

# Proposed Plan / Public Meeting

for the former Camp Croft, South Carolina

FUDS No. I04SC001603

US Army Corps of Engineers

05 May 2016

Spartanburg, South Carolina



US Army Corps of Engineers  
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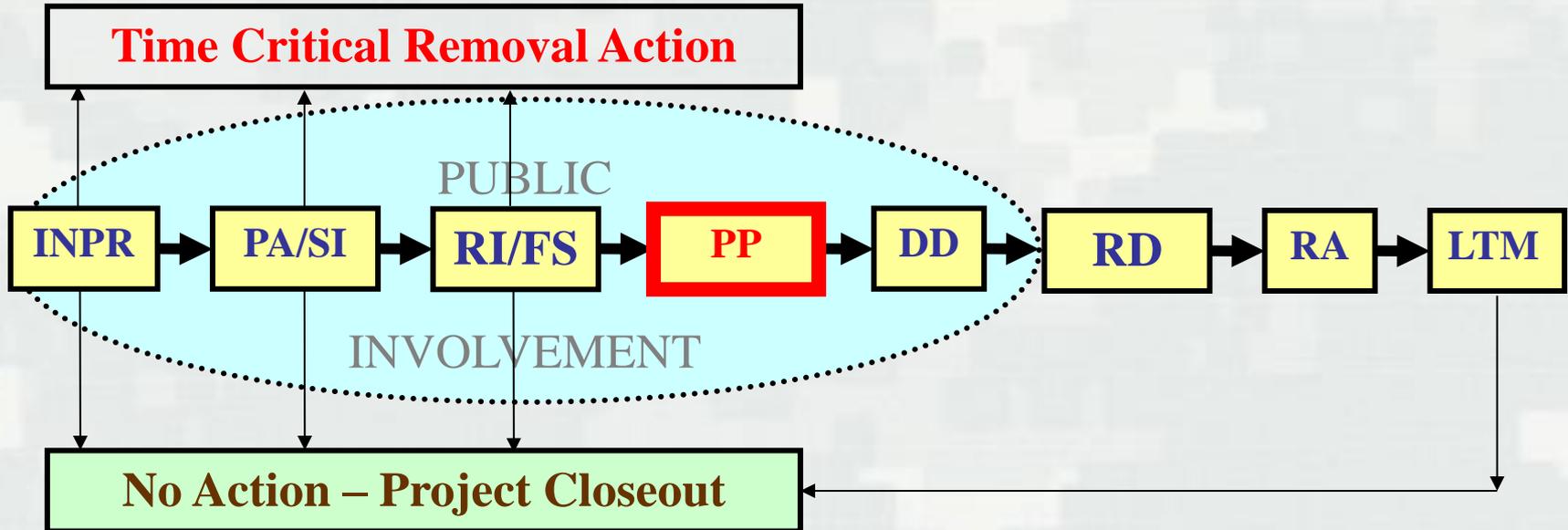


# Agenda

- Legal framework and stakeholders
- Remedial Investigation (RI)
  - ▶ Purpose/Objectives, Findings, & Summary
- Feasibility Study (FS)
  - ▶ Purpose/Objective, Findings and Summary
- Proposed Plan (PP)
  - ▶ Purpose/Objective
- Questions



# CERCLA Process



**CERCLA** = Comprehensive Environmental Response, Compensation and Liability Act

**INPR**: Inventory Project Report

**PA**: Preliminary Assessment

**SI**: Site Inspection

**RI/FS**: Remedial Investigation/Feasibility Study

**PP**: Proposed Plan

**DD**: Decision Document

**RD**: Remedial Design

**RA**: Remedial Action

**LTM**: Long Term Management



# FUDS Program

- Congress established the Defense Environmental Restoration Program in 1986, under which the US Army Corps of Engineers manages the Formerly Used Defense Site (FUDS) Program for Department of Defense (DoD).
- FUDSs are real properties that were owned by, leased to, or otherwise possessed by the United States that were transferred from DoD control prior to October 17, 1986.
- The FUDS program is required to follow CERCLA for the Military Munitions Response Program (MMRP).



# Decision Makers

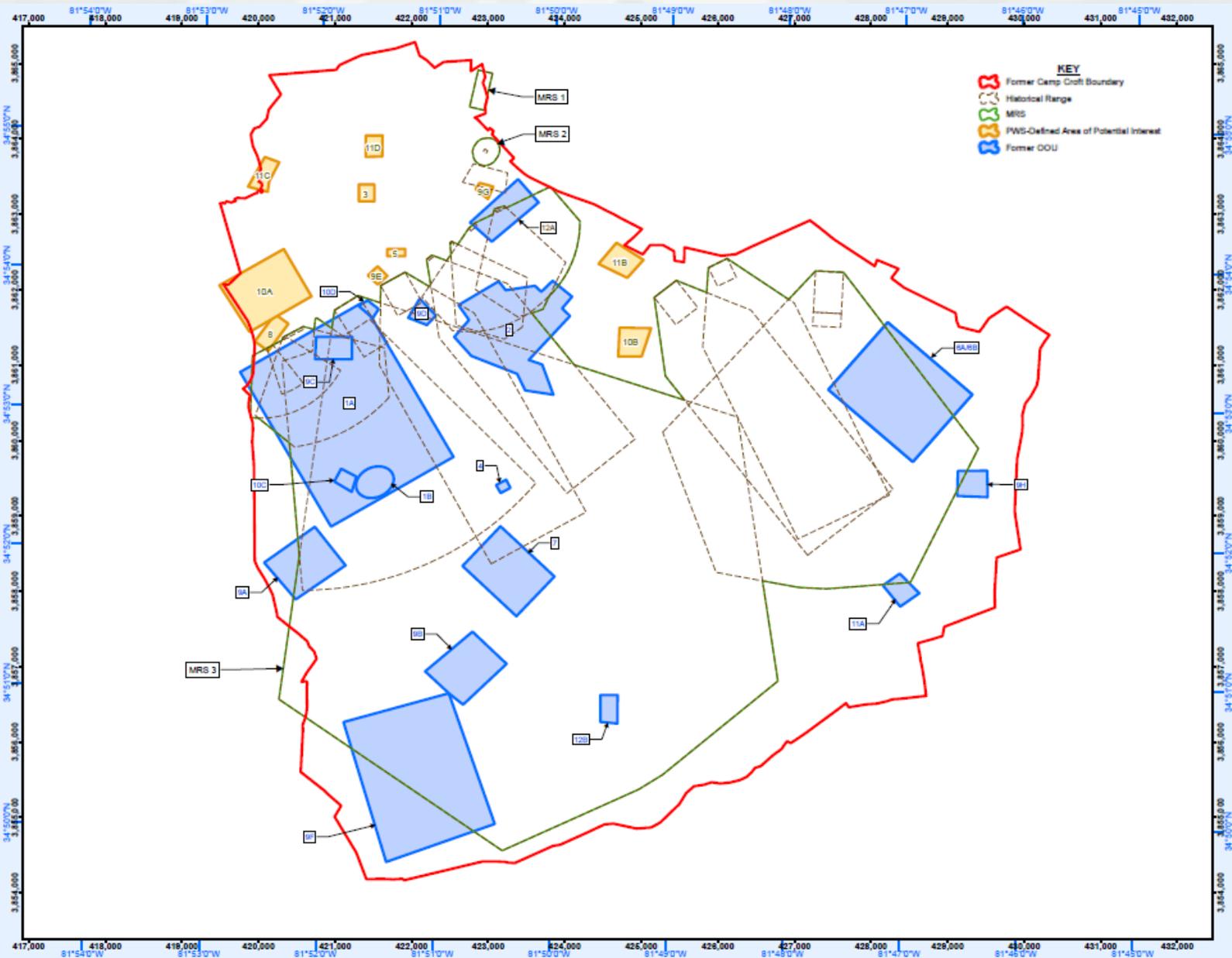
- Stakeholders involvement is key
  - ▶ USACE guides program / technical aspects
  - ▶ SC DHEC has actively participated in planning work and reviewing documents
  - ▶ Restoration Advisory Board has met consistently to monitor progress
  - ▶ Planning and reporting documents are provided to public at Information Repository
  - ▶ Proposed Plan Public Mtg in March 2016



# History of Former Camp Croft

- Camp Croft Infantry Replacement Training Center (IRTC) was officially activated on January 10, 1941.
- Camp Croft had at least 12 live ammunition training ranges used for small arms ammunition, anti-tank rockets, anti-aircraft artillery, 60-millimeter (mm) infantry mortars, and 81mm infantry mortars.
- The training range impact areas comprised 16,929 acres; a 175-acre grenade court was also located at the camp.
- The entire installation (just over 19,000 acres) was declared surplus in November 1946 and excessed to the War Assets Administration in 1947.
- Munitions of concern include grenades, landmines, mortars, projectiles, and rockets.
- Since the early 1990s, numerous investigations and response actions have been completed at the former Camp Croft.





# RI - Purpose and Objective

- Purpose: Characterize the nature and extent of **risks** posed by uncontrolled MEC/MC impacts due to historical Department of Defense usage.
- Objective: Gather information sufficient to support an informed risk management decision regarding potential remedial alternatives.



# RI Summary

- ~77% of investigation area contained only small arms / low quantities of munitions debris (MD).
- 8 areas contained **munitions and explosives of concern (MEC)** and/or very high MD concentrations.
- No munitions constituents (MC) risks were identified.
- 14 areas were investigated; 8 areas were retained for future action.



# RI Munitions Categories

- Grenade – Mk I hand grenade (practice), Mk II hand grenade, M15 hand grenade (smoke), and M19 rifle grenade (illumination)
- Landmine – M1 anti-tank
- Mortar – 60mm [training, illumination, high explosive (HE)], 81mm (training, HE)
- Projectile – 37mm, 57mm, 105mm HE, 105mm Illumination
- Rocket – 2.36" Bazooka



# Typical “Practice” Munitions Debris

37mm/57mm projectiles



60mm mortar

tail fins

grenades

.50 caliber



# Investigation Summary

Area	Size (acres)	Comments
MRS 1	23.8	No MEC/MD observed
MRS 2	24.9	Minimal access; Suspected grenade court
<b>105mm Area</b>	<b>1,399.5</b>	<b>105mm projectiles (primary)</b>
<b>Maneuver Area</b>	<b>1,276.5</b>	<b>Mixed munitions use</b>
<b>60mm Mortar Area</b>	<b>303.4</b>	<b>Mixed munitions use; Primarily mortars</b>
<b>60/81mm Mortar Area</b>	<b>301.3</b>	<b>Mixed munitions use; Primarily mortars</b>
<b>Rocket &amp; Rifle Grenade Area</b>	<b>108.5</b>	<b>Mixed munitions use</b>
<b>Rocket/Grenade Maneuver Area</b>	<b>126.3</b>	<b>Mixed munitions use; two mine fuzes</b>
Remaining Lands	9,093.6	No MEC and minimal MD observed
Grenade Area	19.2	Minimal access; Suspected grenade court
AoPI 5	5.5	No MEC/MD observed

\*RED TEXT – MEC observed during RI



# Investigation Summary

Area	Size (acres)	Comments
AoPI 8	22.9	No MEC/MD observed
AoPI 9E	7.6	No MEC/MD observed
AoPI 9G	6.6	No MEC/MD observed
Rocket Area	93.9	Mixed munitions use; Primarily rockets
<b>Grenade Maneuver Area</b>	<b>450.5</b>	<b>Mortars (and grenades) observed</b>
Practice Grenade Area	6.4	Grenades observed
Mortar/Rifle Grenade Area	22.9	Mortars (and grenades) observed

\*RED TEXT – MEC observed during RI



# MEC Hazard Assessment

- MEC Hazard Assessment
  - ▶ Supports hazard management decision-making process
  - ▶ Addresses explosives safety concerns posed by MEC to human receptors
  - ▶ Does not address environmental or ecological concerns
  - ▶ Range of (possible) scores:
    - 1 (highest) to 4 (lowest)



# MEC Hazard Assessment Scores

Area	Hazard Level Category	Score
105mm Area	1	950
Maneuver Area	1	1,000
60mm Mortar Area	3	705
60/81mm Mortar Area	1	965
Rocket & Rifle Grenade Area	1	905
Rocket/Grenade Maneuver Area	2	760
Grenade Maneuver Area	2	755

- Hazard Level Categories:
  - ▶ Level 1 – 1,000 to 840 (Highest Hazard)
  - ▶ Level 2 – 835 to 725 (High Hazard)
  - ▶ Level 3 – 720 to 530 (Moderate Hazard)
  - ▶ Level 4 – 525 and under (Low Hazard)



# Included in FS

Pre-RI Designation	Pre-RI Acreage	Revised Designation	Revised Acreage	Recommendation*
MRS 3 (Land)	12,102.4	105mm Area	1,399.5	Included in FS
		Maneuver Area	1,276.5	Included in FS
		60mm Mortar Area	303.4	Included in FS
		60/81mm Mortar Area	301.3	Included in FS
		Rocket & Rifle Grenade Area	108.5	Included in FS
		Rocket/Grenade Maneuver Area	126.3	Included in FS
		Remaining Lands (Land + Water)	9,093.6	Included in FS
AoPI 3	11	Grenade Area	19.2	Included in FS
AoPI 10A	171.5	Rocket Area	93.9	Included in FS
AoPI 10B	33.6	Grenade Maneuver Area	450.5	Included in FS
AoPI 11B	343.7			
AoPI 11C	23	Practice Grenade Area	6.4	Included in FS
AoPI 11D	15.1	Mortar/Rifle Grenade Area	22.9	Included in FS
<b>SUM = 12,700.3</b>		<b>SUM = 13,202.0</b>		

\* FS – Feasibility Study; NFA – No Further Action; DD – Decision Document; RI – Remedial Investigation; ROE – Right-of-Entry



# No Further Action / Pending

<b>Pre-RI Designation</b>	<b>Pre-RI Acreage</b>	<b>Revised Designation</b>	<b>Revised Acreage</b>	<b>Recommendation*</b>
MRS 1	23.8	MRS 1	23.8	NFA; Address in DD
MRS 2	24.9	MRS 2	24.9	RI/FS, pending ROE allowance
AoPI 5	5.5	AoPI 5	5.5	NFA; Address in DD
AoPI 8	23.9	AoPI 8	22.9	NFA; Address in DD
AoPI 9E	7.6	AoPI 9E	7.6	NFA; Address in DD
AoPI 9G	6.6	AoPI 9G	6.6	NFA; Address in DD
<b>SUM =</b>	<b>92.3</b>	<b>SUM =</b>	<b>92.3</b>	

\* FS – Feasibility Study; NFA – No Further Action; DD – Decision Document; RI – Remedial Investigation; ROE – Right-of-Entry

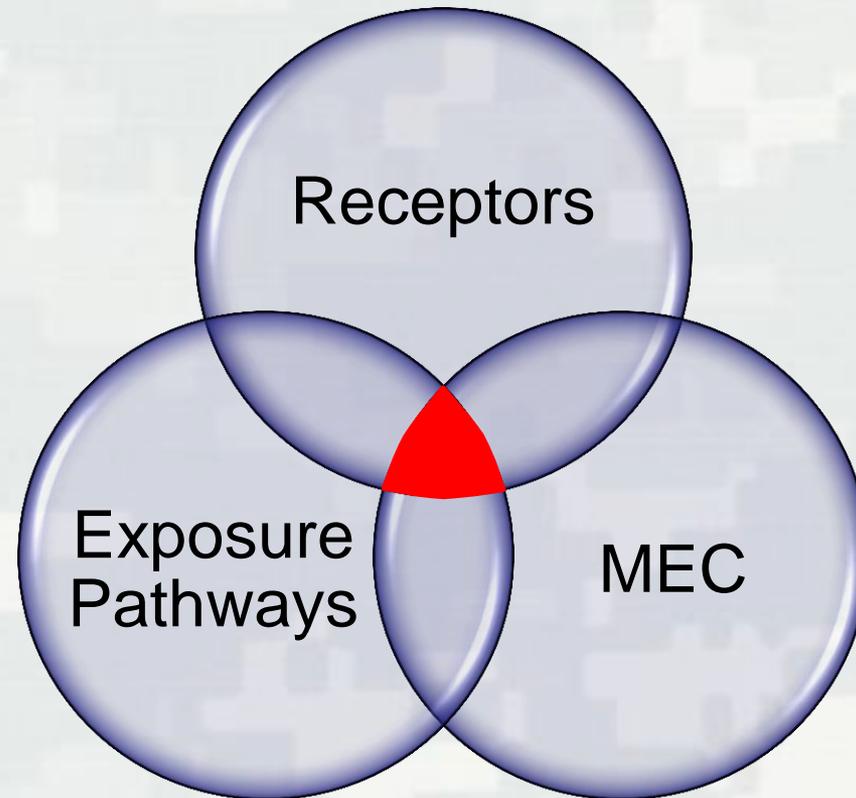


# FS - Purpose and Objective

- Feasibility Study (FS):
  - ▶ Purpose: **develop & evaluate** potential **response alternatives** to manage the MEC / MC hazards and risks to human health and the environment due to historical DoD usage.
  - ▶ Objective: **provide decision makers** the information needed to **support** the appropriate risk-management response alternative(s) for the site.



# Risk Relationship



= Risk!



# Generalized FS Process

- Uses RI findings / risk assessment
- Establishes remedial objectives
- Develop broad range of possible response actions (“alternatives”)
- Screening of possible alternatives
  - ▶ Effective?, Implementable?, Relative Cost?
- Retained alternatives are evaluated using Nine Evaluation Criteria



# Range of Alternatives

- The following potential alternatives were screened:
  - ▶ **No Action** (required, under CERCLA)
  - ▶ **Land Use Controls (LUCs) and Long-Term Management (LTM)**
  - ▶ LUCs (Enhanced) and LTM
  - ▶ Analog Surface MEC Removal, LUCs, LTM
  - ▶ Analog Surface MEC Removal, LUCs (Enhanced), LTM
  - ▶ **Analog Surface and Subsurface MEC Removal, LUCs, LTM**
  - ▶ Analog Surface and Subsurface MEC Removal, LUCs (Enhanced), LTM
  - ▶ Digital Surface and Subsurface MEC Removal, LUCs, LTM
  - ▶ Digital Surface and Subsurface MEC Removal, LUCs (Enhanced), LTM
  - ▶ **Digital Advanced Classification Surface and Subsurface MEC Removal to Support Unlimited Use / Unrestricted Exposure**

\***Bolded** alternatives were retained for detailed analysis



# Nine Evaluation Criteria

- Overall Protection of Human Health and the Environment
  - ▶ Assesses how well an alternative achieves and maintains protection of human health and the environment
- Compliance with ARARs
  - ▶ Assesses how the alternatives comply with location-, chemical-, and action-specific ARARs; there are no ARARs
- Long-Term Effectiveness and Permanence
  - ▶ Evaluates the effectiveness of the alternatives in protecting human health and the environment after response objectives have been met



# Nine Evaluation Criteria (con't.)

- Reduction of Toxicity, Mobility, or Volume with Treatment
  - ▶ Addresses the preference for selecting remedial actions that employ removal action technologies that permanently and significantly reduce the toxicity, mobility, or volume of the hazardous substance
- Short-Term Effectiveness
  - ▶ Examines the effectiveness of the alternatives in protecting human health and the environment during the construction and implementation of a remedy until objectives have been met
- Implementability
  - ▶ Assesses the technical and administrative feasibility of an alternative and the availability of required goods and services



# Nine Evaluation Criteria (con't.)

- **Cost**
  - ▶ Evaluates the capital, and operation and maintenance costs of each alternative
- **State Acceptance**
  - ▶ Considers the state's preferences among or concerns about the alternatives; addressed following SCDHEC review of FS and PP
- **Community Acceptance**
  - ▶ Considers the community's preferences among or concerns about the alternatives; addressed following community's review of FS and PP



# Comparative Analysis

<b>EPA's Nine CERCLA Evaluation Criteria</b>	<b><u>Alternative 1</u></b>  <b>No Action (Baseline Condition)</b>	<b><u>Alternative 2</u></b>  <b>Land Use Controls (LUCs; Limited) and Long-Term Management (LTM)</b>	<b><u>Alternative 3</u></b>  <b>Analog Surface &amp; Subsurface MEC Removal, LUCs (Limited), and LTM</b>	<b><u>Alternative 4</u></b>  <b>Digital Advanced Classification Surface &amp; Subsurface MEC Removal to support UU/UE</b>
Overall Protectiveness of Human Health and the Environment	Not protective	Protective	Protective	Protective
Compliance with ARARs	N/A	N/A	N/A	N/A
Long-Term Effectiveness and Permanence	○	○/●	●/●	●
Reduction of Toxicity, Mobility, or Volume through Treatment	○	○	○	●
Short-Term Effectiveness	○	○	●/●	●
Implementability	○	●	○	○/●
Cost <sup>^</sup>	N/A	\$	\$\$/\$\$\$	\$\$
State Acceptance*	No	To Be Determined	To Be Determined	To Be Determined
Community Acceptance*	No	To Be Determined	To Be Determined	To Be Determined

<sup>^</sup>Cost - Based on overall cost (not cost per acre)

\*State and Community Acceptance cannot be evaluated until comments on the FS/PP are received. SCDHEC is hesitant to support any alternative with the goal of Unlimited Use / Unrestricted Exposure, without some type of land use controls.

N/A – Not Applicable

Symbols: ● – Relatively High; ○ – Relatively Moderate; ○ – Relatively Low to none

Cost: \$ – Low or minimal costs; \$\$ – Moderate costs; \$\$\$ – High costs



# Cost Summary

MRSs	Acres	MEC Factor	Alt #1	Alt #2	Alt #3	Alt #4
			No Action	Land Use Controls (LUCs; Limited) & Long-Term Management (LTM)	Analog Surface & Subsurface MEC Removal, LUCs (Limited) & LTM	Digital Advanced Classification Surface & Subsurface MEC Removal to support UU/UE
<b>105mm Area</b>	1,399.5	1	\$0.00	\$5,077,151	\$11,549,498	\$9,325,693
<b>60mm Mortar Area</b>	303.4	1	\$0.00	\$1,100,527	\$2,503,478	\$2,021,444
<b>60/81mm Mortar Area</b>	301.3	1	\$0.00	\$1,092,910	\$2,486,150	\$2,007,453
Grenade Area	19.2	0.5	\$0.00	\$34,822	\$79,214	\$63,961
<b>Grenade Maneuver Area</b>	450.5	1	\$0.00	\$1,634,105	\$3,717,260	\$3,001,518
<b>Maneuver Area</b>	1,276.5	1	\$0.00	\$4,630,266	\$10,532,925	\$8,504,856
Mortar/Rifle Grenade Area	22.9	0.5	\$0.00	\$41,533	\$94,479	\$76,287
Practice Grenade Area	6.4	0.5	\$0.00	\$11,607	\$26,405	\$21,320
Remaining Lands	9,093.6	0.5	\$0.00	\$16,492,307	\$37,516,685	\$30,293,012
Rocket Area	93.9	0.5	\$0.00	\$170,302	\$387,404	\$312,811
<b>Rocket/Grenade Maneuver Area</b>	126.3	1	\$0.00	\$458,130	\$1,042,153	\$841,491
<b>Rocket &amp; Rifle Grenade Area</b>	108.5	1	\$0.00	\$393,564	\$895,278	\$722,896

Bolded areas contained observed MEC.

MEC Factor used to adjust “conceptual” cost estimate (Appendix A) to former Camp Croft Area.



# PP – Purpose and Objective

- Facilitate public involvement to review and comment in the remedy selection process
- Summarizes remedy alternatives retained during FS (i.e., Alternatives 1 – 4)
- Presents preliminary recommended alternative selection for addressing MEC at each of the MRSs



# Proposed Remedial Action Objectives

Area	MEC Depth (bgs)^	Land Use/ Depth (bgs)	RAO Depth (bgs)
105 mm	2 ft	Resident/2 ft	3 ft
60mm Mortar	6 in.	Resident/2 ft	3 ft
60/81mm Mortar	15 in.	Resident/2 ft	3 ft
Grenade	2 ft	Resident/2 ft	3 ft
Grenade Maneuver	6 in.	Resident/2 ft	3 ft
Maneuver	8 in.	Recreate/1 ft	2 ft
Mortar/Rifle Grenade	-	Recreate/1 ft	1 ft
Practice Grenade	-	Resident/2 ft	2 ft
Remaining Lands	-	Resident/2 ft	2 ft
Rocket	-	Resident/2 ft	2 ft
Rocket/Grenade Maneuver	4 in.	Resident/2 ft	3 ft
Rocket & Rifle Grenade	10 in.	Resident/2 ft	3 ft

^ Where no MEC has been confirmed, no depth is provided.



# Preferred Alternatives

MRS	Acres	Preferred Alternative	
		Alternative #2	Alternative #4
105mm Area	1,399.5		✓
60mm Mortar Area	303.4		✓
60/81mm Mortar Area	301.3		✓
Grenade Area	19.2	✓	
Grenade Maneuver Area	450.5		✓
Maneuver Area	1,276.5		✓
Mortar/Rifle Grenade Area	22.9	✓	
Practice Grenade Area	6.4	✓	
Remaining Lands	9,093.6	✓	
Rocket Area	93.9	✓	
Rocket/Grenade Maneuver Area	126.3	✓	
Rocket & Rifle Grenade Area	108.5		✓



# Decision Document

- Documents the final remedial action decision for each MRS
- Addresses public comments on the Proposed Plan
- Reviewed by South Carolina Department of Health and Environmental Control
- Placed in the Information Repository and Administrative Record File



# Upcoming Schedule

- Proposed Plan Public Comment Period
  - ▶ March 25, 2016 through April 25, 2016
  - ▶ Finalize Proposed Plan
- Decision Document
  - ▶ Responsiveness Summary
  - ▶ Draft Decision Document expected May 2016



# SAFETY

## RECOGNIZE

Military Items can be  
DANGEROUS

## RETREAT

DO NOT TOUCH IT!  
Move away from the area

## REPORT

CALL 911



# Question and Answer Session

**Please mail or email comments on this Proposed Plan to:**

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