Final

Record of Decision
for Soil and Dry Sediment at the
Fuze and Booster Quarry Landfill/Ponds (RVAAP-16)

Ravenna Army Ammunition Plant
Ravenna, Ohio

September 2007

GSA Contract No. GS-10F-0076J
Delivery Order No. W912QR-05-F-0033

Prepared for:

US Army Corps of Engineers®

United States Army Corps of Engineers
Louisville District

Prepared by:

SAIC
From Science to Solutions

Science Applications International Corporation
8866 Commons Boulevard, Suite 201
Twinsburg, Ohio 44087

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LIST OF ACRONYMS

AOC	Area of Concern
ARAR	applicable and relevant or appropriate requirements
BGS	below ground surface
BRA	baseline risk assessment
BRAC	Base Realignment and Closure
CAMU	Corrective Action Management Unit
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CERCLIS	Comprehensive Environmental Response, Compensation, and Liability Act Information System
COC	constituent of concern
DoD	U. S. Department of Defense
DOT	U. S. Department of Transportation
EPC	exposure point concentration
FBQ	Fuze and Booster Quarry Ponds/Landfill
FS	Feasibility Study
HHRA	human health risk assessment
HI	Hazard Index
HQ	hazard quotient
IRP	Installation Restoration Program
LDR	Land Disposal Restrictions
LL12	Load Line 12
MEC	munitions and explosives of concern
MMRP	Military Munitions Response Program
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NGB	National Guard Bureau
OAC	Ohio Administrative Code
OHARNG	Ohio Army National Guard
Ohio EPA	Ohio Environmental Protection Agency
O&M	operation and maintenance
PPE	personal protective equipment
RAB	Restoration Advisory Board
RAO	remedial action objective
RCRA	Resource Conservation and Recovery Act
RD	remedial design
RI	Remedial Investigation
ROD	Record of Decision
RQL	Ramsdell Quarry Landfill
RTLS	Ravenna Training and Logistics Site
RVAAP	Ravenna Army Ammunition Plant
SAIC	Science Applications International Corporation

LIST OF ACRONYMS (continued)

SVOC	semivolatile organic compound
TERP	Transportation and Emergency Response Plan
UHC	underlying hazardous constituent
USACE	U. S. Army Corps of Engineers
USEPA	U. S. Environmental Protection Agency
UTS	Universal Treatment Standard
UXO	unexploded ordnance
VOC	volatile organic compound

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PART I: THE DECLARATION

A. SITE NAME AND LOCATION

This Record of Decision (ROD) addresses soil and dry sediment contaminants at the Fuze and Booster Quarry Landfill/Ponds (FBQ), Ravenna Army Ammunition Plant (RVAAP), Ravenna, Ohio (Figure 1). FBQ is identified in the Army Environmental Database for Restoration as RVAAP-16. The RVAAP is located in east-central Portage County and southwestern Trumbull County, Ohio, approximately 4.8 km (3 miles) east-northeast of the city of Ravenna and approximately 1.6 km (1 mile) northeast of the city of Newton Falls. The FBQ Area of Concern (AOC) is located in the south-central portion of the RVAAP. The Comprehensive Environmental Response, Compensation, and Liability Act Information System (CERCLIS) Identifier for the RVAAP is OH5210020736.

B. STATEMENT OF BASIS AND PURPOSE

The U. S. Department of Army (US Army) is the lead agency and has chosen the selected remedy for FBQ soil and dry sediment 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 FBQ.

The Ohio Environmental Protection Agency (Ohio EPA), the lead regulatory agency, approved the *Final Feasibility Study (FS) for Fuze and Booster Quarry Landfill/Ponds at the Ravenna Army Ammunition Plant* (USACE 2006). This FS evaluated contaminated soil and dry sediment remedies at FBQ and recommended Alternative 3, Excavation of Soil/Dry Sediment and Offsite Disposal – National Guard Trainee Land Use. Ohio EPA concurs with the above recommendation. Excavation offsite disposal of contaminated soil and dry sediment at FBQ satisfies the requirements of the Ohio EPA Director's Final Findings and Orders, dated June 10, 2004 (Ohio EPA 2004).

C. ASSESSMENT OF THE SITE

The response action selected in this ROD is to protect public health, welfare, and the environment from actual or potential releases of hazardous substances into the environment.

D. DESCRIPTION OF THE SELECTED REMEDY

The selected remedy for FBQ is Excavation of Soil/Dry Sediment and Offsite Disposal – National Guard Trainee Land Use. The selected remedy was one of several Alternatives evaluated (Part II, Section I) and involves the removal of chemical contaminants in soil and dry sediment at FBQ that exceed the clean-up goals for the most reasonably anticipated land use (National Guard Trainee).

Other land uses were evaluated; however the selected remedy addresses risks to the National Guard Trainee.

This selected remedy also removes chemical contaminants in soil that exceed clean-up goals for the Resident Subsistence Farmer. The clean-up goals for the National Guard Trainee at FBQ are more stringent than the Resident Subsistence Farmer.

Soil and dry sediment will be disposed at an offsite facility licensed and permitted to accept these wastes. An estimated 68 yd^3 (in-situ) of contaminated soil and dry sediment will require excavation. Confirmation sampling will be conducted to determine whether clean-up goals have been attained. Areas successfully remediated will be backfilled with clean soil. Alternative 3 does not include land use controls, CERCLA five-year reviews, or operation and maintenance (O&M) sampling, as residential land use clean-up goals are attained through remedial actions conducted under this remedial alternative. However, land use controls to address any issues with respect to munitions and explosives of concern (MEC) may be required and will be implemented by the US Army and OHARNG under the Military Munitions Response Program (MMRP).

E. STATUTORY DETERMINATION

The selected remedy is protective of 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 utilizes permanent solutions to the maximum extent practicable.

The remedy does not satisfy the statutory preference for treatment. The treatment technologies evaluated for soil were not found to be feasible for implementation at FBQ. Some treatment technologies were not consistent with the anticipated future land use.

Because this remedy will attain clean-up goals allowing for unrestricted (residential) land use, five-year reviews will not be required, which is compliant with CERCLA Section 121(c).

F. RECORD OF DECISION DATA CERTIFICATION CHECKLIST

Table 1 provides the location of key remedy selection information contained in ROD Part II, Decision Summary. Additional information can be found in the Administrative Record file for FBQ.

Table 1. ROD Data Certification Checklist

ROD Data Checklist Item	ROD Section	Page
COCs and their respective concentrations	II.G	9
Baseline risk represented by the COCs	II.G	9
Clean-up goals established for COCs and the basis for these goals	II. H	12
How source materials constituting principal threats are addressed	II.K	17
Current and reasonably anticipated future land use assumptions used in the baseline risk assessment and ROD	II.F	9
Suitable potential land uses following the selected remedy	II.L.4	20
Estimated capital, annual O&M, and the total present worth costs, discount rate, and the number of years over which the remedy cost estimates are projected	II.J.7 II.L.3	16 19
Key factor(s) that led to selecting the remedy	II.L.1	18

COC – Constituent of concern.
O&M – Operation and Maintenance.
ROD – Record of Decision.

G. AUTHORIZING SIGNATURES AND SUPPORT AGENCY ACCEPTANCE OF REMEDY

Thomas E Lederle
Tom Lederle
~~Division Chief~~ BRANCH Chief
Base Realignment and Closure Division (BRACD)

30 Oct 2007
Date

Christopher Korleski
Director
Ohio Environmental Protection Agency

1/28/08
Date

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PART II: DECISION SUMMARY

A. SITE NAME, LOCATION, AND DESCRIPTION

FBQ was identified as an AOC at the RVAAP in the Preliminary Assessment (USACE 1996). When the RVAAP Installation Restoration Program (IRP) began in 1989, the RVAAP (CERCLIS Identification Number OH5210020736) was identified as a 21,419-acre installation. The property boundary was resurveyed by the Ohio Army National Guard (OHARNG) over a 2-year period (2002 and 2003) and the actual total acreage of the property was found to be 21,683 acres. As of February 2006, a total of 20,403 acres of the former 21,683 acre RVAAP have been transferred to the National Guard Bureau (NGB) and subsequently licensed to OHARNG for use as a military training site. The current RVAAP consists of 1,280 acres scattered throughout the OHARNG Ravenna Training and Logistics Site (RTLS).

The RTLS is in northeastern Ohio within Portage and Trumbull counties, approximately 4.8 km (3 miles) east-northeast of the city of Ravenna and approximately 1.6 km (1 mile) northwest of the city of Newton Falls. RVAAP portions of the property are solely located within Portage County. The RTLS/RVAAP is a parcel of property approximately 17.7 km (11 miles) long and 5.6 km (3.5 miles) wide bounded by State Route 5, the Michael J. Kirwan Reservoir, and the CSX System Railroad on the south; Garret, 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). The RTLS is surrounded by several communities: Windham on the north; Garrettsville 9.6 km (6 miles) to the northwest; Newton Falls 1.6 km (1 mile) to the southeast; Charlestown to the southwest; and Wayland 4.8 km (3 miles) to the south.

When the RVAAP was operational the RTLS did not exist and the entire 21,683-acre parcel was a government-owned, contractor-operated industrial facility. The RVAAP IRP encompasses investigation and clean-up of past activities over the entire 21,683 acres of the former RVAAP. References to the RVAAP in this document include the historical extent of the RVAAP, consisting of the combined acreages of the current RTLS and RVAAP, unless otherwise specifically stated.

The only activities still being carried out at the RVAAP are environmental restoration, ordnance clearance and infrequent demolition of any unexploded ordnance (UXO) discovered during investigation and remediation activities, and building decontamination and demolition.

FBQ, designated as RVAAP-16, encompasses approximately 45 acres in the south-central part of RVAAP (Figures 2 and 3).

The US Army is the lead agency for any remediation, decisions, and any applicable clean-up at the FBQ. These activities are being conducted under the IRP. The Ohio EPA is the lead regulatory agency.

B. SITE HISTORY AND ENFORCEMENT ACTIVITIES

The RVAAP was constructed in 1940 and 1941 for depot storage and ammunition assembly/loading and placed on standby status in 1950. Production activities resumed from 1954 to 1957 and 1968 to 1972. Demilitarization activities, including disassembly of munitions and explosives melt-out and recovery, continued until 1992.

FBQ was initially a stone and ballast quarry for the RVAAP and began operation in 1945. The western part of FBQ contains 11 small, shallow settling basins, and the abandoned rock quarry is located in the eastern portion. After quarry operations ceased, the quarry was reportedly used for open burning and as a landfill before 1976. The debris resulting from landfill operations was reportedly removed during construction of three settling ponds (quarry ponds) in 1976. These quarry ponds, up to 20 to 30 ft deep and separated by earthen berms, were constructed to receive spent brine regenerate and sand filtration backwash water discharge from one of the RVAAP potable water treatment plants. The discharge was regulated under a National Pollutant Discharge Elimination System permit and continued until 1993.

The following investigations have been completed for FBQ:

- *Phase I/Phase II Remedial Investigation Report of the Fuze and Booster Quarry Landfill/Pond (RVAAP-16) at the Ravenna Army Ammunition Plant, Ravenna, Ohio* (USACE 2005a); and
- Supplemental Phase II Remedial Investigation (RI) included in the *Feasibility Study for Fuze and Booster Quarry Landfill/Ponds (RVAAP-16), Ravenna Army Ammunition Plant, Ravenna, Ohio*, (USACE 2006).

C. HIGHLIGHTS OF COMMUNITY PARTICIPATION

Using the RVAAP community relations program, the US Army and Ohio EPA have interacted with the public through news releases, public meetings, reading materials, direct mailings, an internet website, and receiving and responding to public comments. Specific items of the community relations program include the following:

Restoration Advisory Board (RAB): The US Army established a RAB in 1996 to promote community involvement in the U. S. Department of Defense (DoD) environmental clean-up activities and allow the public to review and discuss the progress with decision makers. RAB meetings are held every two months and are open to the public.

The RVAAP Community Relations Plan: The RVAAP Community Relations Plan (USACE 2003) was prepared to establish processes to keep the public informed of activities at the RVAAP. The plan is available in the Administrative Record at the RVAAP.

The RVAAP Internet Website: The US Army established an internet website in 2004 for the RVAAP. This internet website is accessible to the public at www.rvaap.org.

In accordance with Section 117(a) of CERCLA and Section 300.430(f)(2) of the NCP, the US Army released the *Proposed Plan for Soil and Dry Sediment at Fuze and Booster Quarry Landfill/Ponds (RVAAP-16)* (USACE 2007) to the public on April 4, 2007. The Proposed Plan and other project-related documents were made available to the public in the Administrative Record maintained at the RVAAP 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 the media outlets: radio stations, television stations, and newspapers (*Newton Falls Press, Youngstown Vindicator, Warren Tribune-Chronicle, Akron Beacon Journal, and Ravenna Record Courier*), as specified in the RVAAP Community Relations Plan (USACE 2003). The notice of availability initiated the 30-day public comment period from April 4, 2007 to May 3, 2007.

The US Army held a public meeting on April 10, 2007 at the Newton Falls Community Center to present the Proposed Plan to the public. At this meeting, representatives of the US Army provided information and answered questions about soil and dry sediment contamination at FBQ. A transcript of the public meeting is available to the public and has been included in the Administrative Record. Responses to the verbal comments received at this meeting are included in the Responsiveness Summary, which is Part III of this ROD. No additional written comments were received during the public comment period.

The US Army considered public input from the public meeting on the Proposed Plan in selecting the remedial alternative to be used for soil and dry sediment at FBQ.

D. SCOPE AND ROLE OF RESPONSE ACTIONS WITHIN SITE STRATEGY

The overall program goal of the IRP is to clean up previously-contaminated lands to reduce contamination to concentrations that are not anticipated to cause risks at the RVAAP, with primary emphasis on those areas that may impact human health and environment. FBQ is one of 51 AOCs at the RVAAP. This ROD addresses soil and dry sediment and does not address other potentially-contaminated media in FBQ. The selected remedy described in the ROD is consistent with the stated future action(s) to be performed at the RVAAP. Other media at FBQ and other AOCs at the RVAAP will be managed as separate actions or decisions by the US Army and will be considered under separate RODs.

This ROD addresses the soil and dry sediment at FBQ. The contamination present at FBQ poses a potential risk to human health because the COC concentrations exceeded the clean-up goals. Implementation of the remedy described in this ROD will address these risks at FBQ through removal and offsite disposal of contaminated soil.

E. SUMMARY OF SITE CHARACTERISTICS

Characteristics, nature and extent of contamination, and the conceptual site model of FBQ are based on the RIs conducted from 2005 through 2006 (USACE 2005a and USACE 2006).

E.1 Topography/Physiography

General elevation across FBQ varies from 1,088 ft at the eastern side to 1,160 ft above mean sea level on the western side Cultural features at FBQ include gravel access roads, three large settling ponds on the eastern portion of the AOC, and eleven small, shallow settling basins located in the western portion of FBQ. Surface soils adjacent to the ponds and in the central area of FBQ were removed during quarrying operations. Portions of FBQ generally to the north and west were not disturbed and remain as mature hardwood forest. The disturbed areas are characterized by scrub vegetation and immature hardwood trees.

E.2 Geology

The regional geology at the RVAAP consists of horizontal to gently dipping bedrock strata of Mississippian and Pennsylvanian age overlain by varying thicknesses of unconsolidated glacial deposits. FBQ is underlain by weathered, fractured, fine- to medium-grained orthoquartzite sandstone of the Sharon Conglomerate unit of the Pottsville Formation. Soil cover at FBQ varies widely due to past disturbance. In the vicinity of the quarry, soil cover is thin or absent. Deeper soil cover consisting of poorly drained silty clay loam exists in the central and west portions of FBQ.

E.3 Hydrogeology

The water table at FBQ typically ranges from approximately 4 to 40 ft below the surface. The general groundwater flow pattern in most of FBQ is from the northeast to the southwest, which mimics the topography and surface water drainage patterns. The quarry ponds intersect the groundwater table and influence the water table elevations in this portion of FBQ. Results of slug tests performed during the RI reveal moderate hydraulic conductivities in the unconsolidated materials in the central and western portions of the AOC ranging from 2.5×10^{-5} to 3.3×10^{-3} cm/sec.

The southern two quarry settling ponds are filled with water year round. Water is typically present in the northern settling pond; however, water levels can vary widely and sometimes no water is present during very dry periods. Surface water flows from the northernmost quarry pond through gated culverts to the middle pond, and then into the southernmost pond. Surface water exits the southern pond through a culvert to a ditch at the southwest corner of the pond. This ditch leads west through the area encompassing the eleven shallow settling basins and flow eventually exits FBQ via a culvert located at the southwest corner. Drainage off of FBQ eventually flows into Hinkley Creek, which exits the RVAAP in the southwest portion of the installation.

E.4 Ecology

Habitats at FBQ include old-field communities with vegetation corridors and small and large patches of forest vegetation. The three quarry ponds, totaling 2.9 acres, are the primary aquatic habitats at FBQ. Two small drainages totaling 0.5 acres are located in the central portion of FBQ. The 11 small settling basins total 1.2 acres. The settling basins are generally dry except during precipitation events. These habitats support a variety of wildlife, including small mammals, birds, fish, and insects. There are currently no federally-listed species or critical habitats on RVAAP property. State-threatened, State-endangered, State-listed Species of Concern, and State Special Interest Species have been identified at the RVAAP, but none have been documented at FBQ.

E.5 Nature and Extent of Contamination

Contamination identified in soil at FBQ is primarily confined to between 0 and 3 ft below ground surface (BGS). In the central portion of the AOC, soil cover is very thin due to past disturbances. Contaminants identified in soil included explosive and propellant compounds, metals, and some residual semivolatile organic compounds (SVOCs) and volatile organic compounds (VOCs). Most detected contaminants are located northeast of the quarry ponds.

E.6 Contaminant Fate and Transport

Groundwater contaminant migration was modeled as part of the FS. Modeling included evaluation of potential leaching of contaminants from soil to groundwater. Also, the potential for contaminants to migrate from sources to the FBQ boundary was evaluated. Six soil contaminants were identified by the modeling to have the potential to leach from soil to groundwater. None of these contaminants were predicted by the modeling results to migrate beyond the AOC boundary at concentrations above risk-based concentrations or drinking water maximum contaminant levels.

F. CURRENT AND POTENTIAL FUTURE LAND USES

The US Army intends to transfer FBQ to NGB once remedial actions are complete. OHARNG plans to use FBQ for military training. Specifically, this area will be used for mounted training, no digging, which includes operation of wheeled and tracked vehicles.

Although it is not reasonably anticipated that FBQ is a candidate for unrestricted land use, the selected remedy achieves cleanup goals for the Resident Subsistence Farmer and no land use controls with respect to chemical contamination in soil will be required.

G. SUMMARY OF SITE RISKS

The Baseline Risk Assessment (BRA) evaluated potential risks from current and predicted future exposures to soil and dry sediment contaminants at FBQ. The BRA examined human and ecological receptors. The BRA identified the exposure pathways, COCs, if any, and provided a basis for the

remedial decisions. This section of the ROD summarizes the results of the BRA for FBQ, specifically for soil and dry sediment, as presented in detail in the following documents located in the Administrative Record and Information Repositories:

- *Phase I/Phase II Remedial Investigation Report of the Fuze and Booster Quarry Landfill/Pond (RVAAP-16) at the Ravenna Army Ammunition Plant, Ravenna, Ohio*. (USACE 2005a); and
- *Feasibility Study for Fuze and Booster Quarry Landfill/Ponds (RVAAP-16), Ravenna Army Ammunition Plant, Ravenna, Ohio*. (USACE 2006) which includes results from the Supplemental Phase II RI (USACE 2005b).

G.1 Human Health Risk Assessment

A human health risk assessment (HHRA) evaluated potential risks from current and predicted future exposures to soil and dry sediment contaminants at FBQ (USACE 2005a). Only natural resource management activities are currently conducted on FBQ (i.e., no maintenance work or security checks). OHARNG plans to use FBQ for National Guard mounted training. The HHRA evaluated a National Guard Trainee, National Guard Dust/Fire Control Worker, Security Guard/Maintenance Worker, Hunter/Fisher, Resident Subsistence Farmer (adult and child), and Trespasser as receptors to address a range of possible future land uses.

The property will be retained by the U. S. Government (i.e., a federal facility) for use by the OHARNG for military training. The HHRA identified the National Guard Trainee as the representative receptor for the reasonably anticipated future land use. Three other receptors (National Guard Security Guard/Maintenance Worker, Hunter/Fisher, and Fire/Dust Suppression Worker) were also considered under the planned OHARNG future use. The National Guard Trainee is the most sensitive receptor under planned future land use. Potential exposures for the remaining three receptors are less than the National Guard Trainee and clean-up goals for the National Guard Trainee are also protective for these other receptors. The Resident Subsistence Farmer (adult and child) provided a full comparative range of risks for development and analysis of remedial alternatives. Risk information for other receptors is located in the HHRA (USACE 2005a) and FS (USACE 2006).

Arsenic and manganese were identified as constituents of concern (COCs) for the National Guard Trainee in FBQ deep surface soil (0 to 3 ft BGS) and dry sediment in the drainage ditch. Manganese was identified as a COC for dry sediment in the 11 small settling basins. Calculated risks from these two metals are primarily associated with the very high dust-loading factor and inhalation rate assumed for the National Guard Trainee.

Exposure point concentrations (EPCs) for these COCs in deep surface soil and in the 11 small settling basins did not exceed their respective background or clean-up goal concentrations. Therefore, these media do not require remediation for a National Guard Trainee land use. Likewise, the arsenic EPC in the drainage sediments did not exceed its clean-up goal. The manganese EPC in the drainage ditch was 4,100

mg/kg, which exceeded both background and the clean-up goal for the National Guard Trainee (1,950 mg/kg) and the Resident subsistence Farmer (2,900 mg/kg). Based on the risk evaluation, dry sediment within the drainage ditch is considered for remediation.

G.2 Ecological Risk Assessment Summary

The ecological risk assessment for FBQ evaluated the risk to ecological receptors from contaminants in soil, surface water, and wet sediment. Contaminants of potential ecological concern identified for these media include metals, explosives, SVOCs, pesticides, and VOCs. The FS (USACE 2006) presents a weight-of-evidence evaluation and recommends that no quantitative ecological clean-up goals be developed at FBQ. This weight-of-evidence includes field observations showing there are currently few adverse ecological effects at FBQ, remediation to meet human health clean-up goals will reduce overall contaminant concentrations and ecological risk, and any additional removal of soil and dry sediment to further reduce any adverse ecological effects would destroy habitat without substantial benefit to the ecological resources at FBQ.

G.3 Basis for Action Statement

Results of the risk assessment for FBQ indicate that exposure to dry sediment under current and anticipated future land use scenarios may result in unacceptable risks to human receptors, unless remediation is undertaken to reach established clean-up goals for the National Guard Trainee. The response action selected in this ROD is necessary to protect public health or welfare or the environment from actual or threatened releases of hazardous substances into the environment.

H. REMEDIAL ACTION OBJECTIVES

The remedial action objective (RAO) references clean-up goals and target risk levels that are considered protective of human health under current and reasonably anticipated future use scenarios. The RAO for this remedy is to prevent National Guard Trainee exposure to contaminants in soil and dry sediment that exceed clean-up goals to a depth of 4 ft BGS.

Soil and dry sediment to be cleaned up under the selected remedy extend to a maximum depth of 4 ft BGS because future land use will not require disturbance of soil below that depth. Table 2 presents the clean-up goals. The clean-up goal for manganese is the background concentration of this metal.

Table 2. COC and Clean-Up Goal for a National Guard Trainee for Dry Sediment at FBQ[a]

COC[b]	Clean-Up Goal (mg/kg)
Manganese	1,950[c]

[a]Sediment from the ditch.
[b]Total carcinogenic risk to a National Guard Trainee from contaminants in the ditch was calculated as 7.3E-06. The chemical hazard index was 12, which exceeds the target value of 1.
[c]Clean-up goal for the National Guard Trainee is more stringent than the clean-up goal for Resident Subsistence Farmer (2,900 mg/kg)
COC = Constituent of concern. FBQ = Fuze and Booster Quarry Landfill/Ponds.

I. DESCRIPTION OF ALTERNATIVES

The FS was prepared to develop and evaluate remedial alternatives for soil and dry sediment at FBQ based on the RI results. Four remedial alternatives were developed:

- Alternative 1: No Action;
- Alternative 2: Limited Action;
- Alternative 3: Excavation of Soils/Dry Sediments with Offsite Disposal – National Guard Trainee Land Use; and
- Alternative 4: Excavation of Soils/Dry Sediments with Offsite Disposal – Resident Subsistence Farmer Land Use.

This section includes a description of the various components of the four remedial alternatives identified in the FS, including land use controls and monitoring, removal, and disposal and handling.

I.1 Feasibility Study Alternative 1 – No Action

This remedial alternative provides no further remedial action and is required under NCP as a baseline for comparison with other remedial alternatives. Under this alternative, there is no reduction in toxicity, mobility, or volume of contaminated soil and dry sediment. Access restrictions and environmental monitoring would be discontinued. FBQ would have no legal, physical, or administrative land use controls. Environmental monitoring would not be performed. Five-year reviews would not be conducted in accordance with CERCLA 121(c).

I.2 Feasibility Study Alternative 2 – Limited Action

This remedial alternative involves the implementation of land use controls by the US Army and OHARNG to deter unauthorized access and protect human receptors, as well as periodic monitoring to detect any changes in the nature or extent of contamination at FBQ. Five-year reviews would be

conducted in accordance with CERCLA 121(c). The remedial alternative includes an O&M period to detect any changes in nature and extent of contamination at FBQ.

I.3 Feasibility Study Alternative 3 – Excavation of Soil/Dry Sediment with Offsite Disposal – National Guard Trainee Land Use

This remedial alternative involves the removal and transportation of chemical contaminants in dry sediment above National Guard Trainee land use clean-up goals and disposal offsite at a licensed disposal facility. Approximately 68 yd^3 (in-situ) of contaminated dry sediment would be excavated from the drainage ditch and transported to an offsite disposal facility licensed and permitted to accept these wastes. Confirmation sampling would be conducted to ensure National Guard Trainee land use clean-up goals have been achieved. Areas successfully remediated would be backfilled with clean soil.

Alternative 3 does not include land use controls, CERCLA five-year reviews, or O&M sampling, as residential land use clean-up goals are attained through remedial actions conducted under this remedial alternative. However, land use controls to address any issues with respect to MEC may be required and will be implemented by the US Army and OHARNG.

I.4 Feasibility Study Alternative 4 – Excavation of Soil/Dry Sediment with Offsite Disposal – Resident Subsistence Farmer Land Use

This remedial alternative involves the removal and transportation of chemical contaminants in dry sediment above Resident Subsistence Farmer land use clean-up goals and disposal offsite at a licensed disposal facility. Approximately 37 yd^3 of contaminated dry sediment would be excavated from the drainage ditch and transported to an offsite disposal facility licensed and permitted to accept these wastes. Confirmation sampling would be conducted to ensure Resident Subsistence Farmer land use clean-up goals have been achieved. Areas successfully remediated would be backfilled with clean soil and dry sediment, as appropriate. Alternative 4 does not include land use controls, CERCLA five-year reviews, or O&M sampling, as residential land use clean-up goals are attained through remedial actions conducted under this remedial alternative. However, land use controls to address any issues with respect to MEC may be required and will be implemented by the US Army and OHARNG.

J. SUMMARY OF COMPARATIVE ANALYSIS OF ALTERNATIVES

The alternatives were evaluated with respect to the nine comparative analysis criteria, as outlined by CERCLA (Table 3). The nine criteria are categorized into three groups: threshold criteria, primary balancing criteria, and modifying criteria. These criteria are 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 is available. Evaluated fully after public comment on the Proposed Plan.

8. State acceptance.
9. Community acceptance.

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 Applicable or Relevant and Appropriate Requirements – considers how a remedy will meet all 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 clean-up 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 Report, FS, and the Proposed Plan.

J.1 Overall Protection of Human Health and the Environment

This criterion must be met for an alternative to be considered for final selection. Alternative 1 (No Action) will not reduce the short- or long-term risks for human or environmental receptors from potential exposure to the COCs, and thus is not protective. Alternative 2 (Limited Action) does not

offer protectiveness because of its reliance entirely on land use controls. The remaining alternatives (Alternatives 3 and 4) provide long-term protection of human health by removing the source of potential human exposure through ingestion, inhalation, or contact. These alternatives also reduce the potential for migration of COCs from soil and dry sediment into surrounding media. Removing soil and dry sediment with concentrations of COCs exceeding clean-up goals will protect the National Guard Trainee, Trespasser (Adult and Juvenile), and the Resident Subsistence Farmer receptors in the long term.

J.2 Compliance with Applicable or Relevant and Appropriate Requirements

CERCLA Section 121 specifies that remedial actions must comply with requirements or standards under federal or more stringent state environmental laws that are "applicable or relevant and appropriate to the hazardous substances or particular circumstances at the site." There are no identified chemical-specific or location-specific ARARs for any of the four alternatives. Action-specific ARARs were identified for Alternatives 3 and 4. Each alternative could be designed and implemented to meet respective ARARs.

J.3 Long-Term Effectiveness and Permanence

Alternative 1 (No Action) is neither effective nor permanent in the long term. Alternative 2 (Limited Action – Land Use Controls) would offer some degree of protectiveness, but relies entirely on land use controls to protect human receptors from exposure to contaminated soil and dry sediments. Alternatives 3 and 4 are considered permanent and effective in the long term since the alternatives will result in achievement of clean-up goals at FBQ for residential land use.

J.4 Reduction of Toxicity, Mobility, or Volume through Treatment

None of the four alternatives include treatment as a principal element, and; therefore, offer no reduction in contaminant toxicity, mobility, or volume through treatment.

J.5 Short-Term Effectiveness

Short-term effectiveness addresses the period of time needed to implement the remedy and any adverse impacts that may be posed to workers, the community, and environment during construction and operation of the remedy until clean-up goals are achieved. No significant short-term human health risks are associated with Alternatives 1 (No Action) and 2 (Limited Action – Land Use Controls) beyond baseline conditions.

The short-term effectiveness of Alternatives 3 and 4 includes the potential for worker exposure during the excavation process, as well as the exposure to the community during transportation of soil and dry sediment. Workers would follow a health and safety plan and wear appropriate personal protective equipment (PPE) to minimize exposures. Mitigation measures would be used to minimize short-term impacts, such as erosion and dust control during construction.

Excavated soil and dry sediment will be transported by truck to a disposal facility. Risks will be mitigated during transport by inspecting vehicles before and after use, decontaminating when needed, covering the transported material, observing safety protocols, following pre-designated routes, and limiting the distance the waste is transported in vehicles. Transportation risks (e.g., from continuous leaks) increase with distance and volume. Transportation of contaminated materials to an offsite disposal facility would strictly comply with all applicable state and federal regulations. Pre-designated routes would be traveled and an emergency response program developed to facilitate accident response.

J.6 Implementability

No actions are proposed for Alternative 1. Alternative 2 (Limited Action – Land Use Controls) can be easily implemented. Access restrictions are currently in effect at FBQ and implementing additional AOC-specific land use controls would require minimal resources. Alternatives 3 and 4 are technically implementable. Excavation of contaminated soil and dry sediment, construction of temporary roads, and waste handling are conventional construction activities. Multiple disposal facilities are available that can accept generated waste. However, special engineering techniques may be required during construction activities to deal with potential MEC issues at FBQ. Post-action land use controls can easily be implemented.

J.7 Cost

Costs were estimated for comparison purposes only and are believed accurate within a range of -30% to +50%. The estimated present value cost (in base year 2005 dollars with a 3.1% discount factor) to complete each of the alternatives is presented in Table 4.

Table 4. Estimated Cost of Alternatives

Alternative	Capital Cost	O&M Cost	O&M Period	Total Present Worth Cost
1	$0	$0	NA	$0
2	$18,392	$141,669	30 years	$160,061
3	$66,688	$0	NA	$66,688
4	$61,650	$0	NA	$61,650

O&M – Operation and maintenance

J.8 State Acceptance

State acceptance was evaluated formally after the public comment period on the Proposed Plan. Ohio EPA concurs that Alternative 1 (No Action) or Alternative 2 (Limited Action – Land Use Controls) do not provide adequate protection of human health and the environment. Ohio EPA has expressed its support for Alternative 3 (Excavation and Offsite Disposal – National Guard Trainee Land Use). Ohio EPA does not support Alternative 4 because it is not consistent with the planned future land use and does not attain clean-up goals for the National Guard Trainee.

J.9 Community Acceptance

Community acceptance was evaluated formally after the Proposed Plan public comment period. During the public meeting, the community voiced no objections and only sought clarification to Alternative 3 (Excavation and Offsite Disposal – National Guard Trainee Land Use) as indicated in Part III of this ROD, the Responsiveness Summary.

K. PRINCIPAL THREAT WASTES

Principal threat wastes, as defined by U. S. Environmental Protection Agency (USEPA), are those 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. Given the reasonable foreseeable future land use for FBQ (National Guard Trainee), principal threat wastes at FBQ would be those media posing a potential risk of 10^{-3} or greater. Current risk for National Guard Trainee exposure to soil and dry sediment is orders of magnitude less than this threshold. Thus, soil and dry sediment at FBQ do not constitute principal threat wastes.

L. THE SELECTED REMEDY

Alternative 3 (Excavation and Offsite Disposal – National Guard Trainee Land Use) is selected for implementation at FBQ. This remedy is consistent with the planned future land use of National Guard mounted training.

L.1 Rationale for the Selected Remedy

The selected remedy meets the threshold criteria and provides the best overall balance of tradeoffs 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 reasonably anticipated future land 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 is to prevent National Guard Trainee exposure to contaminants in soil and dry sediment that exceed the clean-up goals to a depth of 4 ft BGS. In addition, low risks to ecological receptors will be further reduced.

Using engineering controls, PPE, erosion and sediment controls, proper waste handling practices, and monitoring will mitigate short-term effects during construction.

The selected remedy addresses State and community concerns by removing contaminated soil and dry sediment from FBQ at the RVAAP.

L.2 Description of the Selected Remedy

Alternative 3 consists of excavating contaminated soil and dry sediment to meet the clean-up goals for the National Guard Trainee. Excavated soil and dry sediment will be subsequently disposed of offsite at the licensed disposal facility. Removing contaminated soil and dry sediment will reduce the source of further impacts to groundwater and surface water via leaching and/or direct contact. Utilization of FBQ is assumed to correspond to the OHARNG established future land use. This alternative also attains clean-up goals for residential land use. Because the alternative also attains clean-up goals for a Resident Subsistence Farmer, O&M and CERCLA five-year reviews with respect to chemical contamination will not be required. However, land use controls with respect to MEC issues may be required and will be implemented by the US Army and OHARNG. Alternative 3 will require coordination of remediation and monitoring activities with OHARNG and the US Army. Such coordination will minimize health and safety risks to onsite personnel and potential disruptions during remediation activities. Components of this remedial alternative include:

- Remedial Design (RD) Plan;
- Excavation;
- Handling of waste materials;
- Offsite disposal;
- Confirmatory sampling; and
- Restoration.

Remedial Design Plan. An RD Plan will be developed prior to the initiation of remedial construction activities. This plan will detail preparation activities, the extent of the excavation, implementation and sequence of construction activities, decontamination, and segregation, transportation, and disposal of various waste streams. Engineering and administrative controls (e.g., erosion controls, health and safety controls) will be developed during the active construction period to ensure remedial workers and the environment are protected. Subsequent land use controls, reviews, and environmental monitoring and will not be necessary as there will be no soil and dry sediment onsite above residential land use clean-up goals after the implementation of this alternative.

Excavation. Contaminated soil and dry sediment above National Guard Trainee land use clean-up goals will be excavated and transported to a staging area for loading trucks. The extent of contaminated soil and dry sediment at FBQ is depicted in Figure 3. Estimated disposal volume is 102 yd^3 (ex-situ). Contaminated soil and dry sediment removal will be accomplished using standard construction equipment such as excavators, bulldozers, front-end loaders, and scrapers. Excavation will be guided using a limited quantity of analytical samples. Oversize debris will be crushed or otherwise processed to meet disposal facility requirements. Movement of contaminated soil and dry sediment will be performed using dump trucks and conventional construction equipment. Erosion control materials such as silt fences and straw bales will be installed to minimize erosion.

Contaminated soil and dry sediment will be kept moist or covered with tarps to minimize dust generation. Excavation will take place in stages to limit impacts to current activities. The safety of remediation workers, onsite employees, and the general public will be covered in a site-specific health and safety plan. The health and safety plan will address potential exposures and monitoring requirements to ensure protection.

Handling. Contaminated soil and dry sediment will be hauled to a licensed and permitted disposal facility by truck. Trucks will be lined with polyethylene sheeting and covered with specially designed tarps or hard covers to prevent release of contaminated soils/dry sediments. The trucks will be inspected prior to use and leaving the AOC. Appropriate bills-of-lading [in accordance with U. S. Department of Transportation (DOT) regulations for shipment of contaminated materials on public roads] will accompany waste shipments. Only regulated and licensed transporters and vehicles will be used. The trucks will travel pre-designated routes and an emergency response plan will be developed in the event of a vehicle accident.

Transportation activities will be performed in accordance with a site-specific Transportation and Emergency Response Plan (TERP) developed in the remedial design plan. The TERP will evaluate the types and number of vehicles to be used; the safest transportation routes including considerations to minimize use of high traffic roads, public facilities, or secondary roads not designed for trucks; and emergency response procedures for responding to a vehicle accident.

Offsite Disposal. Contaminated soil and dry sediment will be disposed of at an existing facility licensed and permitted to accept the characterized waste stream. The selection of an appropriate facility will consider the types of wastes, location, transportation options, and cost. Waste streams with different constituents and/or characteristics may be generated. Disposal cost savings may be possible by utilizing specific disposal facilities for different waste streams.

Confirmatory Sampling. Confirmation sampling will be conducted after excavation of each area. The sampling will confirm National Guard Trainee land use clean-up goals have been achieved.

Restoration. Excavated areas that have attained the clean-up goals will be backfilled, if appropriate, with clean soil and re-vegetated. Fill will be tested prior to placement to ensure compliance with acceptance criteria established in the design work plan.

L.3 Summary of the Estimated Remedy Costs

Total present worth costs for the selected remedy (Alternative 3) are estimated at $66,688. Costs are based on excavation and offsite disposal of soil and dry sediment with concentrations of COCs exceeding clean-up goals, to a depth of 4 ft BGS. These estimates assume that FBQ is remediated to the clean-up goals established for land use for National Guard Trainee.

The 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 provides a summary of the clean-up goals to be achieved for soil and dry sediment at FBQ at the end of the construction phase. Residual risks after implementation of the selected remedy will be within the acceptable risk range for the intended future land use. Removal of contaminated soil and dry sediment will reduce the likelihood of contaminant migration to other environmental media, such as surface water or groundwater. Removal of soil and dry sediment to attain human-health clean-up goals will also reduce risks to ecological receptors.

No negative socioeconomic and community revitalization impacts are expected from this remedial action. Positive socioeconomic impacts are expected from the excavation and removal of soil exceeding the clean-up goals because additional resources will available for use by the OHARNG training mission.

M. STATUTORY DETERMINATION

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

Human exposure to COCs will be eliminated or controlled to levels that are protective through excavation and offsite disposal of soil and dry sediment at FBQ. The selected remedy also protects environmental receptors from potential exposure to COC-contaminated media. The selected remedy will comply with the clean-up goals listed in Table 2.

M.2 Compliance with ARARs

The selected remedy will comply with the action-specific ARARs listed in Attachment 1.

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 the maximum extent to which permanent solutions and treatment are practicable for soil and dry sediment that are currently exposed at FBQ. The selected remedy represents the best balance of tradeoffs between the alternatives because it provides a permanent

solution for contaminated media, is cost-effective, and eliminates the need for long-term land use controls respective to chemical contaminants in soil and dry sediment.

M.5 Preference for Treatment as a Principal Element

The selected remedy uses permanent solutions to the maximum extent practicable. The remedy does not satisfy the statutory preference for treatment. The treatment technologies evaluated in the early stages of the FS were found to be technically infeasible and cost prohibitive for implementation at FBQ.

M.6 Five-Year Review Requirements

Five-year reviews will not be required in compliance with CERCLA Section 121(c) and the NCP Section 300.430(f)(4)(ii).

N. DOCUMENTATION OF NO SIGNIFICANT CHANGE

The *Proposed Plan for Fuze and Booster Quarry Ponds/Landfill at RVAAP* (USACE 2007) was released for public comment in April 2007. The Proposed Plan identified Alternative 3, Excavation and Offsite Disposal – National Guard Trainee Land Use, for soil and dry sediment at FBQ as the recommended alternative. After the public comment period, no significant changes regarding the recommended alternative, as originally identified in the Proposed Plan, were necessary or appropriate.

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PART III: RESPONSIVENESS SUMMARY FOR PUBLIC COMMENTS ON THE US ARMY PROPOSED PLAN FOR THE FBQ AT RAVENNA ARMY AMMUNITION PLANT, RAVENNA, OH

A. OVERVIEW

In April 2007, the US Army released the *Proposed Plan for Soil and Dry Sediment at FBQ (RVAAP-16) at the Ravenna Army Ammunition Plant* for public comment. A 30-day public comment period was held from April 4, 2007 to May 3, 2007. The US Army hosted a public meeting on April 10, 2007, to present the Proposed Plan and take questions and comments from the public for the record. The public meeting included presentation of the recommended alternative for FBQ, as well as Ramsdell Quarry Landfill (RQL) and Load Line 12 (LL12).

For soil and dry sediment at FBQ, the US Army recommended Alternative 3 – Excavation of Soil/Dry Sediment with Offsite Disposal – National Guard Trainee Land Use. During the public meeting Ohio EPA concurred with the recommendation of this alternative. Several oral comments were received at the public meeting and are addressed under Section B.

Based on comments received, the community voiced no objections and sought only clarification for Alternative 3 – Excavation of Soil and Dry Sediment with Offsite Disposal National Guard Trainee Land Use, and this alternative is selected as the final remedy for soil and dry sediment at FBQ in this ROD.

B. SUMMARY OF PUBLIC COMMENTS AND AGENCY RESPONSES

Comments were received verbally during the public meeting. No written comments were received during the 30-day public comment period.

B.1 Oral Comments from Public Meeting

Oral comments received during the public meeting are grouped together in the following general topic categories: vadose zone contamination, ditch flow, disposal facility selection, groundwater monitoring, removal tonnage, polycyclic aromatic hydrocarbons (PAHs), bid and contracting process, soil remediation, sample locations, contaminant levels, AOC history, and disposal. The transcript from the meeting was incorporated into the Administrative Record. Oral comments and responses are paraphrased, as required for brevity and presentation in this section.

1. Vadose Zone Contamination

   Comment: One commenter asked if there was contamination in the vadose zone.

   Response: The vadose zone by definition is the unsaturated zone above the water table and includes the soil column at FBQ. The investigations at FBQ showed contamination in the soil

column, which is very thin at FBQ; in many places less than 3 ft. The Proposed Plan addresses these soil contaminants.

2. Ditch Flow

   Comment: One commenter asked where the heavily-contaminated ditches flow, and asked if they flow into a waterway.

   Response: At FBQ, drainage is to the southwest and exits the AOC at a culvert beneath Greenleaf Road. From that point, drainage ultimately flows into Hinkley Creek.

3. Hinkley Creek

   Comment: One commenter asked what Hinkley Creek feeds, and if it was a bigger creek.

   Response: Hinkley Creek flows southward under Highway 5 and into the Mahoning River and nearby Kirwan Reservoir.

4. Disposal Facility Selection

   Comment: One commenter asked if a site has been selected for disposal of removed soils. The commenter also asked if Countywide Landfill in the Canton area would be excluded from soil disposal options because of trouble with underground fires.

   Response: A disposal facility has not yet been selected for disposition of the soils. Disposal site selection is a part of a future remedial design activity, which follows the Proposed Plan phase and ROD.

   Any facility considered, will be evaluated as to its appropriateness. Evaluation and selection will determine if they are licensed, qualified to accept the materials, the engineering specifications of the facility, and any regulatory issues.

5. Groundwater monitoring

   Comment: One commenter asked if SAIC would conduct the groundwater testing or if it was instead planned for another contractor.

   Response: The FBQ Proposed Plan addresses soil and dry sediment. Surface water and groundwater will be evaluated at future studies. A contractor has not been selected for those studies.

6. Removal Tonnage

   Comment: One commenter asked the tonnage of soil to be removed in the three proposals (FBQ, RQL, and LL12). The commenter also asked if a cubic yard was approximately equivalent to a ton.

Response: Estimated soil volume to be removed includes about 1,200 cubic yards at LL12 , about 420 cubic yards at RQL, and about 70 cubic yards at FBQ. A cubic yard is approximately 1.5 tons.

7. PAHs

Comment: One commenter asked for the definition of PAHs.

Response: The definition for PAHs is polycyclic aromatic hydrocarbons.

8. Bid and Contracting Process

Comment: One commenter asked for clarification into the bidding and contracting process that for projects at RVAAP, and particularly how it limits the scope for a contractor like SAIC. The commenter also asked how many environmental corporations have been contracted since the beginning of the program at Ravenna.

Response: When a contract is issued, or requested by the US Army a scope of work is prepared and submitted to the contracting arm of the Army. In the case of BRAC (Base Realignment and Closure Command), who manages demolition activities at RVAAP, contracting is handled by the Tank Automotive Command based out of Rock Island Arsenal, Illinois. In the case of environmental requirements, such as FBQ, the Corps of Engineers in Louisville, Kentucky, handles contracting on behalf of BRAC. There are two scenarios that follow from here. One is many of the contracts are set aside for what is called an 8(a) contractor (small business designation). Small business contractors are supplied through the Small Business Administration. Other contracts are general contracts for open bidding, and any qualified contractor can bid on those. Proposals are solicited and evaluated, along with estimated costs. A selection board decides on which contractor will receive the bid. The scopes of work for each contract are extremely restrictive, and contractors are forbidden to do any work outside of what is specified in the contract. Over the past 4.5 years, approximately five or six different contractors have been employed on RVAAP projects.

9. Soil Remediation

Comment: One commenter asked if it is an option to use a soil remediation facility to not just process the soil for offsite disposal but to remediate the soils to a level appropriate for onsite disposal and reintroduction into the environment, amortizing the value of the facility into a longer range plan.

Response: The FBQ Proposed Plan did not evaluate an alternative for a site-wide integrated soil treatment facility. A facility-wide implementation for onsite treatment would primarily consider cost-benefit analysis. The cost of equipment, machinery, utilization over time, and manpower to staff and operate an onsite treatment facility is greater than offsite disposal at an existing facility. As an example, RVAAP established an onsite flashing furnace for facility-wide utilization. RVAAP projects did not generate sufficient material to allow a return on capital investment and maintenance costs.

10. Sample Locations

Comment: One commenter asked if grid sampling was used to determine risk in the proposed areas. The commenter also asked how the hand auger locations were determined from other sampling methods, and whether it was from historical documentation.

Response: The investigations at FBQ did not employ statistical grid sampling. For subsurface soil, discrete hand auger boring samples were collected. Surface soil samples were collected using trowels, scoops and hand augers.

A number of factors are included in the development of a sampling and analysis plan, which preceded the investigations at RQL, LL12, and FBQ. When writing a sampling and analysis plan, the project team compiles historical data, reviews aerial photographs, and any other available historical information is reviewed and evaluated. On the basis of the operations that may have been, or were known to be, conducted, the team identifies specific areas to sample, such as ditches where sediments may accumulate over time and run-off. In large open areas, samples may be collected on a grid-type pattern. At RQL, LL12, and FBQ, the focus was on discrete sampling around known buildings and within ditches and accumulation points, based on the operational histories.

11. Contaminant Levels

Comment: One commenter asked for the highest level of manganese at FBQ.

Response: The maximum detected concentration of manganese soil and dry sediment was 4,100 milligrams per kilogram (parts per million) and occurred in the ditch west of the three settling ponds.

12. Origin of Contaminants

Comment: One commenter asked what the origins of the manganese contamination found at the FBQ area may have been, and if it was a by-product of the water treatment plant.

Response: Manganese present in the ditch west of the three settling ponds were substantially above the facility-wide background values and indicated a need for action. The manganese appears to be related to some type of former industrial source. Information is not available in the historical records to indicate any specific activity that would result in manganese accumulation in dry sediments in the ditch.

NOTE: Several questions were raised regarding groundwater, monitoring wells, permeability, etc. These topics are not included in the scope of this public meeting and will be addressed under future groundwater actions.

B.2 Written Comments

No written comments were received for FBQ during the public comment period.

C. TECHNICAL AND LEGAL ISSUES

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

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USACE 2005b. *Sampling and Analysis Plan Addendum No.1, Supplemental Phase II Remedial Investigations: Open Demolition Area #2 (RVAAP-02), Fuze and Booster Quarry Landfill/Ponds (RVAAP-16), and Central Burn Pits (RVAAP-49), Ravenna Army Ammunition Plant, Ravenna Ohio*. November 2005.

USACE 2006. *Feasibility Study for Fuze and Booster Quarry Landfill/Ponds (RVAAP-16), Ravenna Army Ammunition Plant, Ravenna, Ohio,* Final, GS-10F-0076J, Delivery Order W912QR-05-F-0033, September 2006.

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U. S. Environmental Protection Agency (USEPA) 1988. *Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA Interim Final,* Document No. EPA/540/G. October 1988.

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FIGURES

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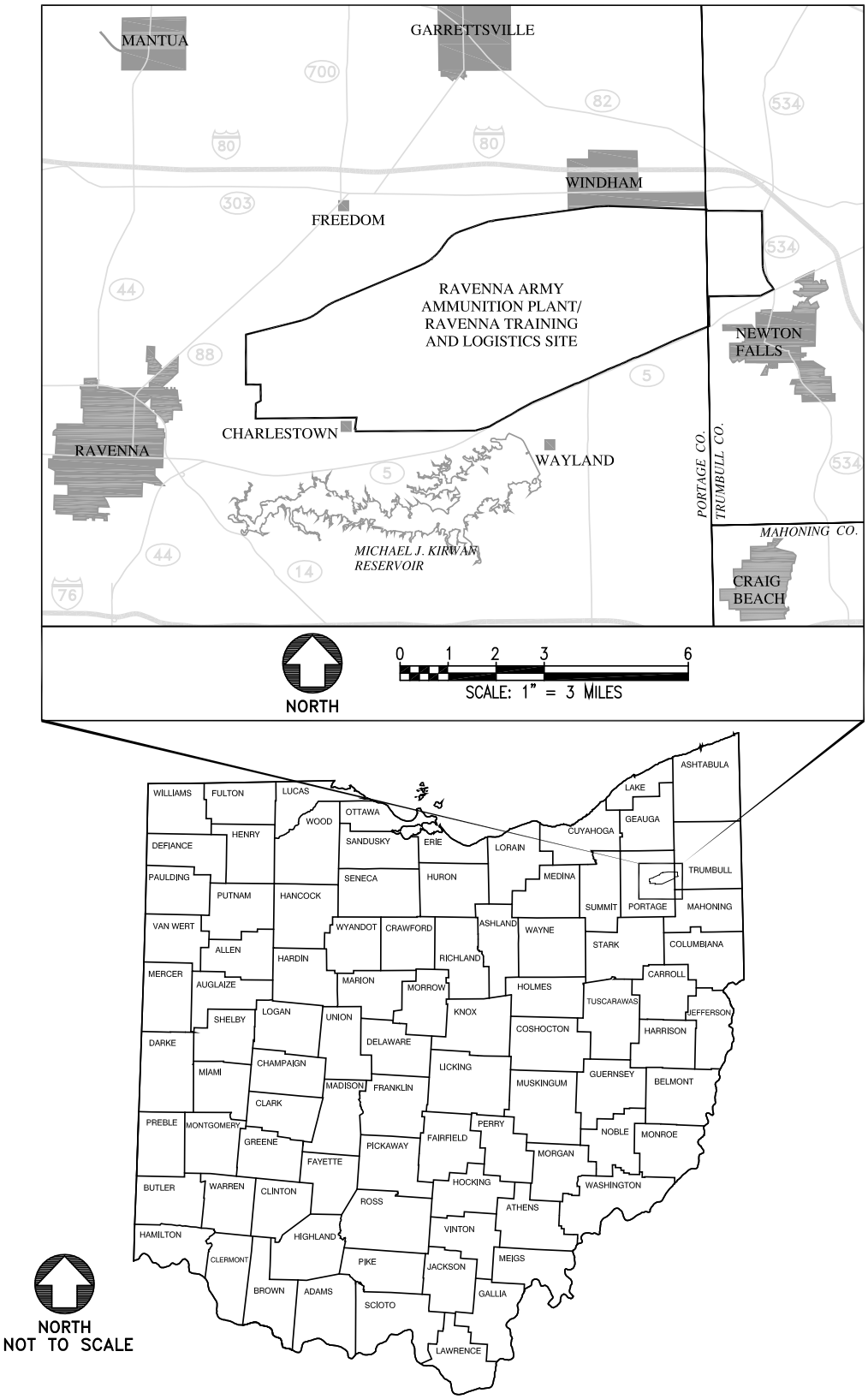

Figure 1. General Location and Orientation of the RVAAP/RTLS

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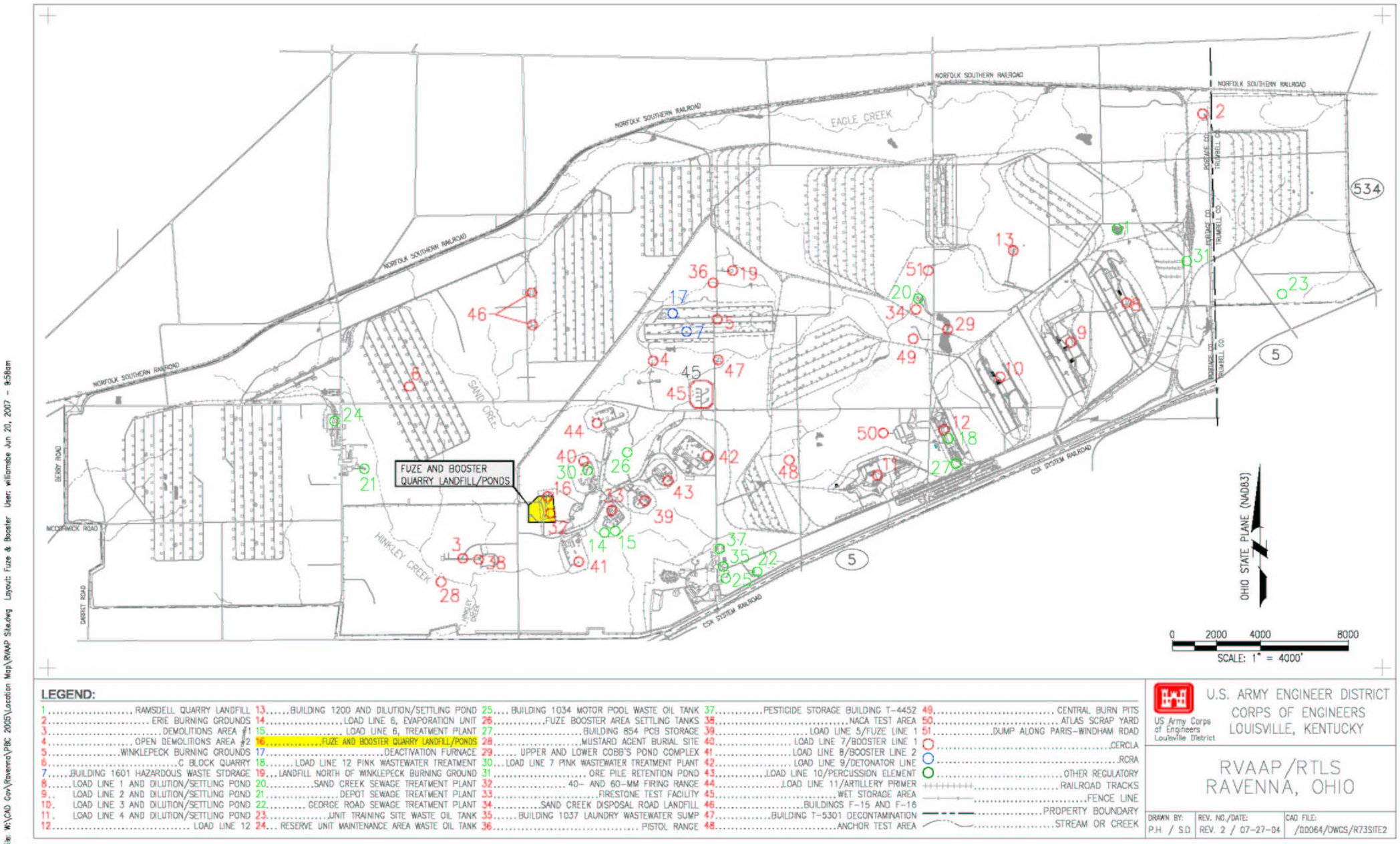

Figure 2. RVAAP/RTLS Installation Map

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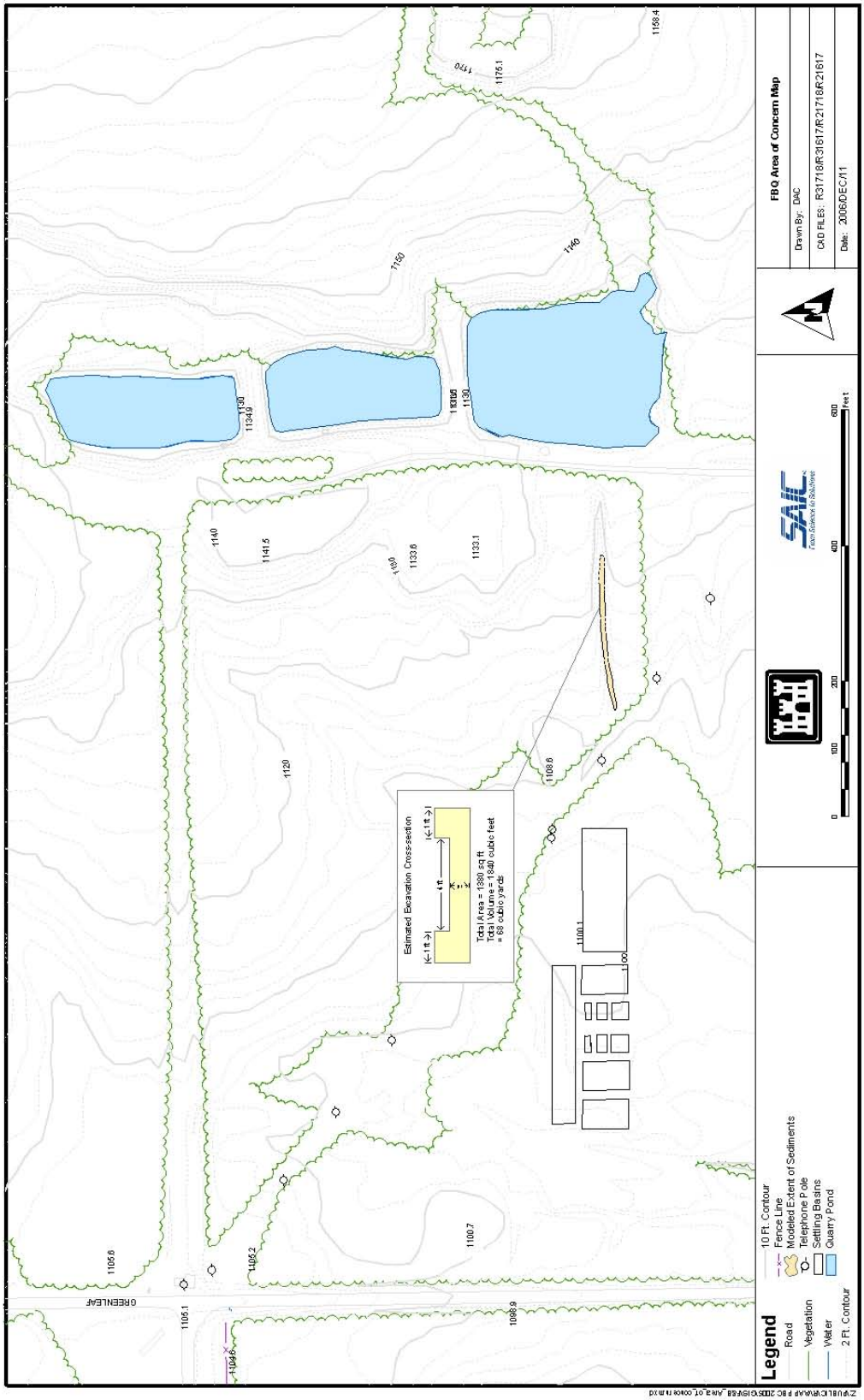

Figure 3. Fuze and Booster Quarry Landfill/Ponds Area of Concern Map

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ATTACHMENT 1

DESCRIPTION OF ARARs

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Applicable or Relevant and Appropriate Requirements for Remediation of Soil/Dry Sediments at FBQ

Action	Requirements	Prerequisite	Citation(s)
Surface Waters and Wetlands	All waters of the state shall be free of suspended solids, floating debris, oil, scum, or toxic substances from human activity that create a nuisance, cause degradation, or adversely affect aquatic life. There may be no degradation of water quality that results in violation of the applicable water quality criteria or the impairment of existing uses. Wetlands-designated uses shall be maintained and protected such that degradation through direct, indirect, or cumulative impacts do not result in wetland use or function.	Applicable to activities that may impact waters of the state (connected drainage ways) or wetlands, including isolated wetlands.	OAC 3745-1-04 OAC 3745-1-51 OAC 3745-1-54(B)(1)
General Construction Standards – Site Preparation and Excavation			
Activities Resulting in the Emission of Particulate Matter, Dusts, Fumes, Gas, Mists, Smoke, etc. From a Hazardous Waste Facility	No owner/operator of a hazardous waste facility shall cause or allow the emission of any particulate matter, dusts, gas, fumes, mists, smoke, vapor, or odorous substances that interferes with the enjoyment of life or property by persons living or working in the vicinity of the facility. Any such action is considered a public nuisance.	Applicable to soil excavation activities at AOC.	ORC 3734.02(I) OAC 3745-15-07(A)
Activities Causing Fugitive Dust Emissions	Persons engaged in construction activities shall take reasonable precautions to prevent particulate matter from becoming airborne; reasonable precautions include, but are not limited to, the following: ▪ the use of water or chemicals for control of dust during construction operations or clearing of land; and ▪ the application of asphalt, oil, water, or suitable chemicals on dirt roads, materials stockpiles, and other surfaces, which can create airborne dusts. No person shall cause, or allow, fugitive dust to be emitted in such a manner that visible emissions are produced beyond the property line.	Applicable to pre-construction clearing activities and excavation activities.	OAC 3745-17-08(B)

Applicable or Relevant and Appropriate Requirements for Remediation of Soil/Dry Sediments at FBQ (continued)

Action	Requirements	Prerequisite	Citation(s)
Construction Activities Causing Storm Water Runoff (e.g., clearing, grading, and excavation)	Construction activities disturbing more than 1 acre must develop and implement a storm water pollution prevention plan incorporating best management practices (including sediment and erosion controls, vegetative controls, and structural controls) in accordance with the requirements of the Ohio EPA General Permit for Construction Activities (Permit ORC 000002). An NOI shall be submitted 21 days prior to initiation of the construction activity.	Applicable to stormwater discharges from land disturbances from a construction activity involving more than 1 acre. NOI must be submitted pursuant to DERR-OO-RR-034, which indicates that no permit exemption equivalent to CERCLA Section 121(e) is available for non-NPL sites.	40 *CFR* 122.26 OAC 3745-38-06
Removal of Contaminated Soils			
Waste Generation, Characterization, Segregation, and Storage-Excavated Soils and Buried Wastes, Sludge, Surface Features, Debris, and Secondary Waste			
Generation and Characterization of Solid Waste *(all primary and secondary wastes)*	The generator must determine if the material is a solid waste, as defined in 40 *CFR* 261.2 and 40 *CFR* 261.4(a). If the material is a solid waste, the generator must determine if the solid waste is a hazardous waste by:	Applicable to generation of a solid waste as defined in 40 *CFR* 261.2 and that is not excluded under 40 *CFR* 261.4(a).	40 CFR 262.11(a)(b)(c) OAC 3745-52-11(A)(B)(C)(D)
	▪ determining if the waste is listed under 40 *CFR* Part 261; or	Applicable to the generation and characterization of hazardous-contaminated soil and hazardous debris resulting from excavation.	40 CFR 262.11(a)(b)(c) OAC 3745-52-11(A)(B)(C)(D) 40 CFR 262.II(a)(b)(c) OAC 3745-52-11(A)(B)(C)(D)
	▪ determining if the waste exhibits characteristics by using prescribed testing methods or applying generator knowledge based on information regarding material or processes used; and		
	▪ determining if the waste is excluded under 40 *CFR* Parts 261, 262, 266, 268, and 273.	Applicable to the generation and characterization of hazardous-contaminated soil and hazardous debris resulting from excavation. Applicable to generation of decontamination wastewater.	

Applicable or Relevant and Appropriate Requirements for Remediation of Soil/Dry Sediments at FBQ (continued)

Action	Requirements	Prerequisite	Citation(s)
	The generator must determine if the waste is restricted from land disposal under 40 *CFR* 268 *et seq.* by testing in accordance with prescribed methods or use of generator knowledge of waste.	Applicable to the generation and characterization of hazardous-contaminated soil and hazardous debris resulting from excavation. Applicable to generation of decontamination wastewater.	40 CFR 268.7 OAC 3745-270-07
	The generator must determine each USEPA Hazardous Waste Number (Waste Code) to determine the applicable treatment standards under 40 CFR 268.40, Subpart D.	Applicable to the generation and characterization of hazardous-contaminated soil and hazardous debris resulting from excavation. Applicable to generation of decontamination wastewater.	40 CFR 268.9(a) OAC 3745-270-07 OAC 3745-270-09
	The generator must determine the underlying hazardous constituents [as defined in 40 CFR 268.2(i)] in the waste.	Applicable to the generation and characterization of RCRA characteristic hazardous waste (except D00I non-wastewaters treated by combustion, recovery of organics, or polymerization. See 268.42, Table I) and to hazardous-contaminated soils for their subsequent storage, treatment, or disposal.	40 CFR 268.9(a) OAC 3745-270-09

Applicable or Relevant and Appropriate Requirements for Remediation of Soil/Dry Sediments at FBQ (continued)

Action	Requirements	Prerequisite	Citation(s)
Accumulation of Hazardous Debris from Excavation and Screening. It is Assumed that any Debris Resulting from Excavation and Screening will be Accumulated for < 90 Days	A generator may accumulate for up to 90 days or conduct treatment of hazardous wastes in containers without an Ohio EPA permit. Generators that accumulate for 90 days or conduct on-site treatment of hazardous waste in containers must comply with the personnel training, preparedness and prevention requirements, and contingency plan requirements of 40 *CFR* 265.16; 40 *CFR* 265, Subpart C; and 40 *CFR* 265, Subpart D, respectively. Personal training and contingency plan requirements would appear to be administrative in nature. Arguably some of the components/goals of the contingency plan such as: (1) to minimize the hazards to human health or environment from fire, explosion or sudden release of hazardous waste or hazardous constituents, or (2) presence of an emergency coordinator on site, could be viewed as substantive. If determined to be substantive, these provisions should be cited as ARAR; however, the plans, details or implementation steps should be included in the CERCLA documentation for the site (i.e., remedial design documents).	Applicable to 90-day accumulation of debris from excavation and screening if such debris contains listed wastes or exhibits a characteristic.	40 CFR 262.34(a)(4) OAC 3745-52-34(A)(4) OAC 3745-66-70 to 66-77
	Containers must be marked with the date upon which period of accumulation began and with the words "Hazardous Waste."	Applicable to 90-day accumulation of debris from excavation and screening if such debris contains listed wastes or exhibits a characteristic.	40 CFR 262.34 (a)(2)(3) OAC 3745-52-34 (A)(2)(3)

Applicable or Relevant and Appropriate Requirements for Remediation of Soil/Dry Sediments at FBQ (continued)

Action	Requirements	Prerequisite	Citation(s)
	Containers holding hazardous wastes must be kept closed except to add or remove wastes and must not be managed in a manner that would cause them to leak.	Applicable to 90-day accumulation of debris from excavation and screening if such debris contains listed wastes or exhibits a characteristic.	40 CFR 264.171 40 CFR 264.172 40 CFR 264.173 40 CFR 264.176 40 CFR 264.17 OAC 3745-52-34(A)(1)
	Containers of hazardous waste must be maintained in good condition and comparable with the waste stored therein. Containers holding ignitable or reactive wastes must be separated from potential ignition sources and located 50 feet from the property boundary.		
Placement of hazardous contaminated soil in a staging pile	In 1998, USEPA created a new unit for the temporary management of remediation wastes known as the staging pile. The staging pile is an accumulation of solid, non-flowing remediation wastes that may be used for storage of those wastes for two years. The requirements for staging piles include the performance criteria of 40 CFR 264.554(d). These standards require that: ▪ the staging pile must be designed to prevent or minimize releases of hazardous waste or hazardous constituents into the environment, ▪ the staging pile must be designed to minimize cross-media transfer as necessary to protect human health and the environment (by using liners, run-off/run-on controls as appropriate) The staging pile requirements also contain closure requirements (separate provisions for staging piles located in previously contaminated areas and those located in previously uncontaminated areas)	Applicable to storage of hazardous contaminated soils in staging piles. Potentially relevant and appropriate if excavated soils are determined to not contain listed wastes or exhibit the toxicity characteristic in soils.	40 CFR 264.554 OAC 3745-57-74

Applicable or Relevant and Appropriate Requirements for Remediation of Soil/Dry Sediments at FBQ (continued)

Action	Requirements	Prerequisite	Citation(s)
Off-site Shipment of Hazardous Wastes, Debris, or Hazardous-contaminated Soils	A generator who transports or offers hazardous wastes for off-site transport must prepare a Uniform Hazardous Waste Manifest.	Applicable to the offsite shipment of soils or wastewater that contain listed wastes or that exhibit the TC.	40 *CFR* 262.20 OAC 3745-52-20
	Before transporting or offering a hazardous waste for transport, the generator must package the waste, label the package, and placard the carrier in accordance with DOT requirements.	Applicable to the off-site shipment of soils or wastewater that contain listed wastes or that exhibit the TC.	40 *CFR* 262.30 to 40 *CFR* 262.33 OAC 3745-52-30 to OAC 3745-52-33

AOC = Area of Concern
ARAR = applicable and relevant or appropriate requirements
CERCLA = Comprehensive Environmental Response, Compensation, and Liability Act
CFR = Code of Federal Regulations
DERR = Division of Emergency and Remedial Response (Ohio EPA)
NOI = Notice of Intent
NPL = National Priorities Listing
OAC = Ohio Administrative Code
Ohio EPA = Ohio Environmental Protection Agency
ORC = Ohio Revised Code
RCRA = Resource Conservation and Recovery Act
USEPA = U. S. Environmental Protection Agency