map can be drawn showing flow direction is west to east based on where the water level is. This happens in the bedrock (sandstone) and unconsolidated layers. The goal is to make sure there is an understanding of the water quality in the unconsolidated layer and if there are any differences in the bedrock. Currently, the thought is these layers are hydraulically connected because the silts, clays and sands that make up the unconsolidated layer are not perfectly confined, meaning they do not hold everything in place. For this reason, the Ohio EPA is asking for more wells in the sandstone to verify if the water quality is different at that level.

Ms. Sarah Lock, Paris Township, continued with a question about well logging and if the soil layers are tracked and identified. Mr. Thomas stated it is standard practice and very important information because it helps the team understand fate and transport. Not just data collected from the well itself, but also the logs. These are all pieces of the puzzle that help in the modeling to develop remedial alternatives.

As follow up Ms. Lock asked in the event the team identifies any type of clay layers from glacial processes, does that affect the conduct of the study moving forward. Mr. Thomas said yes. In this area, most of the wells are tracking towards bedrock. In general, geologists can make field calls when they know the overall data quality objectives. There is a lot of communication between project managers and the stakeholders as new pieces of information develop to choose where the screened intervals in each well should be located. Therefore, depending on the data quality objective, decisions can be made to ensure those objectives are met.

The next question from Ms. Lock was on slide #8, the remedial investigation conclusions. It was mentioned in the presentation that remediation efforts have improved groundwater quality already. Is there a specific data set that shows this? Mr. Thomas stated there is not a quantitative determination, but groundwater quality at the site improves when clean sample fill is used as part of the remediation. Ms. Peterson added that it is important to

remember that remedial actions have been completed to address groundwater contamination from a facility wide perspective. At one point in time, the first approach to all of this, was to look at each potential release location. So, each area of concern was looked at holistically, we look at the soil that may have been contaminated there, the sediment that may have been contaminated, surface water and what of all those releases from any particular activity could have contaminated those media and subsequently contaminated groundwater. We did that by sampling groundwater. As a result of those original investigations, there have been response actions and removal actions and treatment. So, through all those soil removals, we have in effect, addressed groundwater contamination as well, because we are removing those sources that continue to leach or potentially migrate to groundwater. So, it is important to be able to account for those sites that have had removal actions or response actions for soil and sediment because they do inherently improve groundwater in the long term.

Mr. Tadsen, Franklin Township, stated that there has been frequent potentiometric testing done of groundwater throughout the installation. Has any subsequent testing been done anywhere on the installation to verify that there have not been any changes in the groundwater flow direction?

Mr. Thomas, Leidos, stated that on an annual basis they will go out and collect groundwater depths from each of the more than 300 wells and then will use that to look at the potentiometric surfaces to see if there are any changes, which can be weather-related. These results are contained in the annual report which provides the groundwater flow direction that was determined from that year's annual gauging event. In summary, it really has not changed too much and has been consistent over the years. There are some anomalies in the overburden, but in general the groundwater flow directions are consistent.

Mr. Sedlak, National Guard Bureau, stated that the RVAAP.ORG web site was down due to contracting issues but has now been re-established. The complete (including analytical data, maps, discussion, etc.) final remedial investigation report is on RVAAP.ORG. You can download it as a PDF. All previous semi-annual and annual reports are also available on RVAAP.ORG. Mr. Thomas stated that the annual gauging and potentiometric data and maps are included in the annual groundwater reports.

Ms. Denise Smith, Paris Township, stated that she heard during the presentation that the RVAAP.ORG web sites were down due to contracting and funding issues, and asked if these issues have delayed groundwater sampling events. Mr. Sedlak stated that absolutely these events have been delayed by contracting and funding issues. He explained that the funding for these events and projects come from the Department of Defense. Occasionally the government shuts down or has budget issues and the money for these projects is not available. The money for the RVAAP environmental projects originates with the Department of Defense through the Army Environmental Command, through the Corps of Engineers. When the Federal government shuts down, the RVAAP environmental office does not shut down, but the funding does not move, so they cannot spend any money. This situation happened about four years ago, and things were stopped for about eight months. Also, government funding was not available for the groundwater contract last year, so the annual report was late. Once funding is restored, we always

make sure that we go back and make sure the work is done. Ms. Smith asked for a clarification if the contact issues are State or Federal issues and Mr. Sedlak replied that the issues were at the Federal level. The Corps of Engineers acts like the general manger of a construction contract. The National Guard Bureau hires the Corps of Engineers to manage the contracts and all the contractors are hired through the Corps of Engineers. They hire and pay the contractors and manage all the business aspects of the technical resources. Basically, everything starts at the Department of Defense, which then goes to the Army. The funding then gets transferred to the Army National Guard, which then gets transferred to the Army Environmental Command, which then goes to the Corps of Engineers. The Corps of Engineers then hires and pays the contractors.

Mr. Kevin Palombo, Ohio EPA, requested clarification to Attachment 2 concerning estimated plume extent shown in red. Mr. Thomas stated that the area shown in red was not an estimated plume extent, but instead an aggregation of areas from previous remedial investigations that they hope to refine with further investigations.

Mr. Palombo had another question on Attachment 5 concerning groundwater potentiometric contour lines and groundwater flow direction at Load Line 3. He asked for clarification if the proposed wells in that area will be installed in the unconsolidated soil or the Sharon Formation. Mr. Thomas stated that the proposed well would be installed in the Sharon Formation. The proposed well locations were chosen to further delineate groundwater exceedances from upgradient wells that detected groundwater exceedances. Ms. Peterson added that MW-245 is located a good distance downgradient from the proposed two proposed well locations at Load Line 3, and this well shows no groundwater exceedances. The two proposed wells at Load Line 3 are located to fill in some data gaps and provide data points much closer to Load Line 3.

Mr. Brad King, Newton Falls, asked for further information on the area south of the Fuze and Booster Quarry Ponds and if groundwater in that area is being monitored. Mr. Thomas stated that there is a network of wells south of the Fuze and Booster area before it gets to West Branch reservoir. This area was studied for the remedial investigation and no exceedances were detected from the groundwater sampled in this area.

Mr. Adam Eskridge, Charlestown Township, inquired about well locations in the area between the Fuze and Booster Quarry Ponds and West Branch reservoir because he lives in the area just outside of the southern perimeter fence line between the two areas and is concerned about the groundwater, they use it for drinking water. Mr. Thomas stated that the series of wells south of and downgradient of the Fuze and Booster Quarry Ponds have not shown any groundwater contamination. Mr. Eskridge thanks the Army for all their efforts to delineate the groundwater issues at the facility and to follow up where the data leads.

Mr. Eskridge also asked about the groundwater remedial options being considered, and what were some of the options being recommended. Mr. Thomas stated that without getting too far ahead of the investigations and remedial assessment process, possible options include natural attenuation, and pump and treat remedies. The assessment of the proper remedial action will consider plume assessment and concentrations, and what makes sense cost-wise. Ms. Peterson added that the concentrations appear to be very

localized, and they appear to be low. Trend analyses show groundwater concentrations through multiple types of attenuation mechanisms, degradation, dispersion, dilution does not appear that there is elevated risk. Among other things, the decision-making process involves consideration of how long it takes to meet goals, what concentrations are on site versus concentrations that have any potential to migrate off site in the future. As stated previously, no off-site migration has been detected. As of now, no mechanical remedies are being considered, and the preferred approach will probably be a passive one that creates as little disturbance as possible given that contaminants do not appear to be migrating off-site. The goal is to keep any contaminants from going off-site, and many factors will be considered during the feasibility study.

Mr. Don Jones, Charlestown Township, asked if there was a map that shows the gradients inside the arsenal, the depth of the overburden, the depths of the bedrock and so on, in different areas. Mr. Thomas replied that contained within the annual reports are cross-sections taken at various points across the facility that show the various geologic formations. There are also graphical depictions of where Sharon sandstone is versus the Homewood and similar things like that. This information is available in the reports located on the website RVAAP.ORG. These cross-sections and maps also contain information on the potentiometric surface and groundwater depths.

Ms. Sarah Lock of Paris Township asked if there were any further questions or discussion from the board. There were no responses. Ms. Lock then opened the discussion to allow questions or comments from any public attendees.

Ms. Sarah Lock of Paris Township asked if there were any additional questions or comments from any members of the public in attendance.

There were no further questions or comments from the public. This concluded the discussion on the presentation. Sarah Lock of Paris Township then moved onto the RAB general business.

3. General RAB Business

1. The first order of business was scheduling the next meeting. Ms. Lock suggested the next meeting be planned as an in-person meeting. The date of Wednesday, April 19, 2023, was suggested and scheduled. Ms. Lock then asked for a township volunteer to host the meeting. The meeting location was not determined. Further meeting details will be provided by the RAB Administrator closer to the meeting date as they become available.

2. Ms. Lock asked Katie Tait and Kevin Sedlak if a facility site tour would be considered for 2023. Ms. Tait answered that it would be a possibility for a late Summer or Fall meeting. Ms. Lock stated that this discussion should be added to the agenda for the next RAB meeting.

3. Ms. Lock stated that due to contracting issues, the minutes from the April 2022 were not ready to be approved and would have to wait until the next RAB meeting.

4. Ms. Lock requested Board members to review the RAB Member contact list and update their information accordingly.

5. Ms. Lock asked LTC Crock if there were any updates on the installation that he could share. LTC Crock stated that the Mark 19 range was being reconfigured to also be a multi-purpose machine gun range. This would probably be active in Summer and there would be a public announcement. LTC Crock also stated that there will be a full training schedule during the summer and that residents will see increased activity going into and out of the facility. Ms. Tait added that residents may notice that a lot of the perimeter fence is being replaced. Most of the fence has been replaced along the southwest and west portion of the facility and work continues along the northwest and northern fence line.

   Ms. Lock asked Katie Tait and Kevin Sedlak if there were any upcoming public meetings the board should be aware of. There are no public meetings over the next few months.

There were no further comments, discussion, or general business topics.

Ms. Lock adjourned the meeting at 7:38 p.m.

Respectfully submitted,

Angela Cobbs, RVAAP RAB Administrator