Final

Record of Decision
for Soil, Sediment, and Surface Water
at RVAAP-06 C Block Quarry

Former Ravenna Army Ammunition Plant
Portage and Trumbull Counties, Ohio

Contract No. W912QR-21-D-0016
Delivery Order No. W912QR-21-F-0274

Prepared for:

U.S. Army Corps of Engineers
Louisville District

Prepared by:

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8866 Commons Boulevard, Suite 201
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March 1, 2022

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None.

14. ABSTRACT

This Record of Decision for C Block Quarry presents the physical characteristics, geology, and hydrogeology of C Block Quarry. This decision document summarizes nature and extent of contamination in soil, sediment, and surface water; contaminant fate and transport; and human health and ecological risk assessments. Remedial alternatives were developed and assessed, resulting in the selection of Alternative 2: Surficial ACM Removal and land use controls (LUCs). This information was presented to the public, and all public input was considered during the selection of the final remedy for soil, surface water, and sediment at C Block Quarry in this ROD.

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CONTRACTOR STATEMENT OF INDEPENDENT TECHNICAL REVIEW

Leidos has completed the 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. Notice is hereby given that an independent technical review has been conducted that is appropriate to the level of risk and complexity inherent in the project. During the independent technical review, compliance with established policy principles and procedures, utilizing justified and valid assumptions, was verified. This included review of data quality objectives; technical assumptions; methods, procedures, and materials to be used; the appropriateness of data used and level of data obtained; and reasonableness of the results, including whether the product meets the customer's needs consistent with law and existing U.S. Army Corps of Engineers policy.

March 1, 2022

Jed Thomas, P.E.
Study/Design Team Leader

Date

March 1, 2022

W. Kevin Jago
Independent Technical Review Team Leader

Date

Significant concerns and the explanation of the resolution are documented within the project file. As noted above, all concerns resulting from independent technical review of the project have been considered.

March 1, 2022

Lisa Jones-Bateman, PMP, REM
Senior Program Manager

Date

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ARNG = Army National Guard
NEDO = Northeast District Office
OHARNG = Ohio Army National Guard
Ohio EPA = Ohio Environmental Protection Agency
REIMS = Ravenna Environmental Information Management System
SWDO = Southwest District Office
USACE = U.S. Army Corps of Engineers

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TABLE OF CONTENTS

TABLE OF CONTENTS (Continued)

LIST OF FIGURES

LIST OF TABLES

LIST OF APPENDICES

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ACRONYMS AND ABBREVIATIONS

AAP	Asbestos Abatement Plan
ACM	Asbestos-Containing Material
amsl	Above Mean Sea Level
AOC	Area of Concern
ARAR	Applicable or Relevant and Appropriate Requirement
ARNG	Army National Guard
Army	U.S. Department of the Army
bgs	Below Ground Surface
CAHES	Certified Asbestos Hazard Evaluation Specialist
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CJAG	Camp James A. Garfield
CMCOC	Contaminant Migration Chemical of Concern
CMCOPC	Contaminant Migration Chemical of Potential Concern
COC	Chemical of Concern
COPC	Chemical of Potential Concern
COPEC	Chemical of Potential Ecological Concern
CUG	Cleanup Goal
DFFO	Director's Final Findings and Orders
DNT	Dinitrotoluene
DoD	U.S. Department of Defense
ERA	Ecological Risk Assessment
FS	Feasibility Study
FWCUG	Facility-wide Cleanup Goal
FWGWMP	Facility-wide Groundwater Monitoring Program
HHRA	Human Health Risk Assessment
HQ	Hazard Quotient
IRP	Installation Restoration Program
ISM	Incremental Sampling Methodology
LUC	Land Use Control
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
O&M	Operation and Maintenance
OHARNG	Ohio Army National Guard
Ohio EPA	Ohio Environmental Protection Agency
OSHA	Occupational Safety and Health Administration
P.E.	Professional Engineer
PAH	Polycyclic Aromatic Hydrocarbon
PCB	Polychlorinated Biphenyl
PLM	Polarized Light Microscopy
PMP	Project Management Professional
PPE	Personal Protective Equipment

ACRONYMS AND ABBREVIATIONS (Continued)

QC	Quality Control
RAO	Remedial Action Objective
RCRA	Resource Conservation and Recovery Act
RD	Remedial Design
REM	Registered Environmental Manager
RI	Remedial Investigation
ROD	Record of Decision
RSL	Regional Screening Level
RVAAP	Ravenna Army Ammunition Plant
SEMS	Superfund Environmental Management System
SL	Screening Level
SRC	Site-Related Contaminant
SVOC	Semi-Volatile Organic Compound
TCLP	Toxicity Characteristic Leaching Procedure
TNT	2,4,6-Trinitrotoluene
TR	Target Risk
USEPA	U.S. Environmental Protection Agency
USP&FO	U.S. Property and Fiscal Officer
VOC	Volatile Organic Compound

PART I: THE DECLARATION

A SITE NAME AND LOCATION

This Record of Decision (ROD) addresses soil, sediment, and surface water at C Block Quarry. C Block Quarry is designated as area of concern (AOC) RVAAP-06 within the former Ravenna Army Ammunition Plant (RVAAP) (Figures 1 and 2).

The former RVAAP, now known as Camp James A. Garfield (CJAG), located in northeastern Ohio within Portage and Trumbull counties, is approximately 3 miles east/northeast of the city of Ravenna and 1 mile north/northwest of the city of Newton Falls. The facility is approximately 11 miles long and 3.5 miles wide. The facility is bounded by State Route 5, the Michael J. Kirwan Reservoir, and the CSX System Railroad to the south; Garrett, McCormick, and Berry Roads to the west; the Norfolk Southern Railroad to the north; and State Route 534 to the east. In addition, the facility is surrounded by the communities of Windham, Garrettsville, Charlestown, and Wayland. The facility is federal property, which has had multiple accountability transfers amongst multiple Army agencies, making the property ownership and transfer history complex. The most recent administrative accountability transfer occurred in September 2013 when the remaining acreage (not previously transferred) was transferred to the U.S. Property and Fiscal Officer (USP&FO) for Ohio and subsequently licensed to the Ohio Army National Guard (OHARNG) for use as a military training site (Camp James A. Garfield).

C Block Quarry is located between roads 3C and 4C of the Block C Storage Area north of Newton Falls Road in the northwestern portion of CJAG (Figure 2). The Superfund Environmental Management System (SEMS) Identifier for RVAAP is OH5210020736.

B STATEMENT OF BASIS AND PURPOSE

The Army National Guard (ARNG) is the lead agency and has chosen the selected remedy for C Block Quarry in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980, as amended by the Superfund Amendments and Reauthorization Act of 1986 and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). This decision is based on information contained in the Administrative Record file for the AOC.

The Ohio Environmental Protection Agency (Ohio EPA), the supporting state regulatory agency, concurred with the *Remedial Investigation/Feasibility Study Report for Soil, Sediment, and Surface Water at RVAAP-06 C Block Quarry* (Leidos 2019; herein referred to as the C Block Quarry RI/FS Report) and *Proposed Plan for Soil, Sediment, and Surface Water at RVAAP-06 C Block Quarry* (Leidos 2020; herein referred to as the C Block Quarry Proposed Plan).

The Director's Final Findings and Orders (DFFO) was issued to the U.S. Department of the Army (Army) on June 10, 2004 (Ohio EPA 2004). The objective of the DFFO was for the Army and Ohio EPA to "contribute to the protection of public health, safety, and welfare and the environment from the disposal, discharge, or release of contaminants at or from the site, through implementation of a CERCLA-based environmental remediation program. This program will include the development by

respondent of a Remedial Investigation (RI)/Feasibility Study (FS) for each AOC or appropriate group of AOCs at the site, and upon completion and publication of a Proposed Plan and ROD or other appropriate document for each AOC or appropriate group of AOCs, the design, construction, operation, and maintenance of the selected remedy as set forth in the ROD or other appropriate document for each AOC or appropriate group of AOCs."

The C Block Quarry RI/FS Report evaluated surface and subsurface soil at C Block Quarry. Sediment and associated surface water were not evaluated as part of this report, as these media are not present at the AOC. Hexavalent chromium was identified as a chemical of concern (COC) to be carried forward for potential remediation in surface soil and subsurface soil for Unrestricted (Residential) and Military Training Land Uses. No COCs were identified as requiring remediation for Commercial/Industrial Land Use.

Hexavalent chromium in soil at and near sample locations CBLss-003M and CBLss-005M exceeded the U.S. Environmental Protection Agency (USEPA) Resident Soil regional screening level (RSL) of 3 mg/kg. In addition, friable asbestos-containing material (ACM) (e.g., transite and black tar paper) was intermixed with the soil. The C Block Quarry RI/FS Report provided an evaluation of remedial alternatives for soil. Alternative 2: Surficial ACM Removal and Land Use Controls (LUCs) was the recommended alternative.

The decision to conduct a remedial action to address contamination at C Block Quarry satisfies the requirements of the DFFO, as the Army has completed the CERCLA RI/FS phase of investigation at C Block Quarry. ARNG is publishing this ROD to select a remedy for this site that is protective of human health and the environment. Part II, Section M explains how the selected remedy is protective of human health and the environment and that the selected remedy satisfies the statutory requirements of CERCLA Section 121 and the NCP.

C ASSESSMENT OF SITE

The response action selected in this ROD is necessary to protect public health, welfare, or the environment from actual or threatened releases of contaminants in soil at C Block Quarry.

D DESCRIPTION OF THE SELECTED REMEDY

The potential future uses for C Block Quarry are Military Training Land Use or Commercial/Industrial Land Use. The Representative Receptors corresponding to these potential future uses are the National Guard Trainee and Industrial Receptor, respectively. Although residential use is not anticipated at CJAG or C Block Quarry, an Unrestricted (Residential) Land Use scenario was evaluated. Unrestricted (Residential) Land Use is considered protective for, and may be applied to, all categories of land use on the former RVAAP, without further restriction.

The nature and extent of potentially impacted media has been sufficiently characterized, the fate and transport modeling did not identify soil contaminant migration chemicals of concern (CMCOCs) impacting groundwater, and no ecological risk was identified. However, the human health risk

assessment (HHRA) in the C Block Quarry RI/FS Report (Leidos 2019) identified the following to be carried forward for remediation:

- Hexavalent chromium was identified as a COC to be carried forward for potential remediation at C Block Quarry for Unrestricted (Residential) Land Use in surface and subsurface soil and Military Training Land Use in deep surface soil. No COCs were identified as requiring remediation for Commercial/Industrial Land Use.
- Friable ACM (e.g., transite and black tar paper) was observed on the ground surface.

The C Block Quarry RI/FS Report (Leidos 2019) developed and evaluated the following remedial alternatives for soil at C Block Quarry:

- Alternative 1: No Action.
- Alternative 2: Surficial ACM Removal and LUCs.
- Alternative 3: Excavation and Off-Site Disposal – Attain Unrestricted (Residential) Land Use.

The selected remedy for C Block Quarry is Alternative 2: Surficial ACM Removal and LUCs. This alternative involves removing surficial ACM through non-intrusive, no-digging methods to prevent Industrial Receptor exposure to ACM in surface soil; implementing LUCs to prevent the Industrial Receptor from digging and possibly encountering subsurface ACM; and implementing LUCs to prevent Resident Receptor use of the site.

The selected remedy was chosen because it is protective of the 1) Resident Receptor by implementing LUCs to not allow for Unrestricted (Residential) Land Use, thereby preventing Resident Receptor exposure to COCs and ACM; and 2) Industrial Receptor, as no soil COCs require remediation for the Industrial Receptor, ACM on the ground surface will be removed, and no-digging LUCs will prevent exposure to potential subsurface ACM. The following briefly lists the activities associated with Alternative 2:

- Conduct a new, updated inspection to ensure exposed ACM is identified,
- Remove an estimated 10 yd^3 of exposed friable ACM from the ground surface through non-intrusive, no-digging methods,
- Install signs to enhance compliance with digging restrictions at the site,
- Install Seibert stakes to ensure high visibility of the site boundary,
- Maintain the LUC training program, and
- Conduct operation and maintenance (O&M).

The selected remedy will achieve a requisite level of protectiveness for the AOC. The estimated cost of Alternative 2 is $108,534. The Army will be required to develop and implement LUCs, as this remedy does not attain Unrestricted (Residential) Land Use.

E STATUTORY DETERMINATIONS

The selected remedy protects human health and the environment, complies with federal and state laws and regulations that are applicable or relevant and appropriate to the remedial action, is cost effective, and uses permanent solutions to the maximum extent practicable. The selected remedy does not achieve a reduction in the toxicity or volume of contaminated media. The mobility of ACM currently on the ground surface will be reduced when transported to an off-site disposal facility.

Because the selected remedy will result in hazardous substances, pollutants, or contaminants remaining on-site above levels that allow for Unrestricted (Residential) Land Use, 5-year reviews will be required for this remedial action.

F DATA CERTIFICATION CHECKLIST

Table 1 provides the location of key remedy selection information contained in Part II, Decision Summary. Additional information is presented in the Administrative Record file for C Block Quarry.

Table 1. ROD Data Certification Checklist

ROD Data Checklist Item	ROD Section
COCs and their respective concentrations	II.G.1
Baseline risk represented by the COCs	II.G
Cleanup goals established for COCs and the basis for these goals	II.H
How source materials constituting principal threats are addressed	II.K
Current and reasonably anticipated future land use assumptions used in the baseline risk assessment and ROD	II.F
Suitable potential land uses, following the selected remedy	II.L.4
Estimated capital and the total present worth costs, discount rate, and the number of years over which the remedy cost estimates are projected	II.L.3
Key factor(s) that led to selecting the remedy	II.L.1

COC = Chemical of Concern
ROD = Record of Decision

G AUTHORIZING SIGNATURE AND APPROVAL

Anthony Hammett
Colonel, U.S. Army
Chief, G-9
Army National Guard

Date

PART II: DECISION SUMMARY

A SITE NAME, LOCATION, AND DESCRIPTION

When the RVAAP Installation Restoration Program (IRP) began in 1989, RVAAP (SEMS Identification Number OH5210020736) was identified as a 21,419-acre installation. In 2002 and 2003, OHARNG surveyed the property and the total acreage was found to be 21,683 acres. The RVAAP IRP encompasses investigation and cleanup of past activities over the entire 21,683-acre former RVAAP.

As of September 2013, administrative accountability for the entire acreage of the facility has been transferred to the USP&FO for Ohio and subsequently licensed to OHARNG for use as a military training site. ARNG is the lead agency for any remediation, decisions, and applicable cleanup at C Block Quarry. These activities are being funded and conducted under the IRP. Ohio EPA is the supporting state regulatory agency.

CJAG is located in northeastern Ohio within Portage and Trumbull counties, approximately 3 miles east-northeast of the city of Ravenna and approximately 1 mile northwest of the city of Newton Falls. CJAG is a parcel of property approximately 11 miles long and 3.5 miles wide, bounded by State Route 5 and the CSX System Railroad on the south; Garrett, McCormick, and Berry roads on the west; the Norfolk Southern Railroad on the north; and State Route 534 on the east (see Figures 1 and 2). CJAG is surrounded by several communities: Windham 7 miles to the north, Garrettsville 6 miles to the north, Newton Falls 1 mile to the southeast, Charlestown 6 miles to the southwest, and Wayland 3 miles to the south.

C Block Quarry is a 0.96-acre AOC located between Roads 3C and 4C of the Block C Storage Area north of Newton Falls Road in the northwestern portion of CJAG (Figure 2). The Block C Storage Area contains a network of roadways leading to 99 aboveground reinforced concrete igloos that formerly stored munitions on-site. These igloos are earth covered.

During the 1940s and 1950s, C Block Quarry was used to mine Homewood Sandstone. This sandstone was quarried for road and construction base material. C Block Quarry currently has a maximum depth of 25 feet below the surrounding grade. During the 1950s and 1960s, C Block Quarry also was used as a disposal area for annealing process waste for a short duration (USATHAMA 1982). Liquid waste was dumped on the ground surface in the bottom of the abandoned unlined borrow pit. The volume of liquid waste disposed of at C Block Quarry is unknown. The site is believed to have been inactive since the 1960s.

The 2010 RI confirmed the presence of roofing shingle material, ACM, wooden doors, metal hinges and doorknobs, corrugated sheet metal, glass bottles, bricks, and insulation-like foam. As no buildings were constructed within C Block Quarry, these materials are assumed to be the result of dumping during an unknown timeframe.

Figure 3 presents a 1959 aerial photograph depicting the engineered infrastructure such as the 99 aboveground reinforced concrete igloos, C Block Quarry, and access roads. The distinct, current

surface features of the AOC, shown in Figure 4, include the quarry boundary and two gradually sloped areas near the northwestern and southwestern corners of the AOC. No fences exist; however, the eastern and western sides of the AOC are defined by the quarry walls.

Seibert stakes are currently present around C Block Quarry. The AOC is currently heavily forested with brush and trees at least 1 foot in diameter. No perennial surface water features are present within the AOC or in the immediate vicinity.

B SITE HISTORY AND ENFORCEMENT ACTIVITIES

RVAAP was constructed in 1940 and 1941 for depot storage and ammunition assembly/loading and was placed on standby status in 1950. The primary purpose of the former RVAAP was to load medium and major caliber artillery ammunition (i.e., bombs, mines, fuze and boosters, primers, percussion elements) and store finished components. Load Lines 5 through 11 produced fuzes, boosters, primers, detonators, and percussion elements.

In June 2004, the DFFO was issued to the Army (Ohio EPA 2004). The objective of the DFFO was for the Army and Ohio EPA to "contribute to the protection of public health, safety, and welfare and the environment from the disposal, discharge, or release of contaminants at or from the site, through implementation of a CERCLA-based environmental remediation program. This program will include the development by respondent of an RI/FS for each AOC or appropriate group of AOCs at the site, and upon completion and publication of a Proposed Plan and ROD or other appropriate document for each AOC or appropriate group of AOCs, the design, construction, operation, and maintenance of the selected remedy as set forth in the ROD or other appropriate document for each AOC or appropriate group of AOCs."

The Block C Storage Area contains parallel rows of 99 aboveground reinforced concrete igloos that formerly stored munitions. During the 1940s and 1950s, C Block Quarry was used to mine Homewood Sandstone.

In March 1950, a conference was conducted to assess waste disposal for the former RVAAP. The conference concluded that C Block Quarry was the most satisfactory location to dispose of sulfuric acid, nitric acid, mercury, chromic acid, phosphoric acid plus accelerator, alkali compound stripper, and surfactants commonly used in detergents. The summary report (U.S. Government 1950) of the 1950 conference stated that C Block Quarry was selected for facility waste disposal due to:

- Infiltration benefits through stone substrata and combinations with elements of the stone substrata due to relative positions of elements;
- Distance from any water supply or contributory surface water that might contaminate the raw water supply;
- Lack of recognizable traces in any water supply or surface water to date; and
- Evaporation of mixed compounds, which probably leave complex molecular salts of low solubility.

During the 1950s and 1960s, C Block Quarry also was used as a disposal area for annealing process waste for a short duration (USATHAMA 1982). 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 at Load Line 2 and spent pickle liquor containing lead, mercury, chromium, and sulfuric acid from brass finishing operations. The volume of liquid waste disposed of at C Block Quarry is unknown.

The 1989 Resource Conservation and Recovery Act (RCRA) Facility Assessment observed two empty 55-gallon drums, glass fragments, cinder blocks, and several empty 5-gallon buckets at the AOC (Jacobs 1989). The 2010 RI activities confirmed the presence of these items as well as roofing shingle material, ACM, wooden doors, metal hinges and doorknobs, corrugated sheet metal, glass bottles, bricks, and insulation-like foam. As no buildings were constructed within C Block Quarry, these materials are assumed to be the result of dumping during an unknown timeframe. The site is believed to have been inactive since the 1960s. No historical information exists to indicate C Block Quarry was used for any other processes other than what is presented above.

No CERCLA enforcement actions have been conducted related to C Block Quarry.

C COMMUNITY PARTICIPATION

Using the RVAAP community relations program, the Army and Ohio EPA have interacted with the public through public notices, public meetings, reading materials, direct mailings, an Internet website, and receiving and responding to public comments.

Specific items in the community relations program include the following:

- **Restoration Advisory Board –** The Army established a Restoration Advisory Board in 1996 to promote community involvement in U.S. Department of Defense (DoD) environmental cleanup activities and allow the public to review and discuss the progress with decision makers. Board meetings are generally held two to three times per year and are open to the public.
- **Community Relations Plan –** The *Community Relations Plan* (Chenega 2021) is maintained to establish processes to keep the public informed of activities at RVAAP. The plan is available in the Administrative Record at CJAG.
- **Internet Website –** The Army established an internet website in 2004 for RVAAP. It is accessible to the public at www.rvaap.org.

In accordance with CERCLA Section 117(a) and NCP Section 300.430(f)(2), the Army released the C Block Quarry Proposed Plan (Leidos 2020) to the public on August 17, 2020. The Proposed Plan and other project-related documents were made available to the public in the Administrative Record maintained at CJAG and in the Information Repositories at Reed Memorial Library in Ravenna, Ohio, and Newton Falls Public Library in Newton Falls, Ohio. A notice of availability for the Proposed Plan was sent to radio stations, television stations, and newspapers (e.g., *Warren Tribune-Chronicle* and

Ravenna Record Courier), as specified in the Community Relations Plan. The notice of availability initiated the 30-day public comment period beginning August 17, 2020 and ending September 16, 2020.

The Army held a public meeting on August 26, 2020 at CJAG to present the Proposed Plan. At this meeting, representatives of the Army provided information and were available to answer any questions. A transcript of the public meeting is available to the public and has been included in the Administrative Record. Responses to any comments received at this meeting and during the public notification period are included in the Responsiveness Summary, which is Part III of this ROD.

The Army considered public input from the public meeting on the Proposed Plan when selecting the remedy.

D SCOPE AND ROLE OF RESPONSE ACTIONS

The overall program goal of the IRP at the former RVAAP is to clean up previously contaminated lands to reduce contamination to concentrations that are not anticipated to cause risks to human health or the environment. No IRP remedial activities have been performed at C Block Quarry to date.

This ROD addresses soil, sediment, and surface water at C Block Quarry. The potential future land uses for C Block Quarry are Military Training Land Use or Commercial/Industrial Land Use, which are consistent with the intended future land uses for CJAG. Sediment and associated surface water are not present at the AOC. Hexavalent chromium was identified as a COC to be carried forward for potential remediation in surface soil and subsurface soil for Unrestricted (Residential) and Military Training Land Uses. No COCs were identified as requiring remediation for Commercial/Industrial Land Use.

Implementing the remedy described in this ROD will address potential risk through removal and off-site disposal of surficial ACM, implementing LUCs to prevent Unrestricted (Residential) Land Use, and prohibiting digging by the Industrial Receptor. The selected remedy described in the ROD is consistent with, and protective for, the intended future use (Commercial/Industrial) at the AOC. Other media (e.g., groundwater) and AOCs at CJAG will be managed as separate actions or decisions by the Army and will be considered under separate RODs.

Potential impacts to groundwater from soil (e.g., contaminant leaching) were evaluated in the C Block Quarry RI/FS Report (Leidos 2019), as protectiveness to groundwater was included in the fate and transport analysis. However, groundwater will be evaluated as an individual AOC for the entire facility (designated as RVAAP-66) under the Facility-wide Groundwater Monitoring Program (FWGWMP).

E SITE CHARACTERISTICS

This section presents site characteristics, nature and extent of contamination, and the conceptual site model for C Block Quarry. These characteristics and findings are based on investigations conducted from 1978 to 2012 and are further summarized in the C Block Quarry RI/FS Report (Leidos 2019).

E.1 Physical Characteristics

This section describes the topography/physiology, geology, hydrogeology, and ecological characteristics of CJAG and C Block Quarry that were key factors in identifying the potential contaminant transport pathways, receptor populations, and exposure scenarios to evaluate human health and ecological risks.

E.1.1 Topography/Physiography

The topography of CJAG is gently undulating with an overall decrease in ground elevation from a topographic high of approximately 1,220 feet above mean sea level (amsl) in the far western portion of the facility to low areas at approximately 930 feet amsl in the far eastern portion.

C Block Quarry is characterized by a large plateau, which slopes radially in all directions (MKM 2007). The quarry bottom has a maximum depth of 25 feet below the surrounding grade. Access to the quarry bottom is limited to two gradually sloped areas near the northwestern and southwestern corners of the AOC. The eastern and western sides of the AOC are defined by the quarry walls.

Ground elevations within C Block Quarry range from 1,174 feet amsl at the quarry rim to 1,150 feet amsl at the center of the quarry bottom. Bedrock is typically encountered at 1,149 feet amsl across the AOC. No perennial surface water features are present within the AOC or in the immediate vicinity. Intermittent surface water flows into the quarry and accumulates in low-lying areas. The bedrock sidewall of the quarry does not contribute to surface water within the AOC because the water table is below the quarry bottom. Hinkley Creek is approximately 2,400 feet to the west, and Sand Creek is approximately 2,000 feet to the east (Figure 2).

E.1.2 Geology

C Block Quarry is located in the eastern portion of the Lavery Till, as shown in Figure 5. The primary soil type found at C Block Quarry is the Mitiwanga silt loam (MvB) (2-6% slopes) (USDA 2010). Mitiwanga silt loam is a gently sloping, moderately well drained soil formed from glacial till over weathered sandstone. As observed in the 2010 RI soil borings, the composition of unconsolidated deposits at C Block Quarry generally consist of yellowish-brown to brown medium dense sand-rich silt tills with trace to little weathered sandstone throughout (Leidos 2019).

C Block Quarry is located on a local bedrock high. The bedrock formation observed at C Block Quarry is the Pennsylvanian age Pottsville Formation, Homewood Sandstone Member (Figure 6). The Homewood Sandstone Member, the uppermost unit of the Pottsville Formation, exhibits irregular and widely spaced bedding planes and vertical joints. The Homewood is fine-grained sandstone composed of well-rounded quartz grains and substantial quantities of mica. It is bonded with iron oxides and clay matter.

During the C Block Quarry RI, bedrock was encountered at depths ranging from 0.75 feet below ground surface (bgs) in the center of the quarry bottom to 7 feet bgs along the northern edge of the AOC

boundary (Leidos 2019). Bedrock was typically encountered in the southern and western extents of the AOC at approximately 4 feet bgs. During historical investigations, bedrock was reportedly encountered at C Block Quarry at 2 to 6 feet bgs.

E.1.3 Hydrogeology

Four groundwater monitoring wells (CBLmw-001 through CBLmw-004) were installed around C Block Quarry and screened in bedrock during the Characterization of 14 AOCs. In 2012, an additional monitoring well (CBLmw-005) was installed near the northeastern corner of the intersection of Road 4C and Newton Falls Road, approximately 850 feet southeast of the AOC (Figure 4). This monitoring well was completed to 31 feet bgs (1,124 feet amsl) and screened in the Homewood Sandstone to monitor groundwater in the bedrock (EQM 2015).

In 2017, water level elevations at the AOC had a range of 1,132 to 1,138 feet amsl (TEC-Weston 2018). Potentiometric data are consistent with previous reports and show the groundwater flow pattern to the east/southeast toward Sand Creek, which is approximately 2,000 feet east/southeast of C Block Quarry (Figure 4).

E.1.4 Ecology

The ecological risk assessment (ERA) in the C Block Quarry RI/FS Report (Leidos 2019) concluded that the AOC contains no important and significant ecological resources. The size of the habitat is large enough to completely support cover and food for small birds and mammals that typically require approximately 1 acre of habitat (USEPA 1993). The findings of the Level I Scoping ERA did not invoke a Level II Screening ERA. The Level I Screening ERA evaluated soil chemicals of potential ecological concern (COPECs), and concluded that no COPECs require remediation.

C Block Quarry is vegetated primarily with *Acer rubrum* successional forest, with a small area of herbaceous growth (Figure 7). The northern long-eared bat (*Myotis septentrionalis*; endangered species) exists at CJAG. No other federally listed species and no critical habitat occur on CJAG. C Block Quarry has not been surveyed previously for rare, threatened, or endangered species; therefore, no sightings of rare, threatened, or endangered species have been documented at the AOC (OHARNG 2014). The closest recorded state listed or federally listed species [caddisfly (*Psilotreta indecisa*), state threatened species] is located approximately 2,400 feet west-southwest of the AOC (OHARNG 2014).

E.2 Site Investigations

The 1982 *Installation Reassessment of the Ravenna Army Ammunition Plant* (USATHAMA 1982) reassessed RVAAP to review areas with potential for contaminant releases not documented in the 1978 Installation Assessment (USATHAMA 1978), including C Block Quarry. The 1982 Installation Reassessment also incorporated a review of historical operational information and available environmental data to assess the potential for contaminant releases from operational facilities.

No sampling was performed at C Block Quarry as part of the reassessment. The report recommended that RVAAP coordinate with the U.S. Army Environmental Hygiene Agency for future water quality monitoring and site closure (USATHAMA 1982). The reassessment identified the following conditions at RVAAP, applicable to C Block Quarry (USATHAMA 1982):

- Spent rinse solutions and sludge from acid dip tanks were discarded by transporting to and dumping at the stone quarry in the early 1950s and 1960s. Reportedly, this quarry was located in the Block C magazine area and was observed from aerial photographs as a dump site in the 1950s.
- Off-post contaminant migration was not evident, but the quarry bottom dump may be a source of contamination that should be evaluated.

Since 1982, C Block Quarry has been included in various historical assessments and investigations conducted at the former RVAAP. The following environmental investigations have been completed for C Block Quarry:

- Soil and Sediment Analysis Performed for Ravenna Arsenal (Mogul 1982),
- Installation Reassessment of the Ravenna Army Ammunition Plant (USATHAMA 1982),
- Soil Contamination Survey (Mogul 1986),
- RCRA Facility Assessment (Jacobs 1989),
- Preliminary Assessment for the Characterization of Areas of Contamination (USACE 1996),
- Relative Risk Site Evaluation (USACHPPM 1996),
- 2004/2005 Characterization of 14 AOCs (MKM 2007), and
- 2010 RI and 2012 Supplemental Chromium Speciation (Leidos 2019).

The results of the 2010 RI and 2012 Supplemental Chromium Speciation were combined with applicable results of previous sampling events to evaluate the nature and extent of contamination, examine contaminant fate and transport, conduct risk assessments, and evaluate potential remedial alternatives, as summarized in the C Block Quarry RI/FS Report (Leidos 2019).

E.3 Nature and Extent of Contamination

Nature and extent of contamination in surface soil (0 to 1 foot bgs) and subsurface soil (greater than 1 foot bgs) was evaluated in the C Block Quarry RI/FS Report using data from the 2004/2005 Characterization of 14 AOCs RI and 2010 RI. Subsequent to this evaluation, the 2012 Supplemental Chromium Speciation was conducted and is summarized separately in this section. To support the evaluation of nature and extent of contamination, site-related contaminant (SRC) concentrations were compared to screening levels (SLs) corresponding to the lowest facility-wide cleanup goal (FWCUG) for the Resident Receptor (Adult and Child) and National Guard Trainee at a target hazard quotient (HQ) of 0.1 or target risk (TR) of 1E-06, as presented in the *Facility-wide Human Health Cleanup Goals for the Ravenna Army Ammunition Plant, Ravenna, Ohio* (SAIC 2010).

The nature and extent of contamination at the AOC have been effectively characterized by these reports. Surface water and sediment were not evaluated, as these media are not present on the AOC. Figure 8 presents the RI sample locations. Metals, explosives, propellants, semi-volatile organic compounds (SVOCs), volatile organic compounds (VOCs), pesticides, and polychlorinated biphenyls (PCBs) were evaluated across all exposure units. VOCs, pesticides, and PCBs were not detected in surface soil and subsurface soil; propellants were not detected in subsurface soil in C Block Quarry.

E.3.1 Surface and Subsurface Soil

Metals were identified as potential contaminants from former disposal operations (chromium, lead, and mercury) and were thoroughly evaluated across the quarry as a whole. The highest inorganic chemical concentrations were observed in the southern portion of the AOC (incremental sampling methodology [ISM] sample areas CBLss-003M, CBLss-004M, and CBLss-005M and borings CBLsb-025 and CBLsb-026). The chromium concentration was particularly high at 920 mg/kg at CBLss-005M, but was below the Resident Receptor FWCUG at a TR of 1E-05, HQ of 1. Hexavalent chromium was detected at location CBLsb-025 at 19J mg/kg at 0 to 1 foot bgs and 39J mg/kg at 1 to 1.8 feet bgs, which was above the Resident Receptor FWCUG at a TR of 1E-05, HQ of 1 (Figure 9).

Arsenic was detected above the background concentration (15.4 mg/kg) in only one of six ISM samples, with a maximum concentration of 19 mg/kg at 2004 sample location CBLss-001M. Arsenic was not detected above its background concentration in any of the five 2010 RI discrete surface soil samples.

Explosives were thoroughly evaluated across the AOC as a whole. The maximum concentrations for 2-amino-4,6-dinitrotoluene (DNT); 4-amino-2,6-DNT; and nitrocellulose (detected in CBLss-004M in the southern portion of the AOC) were all below their respective SLs and were not considered chemicals of potential concern (COPCs). 2,4,6-trinitrotoluene (TNT) was detected at CBLss-004M in surface soil at a concentration of 22 mg/kg, which exceeded the SL, but was below the Resident Receptor FWCUG at a TR of 1E-05, HQ of 1.

Polycyclic aromatic hydrocarbons (PAHs) were detected at CBLss-005M and CBLsb-011, at the southern end of the AOC. All 12 SVOC SRCs were detected in the 1- to 4-foot bgs interval at CBLss-011. However, concentrations in subsurface soil at this location were less than SLs, except for benzo(a)pyrene. Benzo(a)pyrene was detected at a concentration (0.4 mg/kg) that exceeded its SL of 0.022 mg/kg; therefore, benzo(a)pyrene was identified as a COPC. The benzo(a)pyrene concentration was detected above the Resident Receptor (Adult and Child) FWCUG at a TR of 1E-05, HQ of 1 (0.221 mg/kg).

VOCs, pesticides, and PCBs were not detected in surface soil and subsurface soil; propellants were not detected in subsurface soil in C Block Quarry.

E.3.2 Asbestos-Containing Material

A Certified Asbestos Hazard Evaluation Specialist (CAHES) collected samples and conducted an ACM survey in 2010 (Leidos 2019). The ACM survey included visually inspecting the entire quarry,

identifying suspect materials, estimating the approximate quantity of suspected ACM, and collecting six bulk samples and one soil sample for analysis by polarized light microscopy (PLM).

Four of six bulk samples contained asbestos fibers, ranging from containing 10 to 35 percent chrysotile, and were considered friable. The ACM survey indicated several areas of exposed transite/shingle and steel panels with block insulation and paper within C Block Quarry. The survey indicated that suspect ACM occurred in an area of approximately 2,750 ft^2, although visible debris occupied less than 10 ft^2. PLM analysis of suspect ACM debris samples indicated transite shingles and insulation material contained up to 35 percent asbestos fibers. Samples of firebrick and suspected burn residue/cinder did not contain detectable asbestos fiber. Figure 10 presents the results of the ACM survey.

The one soil sample collected during the ACM survey near a pile of material with suspected ACM contained less than 1 percent asbestos fiber. In addition, nine soil samples collected from 2010 RI soil borings did not contain detectable asbestos fibers (Leidos 2019).

E.3.3 August 2012 Chromium Speciation Sampling

In August 2012, two ISM chromium speciation samples (and one quality control [QC] field duplicate and one quality assurance split) were recollected from historically sampled ISM areas identified as having elevated total chromium concentrations. Sample location CBLss-003M had a historical total chromium concentration of 240 mg/kg, and sample location CBLss-005M had a historical total chromium concentration of 920 mg/kg. The August 2012 samples were collected and analyzed to evaluate the potential contribution of hexavalent chromium to the total chromium concentrations in soil.

In addition, four discrete surface and subsurface soil samples and one QC field duplicate were collected from two soil borings located within CBLss-003M. This ISM area had an elevated chromium concentration of 5.4J mg/kg and had a 2010 surface soil sample from CBLsb-010 that had a total chromium concentration of 2,100 mg/kg.

All six samples had a total chromium concentration above the facility-wide background concentration of 17.4 and 27.2 mg/kg for surface and subsurface soil, respectively. The range of hexavalent chromium concentrations was 0.32J to 39J mg/kg and did not appear to be correlated to total chromium values. These results are included as part of the site-related contaminant screens and in the HHRA and ERA (Figure 11).

E.4 Conceptual Site Model

Conceptual site model elements are discussed in this section, including primary and secondary contaminant sources and release mechanisms, contaminant migration pathways and discharge or exit points, and potential human receptors and ecological resources.

E.4.1 Primary and Secondary Contaminant Sources and Release Mechanisms

No operational facilities representing primary contaminant sources are located at C Block Quarry. Primary sources, such as debris and ACM, exist at C Block Quarry. No material is believed to have been placed in the quarry since the 1960s. Secondary sources (contaminated soil) also are located at C Block Quarry. The site was used for disposing of annealing process liquids (chromic acid) from Load Line 2 and spent pickle liquor containing lead, mercury, chromium, and sulfuric acid from brass finishing operations. This material was reportedly dumped on the ground surface. The volume of liquid waste disposed of at C Block Quarry is unknown. The bottom of the quarry is fully enclosed by a quarry wall, which confines the extent of contaminants in soil to the quarry bottom. The potential mechanisms for contaminant releases from secondary sources at C Block Quarry include:

- Eroding soil with sorbed contaminants and mobilization in turbulent surface water flow under storm conditions (confined to short distances within the quarry bottom),
- Dissolving soluble contaminants and transport in surface water (confined to short distances within the quarry bottom), and
- Contaminant leaching to groundwater.

E.4.2 Contaminant Migration Pathways and Exit Points

The potential for soil contaminants to impact groundwater was evaluated in the fate and transport evaluation presented in the C Block Quarry RI/FS Report (Leidos 2019). Surface water drainage conveyances or streams do not exist within C Block Quarry, and there are no surface water exit points from the quarry. Topography at the AOC directs runoff into the quarry bottom. Surface water pathways for contaminant migration are limited to short distances within the quarry bottom.

Contaminant fate and transport at C Block Quarry was evaluated using 1) groundwater data collected to date at the AOC and 2) modeling to assess the potential for SRCs to leach from surface and subsurface soil and impact groundwater beneath the sources. The fate and transport evaluation concluded that chromium and mercury were not potentially impacting groundwater through soil screening analysis (i.e., by comparing their maximum soil concentrations to the maximum contaminant level-based generic soil screening levels), and lead and hexavalent chromium were not expected to reach the water table from the source area within 1,000 years. The fate and transport evaluation identified TNT; 2-amino-4,6-DNT; and 4-amino-2,6-DNT as final contaminant migration chemicals of potential concern (CMCOPCs). Based on soil concentrations, these final CMCOPCs were predicted to exceed the screening criteria in groundwater beneath the source area. However, none of these final CMCOPCs were detected in AOC groundwater samples collected from 2009 to 2013. A qualitative assessment of the groundwater sample results was performed and the limitations and assumptions of the models were considered to identify if any CMCOCs are present in soil at C Block Quarry that may potentially impact groundwater. This qualitative assessment concluded that CMCOPCs are not adversely impacting groundwater quality based on current data and are not predicted to have future impacts. Groundwater will be further evaluated under the FWGWMP.

E.4.3 Potential Human Receptors and Ecological Resources

In February 2014, the Army and Ohio EPA amended the risk assessment process to address changes in the RVAAP restoration program. The *Final Technical Memorandum: Land Uses and Revised Risk Assessment Process for the RVAAP Installation Restoration Program* (ARNG 2014) identified the following three Categorical Land Uses and Representative Receptors to be considered during the RI phase of the CERCLA process.

1. Unrestricted (Residential) Land Use – Resident Receptor (Adult and Child) (formerly called Resident Farmer).
2. Military Training Land Use – National Guard Trainee.
3. Commercial/Industrial Land Use – Industrial Receptor (USEPA Composite Worker).

An evaluation using Resident Receptor (Adult and Child) FWCUGs was used to provide an Unrestricted (Residential) Land Use evaluation. If a site meets the standards for Unrestricted (Residential) Land Use, it can be used for all categories of land use at CJAG. The receptor is assumed to be exposed to surface soil from 0 to 1 foot bgs and subsurface soil from 1 to 13 feet bgs.

The HHRA identified hexavalent chromium as a COC requiring remediation in surface and subsurface soil for the Resident Receptor and National Guard Trainee but did not identify a COC requiring remediation for the Industrial Receptor.

No important and significant ecological resources such as wetlands and surface water were identified at C Block Quarry when performing assessments for the C Block Quarry RI/FS Report (Leidos 2019); however, C Block Quarry contains habitat that completely supports cover and food for small birds and mammals that typically require approximately 1 acre of habitat (USEPA 1993). Groundwater is not considered an exposure medium for ecological receptors on the AOC.

F CURRENT AND POTENTIAL FUTURE LAND AND RESOURCE USES

C Block Quarry is currently inactive. The site is believed to have been inactive since the 1960s. The potential future uses for C Block Quarry are Military Training Land Use or Commercial/Industrial Land Use. Although residential use is not anticipated at CJAG or C Block Quarry, the Resident Receptor was evaluated in the HHRA to assess an Unrestricted (Residential) Land Use scenario. This ROD discusses future land use as it pertains to soil, sediment, and surface water and how it impacts human health, the environment, and groundwater.

G SUMMARY OF SITE RISKS

The HHRA and ERA estimated risks to human receptors and ecological resources; identified exposure pathways; presented COCs and COPECs, if any; and provided a basis for remedial decisions. This section of the ROD summarizes the results of the HHRA and ERA, which are presented in detail in the C Block Quarry RI/FS Report (Leidos 2019) and C Block Quarry Proposed Plan (Leidos 2020) located in the Administrative Record and Information Repositories.

G.1 Human Health Risk Assessment

An HHRA was performed to identify COCs and provide a risk management evaluation to determine if remediation is required under CERCLA based on potential risks to human receptors. The media evaluated in the HHRA were surface soil and subsurface soil. Surface water and sediment were not present within C Block Quarry. Using the results from the 2010 RI and 2012 chromium speciation sampling, one COC is recommended to be carried forward.

The HHRA identified hexavalent chromium as a soil COC to be carried forward for remediation in surface soil (0 to 1 foot bgs) and subsurface soil (1 to 7 feet bgs) for Unrestricted (Residential) Land Use and as a COC for potential remediation in deep surface soil (0 to 4 feet bgs) for Military Training Land Use. No COCs were identified for Commercial/Industrial Land Use. Hexavalent chromium within C Block Quarry is likely attributable to the site being used for disposing of annealing process liquids (chromic acid) from Load Line 2 and spent pickle liquor containing lead, mercury, chromium, and sulfuric acid from brass finishing operations.

In addition, friable ACM (e.g., transite and black tar paper) was intermixed with the soil. Removal of surficial ACM and implementation of LUCs would prevent Resident Receptor and Industrial Receptor exposure to friable ACM.

G.2 Ecological Risk Assessment

The ecological habitat at C Block Quarry is approximately 0.96 acres and consists of mostly forest and brush with trees at least 1 foot in diameter. The vegetation provides a habitat for birds, mammals, insects, and other organisms. The size of the habitat is large enough to completely support cover and food for small birds and mammals that typically require approximately 1 acre of habitat (USEPA 1993). Surface water drainage generally follows the topography at the AOC radially inward toward the quarry bottom. Low-lying areas contain surface water for short periods of time only during precipitation events or periods of snow melt. Ecological resources at C Block Quarry were compared to the list of important ecological places and resources. Based on the 39 criteria defining important places as identified by the Army and Ohio EPA, important/significant ecological resources were not identified at the AOC. The vegetation types present at C Block Quarry are also found elsewhere near the AOC, at CJAG, and in the ecoregion.

The northern long-eared bat (*Myotis septentrionalis*; federally threatened) exists at CJAG. No other federally listed species or critical habitats are found on CJAG. C Block Quarry has not been previously surveyed for rare, threatened, or endangered species; therefore, no sightings of rare, threatened, or endangered species have been documented at the AOC (OHARNG 2014). The closest recorded state listed or federally listed species (caddisfly [*Psilotreta indecisa*], state threatened species) is located approximately 2,400 feet west-southwest of the AOC (OHARNG 2014).

The ERA was conducted in accordance with the *Guidance for Conducting Ecological Risk Assessments* (Ohio EPA 2008). The Level I Scoping ERA evaluated chemical contamination to determine if it posed a risk to the environment. However, as no important or significant ecological resources were present at C Block Quarry, no further action is required to be protective of ecological resources.

H REMEDIAL ACTION OBJECTIVES

The remedial action objective (RAO) references cleanup goals (CUGs) and risk levels that are considered protective of human health under current and future use scenarios. The RAOs for C Block Quarry are to 1) prevent Resident Receptor exposure to hexavalent chromium in soil with concentrations above the USEPA Resident Soil RSL of 3 mg/kg at sample locations CBLss-003M and CBLss-005M; and 2) prevent Resident Receptor and Industrial Receptor exposure to friable ACM (e.g., transite and black tar paper) intermixed with the soil.

Figure 12 presents the estimated extent of surface soil (0 to 1 foot bgs) and surficial ACM requiring remediation. Table 2 presents the remedial CUGs.

Table 2. Remedial Cleanup Goals

Chemical of Concern	Remedial Cleanup Goal
Hexavalent Chromium	3 mg/kg
Asbestos	Non-detectable

mg/kg = Milligrams per Kilogram
Non-detectable concentration of asbestos will be determined by using test methods with an analytical sensitivity of at least 0.25 percent by weight.

I DESCRIPTION OF ALTERNATIVES

Remedial alternatives for soil at C Block Quarry were developed and evaluated in the C Block Quarry RI/FS Report (Leidos 2019). The remedial alternatives are listed below:

- Alternative 1: No Action.
- Alternative 2: Surficial ACM Removal and LUCs.
- Alternative 3: Excavation and Off-Site Disposal – Attain Unrestricted (Residential) Land Use.

This section includes a description of various components of the remedial alternatives identified in the C Block Quarry RI/FS Report (Leidos 2019), including ACM removal, soil removal, disposal, and handling.

I.1 Alternative 1: No Action

Alternative 1 provides no remedial action and is required under the NCP as a baseline for comparison with other remedial alternatives. Alternative 1 provides no additional protection to human health and the environment. Any current legal and administrative LUC mechanisms at the AOC would be discontinued. No future legal, administrative, or physical LUC mechanisms would be employed at the AOC. Environmental monitoring would not be performed, and 5-year reviews would not be conducted in accordance with CERCLA 121(c). In addition, no restrictions on land use would be pursued. COCs at the AOC would not be removed or treated.

I.2 Alternative 2: Surficial ACM Removal and LUCs

Alternative 2 consists of implementing LUCs to prevent Unrestricted (Residential) Land Use of the site and corresponding Resident Receptor exposure to hexavalent chromium and ACM. In addition, surficial ACM will be removed and digging restrictions will be implemented to prevent Industrial Receptor exposure to ACM. No COCs requiring action were identified for the Industrial Receptor. The following subsections describe activities associated with this alternative.

I.2.1 Remedial Design

A remedial design (RD) will be developed prior to initiating remedial actions. This RD will contain an Asbestos Abatement Plan (AAP) that specifies the notifications and submittals required prior to and during ACM cleanup activities. This AAP will define roles, responsibilities, and required licenses and/or certifications. The AAP will specify controls for the site during ACM cleanup activities, including site setup, asbestos cleanup details, air monitoring, personal protective equipment (PPE), decontamination, and site closeout.

I.2.2 Surficial Asbestos-Containing Material Removal

Alternative 2 will include the removal of ACM that was observed on the ground surface at C Block Quarry. An estimated total of 10 yd^3 of exposed ACM (e.g., transite/shingle and steel panels with block insulation and paper) were observed to be in the surface soil at C Block Quarry. The sizes of individual pieces of ACM vary. As part of the ACM removal, the site will undergo a visual inspection by a CAHES to ensure exposed ACM is identified and removed.

The ACM will be removed by an Asbestos Hazard Abatement Specialist. Personnel will execute the removal with proper PPE, as required by Occupational Safety and Health Administration (OSHA) asbestos removal requirements. In addition, an AAP will be developed to outline requirements specific to the removal of ACM, including identifying key personnel and PPE, specifying air monitoring requirements, and stating the site control measures. If needed, water will be used to mist the ACM to ensure asbestos does not become airborne during the removal. The ACM will be removed and placed in an appropriate-sized container that has a 12-millimeter liner. The container will be sealed, adequately marked in accordance with U.S. Department of Transportation requirements, and shipped for disposal at an approved landfill. Appropriate waste manifests will accompany each waste shipment. Only regulated and licensed transporters and vehicles will be used.

Wind and sediment erosion at C Block Quarry is negligible. As presented in Figure 4, soil within C Block Quarry boundary is predominantly surrounded by approximately 25-foot-high walls created during the quarry operations. These high walls will reduce the likelihood of wind erosion. The AOC is heavily vegetated, as further confirmed during a site walk with Ohio EPA conducted in 2017, which will deter soil erosion. In addition, surface water is not a permanent feature of the site, and rain events generally do not create ponds or surficial flow.

As presented in Figure 10, the one sample location (CBLss-013) that had asbestos in soil is in flat terrain, very near the approximately 25-foot-high quarry wall, and thus is unlikely to result in the limited asbestos in soil traveling beyond the LUC boundary.

I.2.3 Land Use Controls

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

1. Prevent Resident Receptor use of the site, as hexavalent chromium in soil above the USEPA Resident Soil RSL of 3 mg/kg will remain on-site.
2. Prevent intrusive and digging activities deeper than surface soil (0 to 1 foot bgs), as friable ACM potentially exists in the subsurface soil. Any necessary intrusive activities deeper than 1 foot bgs will be performed in accordance with asbestos regulations.
3. Install signs to enhance compliance with digging restrictions at the site.
4. Install Seibert stakes to ensure high visibility of the site boundary.
5. Maintain the LUC training program.

I.2.4 Land Use Control Remedial Design

A LUC RD will be developed to present the site's land use, activities, RAOs, and LUC requirements for C Block Quarry. The LUC requirements will include LUC objectives, land use restrictions, site disturbance restrictions, sign specification, potential modification and termination of LUCs, monitoring and reporting requirements, LUC enforcement, and property transfers.

This information will be presented in an appendix to the *Property Management Plan for the Designated Areas of Concerns and Munitions Response Sites* (USACE 2012). The Property Management Plan identifies LUCs and restrictions for specific AOCs/munitions response sites within the former RVAAP. The procedures within the Property Management Plan are intended to comply with the DoD Manual, Defense Environmental Restoration Program Management, Number 4715.20, March 9, 2012 (DoD Office of the Under Secretary of Defense for Acquisition, Technology and Logistics), Incorporating Change 1 dated August 31, 2018, and Ohio Revised Code 5913.10.

I.3 Alternative 3: Excavation and Off-Site Disposal – Attain Unrestricted (Residential) Land Use

Hexavalent chromium is identified as a Resident Receptor COC in soil. In addition, ACM (e.g., transite/shingle and steel panels with block insulation and paper) is present on the ground surface at C Block Quarry. Implementing surface and subsurface soil removal (0 to 2 feet bgs) within C Block Quarry would attain Unrestricted (Residential) Land Use. The following subsections describe activities associated with this alternative.

I.3.1 Subsurface Asbestos-Containing Material Evaluation

Friable ACM was identified on the ground surface during the RI. Potential exposure to the Resident Receptor includes digging to 13 feet bgs, although the maximum depth to bedrock at C Block Quarry is estimated to be 7 feet bgs. This alternative will include excavating test trenches throughout the quarry

bottom to identify any possible subsurface ACM. Additional areas in which ACM is present in soil will be removed and disposed of accordingly.

I.3.2 Pre-Excavation and Waste Characterization Sampling

The C Block Quarry RI/FS Report (Leidos 2019) assumed the horizontal extent of soil requiring remediation for hexavalent chromium includes ISM sample locations CBLss-003M and CBLss-005M. In addition, a portion of CBLss-002M is included in the area requiring remediation, as friable ACM was identified in this area. To coincide with and support development of the RD, pre-excavation sampling will be conducted to confirm the limits of soil excavation and minimize the time required to implement the remedial action.

Due to the presence of friable ACM, the soil removed per this alternative is assumed to be disposed of as ACM. However, waste characterization samples will be collected from the areas requiring removal. The waste characterization samples will be collected from the areas undergoing this remedy to provide data to properly profile the waste and determine if it is characteristically non-hazardous or hazardous. Each waste characterization sample may include, but is not limited to, toxicity characteristic leaching procedure (TCLP) metals, TCLP SVOCs, TCLP pesticides, TCLP herbicides, reactive cyanide, reactive sulfide, and PCBs.

I.3.3 Remedial Design

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

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

I.3.4 Soil Excavation and Disposal

Prior to any ground disturbance, the excavation area will be surveyed and demarcated by stakes. C Block Quarry is surrounded by a bedrock high wall with no stormwater exit points. Any soil removal will be at the bottom of a quarry and will not result in stormwater runoff or sediment erosion to a surface water body. Therefore, this alternative will not require sediment and erosion controls. Dust generation will be minimized during excavation activities by keeping equipment movement areas and excavation

areas misted with water. The health and safety of remediation workers, on-site CJAG employees, and the general public will be covered in a site-specific health and safety plan.

Asbestos abatement-trained personnel will install asbestos caution tape and signage to demarcate the regulated areas. A decontamination unit will be erected with connecting water and filter drain that will be properly disposed of.

All personnel entering the asbestos work areas will have appropriate PPE for asbestos work. PPE may include full-body coveralls and half-mask air-purifying respirators equipped with high-efficiency particulate air filters. During the excavation, asbestos air samples will be collected in accordance with OSHA Class I and Class II asbestos removal requirements. Water will be used to mist the excavated soil.

Once adequately wetted, the soil will be removed by a front-end loader and placed in a 12-millimeter, lined, roll-off dumpster or haul truck for transport and disposal at an approved landfill. Oversized debris will be crushed or otherwise processed to meet disposal facility requirements. The lateral and vertical extents of excavation account for the hexavalent chromium exceedance and ACM in soil to 2 feet bgs. Additional excavation may be required to remove ACM from the subsurface below 2 feet bgs based on the subsurface ACM evaluation described in Section I.3.1.

Once the soil is loaded, the container will be covered and affixed with appropriate signage to the truck, as required for transportation to the approved landfill. All trucks are inspected prior to exiting the AOC. Appropriate waste manifests accompany each waste shipment. Only regulated and licensed transporters and vehicles will be used. All trucks travel pre-designated routes within CJAG.

Excavated soil will be disposed of at an existing off-site facility licensed and permitted to accept the characterized waste stream. The selection of an appropriate facility considers the types of waste, location, transportation options, and cost. Waste streams with different constituents and/or characteristics may be generated. Disposal cost savings are possible by using specific disposal facilities for different waste streams.

I.3.5 Confirmatory Sampling

Once the vertical and lateral extents of the excavation are complete and no visible ACM remains, confirmation samples will be collected from the excavation floor and sidewalls. The confirmation samples will be analyzed for hexavalent chromium and asbestos content. If the analyses indicate the hexavalent chromium concentration or asbestos content in soil exceeds the CUGs, further excavation will be conducted. If confirmation sample results are less than CUGs, further soil removal is not required, and the area can be restored.

I.4 Site Restoration

Upon completion of soil excavation, all disturbed and excavated areas will be backfilled with clean soil and graded to meet neighboring contours. The backfill will come from a clean source sampled and

approved for use by the Army and Ohio EPA. To ensure adequate vegetation is established within the excavated area, a layer of topsoil from a clean source will be placed on the backfill. After the area is backfilled and graded, workers will apply a seed mixture (as approved by OHARNG) and mulch. Restored areas will be inspected and monitored as required in the stormwater best management practices established in the RD.

J COMPARATIVE ANALYSIS OF ALTERNATIVES

These alternatives were evaluated with respect to the nine comparative analysis criteria. These criteria are further described, as outlined by CERCLA, in Table 3.

Table 3. CERCLA Evaluation Criteria

Overall Protection of Human Health and the Environment – Considers whether or not an alternative provides adequate protection and describes how risks posed through each pathway are eliminated, reduced, or controlled through treatment, engineering controls, or institutional controls.
Compliance with ARARs – Considers how a remedy will meet all of the applicable or relevant and appropriate requirements of other federal and state environmental statutes and/or provide grounds for invoking a waiver.
Long-term Effectiveness and Permanence – Considers the magnitude of residual risk and the ability of a remedy to maintain reliable protection of human health and the environment over time once cleanup goals have been met.
Reduction of Toxicity, Mobility, or Volume Through Treatment – Considers the anticipated performance of the treatment technologies that may be employed in a remedy.
Short-Term Effectiveness – Considers the speed with which the remedy achieves protection, as well as the potential to create adverse impacts on human health and the environment that may result during the construction and implementation period.
Implementability – Considers the technical and administrative feasibility of a remedy, including the availability of materials and services needed to implement the chosen solution.
Cost – Considers capital costs and operation and maintenance costs associated with the implementation of the alternative.
State Acceptance – Indicates whether the state concurs with, opposes, or has no comment on the preferred alternative.
Community Acceptance – Considers public input following a review of the public comments received on the RI/FS Report and Proposed Plan.

ARAR = Applicable or Relevant and Appropriate Requirement
RI/FS = Remedial Investigation/Feasibility Study

The nine criteria are categorized into three groups: threshold criteria, primary balancing criteria, and modifying criteria, as follows:

Threshold Criteria – Must be met for the alternative to be eligible for selection as a remedial option.

1. Overall protection of human health and the environment.
2. Compliance with applicable or relevant and appropriate requirements (ARARs).

Primary Balancing Criteria – Used to weigh major trade-offs among alternatives.

3. Long-term effectiveness and permanence.
4. Reduction of toxicity, mobility, or volume through treatment.
5. Short-term effectiveness.
6. Implementability.
7. Cost.

Modifying Criteria – FS consideration to the extent that information was available. Evaluated fully after public comment period on the Proposed Plan.

8. State acceptance.
9. Community acceptance.

The following subsections discuss the comparative analysis of the alternatives developed for C Block Quarry, and a scoring of these alternatives is presented in Table 4.

J.1 Overall Protection of Human Health and the Environment

Overall protection and compliance with ARARs are threshold criteria that must be met by any alternative to be eligible for selection. If any alternative is considered "not protective" for overall protectiveness of human health and the environment or "not compliant" for compliance with ARARs, it is not eligible for selection as the recommended alternative.

Alternative 1 is not protective of human health and is not compliant with ARARs. In addition, Alternative 1 does not meet the RAOs to prevent Resident Receptor exposure to soil with concentrations of hexavalent chromium above the USEPA Resident Soil RSL (3 mg/kg) or prevent exposure to ACM. Therefore, Alternative 1 is not eligible for selection.

For the remaining alternatives, the balancing criteria (short- and long-term effectiveness; reduction of contaminant toxicity, mobility, or volume through treatment; ease of implementation; and cost) are used to select a recommended alternative among the alternatives that satisfy the threshold criteria. The remaining alternatives are ranked among one another for each of the balancing criteria and a total score is generated.

Alternative 2 – Surficial ACM Removal and LUCs scores the highest and is the recommended alternative. This alternative scores highly in short-term effectiveness and implementability, as the minimal ACM removal will have low risks and limited exposure to workers and the public. In addition, LUCs are already implemented at CJAG, and the cost to implement Alternative 2 is significantly less than the cost of Alternative 3. Although Alternative 3 scores higher in the long-term effectiveness criteria, the minimal future use of the site does not justify the need for the extent of the remediation anticipated for Alternative 3.

J.2 State Acceptance

State acceptance was evaluated formally after the public comment period on the Proposed Plan. Ohio EPA has expressed its support for Alternative 2: Surficial ACM Removal and LUCs.

J.3 Community Acceptance

Community acceptance was evaluated formally after the public comment period. During the public meeting, the community voiced no objections to Alternative 2: Surficial ACM Removal and LUCs, as indicated in Part III of this ROD, the Responsiveness Summary.

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Table 4. Summary of Comparative Analysis of Remedial Alternatives

NCP Evaluation Criteria	Alternative 1: No Action	Alternative 2: Surficial ACM Removal and LUCs	Alternative 3: Excavation and Off-Site Disposal – Attain Unrestricted (Residential) Land Use
Threshold Criteria	***Result***	***Result***	***Result***
1. Overall Protection of Human Health and the Environment	Not protective	Protective	Protective
2. Compliance with ARARs	Not compliant	Compliant	Compliant
Balancing Criteria	***Score***	***Score***	***Score***
3. Long-Term Effectiveness and Permanence	Not applicable	1	2
4. Reduction of Toxicity, Mobility, or Volume through Treatment	Not applicable	1	2
5. Short-Term Effectiveness	Not applicable	2	1
6. Implementability	Not applicable	2	1
7. Cost	Not applicable ($0)	2 ($108,534)	1 ($390,224)
Balancing Criteria Score	*Not applicable*	*8*	*7*

Any alternative considered "not protective" for overall protectiveness of human health and the environment or "not compliant" for compliance with ARARs is not eligible for selection as the recommended alternative. Therefore, that alternative is not ranked as part of the balancing criteria evaluation.

Scoring for the balancing criteria is as follows: Most favorable = 2, least favorable = 1. The alternative with the highest total balancing criteria score is considered the most feasible.

ACM = Asbestos-Containing Material

ARAR = Applicable or Relevant and Appropriate Requirement

LUC = Land Use Control

NCP = National Oil and Hazardous Substances Pollution Contingency Plan

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K PRINCIPAL THREAT WASTES

Principal threat wastes, as defined by USEPA in *A Guide to Principal Threat and Low Level Threat Wastes* (USEPA 1991), are source materials considered to be highly toxic or highly mobile that generally cannot be reliably contained, or would present a significant risk to human health or the environment should exposure occur.

Wastes that generally are considered to constitute principal threats include, but are not limited to:

- **Liquids** – Wastes contained in drums, lagoons, or tanks, free product floating on or under groundwater.
- **Mobile Source Material** – Surface soil or subsurface soil containing high concentrations of chemicals that are mobile due to wind entrainment, volatilization, surface runoff, or subsurface transport.
- **Highly Toxic Source Material** – Buried drummed non-liquid wastes, buried tanks containing non-liquid wastes, or soils containing significant concentrations of highly toxic materials.

USEPA guidance indicates where mobility and toxicity of source material combine to pose a potential risk of 10^{-3} or greater, generally treatment alternatives should be considered. C Block Quarry does not contain source materials that are considered principal threat wastes, as described above, and no chemicals pose a risk of 10^{-3} or greater. As such, no remedies are required to address principal threat wastes at this AOC.

L SELECTED REMEDY

Alternative 2: Surficial ACM Removal and LUCs is selected for implementation at C Block Quarry. This alternative also attains the requisite level of cleanup for Commercial/Industrial Land Use.

L.1 Rationale for the Selected Remedy

The selected remedy meets the threshold criteria and provides the best overall balance of trade-offs in terms of the five balancing criteria:

- Long-term effectiveness and permanence;
- Reduction of toxicity, mobility, and volume;
- Short-term effectiveness;
- Implementability; and
- Cost.

The selected remedy is protective for the future use, is cost effective, and can be performed in a timely manner. Based on the available risk assessment information, the selected remedy will achieve the RAO, which prevents Resident Receptor exposure to surface soil (0 to 1 foot bgs) with concentrations of hexavalent chromium above CUGs and friable ACM. The selected remedy also is protective of the Industrial Receptor, as no soil COCs require remediation for the Industrial Receptor, ACM on the

ground surface will be removed, and no-digging LUCs prevents the Industrial Receptor from digging and possibly encountering subsurface ACM.

Using engineering controls, PPE, proper waste handling practices, and monitoring will mitigate short-term effects during construction. The selected remedy addresses state and community concerns by removing a minimal amount of surficial ACM from C Block Quarry.

The selected remedy has high short-term effectiveness and implementability, as the minimal ACM removal will have low risks and limited exposure to workers and the public. Current land use allows for sustainability of terrestrial habitat for ecological receptors.

L.2 Description of the Selected Remedy

Alternative 2 implements the removal of surficial ACM and LUCs. The LUCs limit activities in C Block Quarry to those identified for the Industrial Receptor and other essential security, safety, and natural resources management activities, with the addition of prohibiting digging or subsurface activities. Implementing Alternative 2 would not attain a level of protection required for Unrestricted (Residential) Land Use of the AOC. This alternative is described in more detail in Section I.2.

L.3 Summary of the Estimated Remedy Costs

The cost to complete Alternative 2 is approximately $108,534 (in base year 2017 dollars). This alternative includes an O&M period.

This cost estimate is based on the best available information regarding the anticipated scope of the selected remedy. This is an order of magnitude engineering cost estimate that is expected to be within -30 to +50% of the actual project cost in accordance with USEPA guidance (USEPA 1988).

L.4 Expected Outcomes of the Selected Remedy

Table 2 summarizes the CUGs to be achieved for soil at C Block Quarry after the remedial activities are complete. Residual risks after implementing the selected remedy will be within the acceptable risk range for the future use by Industrial Receptor but will not meet the criteria for Unrestricted (Residential) Land Use. Removing surficial ACM will reduce the likelihood of contaminant migration to other environmental media, such as soil and surface water.

No negative socioeconomic and community revitalization impacts are expected from this remedial action. Positive socioeconomic impacts are expected from removing ACM and preventing exposure to COCs exceeding the CUG, creating additional resources available for use by the OHARNG training mission.

M STATUTORY DETERMINATIONS

The selected remedy satisfies the statutory requirements of CERCLA Section 121 and the NCP, as described below.

M.1 Protection of Human Health and the Environment

The selected remedy is protective of the Resident Receptor by implementing LUCs to not allow for Unrestricted (Residential) Land Use, thereby preventing Resident Receptor exposure to COCs and ACM. Alternative 2 is protective of the Industrial Receptor, as no soil COCs require remediation for the Industrial Receptor, ACM on the ground surface will be removed, and no-digging LUCs will prevent exposure to potential subsurface ACM. The selected remedy does not reduce the current risk and the ecological importance of the AOC remains unchanged. Current land use allows for sustainability of terrestrial habitat for ecological receptors.

M.2 Compliance with ARARs

The selected remedy will comply with the action-specific ARARs listed in Appendix A.

M.3 Cost Effectiveness

The selected remedy meets the statutory requirement for a cost-effective remedy. Cost effectiveness is concerned with the reasonableness of the relationship between the effectiveness afforded by each alternative and its costs compared to other available options.

M.4 Utilization of Permanent Solutions and Alternative Treatment (or Resource Recovery) Technologies to the Maximum Extent Practicable

The selected remedy represents a practicable, effective, and permanent solution to achieve the RAOs for soil at C Block Quarry. The selected remedy represents the best balance of trade-offs between the alternatives because it provides a permanent solution for surficial ACM, implements LUCs to prevent Resident Receptor exposure to COCs and ACM, and is cost-effective. As indicated previously, the Army does not intend to use C Block Quarry for Unrestricted (Residential) Land Use.

M.5 Preference for Treatment as a Principal Element

The selected remedy does not use include treatment and does not achieve a reduction in the toxicity or volume of contaminated media. The mobility of ACM currently on the ground surface will be reduced when transported to an off-site disposal facility.

M.6 Five-Year Review Requirements

Five-year reviews in compliance with CERCLA Section 121(c) and NCP Section 300.430(f)(4)(ii) will be required to assess the effectiveness of LUCs and whether a need to modify them exists. The Army will verify whether the LUCs continue to be properly documented and maintained. Each review of the remedy will evaluate whether land use has changed. If the risk levels have changed since initial LUC implementation, LUC modifications will be considered, which may include a change in monitoring frequency.

N DOCUMENTATION OF SIGNIFICANT CHANGES FROM PREFERRED ALTERNATIVE OF PROPOSED PLAN

The C Block Quarry Proposed Plan (Leidos 2020) was released for public comment on August 17, 2020. Feedback received from the public during the public comment period and public meeting are presented in Part III of this ROD. The Proposed Plan identified Alternative 2: Surficial ACM Removal and LUCs is selected for implementation at C Block Quarry. No significant changes were necessary or appropriate following the conclusion of the public comment period.

PART III: RESPONSIVENESS SUMMARY FOR PUBLIC COMMENTS ON THE ARMY PROPOSED PLAN FOR RVAAP-06 C BLOCK QUARRY

A OVERVIEW

On August 17, 2020, the Army released the C Block Quarry Proposed Plan (Leidos 2020) for public comment. A 30-day public comment period was held from August 17, 2020 to September 16, 2020. The Army hosted a public meeting on August 26, 2020 to present the Proposed Plan and take questions and comments from the public for the record. The public comment period and public meeting also included the Proposed Plan for Atlas Scrap Yard.

For soil at C Block, the Army recommended Alternative 2: Surficial ACM Removal and LUCs for implementation at C Block Quarry. During the public meeting, Ohio EPA concurred with the recommendation of this alternative.

The community voiced no objections to this recommendation. All public input, including the oral and written comments provided, was considered during the selection of the final remedy for soil, surface water, and sediment at C Block Quarry in this ROD.

B STAKEHOLDER ISSUES AND LEAD AGENCY RESPONSES

The following subsections summarize the oral and written comments provided during the public comment period and public meeting. ARNG's responses provided below are considered final upon approval of the Final ROD.

B.1 Oral Comments from Public Meeting

No oral comments regarding C Block Quarry were received during the public meeting or public comment period.

B.2 Written Comments

No written comments were received during the public comment period.

C TECHNICAL AND LEGAL ISSUES

No technical or legal issues were raised during the public comment period.

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PART IV: REFERENCES

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FIGURES

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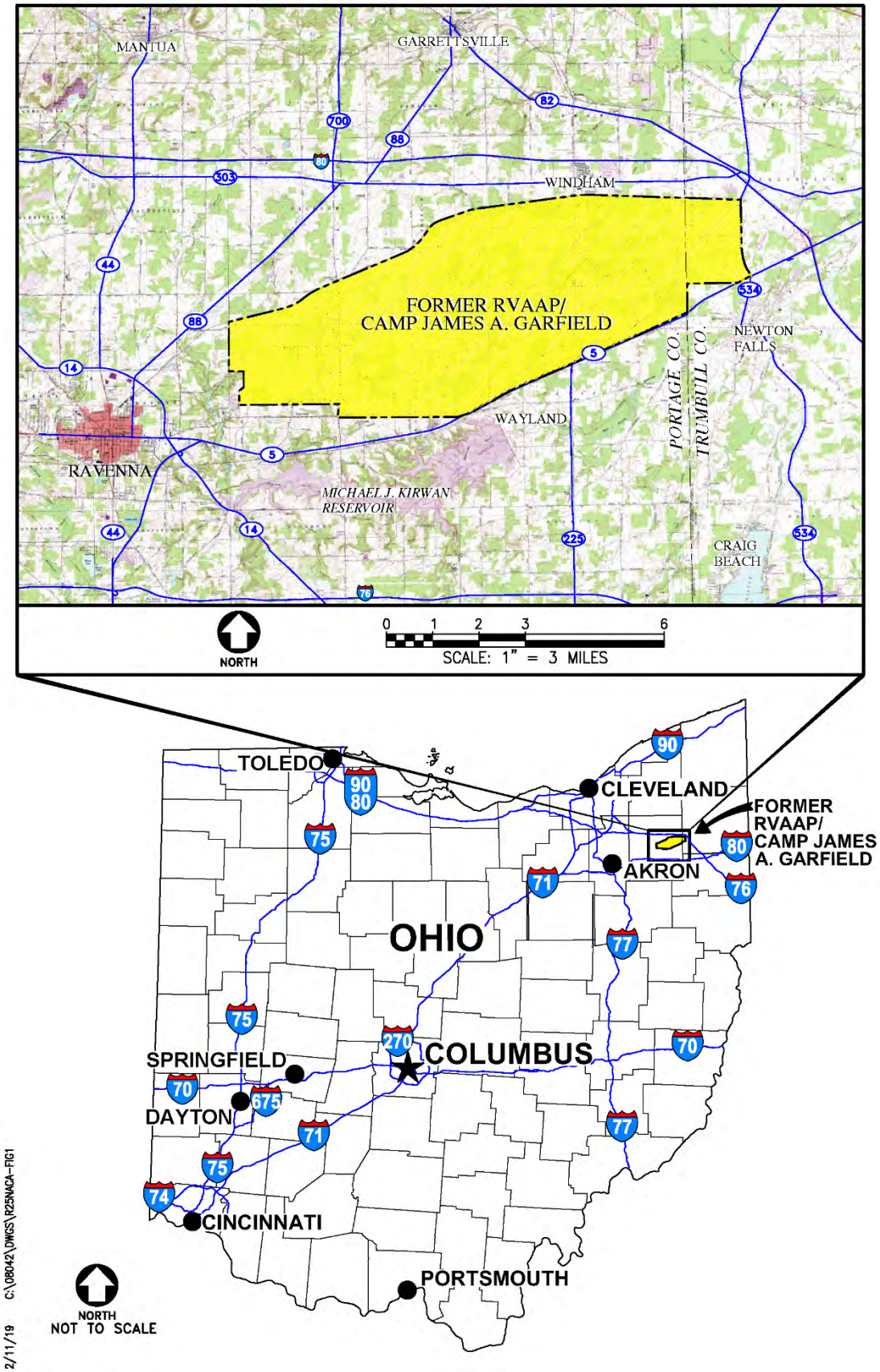

Figure 1. General Location and Orientation of Camp James A. Garfield

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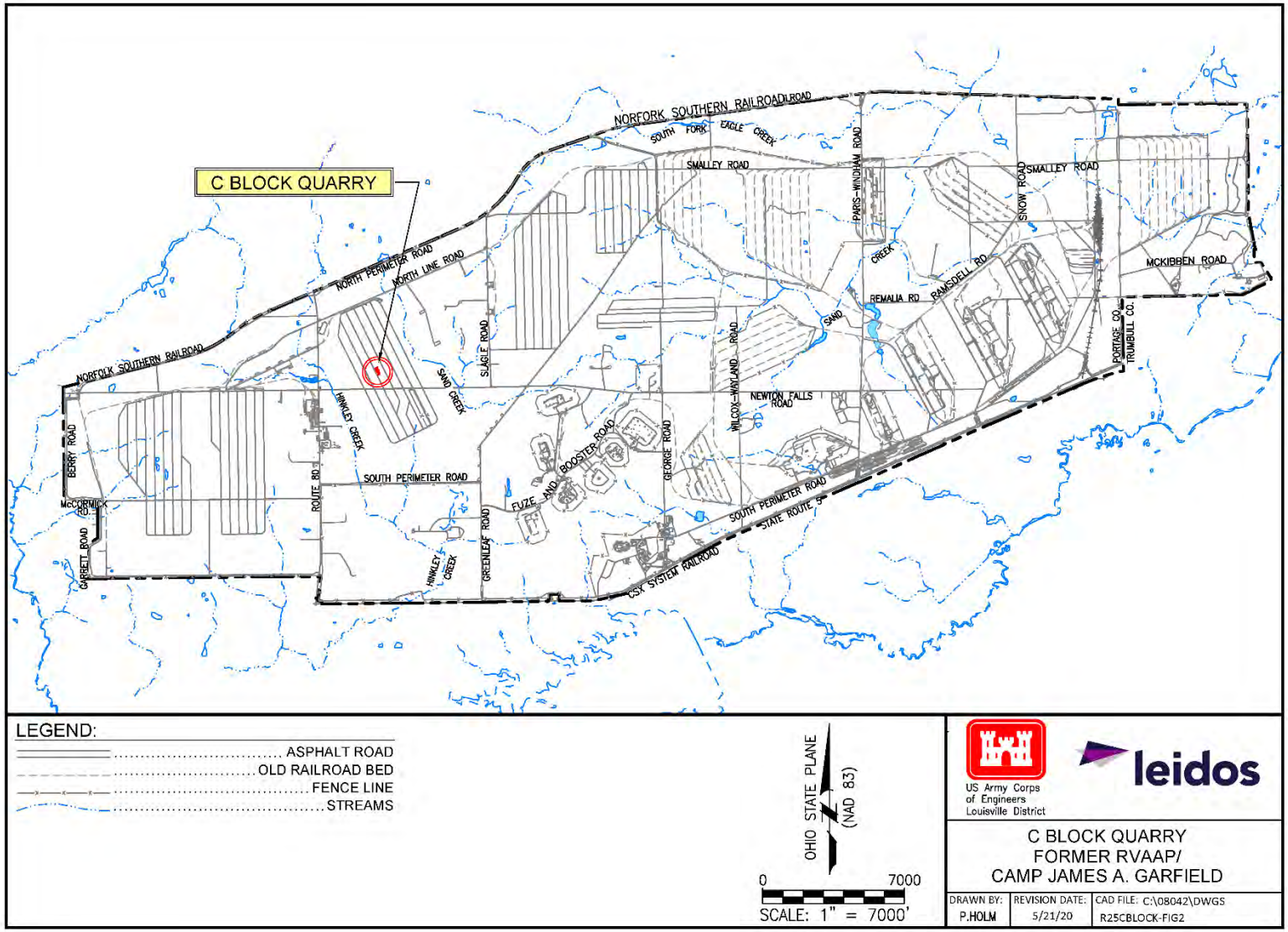

Figure 2. Location of C Block Quarry within Camp James A. Garfield

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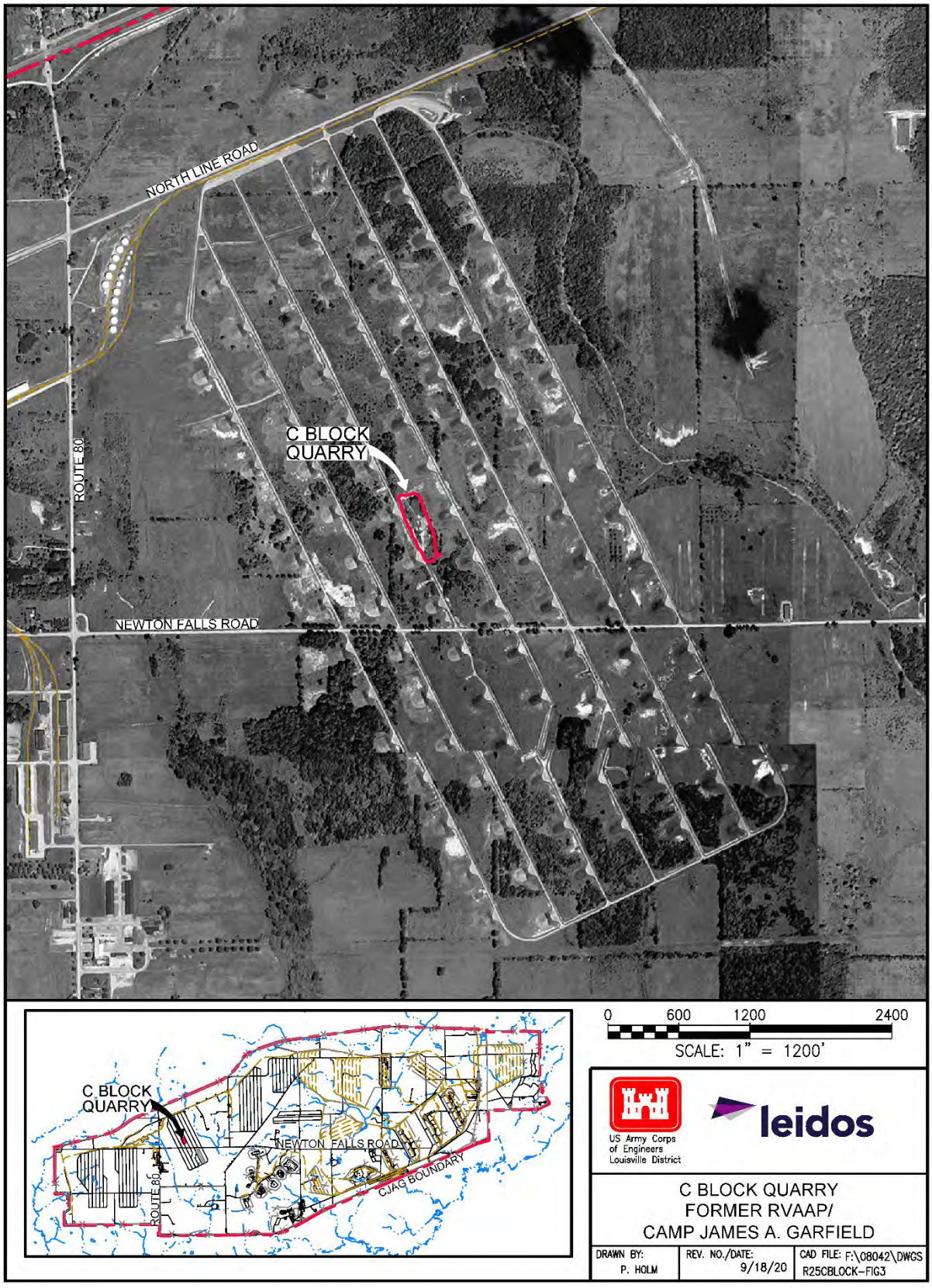

Figure 3. Block C Storage Area – 1959 Aerial Photograph

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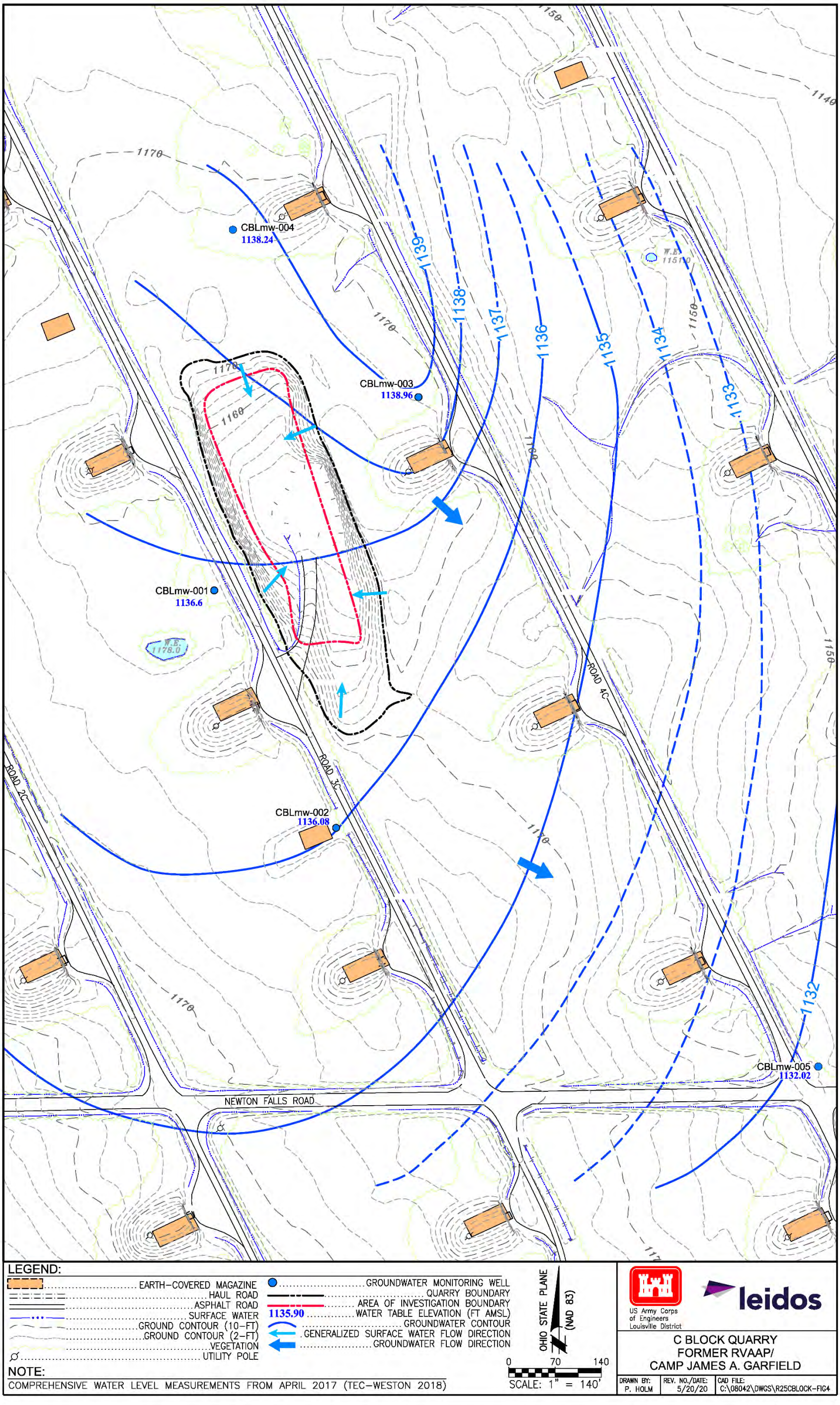

Figure 4. C Block Quarry – Current Site Features

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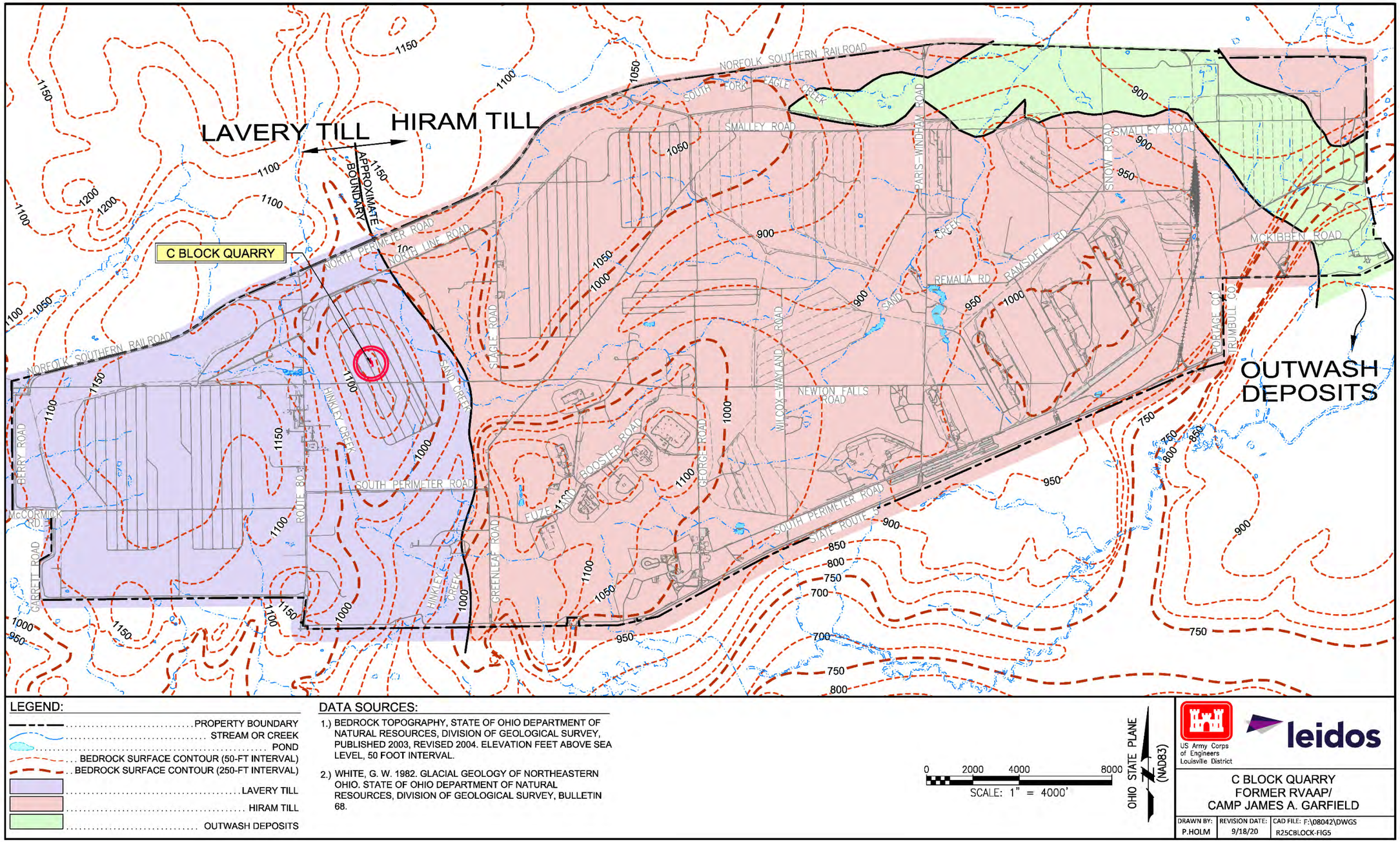

Figure 5. Geologic Map of Unconsolidated Deposits on Camp James A. Garfield

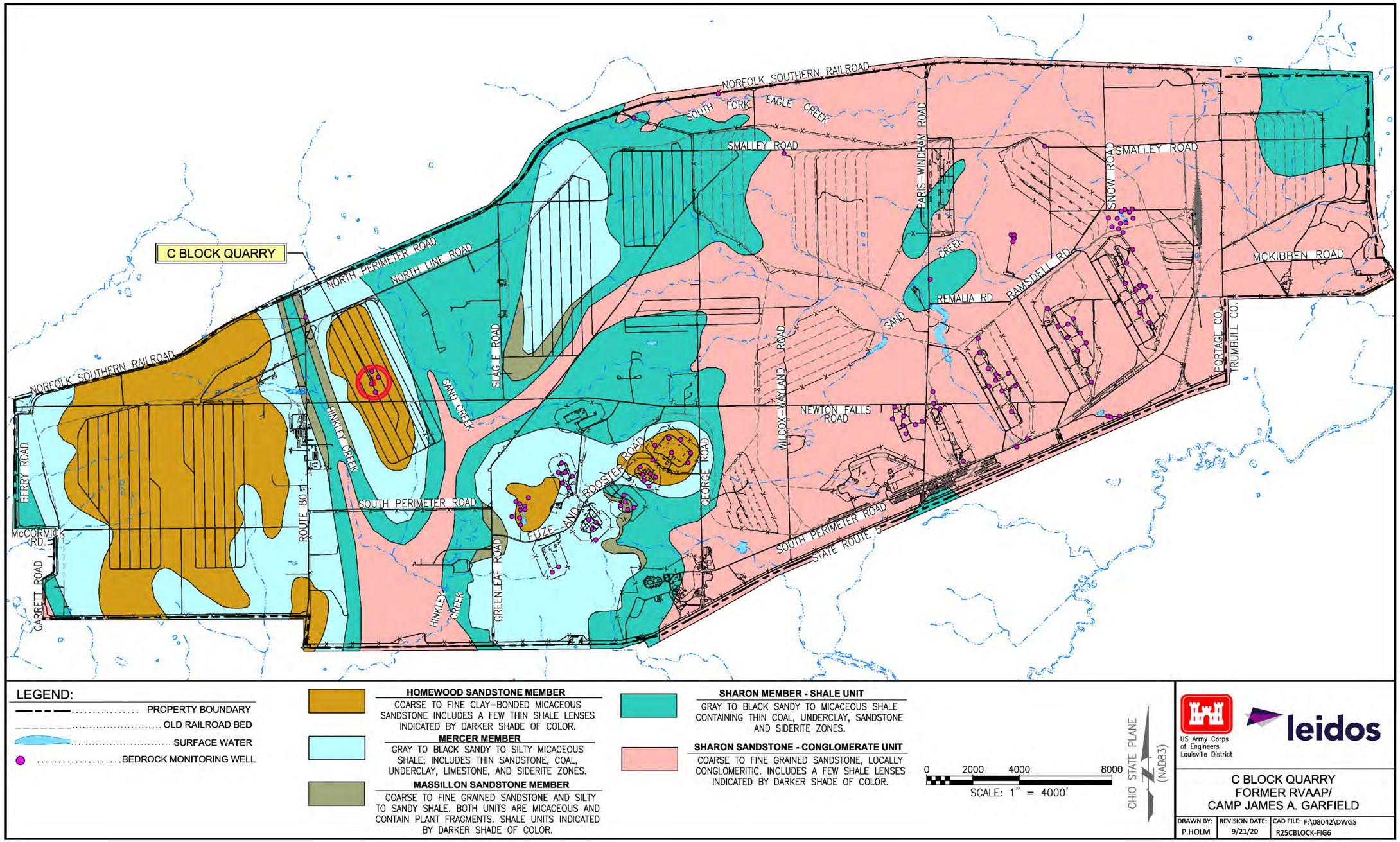

Figure 6. Geologic Bedrock Map and Stratigraphic Description of Units on Camp James A. Garfield

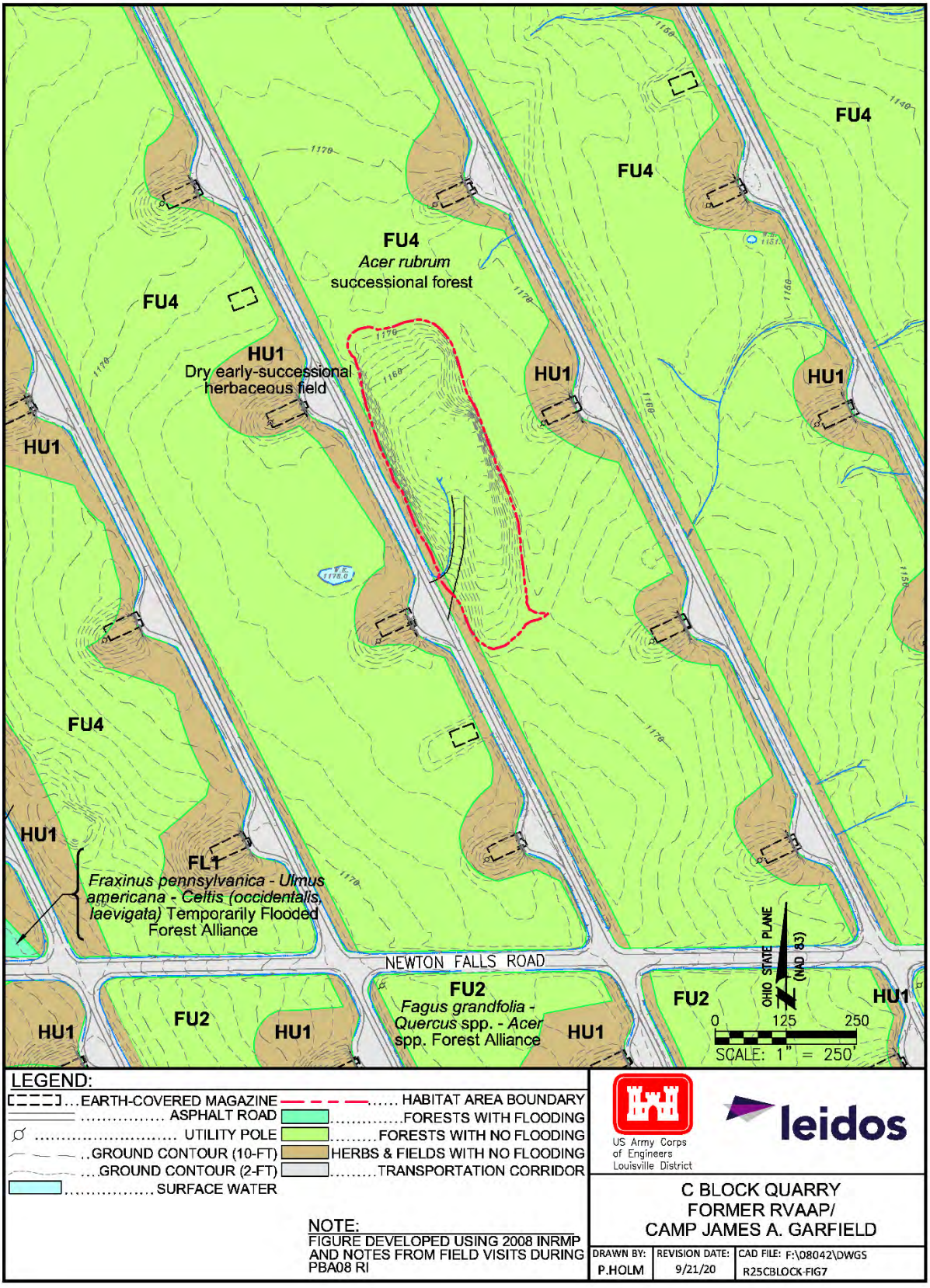

Figure 7. Natural Resources Inside and Near the Habitat Area at C Block Quarry

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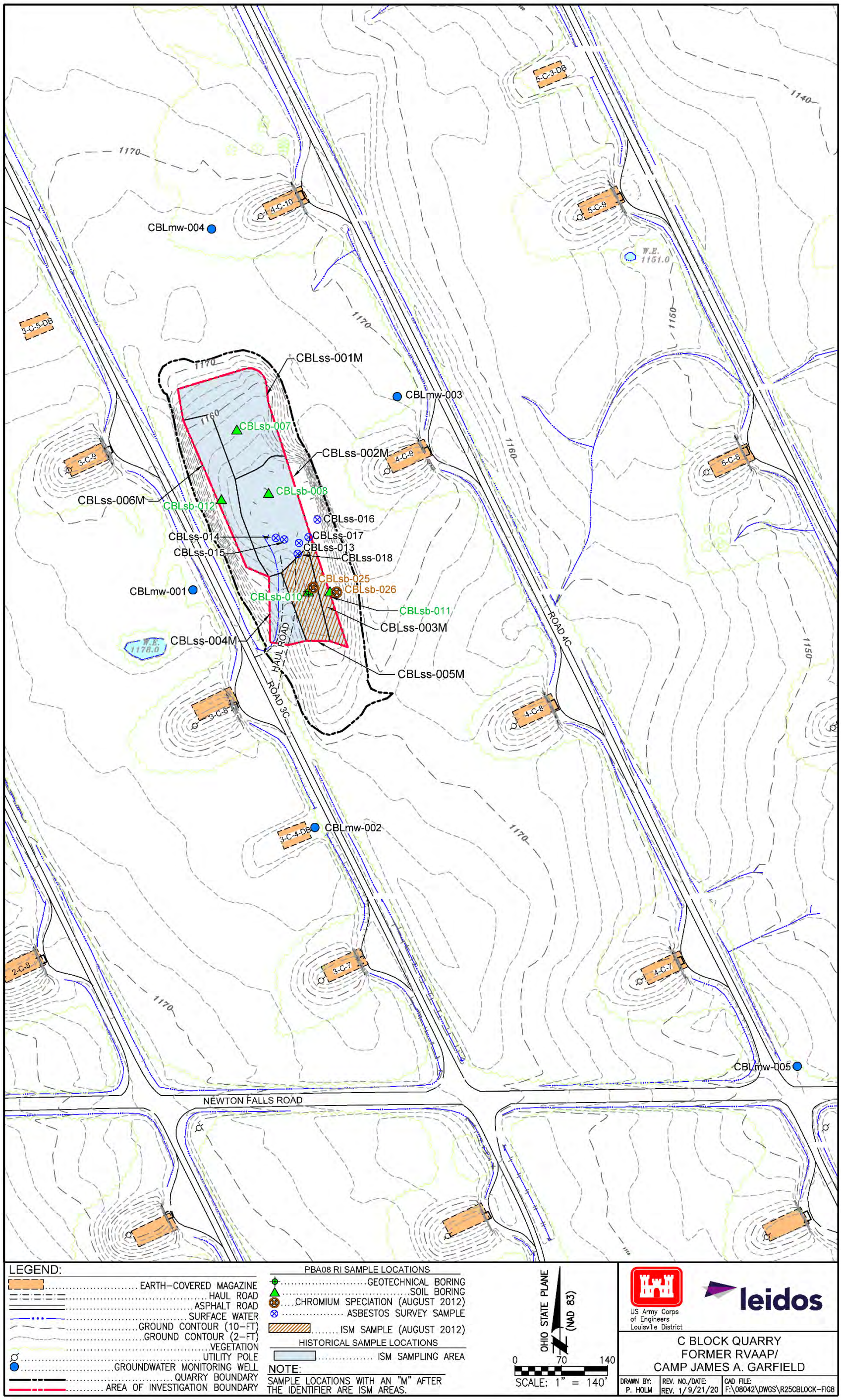

Figure 8. C Block Quarry Remedial Investigation Sampling Locations

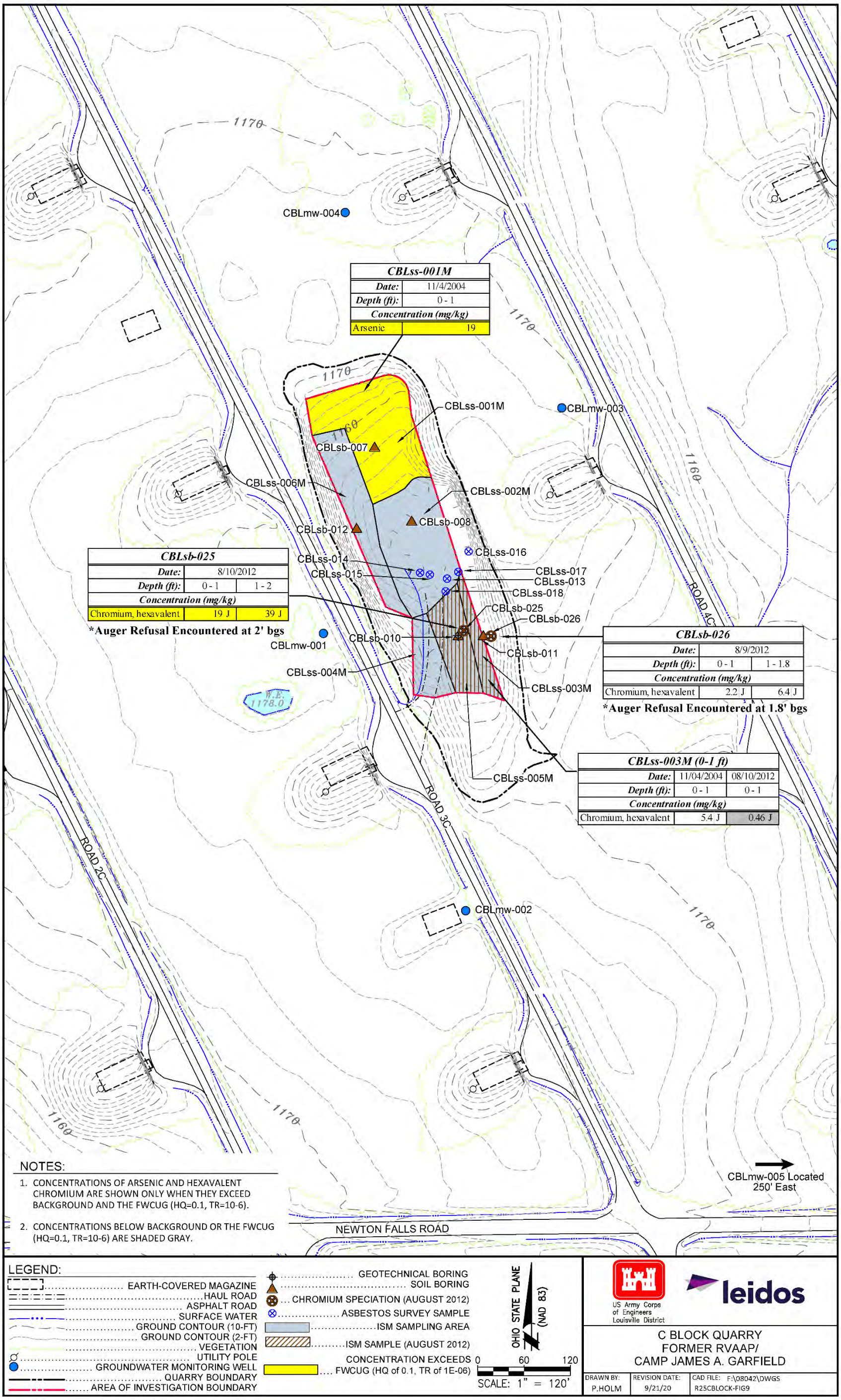

Figure 9. Exceedances of FWCUG (HQ of 0.1, TR of 1E-06) for Arsenic and Hexavalent Chromium in Soil

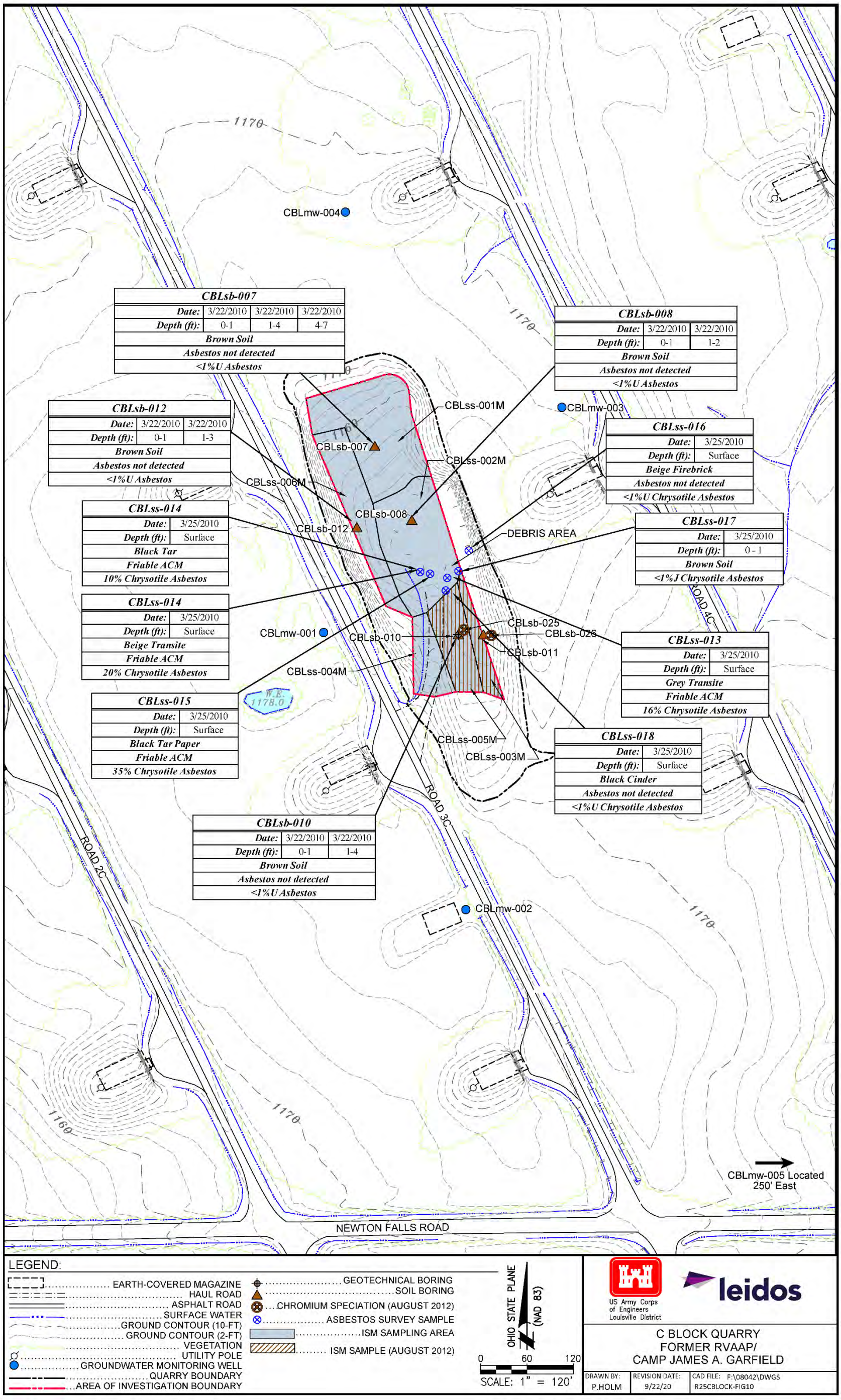

Figure 10. Asbestos-Containing Material Survey and Sampling Results

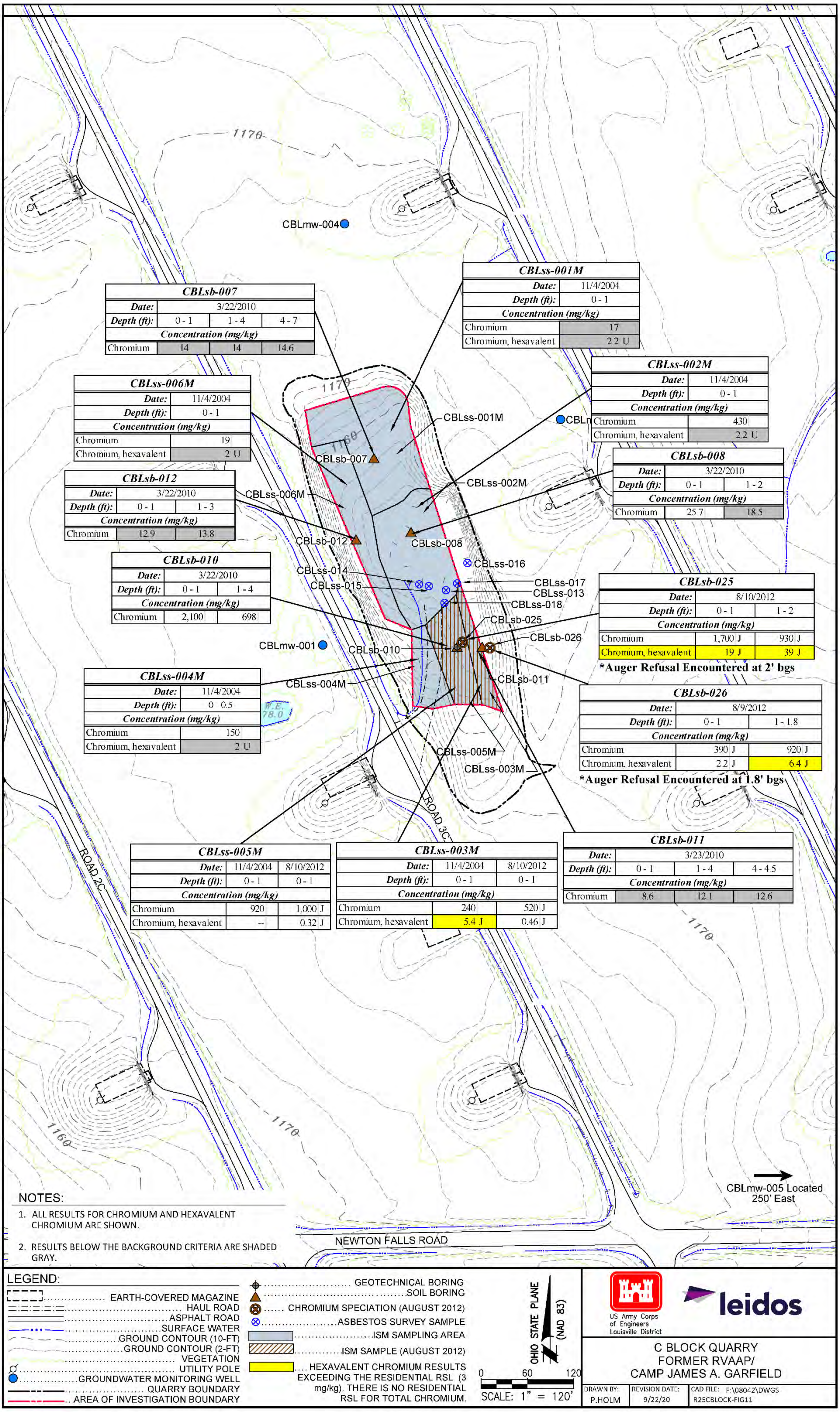

Figure 11. Total Chromium and Hexavalent Chromium Results in Soil Samples

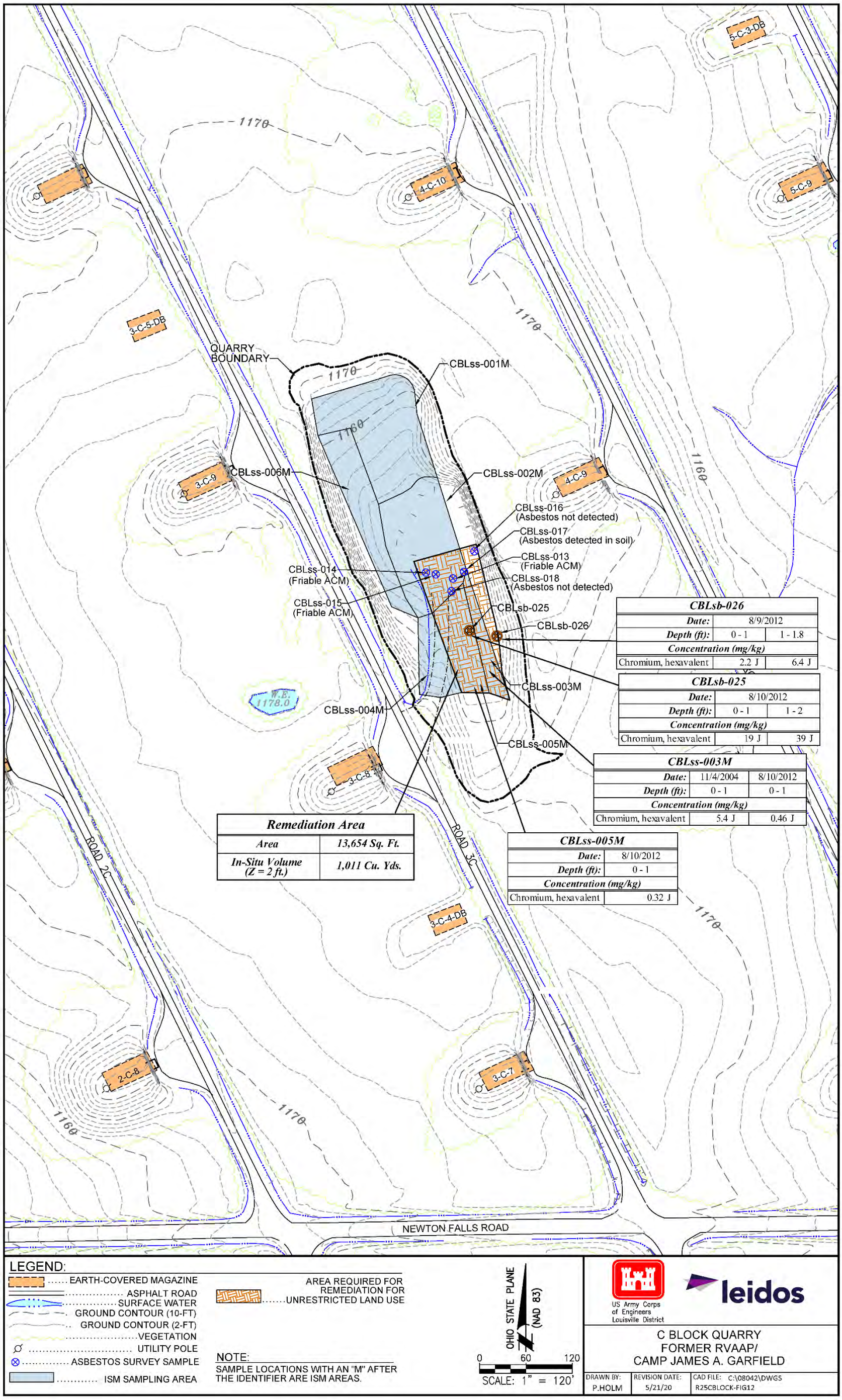

Figure 12. Estimated Extent of Soil Requiring Remediation

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APPENDIX A

Applicable or Relevant and Appropriate Requirements (ARARs)

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Table A-1. Potential Action-Specific ARARs

Medium and Citation	Description of Requirement	Potential ARAR Status	Standard
NESHAP standard for demolition and renovation 40 CFR 61.145	This rule establishes compliance procedures for demolition and renovation activities in the presence of asbestos and includes restrictions for the emission of fugitive dust.	Applies to sites in which asbestos abatement activities will occur and may have associated fugitive emissions (non-stack) of dust.	The owner or operator of a demolition or renovation activity must: 1. Provide written notice to the administrating agency prior to beginning construction activities. 2. Comply with procedures for asbestos emission control.
Asbestos construction standard 29 CFR 1926.1101	This rule regulates worker protection measures for all construction work involving asbestos, including demolition and renovation work practices, worker training, bagging of waste, and permissible exposure level.	Applies to workers who will remove ACM and workers who will provide construction oversight.	Work practices to minimize exposure to ACM must be implemented during construction work involving asbestos.
NESHAP standard for waste disposal for manufacturing, fabricating, demolition, renovation, and spraying operations 40 CFR 61.150	This rule establishes the standards for collection, processing, packaging, transportation, management, and disposal of ACM.	Applies to any activity that could result in discharge of visible emissions to the outside air during the collection, processing, packaging, transporting, or deposition of any asbestos-containing waste material.	The owner or operator of ACM waste must meet the following requirements: 1. Discharge no visible emissions to the outside air during the collection, processing, packaging, or transporting of any ACM waste generated by the source, or use an approved emission control. 2. Dispose of ACM waste as soon as practical by the waste generator. 3. Mark vehicles used to transport ACM waste with visible signs during loading and unloading. 4. Maintain specified waste shipment records. 5. Make all waste shipment records available upon request.

Table A-1. Potential Action-Specific ARARs (Continued)

Medium and Citation	Description of Requirement	Potential ARAR Status	Standard
Asbestos emission control OAC Section 3745-20-07	This rule establishes state standards for inactive asbestos waste disposal sites.	Applies to inactive asbestos waste disposal sites that could result in discharge of visible emissions to the outside air. Although the site is not considered an inactive waste disposal site, standards and requirements may be relevant and appropriate.	Discharge of visible emissions to the outside air from an inactive asbestos waste disposal site is prohibited or controls are required to prevent exposure of ACM.
DOT transportation of hazardous materials 49 CFR parts 171 and 172	This rule regulates the transportation of asbestos as a hazardous waste. Requires waste containment and shipping papers.	Applies to the off-site transportation of ACM waste from construction abatement activities.	An approved transporter of hazardous waste must travel with a waste manifest and have appropriate placards on the transportation vehicle, if required.
Hazardous waste determination 40 CFR 262.11	These rules require that a generator determine whether a material generated is a hazardous waste.	Applies to any material that is or contains a solid waste. Must be characterized to determine whether the material is or contains a hazardous waste.	Any person that generates a waste as defined must use prescribed methods to determine if the waste is considered characteristically hazardous using the prescribed methods.
Hazardous waste management (RCRA) 40 CFR 264.171-175	These rules require that hazardous waste be properly packaged, labeled, marked, and accumulated on-site pending on- or off-site disposal.	Applies to any hazardous waste or medium containing a hazardous waste that is generated from on-site activities.	All hazardous waste must be accumulated in a compliant manner. This includes proper marking, labeling, and packaging such waste in accordance with the specified regulations. Containers or container areas will be inspected where hazardous waste is accumulated on-site.

Table A-1. Potential Action-Specific ARARs (Continued)

Medium and Citation	Description of Requirement	Potential ARAR Status	Standard
Soil contaminated with RCRA hazardous waste 40 CFR 268.40-49	These rules prohibit land disposal of RCRA hazardous waste subject to them, unless the waste is treated to meet certain standards that are protective of human health and the environment. Standards for treating hazardous waste-contaminated soil prior to disposal are set forth in the two cited rules. Using the greater of either technology-based standards or UTS is prescribed.	LDRs apply only to RCRA hazardous waste. This rule is considered for ARAR status only upon generating a RCRA hazardous waste. If any soil is determined to be hazardous under RCRA and if it will be disposed of on-site, this rule is potentially applicable to disposal of the soil.	All soil subject to treatment must be treated as follows: 1. For non-metals (except carbon disulfide, cyclohexanone, and methanol), treatment must achieve 90% reduction in total constituent concentration (primary constituent for which the waste is characteristically hazardous, as well as for any organic or inorganic UHC), subject to item 3 below. 2. For metals and carbon disulfide, cyclohexanone, and methanol, treatment must achieve 90% reduction in constituent concentrations as measured in leachate from the treated media (tested according to the TCLP) or 90% reduction in total constituent concentrations (when a metal removal treatment technology is used), subject to item 3 below. 3. When treating any constituent subject to achieve a 90% reduction standard would result in a concentration less than 10 times the UTS for that constituent, treatment to achieve constituent concentrations less than 10 times the UTS is not required. This is commonly referred to as “90% capped by 10 × UTS.”

Table A-1. Potential Action-Specific ARARs (Continued)

Medium and Citation	Description of Requirement	Potential ARAR Status	Standard
Soil/debris contaminated with RCRA hazardous waste – variance from a treatment standard 40 CFR 268.44	The Ohio EPA Director will recognize a variance approved by the USEPA from the alternative treatment standards for hazardous contaminated soil or hazardous debris.	Potentially applicable to RCRA hazardous soil or debris that is generated and placed back into a unit and that will be disposed of on-site.	A site-specific variance from the soil treatment standards that can be used when treating concentrations of hazardous constituents higher than those specified in the soil treatment standards, minimizing short- and long-term threats to human health and the environment. In this way, on a case-by-case basis, risk-based LDR treatment standards approved through a variance process could supersede the soil treatment standards.

ACM = Asbestos-Containing Material
ARAR = Applicable or Relevant and Appropriate Requirement
CFR = Code of Federal Regulations
DOT = U.S. Department of Transportation
LDR = Land Disposal Restriction
NESHAP = National Emission Standards for Hazardous Air Pollutants
OAC = Ohio Administrative Code
Ohio EPA = Ohio Environmental Protection Agency
RCRA = Resource Conservation and Recovery Act
TCLP = Toxicity Characteristic Leaching Procedure
UHC = Underlying Hazardous Constituent
USEPA = U.S. Environmental Protection Agency
UTS = Universal Treatment Standard

APPENDIX B

Affidavits

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Affidavit of Publication, Tribune Chronicle, August 16, 2020 and August 23, 2020

PUBLIC NOTICE

Proposed Plans for Atlas Scrap Yard and C Block Quarry at the Former Ravenna Army Ammunition Plant (RVAAP) Available for Public Comment

The Proposed Plans for two Areas of Concern at the former RVAAP are available for public comment. The Atlas Scrap Yard Proposed Plan presents two recommendations: 1) Excavation, Stabilization, and Off-site disposal of lead-contaminated soil; and 2) Ex-situ Thermal Treatment of PAH-contaminated soil. The Proposed Plan for C-Block Quarry presents a recommendation of Surficial Asbestos-Containing Material (ACM) Removal and Land Use Controls (LUCs). Each Proposed Plan provides the rationale for these recommendations.

The Proposed Plans are available at www.rvaap.org and the information repositories listed below:

Newton Falls Public Library
204 South Canal Street
Newton Falls, Ohio 44444

Reed Memorial Library
167 East Main Street
Ravenna, Ohio 44266

Please join us for an OPEN HOUSE and PUBLIC MEETING.

The Army National Guard will host an informational open house and a public meeting to explain the recommendations in the Proposed Plans. Oral and written comments will be accepted at the meeting. Written comments may also be mailed to the Camp James A. Garfield Environmental Office: 1438 State Route 534 SW, Newton Falls, OH 44444. Comments will be accepted during the public comment period from August 17, 2020 to September 15, 2020.

Due to COVID-19 safety precautions, face coverings are mandatory and social distancing will be observed. The public meeting will be held at an outdoor pavilion (weather permitting) or alternate location within Camp James A. Garfield. Once you arrive at Camp James A. Garfield, the guard will provide directions to the meeting venue.

The public meeting is scheduled for:

Wednesday August 26, 2020 at: **Camp James A. Garfield (Main Entrance)**
5:00 pm Open House 8451 State Route 5
5:30 pm Public Meeting Ravenna, OH 44266

For more information or if you need special accommodations to attend, please contact Katie Tait at 614-336-6136.

#5284

#229-2T-August 16 & 23, 2020

PROOF OF PUBLICATION

STATE OF OHIO
TRUMBULL COUNTY SS: CONNIE PACEK

BEING DULY SWORN, UPON OATH STATES THAT SHE IS AN AUTHORIZED REPRESENTATIVE OF EASTERN OHIO NEWSPAPERS INC , PUBLISHERS OF THE TRIBUNE CHRONICLE AND THE VINDICATOR (an edition of the Tribune Chronicle), NEWSPAPERS PRINTED AND IN THE GENERAL CIRCULATION OF TRUMBULL, MAHONING, COLUMBIANA COUNTIES IN OHIO AND IN MERCER COUNTY IN PENNSYLVANIA.

THE ATTACHED ADVERTISEMENT WAS PUBLISHED IN

Y THE TRIBUNE CHRONICLE
Y THE VINDICATOR

EVERY: SUNDAY

FOR TWO CONSECUTIVE WEEKS AND

THAT THE FIRST INSERTION WAS ON SUNDAY

THE 16th DAY OF AUGUST 2020

CONNIE PACEK

SWORN TO BEFORE ME AND SUBSCRIBED IN MY PRESENCE ON THIS

26TH DAY OF August 2020

NOTARY PUBLIC

SEAL

LAWRENCE J. KOVACH, Notary Public
STATE OF OHIO
MY COMMISSION EXPIRES SEPTEMBER 23, 2022

ADVERTISING COST $ 724.84

Affidavit of Publication, Record-Courier, August 16 , 2020 and August 23, 2020

31193093

Proof of Publication
Record Publishing Company
1050 W. Main Street,
Kent, OH 44240
Phone (330) 541-9400
Fax (330) 673-6363

I, Teresa Smilam being first duly sworn depose and say that I am Advertising Clerk of
Record Publishing Company

30 Record-Courier a newspaper printed and published in the city of Kent, and of General circulation in the County of Portage, State of Ohio, and personal knowledge of the facts herein stated and that the notice hereto annexed was Published in said newspapers for 2 insertions on the same day of the week from and after the 16th day of August, 2020 and that the fees charged are legal.

Teresa S Milam

Name of Account: Leidos
Ad Number: 12665977
No. of Lines: 28

Day(s) Published: 08/16, 08/23.
Printers Fee: $240.40

Sworn to and subscribed before this 25th day of August, 2020.

Elizabeth McDaniel
Notary Public
Commission Expires June 19, 2021

Public Notice

Proposed Plans for Atlas Scrap Yard and C Block Quarry at the Former Ravenna Army Ammunition Plant (RVAAP) Available for Public Comment

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5:00 pm Open House	8451 State Route 5
5:30 pm Public Meeting	Ravenna, OH 44266

RC, Aug 16, 23, 2020, 12665977

For more information or if you need special accommodations to attend, please contact Katie Tait at 614-336-6136.

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APPENDIX C

Ohio EPA Comments

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Ohio Environmental Protection Agency

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

February 3, 2022

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
267000859113

Subject: **Response to Ohio EPA Comments on 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 December 21, 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 "Response to Ohio EPA Comments on 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," dated December 21, 2021. These response to comments were prepared by the United States Army Corps of Engineers (USACE) on behalf of the Army National Guard by Leidos under Contract No. W912QR-21-D-0016.

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

At 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.

Sincerely,

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

ec: Nat Peters, USACE Louisville
Katie Tait, OHARNG RTLS
Steven Kavaal, 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, Legal

KMP/ams

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

December 21, 2021

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

Subject: Ravenna Army Ammunition Plant (RVAAP) Restoration Program, Portage/Trumbull Counties, RVAAP-06 C Block Quarry, Draft Record of Decision (Work Activity No. 267-000-859-113)

Dear Mr. D'Amato:

The Army appreciates your comments on the Draft Record of Decision for Soil, Sediment, and Surface Water at RVAAP-06 C Block Quarry. 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,

TAIT.KATHRYN.SERENA.1289508275
Digitally signed by TAIT.KATHRYN.SERENA.1289508275
Date: 2021.12.23 07:34:21 -05'00'

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
Megan Oravec, Ohio EPA, NEDO, DERR
Thomas Schneider, Ohio EPA, SWDO, DERR
William Damschroder, Ohio EPA, CO, Legal
Katie Tait, OHARNG, Camp James A. Garfield
Steve Kvaal, USACE Louisville
Nathaniel Peters, II, USACE Louisville
Jed Thomas, Leidos
Rebecca Shreffler, Chenega Tri-Services

Subject: Former Ravenna Army Ammunition Plant (RVAAP) Restoration Program, Portage/Trumbull Counties, RVAAP-06 C Block Quarry, Draft Record of Decision (Work Activity No. 267-000-859-113)

COMMENTS

Ohio EPA 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.

Army Response: Clarification and agree. The referenced sentence discusses actions taken to be protective of the Industrial Receptor. The hexavalent chromium concentrations do not require an action to be taken for the site to be protective for the Industrial Receptor, only for the Resident Receptor. For further clarity, the paragraph has been revised as presented below:

"Alternative 2 consists of implementing LUCs to prevent Unrestricted (Residential) Land Use of the site and corresponding Resident Receptor exposure to hexavalent chromium and ACM. Additionally, surficial ACM will be removed and digging restrictions will be implemented to prevent Industrial Receptor exposure to ACM. No COCs requiring action were identified for the Industrial Receptor. The following subsections describe activities associated with this alternative."

Ohio EPA 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.

Army Response: Agree. The removal action will be confirmed by visual inspection, as previously performed during the Remedial Action at Ramsdell Quarry Landfill. The estimated total quantity is 10 cubic yards, with varying sizes of ACM that will be removed. The first paragraph of Section I.2.2 has been revised as follows:

"Alternative 2 will include the removal of ACM that was observed on the ground surface at C Block Quarry. An estimated total of 10 yd3 of exposed ACM (e.g., transite/shingle and steel panels with block insulation and paper) were observed to be in the surface soil at C Block Quarry. The sizes of individual pieces of ACM vary. As part of the ACM removal, the site will undergo a visual inspection by a Certified Asbestos Hazard Evaluation Specialist (CAHES) to ensure exposed ACM is identified and removed."

Ohio EPA Comment 3: Typographical. Page 6, paragraph 2, first sentence, line 200. The second word "states," should read "stakes."

Army Response: Agree. Text revised as recommended.

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.

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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

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