



Final Explosive Site Plan

OPERATION AND MAINTENANCE OF SAND CREEK BARRIER SYSTEM

RAVENNA ARMY AMMUNITION PLANT
RAVENNA, OH 44266

August 2008

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Table of Contents

Table of Contents i

List of Acronyms ii

1. Site 1

2. Anticipated Dates 1

3. Purpose 1

4. Site Background and Current Conditions 1

5. Executing Agencies 2

6. Scope of Investigative/Characterization Action 2

7. Safety Criteria 2

8. Methods of Disposal 3

9. Maps 4

Appendices

Appendix A: Figures A-1

Appendix B: Fragmentation Calculation Sheets B-1

Appendix C: Ohio EPA MEC Demolition Notification C-1

List of Acronyms

BATFE	Bureau of Alcohol, Tobacco, Firearms and Explosives
BIP	Blow in Place
CERCL	Comprehensive Environmental Response Compensation and Liability Act
DDESB	Department of Defense Explosives Safety Board
e ² M	engineering-environmental Management, Inc.
EPA	Environmental Protection Agency
ESP	Explosive Site Plan
ESQD	Explosive Safety Quantity Distance
ESS	Explosives Safety Submission
HFD	Hazardous Fragmentation Distance
IAW	In Accordance With
MC	Munitions Constituents
MEC	Munitions and Explosives of Concern
MD	Munitions Debris
MFR-H	Maximum Fragment Range - Horizontal
MGFD	Munitions with Greatest Fragmentation Distance
mm	millimeter
MPPEH	Material Potentially Presenting an Explosive Hazard
MSD	Minimum Separation Distance
NEW	Net Explosive Weight
NGB	National Guard Bureau
NSCMP	Non Stockpile Chemical Material
ODA2	Open Demolition Area 2
Ohio EPA	Ohio Environmental Protection Agency
OHARNG	Ohio Army National Guard
O&M	Operation And Maintenance
PIKA	PIKA International, Inc.
PTRD	Public Traffic Route Distance
RVAAP	Ravenna Army Ammunition Plant
SARA	Superfund Amendments and Reauthorization Act
TCRA	Time Critical Response Action
USACE	U.S. Army Corps of Engineers
UXO	Unexploded Ordnance

1. Site

- a. Name: Operation and Maintenance (O&M) of Sand Creek Barrier System, 2,700 feet east of the Rocket Ridge Area of Open Demolition Area #2 (ODA2), Ravenna Army Ammunition Plant (RVAAP), Ravenna, Ohio. Under U.S. Army Corps of Engineers (USACE) Omaha District, see Figure 1.
- b. State: Ohio
- c. This O&M work is being performed under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA), and is part of a Time Critical Response Action (TCRA). If subsequent response actions are determined to be necessary, an ESS will be prepared and submitted for review and approval as necessary to support that response.

2. Anticipated Dates

- a. Start: May 31, 2008
- b. Complete: July 31, 2009

3. Purpose

- a. To prevent the potential downstream movement of Munitions and Explosives of Concern (MEC) and Munitions Debris (MD) within Sand Creek.
- b. Inspection and removal of MEC and MD accumulated on the screens.
- c. MEC Storage at Earth Covered Magazine number 1501 located at ODA2, Disposal of MEC by blow in place (BIP), or at the ODA2 demolition site.

4. Site Background and Current Conditions

- a. Rocket Ridge is a steep embankment approximately 500 feet long and 25 feet high located adjacent to Sand Creek within ODA2, approximately 2,700 feet upstream of the George Road Bridge.
- b. ODA2 was used for munitions demilitarization, including detonation of large caliber munitions and off-specification bulk explosives that could not be deactivated or demilitarized by any other means. The Rocket Ridge slope was used for the disposal of demilitarized munitions, although not all munitions appear to have been completely demilitarized.
- c. Munitions were transported from the demolition site to Rocket Ridge and dumped at the top of the slope. Sand Creek flows in an eastward direction along the northern boundary of the Rocket Ridge Area of ODA2, at the toe of the slope. Due to the steep slope of the disposal

area and the stream bank erosion resulting from high water events, some of the munitions materials have reached Sand Creek.

- d. On 18 June 2007, a rifle grenade containing white phosphorus exploded on the slope of Rocket Ridge. This event triggered the need for a response action at Rocket Ridge. Therefore, a survey conducted on 5-6 November 2007 upstream of the George Road Bridge identified a piece of munitions debris approximately 1,200 feet downstream of Rocket Ridge. Thirteen additional magnetometer anomalies from buried sources were found in the stream between the piece of munitions debris and the location of the barrier system. The sources of these subsurface anomalies have not been investigated.
- e. In order to prevent the downstream movement of MEC within Sand Creek, the Army will construct a barrier system. The barrier system will be installed across Sand Creek approximately 2,700 feet downstream of Rocket Ridge and 40 feet upstream of George Road Bridge. The barrier location is downstream of the farthest visible piece of munitions-related material that may have migrated from Rocket Ridge.

5. Executing Agencies

- a. U.S. Army Corps of Engineers, Omaha District

6. Scope of Investigative/Characterization Action

- a. The O&M phase of the Sand Creek Barrier System is focused on inspecting and removing the debris accumulated on the screen and assessing the integrity of the construction. This will be on a monthly basis.
- b. Inspection of any MEC and Material Potentially Presenting an Explosive Hazard (MPPEH) found on the screen.
- c. Storage and disposal of MEC and MD found on the screen.

7. Safety Criteria

- a. The MEC that has been identified or is anticipated to be present at Rocket Ridge includes: 75-millimeter (mm) and 105-mm projectiles, booster cups, three 500-pound bombs, white phosphorus rifle grenades, fuzes, and burster tubes. The Munitions with Greatest Fragmentation Distance (MGFD) identified is the 500 lb Bomb M64A1. During the course of this action, if MEC with a greater fragmentation distance is encountered, the Minimum Separation Distance (MSD) will be adjusted in accordance with DDESB Technical Paper 16, operations will continue, and an amendment to this ESP submitted for approval expeditiously.
- b. See **Table 7-1** for Minimum Separation Distances.

Table 7-1						
Minimum Separation Distances (MSD)						
Area	MEC	MSD (ft) ¹				
Rocket Ridge area of the ODA2 Sand Creek Barrier		For Unintentional Detonations		For Intentional Detonations		
		Team Separation Distance (K40)	Hazardous Fragment Distance (HFD)	Without Engineering Controls	Using Sandbag Mitigation	Using Water Mitigation Carboys/Pool
RVAAP	500 lb Bomb M64A1 ²	293	680	2501	NA	NA

Notes:

- See Figure 2 for calculation sheets and documentation of MSD.
- Denotes MGF D during intrusive operation within the area indicated.

- c. Any occupied buildings or public roadways in the MSD areas will be evacuated and/or roadways blocked to prevent non-essential personnel from entering during the conduct of intrusive investigations. There are no occupied buildings or public roadways in the MSD areas, see Figure 2. However, the MSDs may include facility roads. Any facility roads and areas to be closed or evacuated will be coordinated with OHARNG.
- d. The accumulated debris will be inspected for MEC/MD. Those items that are unfuzed and safe to move will be collected and placed in Igloo 1501 located at ODA2. If an item is fuzed or otherwise unsafe to move, the item will be BIP.
- e. If a smaller MEC item is identified, demolition operations will be conducted using sandbag mitigation in accordance with (IAW) HNC-ED-CS-S-98-7, August 1998 and the DDESB Fragmentation Database if permitted in the publications.
- f. Prior to initiating any disposal activities at RVAAP, the Contractor will submit the MEC Demolition/Disposal Notification to the Ohio EPA, as provided in the MEC Notification Procedure dated March 8, 2005 (Appendix C).

8. Methods of Disposal

- a. A portable Bureau of Alcohol, Tobacco, Firearms and Explosives (BATFE) approved Type 2, Class ABC magazine has been previously sited for proper storage of explosives at RVAAP. The magazine is sited inside explosive storage igloo 7-C-1 in the RVAAP C-Block explosives storage area (Figure 3). The portable magazine is provided lightning protection by the existing lightning protection system intended to protect the earth-covered magazine 7-C-1. The portable magazine is approximately 44” tall, with the earth-covered

magazine being approximately 10' tall. The lightning system for 7-C-1 extends approximately 3' above the earth-covered magazine, and the grounding system for the Type II magazine is connected into the earth-covered magazine.







- b. The portable magazine will be used for the storage of both 1.1 and 1.4 class explosives to be used for demolition operations. All 1.1 and 1.4 explosives stored in the main body of the magazine will be of compatible storage categories. Blasting caps and other initiators used for demolition operations will be stored outside the magazine in the attached 18" x 18" x 18" "cap" box that is welded to the outside of the magazine. The Net Explosive Weight (NEW) for the demolition material magazine will be a maximum of 100 pounds NEW (Figure 3).
- c. An existing Earth Covered Magazine number 1501 located at ODA2 will be used for the storage of MEC that have been inspected by Unexploded Ordnance (UXO)-qualified personnel and determined to be "acceptable to move" (Figure 3). The ODA2 is a restricted explosives storage area within the RVAAP. Access to the ODA2 area is controlled through RVAAP Post 1 Security and an onsite locked gate. The magazine will be afforded a lighting protection system IAW Department of the Army (DA) Pamphlet (PAM) 365-64.
- d. The Explosive Safety Quantity Distance (ESQD) arc for intentional detonations when conducting BIP or disposal at ODA2 is 2,501 feet and is depicted in Figure 4.

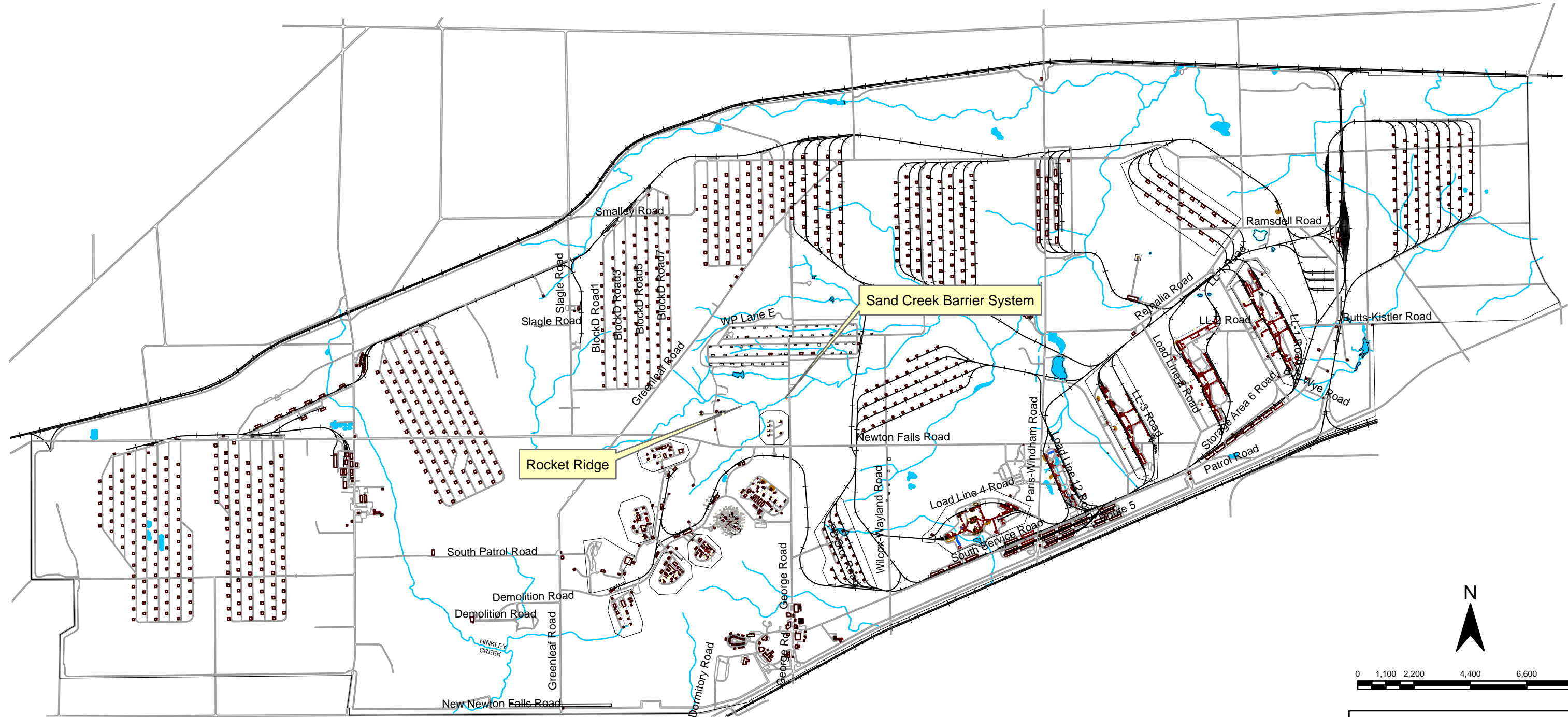
9. Maps

Figure 1 shows the regional location of the Sand Creek Barrier within the RVAAP. Figure 2 depicts the Hazardous Fragmentation Distance around each investigation area. Figure 3 identifies the Inhabited Building Distance and Public Traffic Route Distance for the explosive storage magazines. Figure 4 identifies the Maximum Fragment Range – Horizontal (MFR-H) distance each area for the munition with the greatest fragmentation distance (MGFD).

APPENDIX A
Figures

Legend

-  Water Bodies
-  Buildings
-  Walkways
-  Railroads
-  Berms
-  Pond



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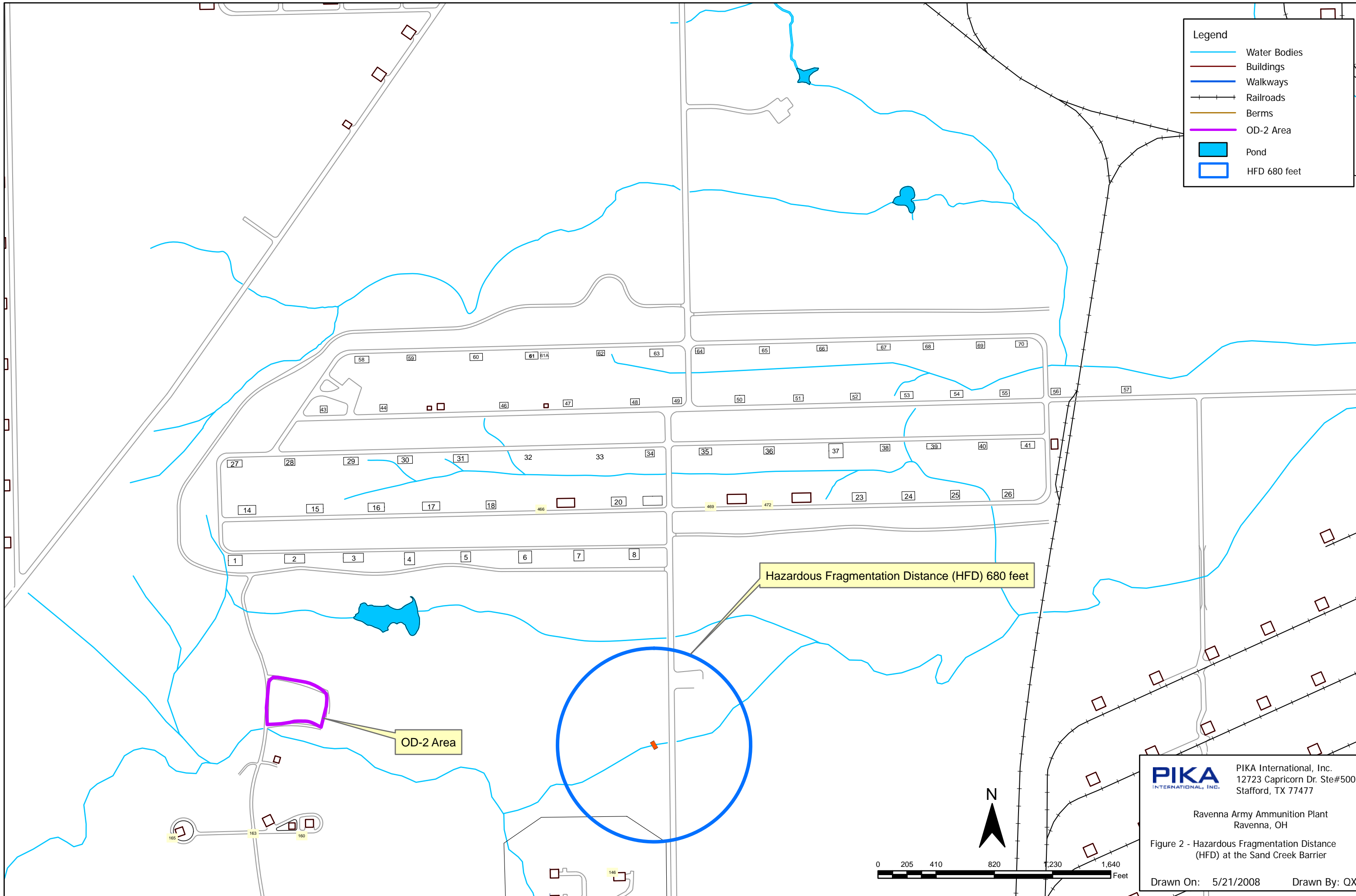
Ravenna Army Ammunition Plant
Ravenna, OH

Figure 1
Regional Location of Rocket Ridge
and the Sand Creek Barrier System

Drawn On: 5/21/2008 Drawn By: QX

Legend

-  Water Bodies
-  Buildings
-  Walkways
-  Railroads
-  Berms
-  OD-2 Area
-  Pond
-  HFD 680 feet



Hazardous Fragmentation Distance (HFD) 680 feet

OD-2 Area

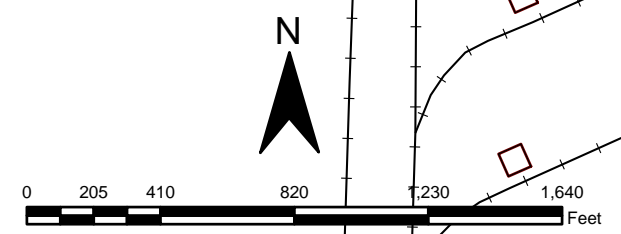
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Ravenna, OH

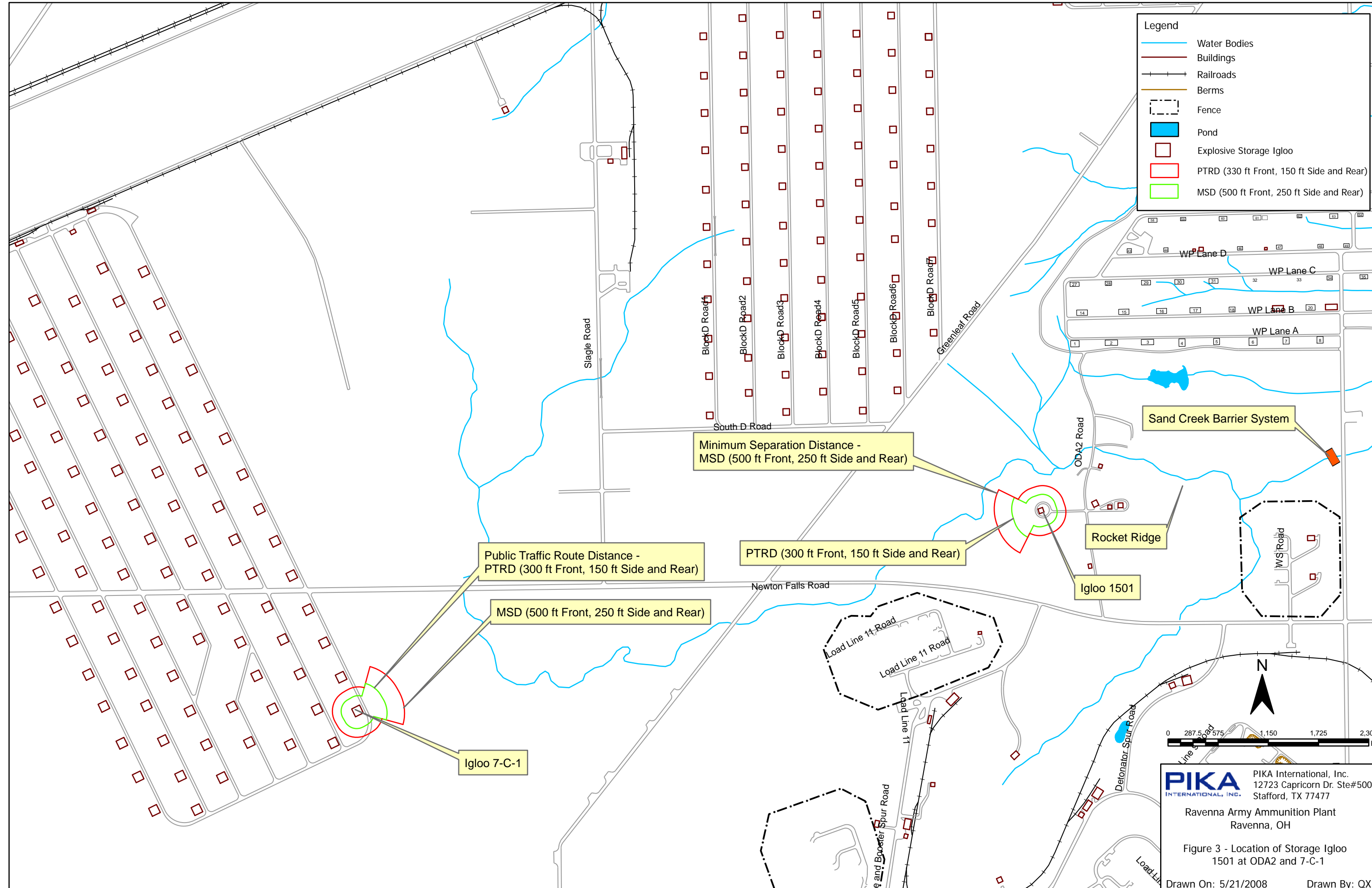
Figure 2 - Hazardous Fragmentation Distance (HFD) at the Sand Creek Barrier

Drawn On: 5/21/2008 Drawn By: QX



Legend

-  Water Bodies
-  Buildings
-  Railroads
-  Berms
-  Fence
-  Pond
-  Explosive Storage Igloo
-  PTRD (330 ft Front, 150 ft Side and Rear)
-  MSD (500 ft Front, 250 ft Side and Rear)



Minimum Separation Distance -
MSD (500 ft Front, 250 ft Side and Rear)

Public Traffic Route Distance -
PTRD (300 ft Front, 150 ft Side and Rear)

PTRD (300 ft Front, 150 ft Side and Rear)

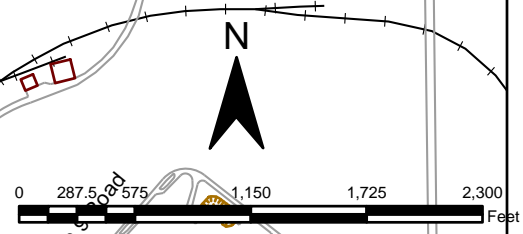
MSD (500 ft Front, 250 ft Side and Rear)

Igloo 7-C-1

Igloo 1501

Rocket Ridge

Sand Creek Barrier System

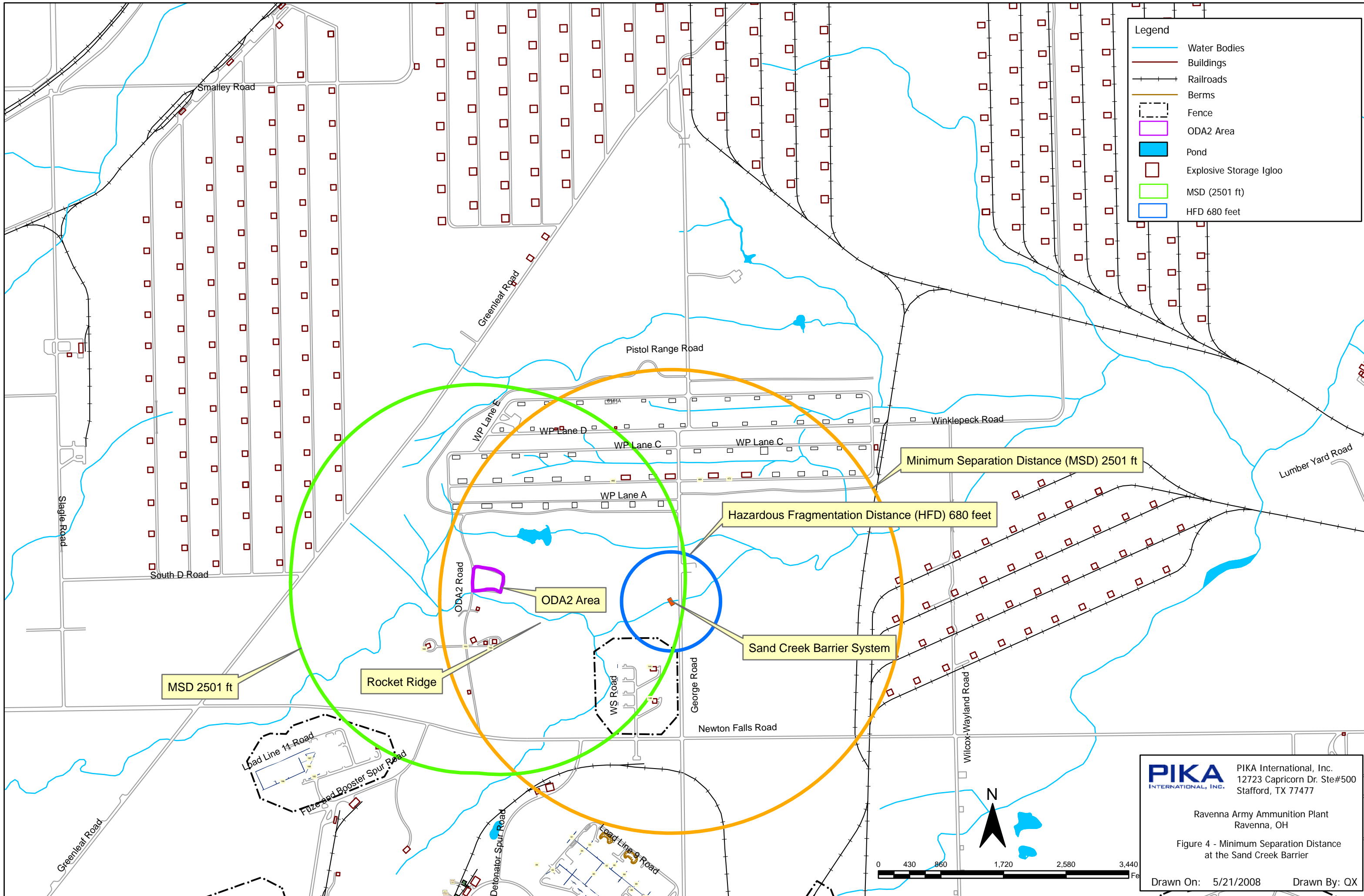


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 Ravenna, OH

Figure 3 - Location of Storage Igloo
 1501 at ODA2 and 7-C-1

Drawn On: 5/21/2008 Drawn By: QX



Legend

- Water Bodies
- Buildings
- Railroads
- Berms
- Fence
- ODA2 Area
- Pond
- Explosive Storage Igloo
- MSD (2501 ft)
- HFD 680 feet

Minimum Separation Distance (MSD) 2501 ft

Hazardous Fragmentation Distance (HFD) 680 feet

ODA2 Area

Sand Creek Barrier System

MSD 2501 ft

Rocket Ridge

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Ravenna, OH

Figure 4 - Minimum Separation Distance
at the Sand Creek Barrier

Drawn On: 5/21/2008 Drawn By: QX



APPENDIX B
Fragmentation Calculation Sheets

FRAGMENTATION DATA REVIEW FORM

Database Revision Date 12/31/07

Category:	<input type="text" value="HE Bombs"/>	DODIC:	<input type="text"/>
Munition:	<input type="text" value="500 lb Bomb M64A1"/>	Date Record Created:	<input type="text" value="7/30/2004"/>
Primary Database Category:	<input type="text" value="bomb"/>	Last Date Record Updated:	<input type="text" value="6/25/2007"/>
Secondary Database Category:	<input type="text" value="500 lb"/>	Individual Last Updated Record:	<input type="text" value="Crull"/>
Munition Case Classification:	<input type="text" value="Non-Robust"/>	Date Record Retired:	<input type="text"/>

Munition Information and Fragmentation Characteristics

Explosive Type:	<input type="text" value="Comp B"/>
Explosive Weight (lb):	<input type="text" value="274.00000"/>
Diameter (in):	<input type="text" value="14.2000"/>
Max Fragment Weight (lb):	<input type="text" value="0.289082"/>
Critical Fragment Velocity (fps):	<input type="text" value="8116"/>

Theoretical Calculated Fragment Range

HFD [Range to No More Than 1 Hazardous Fragment per 600 Square Feet] (ft):	<input type="text" value="680"/>
MFR-V [Vertical Range of Max Weight Fragment] (ft):	<input type="text" value="1991"/>
MFR-H [Horizontal Range of Maximum Weight Fragment] (ft):	<input type="text" value="2501"/>

Overpressure Distances

Inhabited Building Distance (12 psi), K40 Distance:	<input type="text" value="293"/>
Inhabited Building Distance (09 psi), K50 Distance:	<input type="text" value="367"/>
Intentional MSD (0065 psi), K328 Distance:	<input type="text" value="2406"/>

Minimum Thickness to Prevent Perforation

4000 psi Concrete (Prevent Spall):	<input type="text" value="8.94"/>
Mild Steel:	<input type="text" value="1.46"/>
Hard Steel:	<input type="text" value="1.20"/>
Aluminum:	<input type="text" value="3.05"/>
LEXAN:	<input type="text" value="6.77"/>
Plexi-glass:	<input type="text" value="5.12"/>
Bullet Resist Glass:	<input type="text" value="4.24"/>

Required Sandbag Thickness

Max Fragment Weight (lb)SB:	<input type="text" value="0.022120"/>
Critical Fragment Velocity (fps)SB:	<input type="text" value="8116"/>
Kinetic Energy 106 (lb-ft ² /s ²)SB:	<input type="text" value="0.7285"/>
Required Wall Roof Sandbag Thickness (in)SB:	<input type="text" value="NA"/>
Expected Maximum Sandbag Throw Distance (ft)SB:	<input type="text" value="NA"/>
Minimum Separation Distance (ft)SB:	<input type="text" value="NA"/>

Water Containment System and Minimum Separation Distance:

Max Fragment Weight (lb)W:	<input type="text" value="0.022120"/>
Critical Fragment Velocity (fps)W:	<input type="text" value="8116"/>
Kinetic Energy 106 (lb-ft ² /s ²)W:	<input type="text" value="0.7285"/>
Water Containment System:	<input type="text" value="NA"/>
Minimum Separation Distance (ft)W:	<input type="text" value="NA"/>



Print This Form

Close Form

APPENDIX C

Ohio EPA MEC Demolition Notification

Munitions and Explosives of Concern (MEC) at the Ravenna Army Ammunition Plant (RVAAP) - Notification Procedures

Paragraph 9(a) of the Director's Final Findings and Orders (journalized June 10, 2004) allows for the following exemption: "The requirement to obtain a hazardous waste facility installation and operation permit, as required by ORC 3734.02 (E), for the storage and treatment (destruction) of MEC (excluding bulk storage of munitions and chemical and biological warfare materiel) at OD#2, and for the in-place treatment (destruction) of MEC (excluding bulk storage of munitions and chemical and biological warfare materiel) discovered at the RVAAP that can not be safely transported to OD#2, provided, however, that Respondent shall comply with all applicable requirements of ORC chapter 3734 and OAC chapters 3745-50 through 3745-68, including but not limited to the hazardous waste requirements set forth at Appendix E."

In the absence of obtaining emergency permits, the following is the type of information that should be provided to Ohio EPA Northeast District Office (NEDO), Division of Emergency and Remedial Response (DERR) [attn: Eileen Mohr] and Division of Hazardous Waste Management (DHWM)[attn: Greg Orr]. The information is divided into categories: prior to destruction of the MEC and subsequent to the destruction of the MEC. Prior to the MEC destruction, notification can be made via either letter or email. Subsequent to detonation, the information can be transmitted in a written summary report after each detonation event or at the conclusion of clearance activities at a particular Area of Concern (AOC).]

Information to be provided prior to Blow in Place (BIP) or Detonation at OD#2:

1. Point of Contact (POC)
2. POC's phone number(s) and fax number
3. Location/date/time/person discovering the MEC
4. Description of MEC to be blown: including type and quantity
5. Proposed destruction location: either at OD#2 or BIP
6. Proposed method of destruction
7. Proposed methods to mitigate/abate potential contamination
8. Preparedness and prevention
9. Notifications to be made

Information to be provided subsequent to BIP or Detonation at OD#2:

1. POC
2. POC's phone number(s) and fax number
3. Description of MEC blown: including type and quantity
4. Location/date/time/person responsible for the MEC destruction
5. Location of destruction activities - description and map with GPS locations listed and (if applicable) the depth and number of shot holes utilized at OD#2
6. Method of destruction utilized
7. List of donor charges and amounts
8. Any problems encountered
9. Inspection/disposal of residues
10. Confirmation of adherence to minimum isolation distances specified in OAC 3745-68-82
11. Whether or not any subsequent soil samples were collected and location of available analytical results

COMMENT RESPONSE TABLE

DOCUMENT PREPARERS: PIKA and e²M

DOCUMENT TITLES: 1) Explosive Site Plan (ESP), Operation and Maintenance of Sand Creek Barrier System; 2) Draft Revised Operations and Maintenance Plan (O+M), Sand Creek Barrier System; and 3) Site Safety and Health Plan (SSHP)

PROJECT: Time Critical Response Action at the Rocket Ridge Area of Open Demolition Area #2.

DOCUMENT REVIEWER: Eileen T. Mohr, Ohio EPA, NEDO, DERR

DATE TRANSMITTED: July 2, 2008

CMT. #	DOCUMENT/ PAGE #/	REVIEWER COMMENT	REVIEWER RECOMMENDATION	PREPARER RESPONSE
ESP, O&M, and SSHP				
1	General – All	Future documents.	Please ensure that draft documents are clearly stamped “draft.” No changes needed on these documents.	Comment noted
2	General – All	Future documents.	Please ensure that draft documents have line numbers. No changes needed to these documents.	Comment noted
3	General – All	Explanation needed and potential change.	Although I know that there are 3- 500 lb bombs in Rocket Ridge, it is unclear as to why this munition was selected for determining the MGF, etc.. It is unlikely that any of the larger munitions would migrate towards the barrier system; typically it would be the smaller munitions. Please clarify and change if needed. (This would include text, maps and calculations on all three documents).	Army Corps and DDES requirements state that the MGF be based upon the largest known item at the site. This is also an added safety precaution and will not negatively impact any other operations.
ESP				
4	ESP – pg 2, item 4e	Tense correction needed.	Change tenses in the first 2 sentences in this item to match. (One is currently past tense, one is future tense.)	Tense correction has been made. .., the Army will construct a barrier system.
5	ESP – pg 2, item 7a	Text change. (Because we don’t know all the munitions in Rocket Ridge).	Change text to read: “...., or is expected to be on-site includes: 75 millimeter...”	The text has been revised: “The MEC that has been identified or is anticipated to be present at Rocket Ridge includes...”
6	ESP – App A, fig 1	Legend correction.	What is the “proposed area” denoted in the legend. Remove if necessary.	The Legend denotation was corrected to Sand Creek Barrier System
7	ESP – App A, fig 3	Map changes requested.	a. remove “crop” ☺ circles from the map.	The map has been revised as follows: a. The circles were removed

COMMENT RESPONSE TABLE

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CMT. #	DOCUMENT/ PAGE #/	REVIEWER COMMENT	REVIEWER RECOMMENDATION	PREPARER RESPONSE
			b. several Slagle Roads... confirm or change. c. add igloos to the legend. d. what is the "proposed area" denoted in the legend? Remove if necessary. e. the amount of added detail to this map is not needed. For example: buildings at LL9 and 11 are gone, most of the Wet Storage igloos are gone, etc.. Update to reflect current conditions. f. define PTRD somewhere. Add an acronym list to the front of the document? g. label Rocket Ridge.	b. The Slagle Road denotation has been changed. c. Igloos were added to the legend. d. The "Proposed Area" denotation has been removed. e. The map has been updated to reflect current conditions. f. PTRD has been defined on map. Acronym list was added. g. Rocket Ridge has been labeled.
8	ESP – App A, fig 4	Map changes requested.	a. remove "crop" ☺ circles from the map. b. add igloos to the legend. c. the amount of added detail to this map is not needed. For example: buildings at LL9 and 11 are gone, most of the Wet Storage igloos are gone, etc.. Update to reflect current conditions. d. add igloos to the legend.	The map has been revised as follows: a. The circles were removed. b. Igloos were added to the legend. c. The map has been updated to reflect current conditions. d. Igloos were added to the legend.
Revised O&M				
9	O+M – pg 2, sec 3.2	Text change.	Pam EP 75-1-2... Munitions and Explosives...	The text on page 2 has been revised to read as noted.
10	O+M – pg 5, sec 3.5	Items C+D... question.	Both items reference contract option items to be exercised. How long will exercising a contract option for MEC and MD management take? We do not want any material stored indefinitely.	Either contract option will be exercised within a week.

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PROJECT: Time Critical Response Action at the Rocket Ridge Area of Open Demolition Area #2.

DOCUMENT REVIEWER: Eileen T. Mohr, Ohio EPA, NEDO, DERR

DATE TRANSMITTED: July 2, 2008

CMT. #	DOCUMENT/ PAGE #/	REVIEWER COMMENT	REVIEWER RECOMMENDATION	PREPARER RESPONSE
11	O+M – pg 6, sec 3.6.4	Clarification requested.	The UXO team leader has the final ... what? (There is a word missing in the sentence.)	The team leader has “final on-site authority on MEC procedures and safety issues.” Please re-read sentence with this clarification.
12	O+M – pg 9, sec 3.7.3	Recommendation.	Consider have key back-up equipment (ex. Schonstedt) on site to minimize lost time in obtaining a replacement	The text has been revised as noted. “A back-up unit is maintained on-site during field operations.”
13	O+M – pg 11, sec 3.12.6	Revision requested.	The text references Appendix XX. Please insert the applicable #.	The correct reference is “Attachment 1”. The text has been revised accordingly.
14	O+M – pg 12, sec 3.12.7	Text change. (Because we don't know all the munitions in Rocket Ridge).	Change text to read: “...., or is expected to be on-site includes: 75 millimeter...”	The text on page 12 has been revised as noted.
15	O+M – pg 12, table 3-3	Clarification requested.	The text in the 2 nd bullet appears to be contradictory. The first sentence indicates that artifacts and/or remains should be collected or secured. The second sentence indicates that the human remains are not to be disturbed.	The text was provided by the RTLS Cultural Resources Office. The first sentence indicates that only appropriate RTLS personnel may collect artifacts or human remains, if found at the site. The second sentence directs the Contractor to not disturb any artifacts or human remains.
16	O+M – pg 28, sec 5.2.8	Revision requested.	Change text to read: “...onsite or offsite...”	The text in section 5.2.8 on page 28 has been revised as noted.
17	O+M – Attach 2, pg 200-2	Section 7 lists the attachments.	ESHF-206, 207, and 208 are not included. They also are not applicable to this project. Either remove from the attachment list, or provide.	ESHF-206, 207, and 208 have been removed from the attachment list.

SSHP

18	SSHP – GENERAL	Although Ohio EPA does not have regulatory authority over health and safety plans, the Agency has reviewed the SSHP.	Comments are not required to be addressed.	Comment noted.
19	SSHP – pgs 4 and 5	This section lists all of the RVAAP MMRP sites.	Instead of the general description, there should be a description specific to ODA2, Rocket Ridge, and the migration	The following text has been inserted: Rocket Ridge is located at Demolition Area #2 MRS.

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DATE TRANSMITTED: July 2, 2008

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			downstream issue.	<p>The following is a description of Rocket Ridge:</p> <p>“Rocket Ridge is a steep embankment approximately 500 feet long and 25 feet high located adjacent to Sand Creek within ODA2, approximately 2,700 feet upstream of the George Road Bridge. ODA2 was used for munitions demilitarization, including detonation of large caliber munitions and off-specification bulk explosives that could not be deactivated or demilitarized by any other means. The Rocket Ridge slope was used for the disposal of demilitarized munitions, although not all munitions appear to have been completely demilitarized. Munitions-related items that could be identified include 75-millimeter (mm) and 105-mm rounds, booster cups, three 500-pound bombs, white phosphorus rifle grenades, fuzes, and burster tubes. It appears that the munitions were transported from the demolition site to Rocket Ridge and dumped at the top of the slope. Sand Creek flows in an eastward direction along the northern boundary of the Rocket Ridge Area of ODA2, at the toe of the slope. Due to the steep slope of the disposal area and the stream bank erosion resulting from high water events, some of the munitions materials have reached Sand Creek.”</p>
20	SSHP – pg 8, sec 2.5.2	Revise as necessary.	There appears to be duplicative language in the 1 st sentence of this section.	For clarification the sentence has been changed to read as follows: A hazardous substance is defined as <i>“any substance, as defined as a hazardous</i>

COMMENT RESPONSE TABLE

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PROJECT: Time Critical Response Action at the Rocket Ridge Area of Open Demolition Area #2.

DOCUMENT REVIEWER: Eileen T. Mohr, Ohio EPA, NEDO, DERR

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				<i>substance under 29 CFR 1910.120, 1926.65, or 40 CFR Part 302, or any chemical determined to be a hazard as specified in 29 CFR 1910.1200 or 1926.59 to include a chemical (as a gas, liquid, vapor, mist, dust or fume) which has been identified as causing adverse health effects in exposed humans."</i>
21	SSHP – pg 26, sec 7.5.1	Clarification.	What clinic?	The PIKA designated occupational health clinic for work at the RVAAP: MEDGroup – 3913 Darrow Road, Suite 100, Stow Ohio 44224. This information will be incorporated into the noted text for clarification.
22	SSHP- pg 28, sec 8.4	Clarification.	The text references a 1 ft MEC removal. Please clarify. This should be a surface removal (unless covered by sediment/debris).	This language is a carry-over from a previous project. The text will be corrected to read "Integrated breathing zone (BZ) sampling will not be required during the performance of the O&M of the Sand Creek Barrier System being performed by PIKA personnel."
23	SSHP- pg 31, secs 9.1.5 and 9.2.2	Recommendation.	In future SSHPs, please detail prevention, signs and symptoms, and treatment for levels of heat and cold stress. It is unlikely that workers will flip back to the specific SOPs. Consider having them posted in a conspicuous place.	Comment noted.
24	SSHP – pg 42, sec 12.2	Clarification.	Is the intent to have portable toilets or just use the field office facilities?	Text in section 12.2 will be corrected to read as follows: During the O&M activities, personnel will utilize the toilet facilities provided in the PIKA field office at Building 1038. Antibacterial hand cleaning solution will be available within the restroom."

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25	SSHP – pg 44, table 14-1	Clarification.	Will there be a field trailer or will the PIKA field office just be used given the close proximity to the site?	Personnel will use the PIKA field office in Building 1038. Table 14-1 will be revised accordingly.
26	SSHP – pg 47, top of page	Revision.	All contacts for emergency services go through Post #1.	<p>The following text was inserted: The off-site emergency resources presented in Table 15-1 will be contacted by the EC in the event of an emergency.</p> <p style="text-align: center;">Table 15-1: Emergency Telephone Numbers</p> <p style="text-align: center;">“**CONTACT POST 1 VIA RADIO COMMUNICATION OR BY PHONE AT 330-358-2017 FOR ALL EMERGENCY NOTIFICATIONS**</p> <p style="text-align: center;">The numbers listed below are for information only”</p>
27	SSHP – pg 47, table 15-1	Addition requested.	Add Post #1 contact information.	Please refer to response #26
28	SSHP – pg 48, sec 15.9.1	Clarification.	In the event that emergency services need to be contacted, communications go through Post 1.	The following text was inserted: Post 1 will be contacted to summon off-site emergency services as needed for treatment of injuries or exposure.
29	SSHP – pg 48, sec 15.9.2	Clarification.	In the event that emergency services need to be contacted, communications go through Post 1.	The following text was inserted: Post 1 will be contacted to summon off-site emergency services as needed for treatment of

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				injuries or exposure.
30	SSHP – pg 52, sec 15.12.3, 2 nd last line before bullets	Text change.	Change to read: "...and transportation will be summoned. The first aid..."	The text has been revised to read: "... and transportation will be summoned. The first aid..."
31	SSHP – pg 52, sec 15.12.3	Clarification.	In the event that emergency services need to be contacted, communications go through Post 1.	The following text was inserted: Post 1 will be contacted to summon off-site emergency services as needed for treatment of injuries or exposure.
32	SSHP – pg 53, sec 15.12.4	Clarification.	In the event that emergency services need to be contacted, communications go through Post 1.	The text has been revised to read: If immediate transportation to a medical facility is required Post 1 will be contacted to summon off-site emergency services.
33	SSHP – pg 53, sec 15.12.4	Recommendation.	Unless an injury is really minor, consider calling a squad for transport.	Comment noted.
34	SSHP- pg 54, sec 15.15	Clarification.	Not all ambulance service in the area is ALS, most is BLS. Unless an injury is really minor, consider calling a squad for transport.	Comment noted.
35	SSHP – pg 56, sec 15.17.1	Clarification.	Is it anticipated that there will be subsurface investigation of anomalies during this project?	This was an incorrect project citation. The text will be corrected to read: "During site operations that involve O&M of the Sand Creek Barrier,..."
36	SSHP – attach 1 CAHAs throughout.	Change in future documents.	Sever should be severe.	The comment has been incorporated into the document.

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37	SSHP – attach 1 CAHAs throughout.	Clarification.	In slips, trips and falls, reference the water hazards in here.	The following text was inserted: “In and around the creek areas, algae, moss, rocks, and rushing water can cause slippery, uneven and unstable walking surfaces. Personnel will remain alert to the potential for slip, trips and falls when working around the water.”
38	SSHP – attach 2	Question.	CD of SOPs not included with the document.	The CD was inadvertently omitted. A CD of the SOPS will be provided in the next iteration.
39	SSHP – attach 3, veh.insp. list	Change in future documents.	Item #3 – change to Eyewash Kits.	The text in attachment 3 has been changed as noted.

RESPONSES TO REVIEW COMMENTS

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DOCUMENT REVIEWER: Katie Elgin, OHARNG, Ravenna Training And Logistics Site

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ESP				
1	Pg 1, 1a	“Operation and Maintenance of Sand Creek Barrier System, Rocket Ridge Area of ODA2...” Since you are describing the name of the site and referencing the location, I recommend inserting “2,700 feet east of the” before “Rocket Ridge”. This is how the site was described in the other documents.		The comment was incorporated into the document.
2	Pg 1, 3a	“To prevent the downstream movement of munitions and explosives of Concern (MEC) and Munitions Debris (MD) within Sand Creek” Change to “To prevent the potential downstream movement of Munitions and Explosives of Concern (MEC) and Munitions Debris (MD) from Rocket Ridge within Sand Creek”		The comment was incorporated into the document.
3	Pg 2, 4d	“On 18 June 2007, a rifle grenade containing white phosphorous exploded on the slope of Rocket Ridge. A survey conducted on 5-6 November 2007 upstream of the George Rod bridge identified a piece of munitions debris approximately 1200 feet downstream of Rocket Ridge...” There needs to be a statement in here of how the white phosphorous grenade explosion relates to the November survey and subsequent Sand Creek barrier. Suggestion: Insert the following line after the first sentence: “This event triggered the need for a response action at Rocket Ridge. Therefore, a survey was conducted on...”		The noted text has been revised to read as follows: “This event triggered the need for a response action at Rocket Ridge. Therefore, a survey...”
4	General	Recommend inserting an acronym table in this document since this is a stand-alone document and there are many undefined acronyms.		An acronym table was inserted into the document.
5	Pg 2, 7a	“The MEC that has been discovered, or is expected to be on site is...” Here we are talking about Rocket Ridge and not the Sand Creek barrier area. Therefore, I would change the sentence to the following: “The MEC that has been identified or is anticipated to be present at Rocket Ridge is...”		The text suggested by the commenter was inserted into the document.
6	Pg 2, 7a	Define MGF and MSD in the text as this is the first references.		The comment was incorporated into the document.

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7	Pg 2, 7a	“The MGFID identified is the 500 lb Bomb M64A1. During the course of this investigative action, if MEC with a greater fragmentation distance is encountered...” This is not an “investigative action”. Recommend deleting the word “investigative”.		The comment was incorporated into the document.
8	Pg 3, item c	Even though there are no public roadways, there are facility/personnel roadways that would need to be closed. Mention these facility roads and that any areas to be closed or evacuated will be coordinated with the OHARNG.		The following text was added at the end of item c: “However, the MSDs may include facility roads. Any facility roads and areas to be closed or evacuated will be coordinated with OHARNG.”
9	Pg 3, item d	OD-2 should be changed to ODA2 to be consistent.		The comment was incorporated into the document.
10	Pg 4, item b	Define NEW in the text as this is the first reference.		The comment was incorporated into the document.
11	Pg 4, item c	“Access to the ODA2 area is controlled through RVAAP Post 1 Security.” Also add in that it is controlled through an onsite locked gate.		The noted text has been revised to read as follows: Access to the ODA2 area is controlled through RVAAP Post 1 Security... “and an onsite locked gate.”
12	Pg 4, item d	Define ESQD as this is the first reference.		The comment was incorporated into the document.
13	Appendix A, Figure 3 and 4	Recommend deleting the small black circles as they are distracting and not needed.		The comment was incorporated into the document.
Revised O&M				
1	Pg 2, 1 st paragraph	“... have been subsequently licensed to the OHARNG for use as a military training site.” After “site”, insert “, the Ravenna Training and Logistics Site (RTLS).”		The comment was incorporated into the document.

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2	Pg 2, last full paragraph	This paragraph seems lost in that it does not describe how it relates to the installation of the barrier. You need to insert a line at the end of the paragraph indicating that the white phosphorous grenade event triggered the need for a response action at Rocket Ridge with the MEC barrier being the first step or interim measure in the response action.		He following new text has been incorporated into the last paragraph on page 2: "The rifle grenade event triggered the need for a response action at Rocket Ridge with the MEC barrier being the first step or interim measure in the response action."
3	Pg 4, Section 3.3, 1 st paragraph	"Once the site is secured, PIKA personnel will continue to secure the site until relieved by military EOD. Confirmation of CWM will require a halt in specific Area of Concern (AOC) operations." Recommend deleting "Area of Concern (AOC)" since the MEC barrier is not located on an AOC.		The comment was incorporated into the document.
4	Pg 10, Section 3.10	In this section (Project Notifications), it may be a good idea to identify a subsection for the notification/ coordination with the OHARNG. Prior to any field visit, the contractor will need to notify and coordinate with the range control and MAJ Meade to make sure there is no firing on the MK19 range and to coordinate what time the George Road gate will need to be opened. This is a pretty important notification/ coordination that should also be mentioned in this section so it is not overlooked.		The following new paragraph was inserted: "3.10.3 Notification and Coordination with OHARNG Prior to any field visit, e ² M or PIKA will notify and coordinate with the range control and MAJ Meade to ensure there is no firing on the MK19 range and to coordinate what time the George Road gate will need to be opened."
5	Pg 10, Section 3.10.2	MAJ Meade's listed phone number is incorrect. Change 6790 to 6560.		The comment was incorporated into the document.
6	Pg 11, Section 3.12.5	Here it mentions that the approved MEC storage area is at Igloo 1502. All other documents and sections reference the approved storage area as Igloo 1501. Please check and change the Igloo number if needed.		Storage Igloo 1501 is the correct citation. As such the text has been revised to read as follows: "Collection points are those areas used to temporarily accumulate MEC within an area pending transportation to the

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				approved storage location at Igloo 1501 or ODA2.
7	Pg 13, Section 3.13, 1 st bullet	Please add in the following at the end of the text for this bullet "The O&M visit must not interfere with activities on the MK19 range."		The comment was incorporated into the document.
SSHP				
1	Section 15.17 Spills	Somewhere in this section it needs to reference that if there is a spill on OHARNG property, the notification and spill cleanup must be in compliance with the RTLS Integrated Contingency Plan. The OHARNG must be notified according to our First Responder Notification Form.		The following text was inserted: "In the event of a spill, the PIKA SUXOS will notify the OHARNG of the nature and extent of the spill. Both notification and spill clean-up will be conducted in accordance with the RTLS Integrated Contingency Plan using the OHARNG First Responder Notification Form."