APPENDIX L

TPP MEMORANDUM

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AGENDA

Project Name: Remedial Investigation/Feasibility Study (RI/FS), Former Camp Croft, Spartanburg, South Carolina

Date of Meeting: 16 March 2011

Time of Meeting: 8:30 am – 4:30 pm

Attendees:

1. Shawn Boone, USACE, Charleston
2. Spencer O'Neal, USAESCH
3. Teresa Carpenter USAESCH
4. Jason Shiflet, ZAPATA
5. Michael Winningham, ZAPATA
6. Suzy Cantor-McKinney, ZAPATA
7. Jeff Schwalm, ZAPATA
8. Susan Byrd, SC DHEC
9. South Carolina Parks and Recreation (tentative)
10. Croft State Natural Area (tentative)

Purpose of Meeting:

The purpose of this meeting is to establish the TPP team and to begin the TPP process for the Remedial Investigation/Feasibility Study at the former Camp Croft FUDS. Zapata Incorporated (ZAPATA) has developed Pre-Work Plans based on a technical proposal submitted to the United States Army Engineering and Support Center, Huntsville (USAESCH) in response to a Performance Work Statement dated 02 December 2010. Proposed meeting goals and discussion topics are provided below.

Meeting Goals:

1. Assemble and introduce the TPP team
2. Clarify the general RI/FS process
3. Obtain consensus on the project objectives
4. Facilitate the evaluation of potential data gaps from existing documents
5. Refine the preliminary CSM
6. Determine data requirements to achieve project objectives
7. Establish RI DQOs
8. Complete the initial TPP process such that Work Plans can be developed

Discussion Topics:

1. Opening Remark and introductions
2. Review agenda goals
3. Brief review of RI/FS process
4. Discuss the preliminary Conceptual Site Model
5. Complete TPP Worksheets (from Interim Guidance Document 01-02)
6. Discuss data collection strategies
7. Closing Remarks

Action Items (note responsible party and proposed due date):

Responsible Party	Target Due Date	Action

Croft TPP
RI/FS
3/16/2011

Name/agency	Email
Suzy McKinney ZAPATA	SCMcKinney@zapatainc.com
Deb Edwards, USACE	Debra.L.Edwards@usace.army.mil
John Moon Croft SNA	jmoon@scprt.com
Spence O'Neal USACE	Spencer.D.Oneal@USACE.Army.mil
Teresa Carpenter (USACE)	teresa.m.carpenter@usace.army.mil
Shawn Boone USACE Charleston	shawn.a.boone@usace.army.mil
Susan Byrd SCDHEC	byrdsk@dhec.sc.gov
Jason Shiflet ZAPATA	jshiflet@zapatainc.com

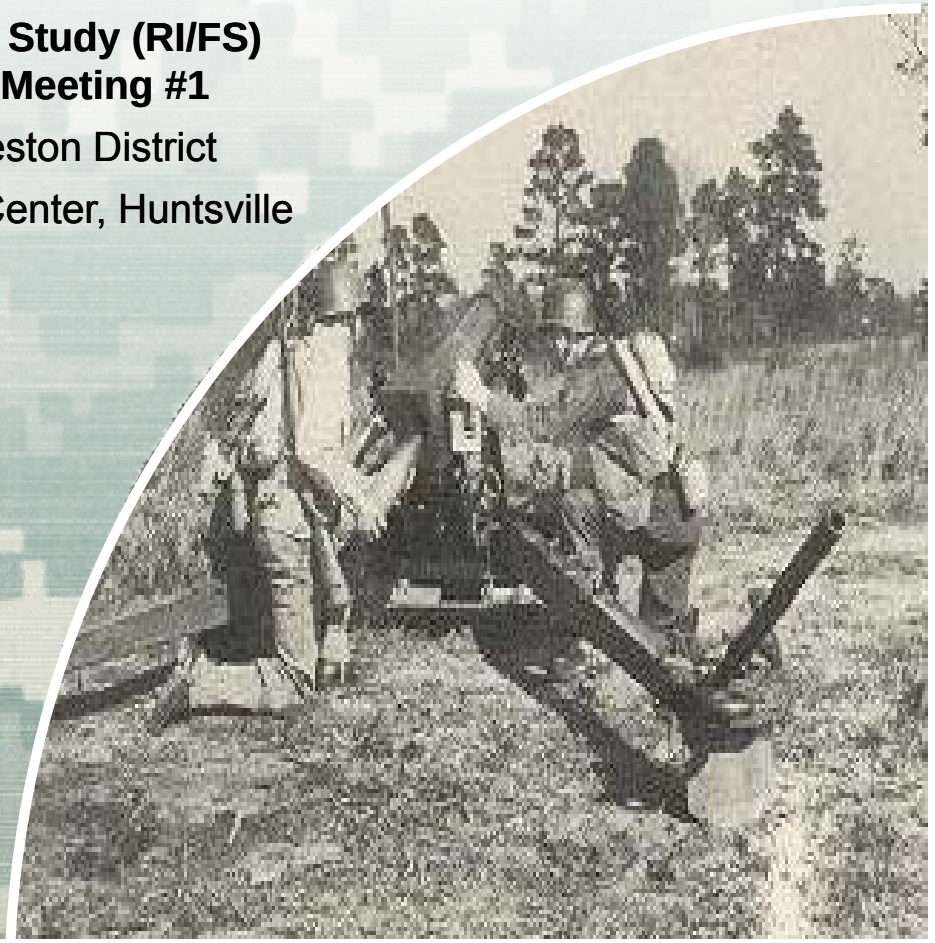
Former Camp Croft
Spartanburg, South Carolina

Remedial Investigation/Feasibility Study (RI/FS)
Technical Project Planning (TPP), Meeting #1

US Army Corps of Engineers, Charleston District

US Army Engineering and Support Center, Huntsville

16 March 2011



US Army Corps of Engineers
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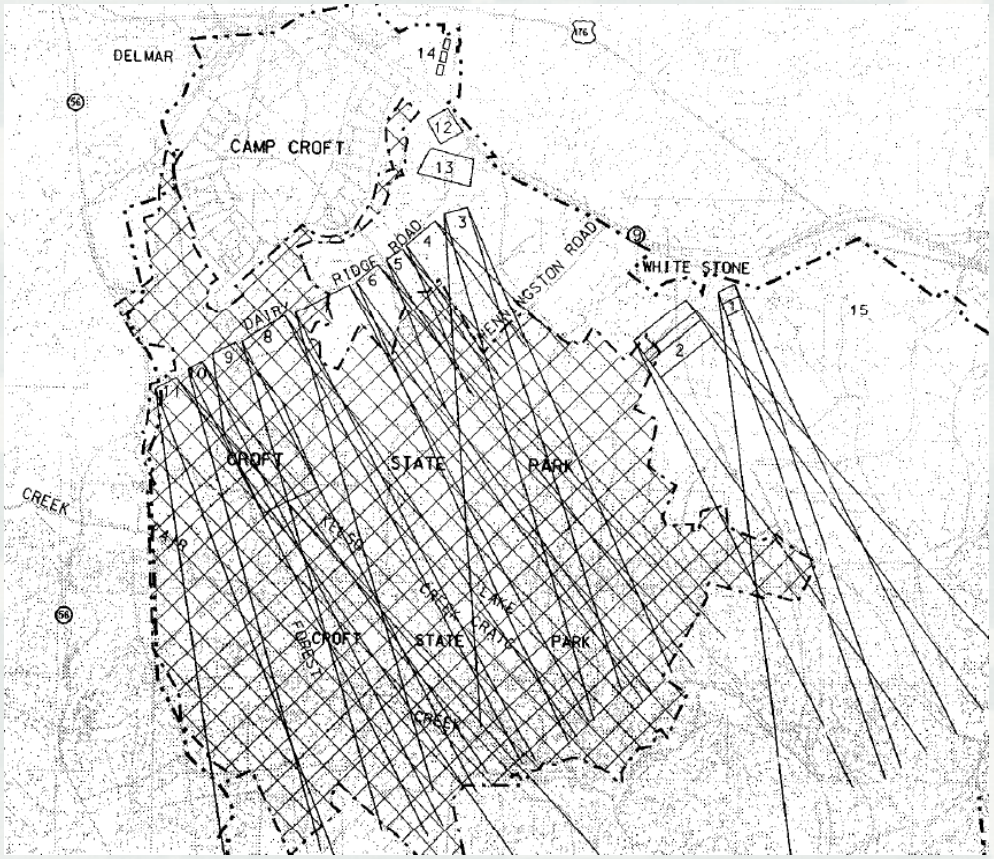
History

The infantry replacement Training Center in Spartanburg, South Carolina was activated on January 10, 1941. It was a training facility for all phases of combat and encompassed approximately 19,000 acres.

By July 1945, nearly 200,000 men had trained at the facility named “Camp Croft.”

In 1947, the camp was declared excess to the War Assets Administration, and parcels of the land were disposed of by sale or quitclaim to organizations, business interests, and former owners.

History



LEGEND:

1. Rifle – Auto. Rifle – 200-300 yds
2. Rifle – Auto. Rifle – 200-300 yds
3. Landscape Target – 600', 9 sets
4. AA Miniature Range – 1080'
5. Pistol – 600', 120 targets
6. 1000 inch machine gun range
7. Rifle – Auto. Rifle – field targets
8. Machine gun – field targets
9. 60mm and 81mm mortar
10. 1000 inch AT
11. Moving target AT
12. Grenade court
13. Bayonet court
14. Gas Chambers
15. Combat Ranges

Source: Archives Search Report, 1993

The MEC Problem

Military uses that can result in the presence of MEC:

- Ranges and Impact Areas
- Training Areas
- Facilities
- Disposal Areas

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Munitions and Explosives of Concern (MEC)

Our focus is minimizing the safety hazards from MEC remaining at this FUDS site.

MEC and UXO:

- MEC consists of munitions and explosives, including fired and/or discarded items, explosive filler, etc.
- UXO is defined as *unexploded ordnance*
- UXO is *a subset of MEC*

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Project Object

- Achieve acceptance of Decision Document (DD) at
  - Gas Chambers MRS,
  - Grenade Court MRS, and
  - Land Range Complex MRS by 31 January 2013.
- Achieve acceptance of DD in compliance with
  - factors listed in 40 Code of Federal Regulations (CFR) 300.430(d)(2),
  - the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA),
  - Department of Defense (DoD),
  - U.S. Army and
  - USACE regulations and guidance.

Stakeholder Involvement

Stakeholders provide input throughout the project:

- Voice community concerns
- Participate on the Restoration Advisory Board (RAB)/attend RAB meetings
- Review and give input on technical reports

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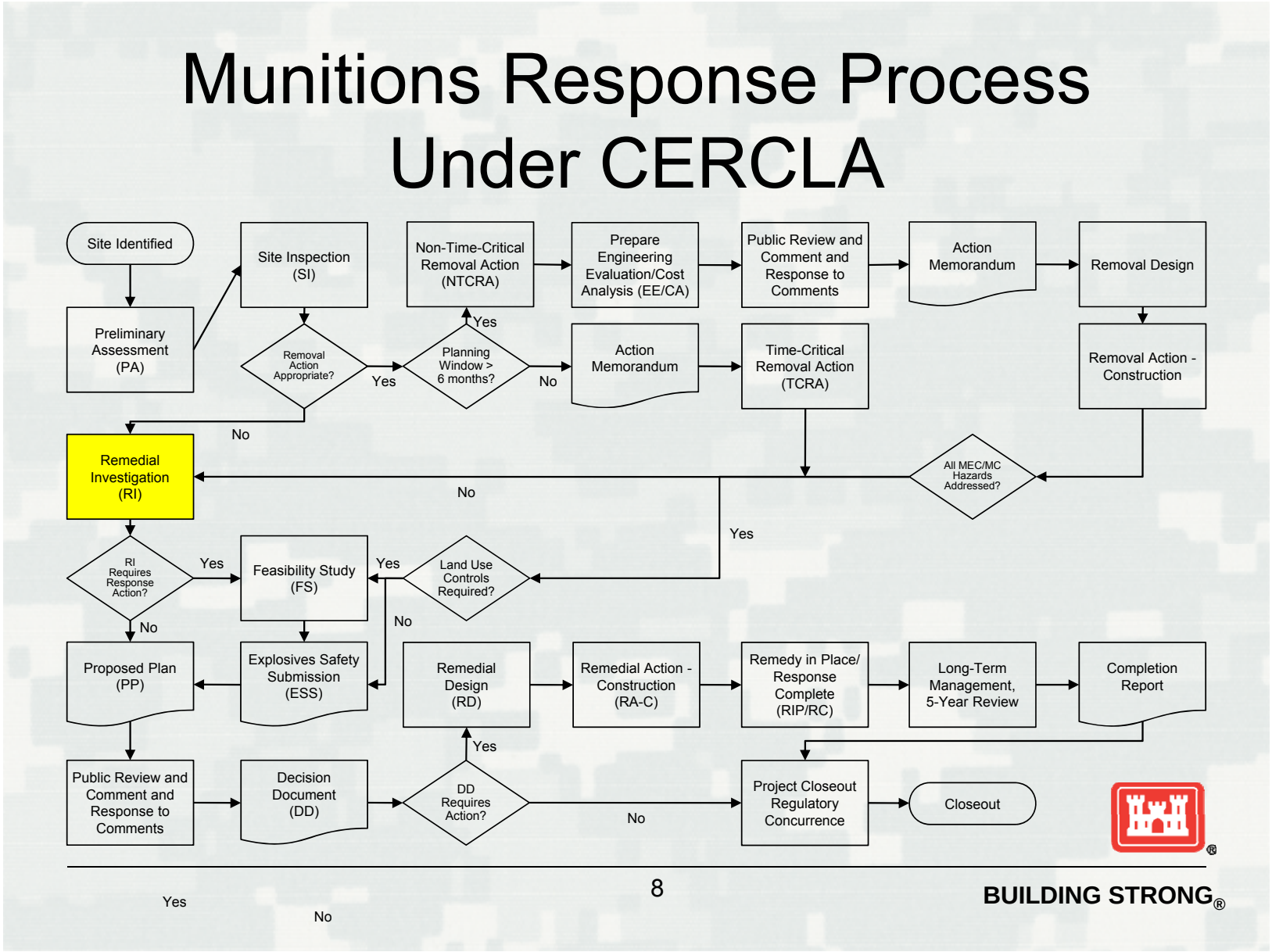
Munitions Response Process
Under CERCLA
Site Identified
Preliminary Assessment (PA)
Site Inspection (SI)
Removal Action Appropriate?
Yes
No
Planning Window > 6 months?
Yes
No
Non-Time-Critical Removal Action (NTCRA)
Prepare Engineering Evaluation/Cost Analysis (EE/CA)
Public Review and Comment and Response to Comments
Action Memorandum
Action Memorandum
Time-Critical Removal Action (TCRA)
Action Memorandum
Removal Design
Removal Action - Construction
All MEC/MC Hazards Addressed?
No
Yes
Remedial Investigation (RI)
RI Requires Response Action?
Yes
No
Feasibility Study (FS)
Land Use Controls Required?
Yes
No
Proposed Plan (PP)
Explosives Safety Submission (ESS)
Remedial Design (RD)
Remedial Action - Construction (RA-C)
Remedy in Place/ Response Complete (RIP/RC)
Long-Term Management, 5-Year Review
Completion Report
Public Review and Comment and Response to Comments
Decision Document (DD)
DD Requires Action?
Yes
No
Project Closeout Regulatory Concurrence
Closeout
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Yes
No

Inventory

Preliminary Assessment/Findings of Determination, 1991

- Determines FUDS eligibility
- Recommends projects (MEC, HTRW, etc.)

Archives Search Report (ASR), 1993

- Details site history
- Historical photo analysis
- Compiles information on past military activities

Archives Search Supplement, 2004 *(printed)*

- Provided additional information on 15 ranges/sub-ranges

GIS-Based Historical Photographic Analysis, 2005

- Identified and mapped areas of potential concern (ground scars, impact craters, trenches, ranges, etc) based on the analysis of historical aerial photographs.

Investigation

Engineering Evaluation/Cost Analysis (EE/CA)

Two EE/CAs have been completed for the former Camp Croft. Areas of investigation are divided into smaller, manageable areas referred to as ordnance operable units (OOUs).

The EE/CAs identified munitions concerns and presented risk reduction alternatives for each area of concern.

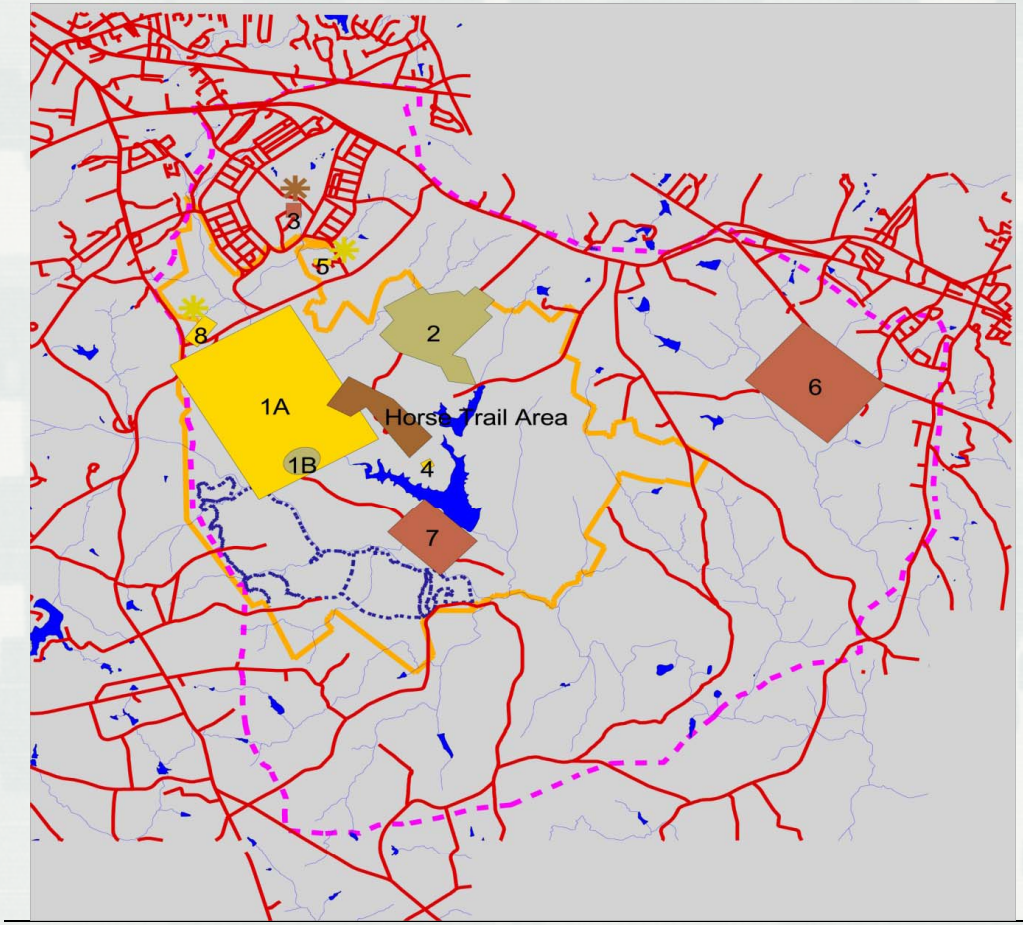
Phase I - January 1996
Action Memorandum dated February 1996
Phase II - January 1998
Action Memorandum dated March 1999

Investigation

The EE/CA process included:

- Review of historical information
- Data collection
- Evaluation of risk based on:
  - Types of munitions (UXO, inert, scrap)
  - Depth of penetration
  - Sensitivity of the munitions
  - Likelihood of human exposure based on land use
- Documentation of Response Alternatives and Associated Costs
- Regulatory and Public Review/Comment Period
- Action Memorandum (authorizing remedial responses) signed by the US Army Corps of Engineers

Phase I EE/CA



Risk Reduction Alternatives

Croft OOU
- Clearance to Depth
- Surface Clearance
- No Further Action

Explanation
- Croft State Park
- Former Camp Croft
- Streets
- Streams
- Lakes
- Horse Trails

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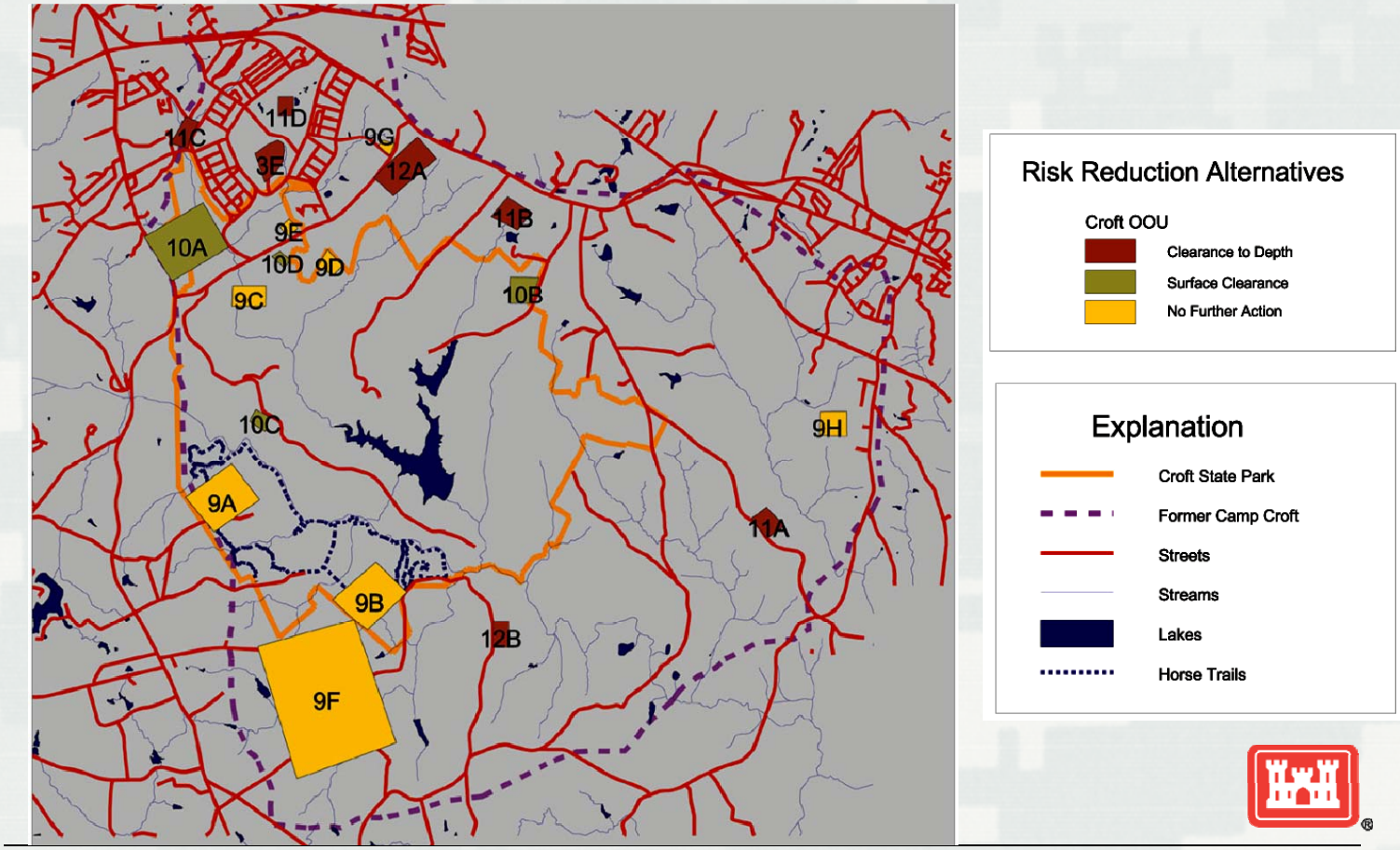
Phase II EE/CA



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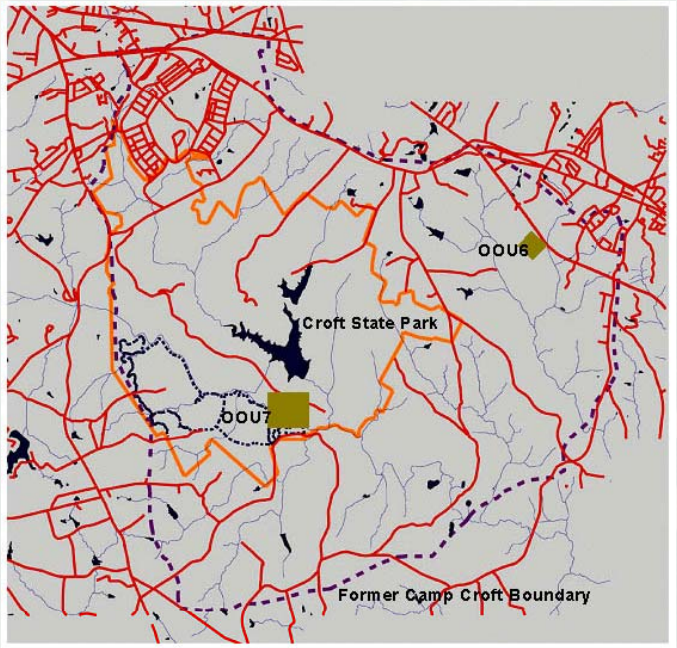
Response Actions to Date

Two Time Critical Removal Actions (TCRAs) were completed in 1994-1995 to clear munitions hazards from the ground surface in areas readily accessible to the public. These areas included:



- 50 acres of Croft State Park, near the fitness trail
- 15 acres of privately-owned property

Surface Clearance

Items found:

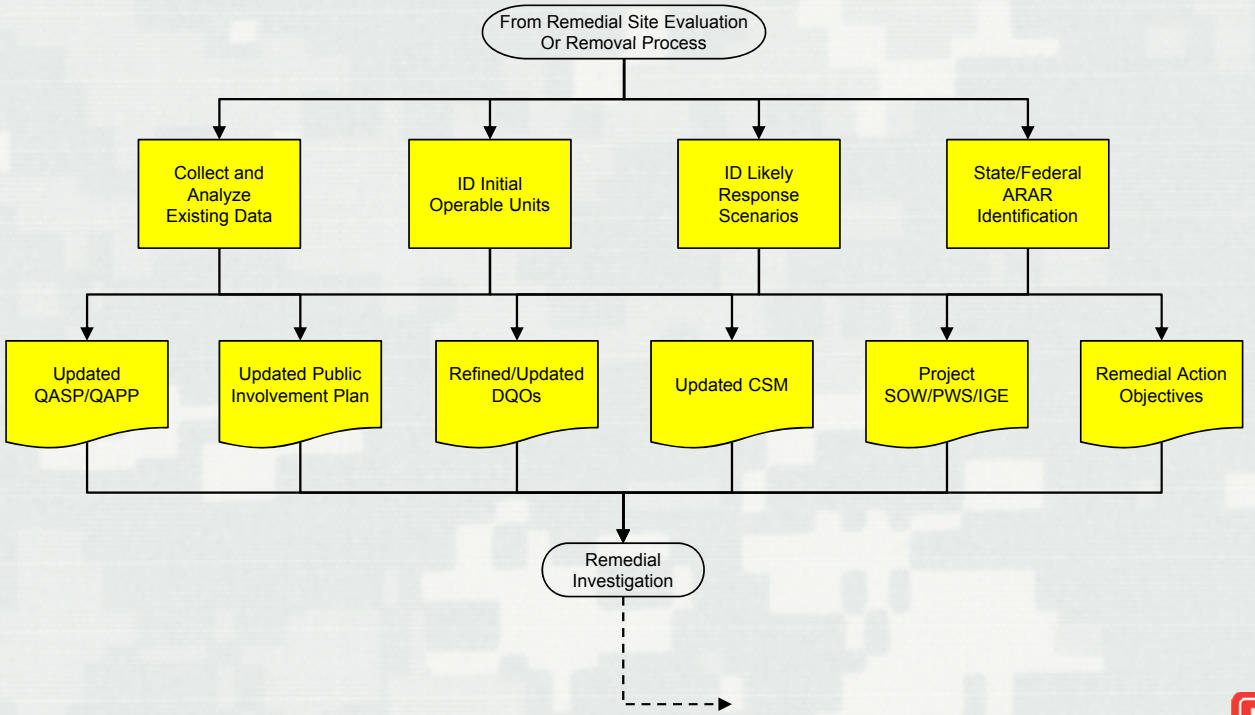
36 – 60mm mortar
1 – 155mm projectile w/ burster tube
3 – 2.36" rockets (expended)
1 – 105mm projectile
14,000 pounds scrap

Response Actions to Date

The following non-time critical removal actions have occurred:

OOU6 – Clearance of 4 acres; completed in 2001
OOU3/OOU3 Expanded – Clearance of ~45 acres; completed in 2011
OOU11C – Clearance of 17 acres; completed in 2010

RI/FS Process



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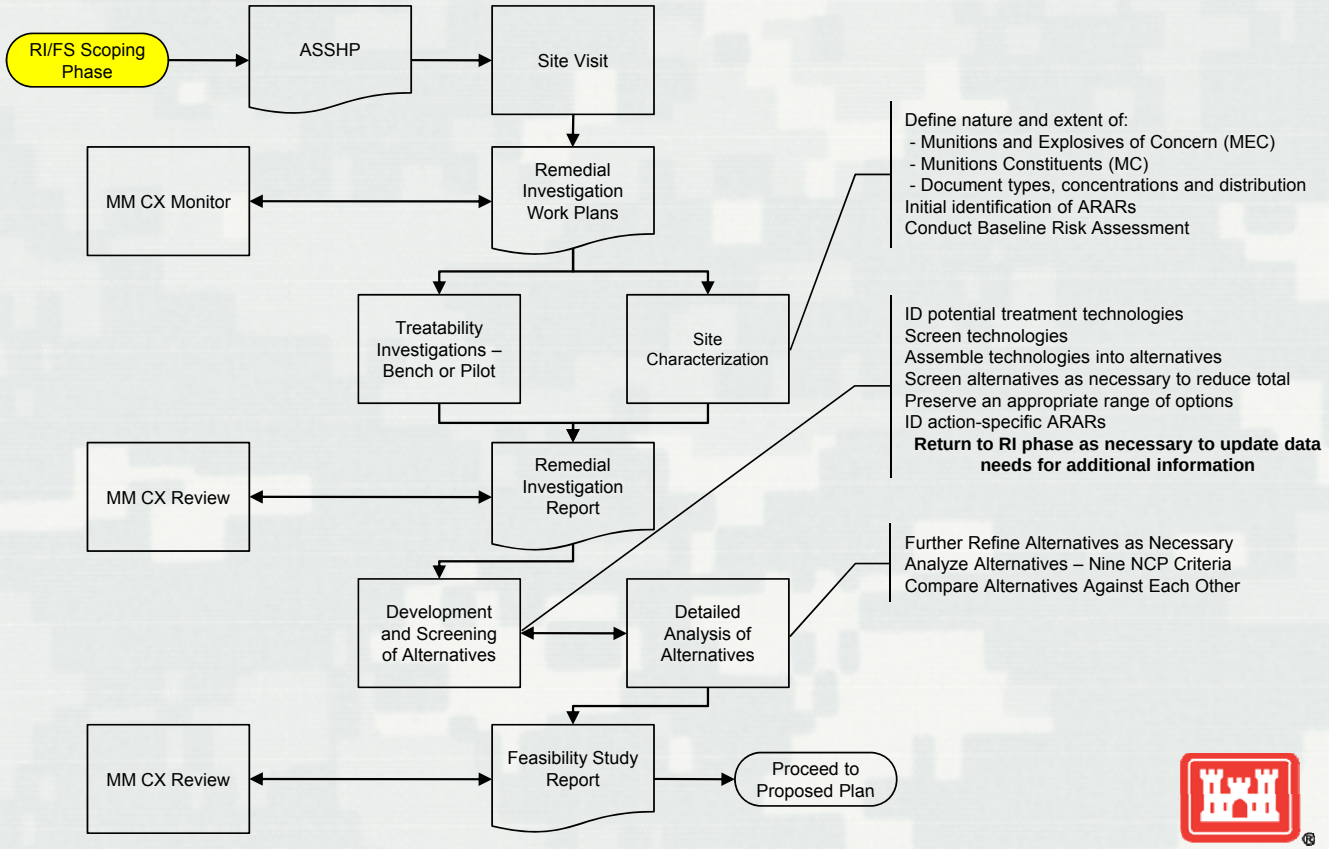
RI/FS Process (Con't.)



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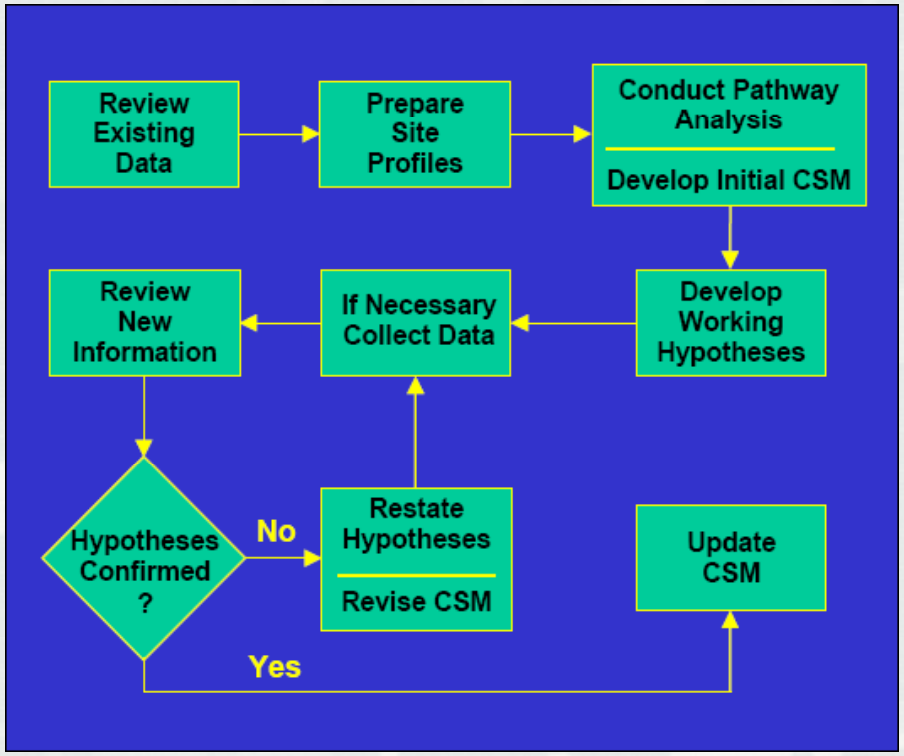
CSM Development Process



Ref.: EM 1110-1-1200

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Conceptual Site Model

- 15 Military Munitions Response (MMR) areas have been identified in the Archive Search Report (ASR; USACE, 1993) and ASR Supplement (USACE, 2004).
- 3 correspond to the three designated MRSs (i.e., the Gas Chamber, Grenade Court, and the Range Complex).
  - Range Complex (MRS 3) is composed of Lake Johnson and Lake Craig and 12 sub-ranges.
  - Sub-ranges include small arms, mortar, rifle grenade, anti-tank rockets, and combat ranges.
  - 10 of the 12 sub-ranges, documented ordnance use was limited to small arms ammunition.
  - Documented use at Ranges 9 and 11 included all types of 60mm and 81mm mortars, rifle grenades and 2.36-inch rockets.
- ZAPATA reviewed investigation and removal action documents and compared findings with ASR and ASR Supplement information.
  - We identified discrepancies between documented ordnance types and actual findings in numerous locations.
  - For example, 60mm and 81mm mortars and 105mm hexachlorethane smoke rounds were recovered at OOU6 (former Range 15).

Proposed RI Fieldwork

- We propose to conduct a combination of:
  - Mag-and-dig – analog instrument-assisted intrusive investigations,
  - AIR – analog instrument-assisted surface reconnaissance,
  - DGM – digital geophysical mapping of transects and grids, and
  - MC sampling, both discrete and incremental

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Transect Spacing

- based on MKII grenade, rifle grenade or 60mm mortar
- Determined using VSP
- Methodology (Mag-and-dig vs. AIR) based on range usage and previous RI/FS experience

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VSP Input and Results

Munition	Range to No More Than 1 Hazardous Fragment/600 ft² Area	1.5 Hazardous Fragment Range (ft)	Survey Design	Survey Area Geometry	Anomaly Distribution	Background Anomaly Density (anom/acre)	False Negative (%)	Decision Rule: % Confidence[1]	Detection Probability[2]	Calculated Transect Spacing (ft)	Recommended Transect Spacing (ft)
60mm	166.3	250	Parallel	Circular	Bivariate Normal	15	5	95	90	416	400
MKII Grenade	62	93	Parallel	Circular	Bivariate Normal	15	5	95	90	112	100
Rifle Grenade	87	130.5	Parallel	Circular	Bivariate Normal	15	5	95	90	173	150

Munition	Range to No More Than 1 Hazardous Fragment/600 ft² Area	1.5 Hazardous Fragment Range (ft)	1.5 Hazardous Fragment range (m)	Average (ft) Excluding TP	Average (m) Excluding TP
37 mm M54	114	171	52.13414634	156.75	47.78963415
37 mm M63 TP	95	142.5	43.44512195	156.75	47.78963415
37 mm Mk I, LE Practice	68	102	31.09756098	102	31.09756098
37 mm MK II (0.053lb)	90	135	41.15853659	149.5	45.57926829
60 mm M49A2	150	225	68.59756098	249.5	76.06707317
60 mm M49A3	166	249	75.91463415	249.5	76.06707317
60 mm M49A5	183	274.5	83.68902439	249.5	76.06707317
60 mm TP M50	79	118.5	36.12804878	118.5	36.12804878
81 mm M362A1	243	364.5	111.1280488	345.6	105.3658537
81 mm M374	234	351	107.0121951	345.6	105.3658537
81 mm M43	230	345	105.1829268	345.6	105.3658537
81 mm M45	224	336	102.4390244	345.6	105.3658537
81 mm M56	221	331.5	101.0670732	345.6	105.3658537
81 mm TP M43A1	89	133.5	40.70121951	133.5	40.70121951
MKII Grenade	62	93	28.35365854	93	28.35365854
Rifle Grenade Robust	87	130.5	39.78658537	130.5	39.78658537

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MC Sampling

- Samples should be collected from "biased" locations (i.e., target areas or firing points)
- Incremental samples (IS) collected from sampling units of ~100 ft by 100 ft
- IS analyzed for explosives and select metals (Cu, Pb, Sb, and Zn)
- If white phosphorus is discovered, we will collect discrete samples

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Data Quality Objectives

- Data Quality Objectives (DQOs) are statements that;
  - define the quality, quantity and type of data required,
  - the manner in which data may be collected, and
  - the acceptance criteria for those data.

MEC DQOs

- Problem statement: Determine the nature and extent of MEC within each MRS and AoPI.
- Refer to MEC initial DQO table included with read-ahead materials

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MC DQOs

- Problem statement: Determine the nature and extent of MC within each MRS and AoPI.
- All plans and requirements for MC will be addressed in the UFP-QAPP
- UFP-QAPP should specify data types, quantities, acceptable decision errors, and how data will be used.

MC DQOs

- Samples will be analyzed for
  - ►Explosives, incl. PETN & NG
    - IS samples via EPA Method 8330B
    - Discrete samples via EPA Method 8330A
  - ►Select metals (Cu, Sb, Pb, and Zn)
    - IS/discrete samples via EPA Method 6010B
  - ►White phosphorous (if evidence exists)
    - Discrete samples via EPA Method 7580

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MC DQOs

- QA/QC samples will be collected as follows;
  - ►QC duplicates – 1:10 (minimum per MRS),
  - ►QA splits – 1:10 (minimum per MRS),
  - ►MS/MSD – 1:20 (minimum per MRS)
  - ►Equipment rinsate – 1 per day per matrix
  - ►Temperature blanks – 1 per cooler

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MC Action/Quantitation Limits

- Project action limits will be based on the most stringent of either EPA Regional Screening Levels – To Be Determined
- Project Quantitation Limits will be approximately 10% of the Action Limits
- Achievable Laboratory Limits (including detection and reporting limits) vary; most recently determined values will be included with the work plans.

Reference Limits - Explosives

Matrix: Soil

Analytical Group: Explosives (EPA Method 8330B)

Concentration Level: Low

Analyte	CAS Number	Project Action Limit (mg/kg)	Project Quantitation Limit (mg/kg)	Analytical Method (mg/kg)		Achievable Laboratory Limits (mg/kg)		
				Detection Limits	Quantitation Limits	Detection Limits	Limits of Detection	Reporting Limits
2,4,6-Trinitrotoluene	118-96-7			Not Provided	0.25	0.040	0.05	0.1
2,4-Dinitrotoluene	121-14-2			Not Provided	0.25	0.040	0.05	0.1
Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	121-82-4			Not Provided	1.0	0.056	0.075	0.1
4-Amino-2,6-dinitrotoluene	19406-51-0			Not Provided	Not Provided	0.040	0.05	0.1
Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine ()	2691-41-0			Not Provided	2.2	0.041	0.05	0.1
2-Amino-4,6-dinitrotoluene	35572-78-2			Not Provided	Not Provided	0.048	0.05	0.1
Methyl-2,4,6-trinitrophenylnitramine (Tertyl)	479-45-8			Not Provided	0.65	0.045	0.05	0.1
2,6-Dinitrotoluene	606-20-2			Not Provided	0.26	0.063	0.075	0.1
2-Nitrotoluene	88-72-2			Not Provided	0.25	0.041	0.05	0.1
Nitrobenzene	98-95-3			Not Provided	0.26	0.040	0.05	0.1
3-Nitrotoluene	99-08-1			Not Provided	0.25	0.040	0.05	0.1
1,3,5-Trinitrobenzene	99-35-4			Not Provided	0.25	0.040	0.05	0.1
1,3-Dinitrobenzene	99-65-0			Not Provided	0.25	0.040	0.05	0.1
4-Nitrotoluene	99-99-0			Not Provided	0.25	0.040	0.05	0.1
Nitroglycerin	55-63-0			Not Provided	Not Provided	0.250	0.5	1
Pentaerythritol tetranitrate (PETN)	78-11-5			Not Provided	Not Provided	0.440	0.5	1

Reference Limits - Metals

Matrix: Soil

Analytical Group: Metals (EPA Methods 6020A/7471A)

Concentration Level: Low

Analyte	CAS Number	Project Action Limit (mg/kg)	Project Quantitation Limit (mg/kg)	Analytical Method (ppm)		Achievable Laboratory Limits (mg/kg)		
				Detection Limits	Quantitation Limits	Detection Limits	Limits of Detection	Reporting Limits
Copper	7440-50-8			0.0036	Not Provided	0.036	1	2
Lead	7439-92-1			0.028	Not Provided	0.008	0.125	0.250
Zinc	7440-66-6			0.0012	Not Provided	0.466	1.5	2
Antimony	7440-36-0			0.021	Not Provided	0.022	0.250	0.250

Data Collection

Hand-held analog all metals detector

- Produces an audible signal to indicate subsurface metallic items

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Data Collection

Digital Geophysical Mapping

- Digital data are recorded and analyzed to identify subsurface items most likely to be MEC

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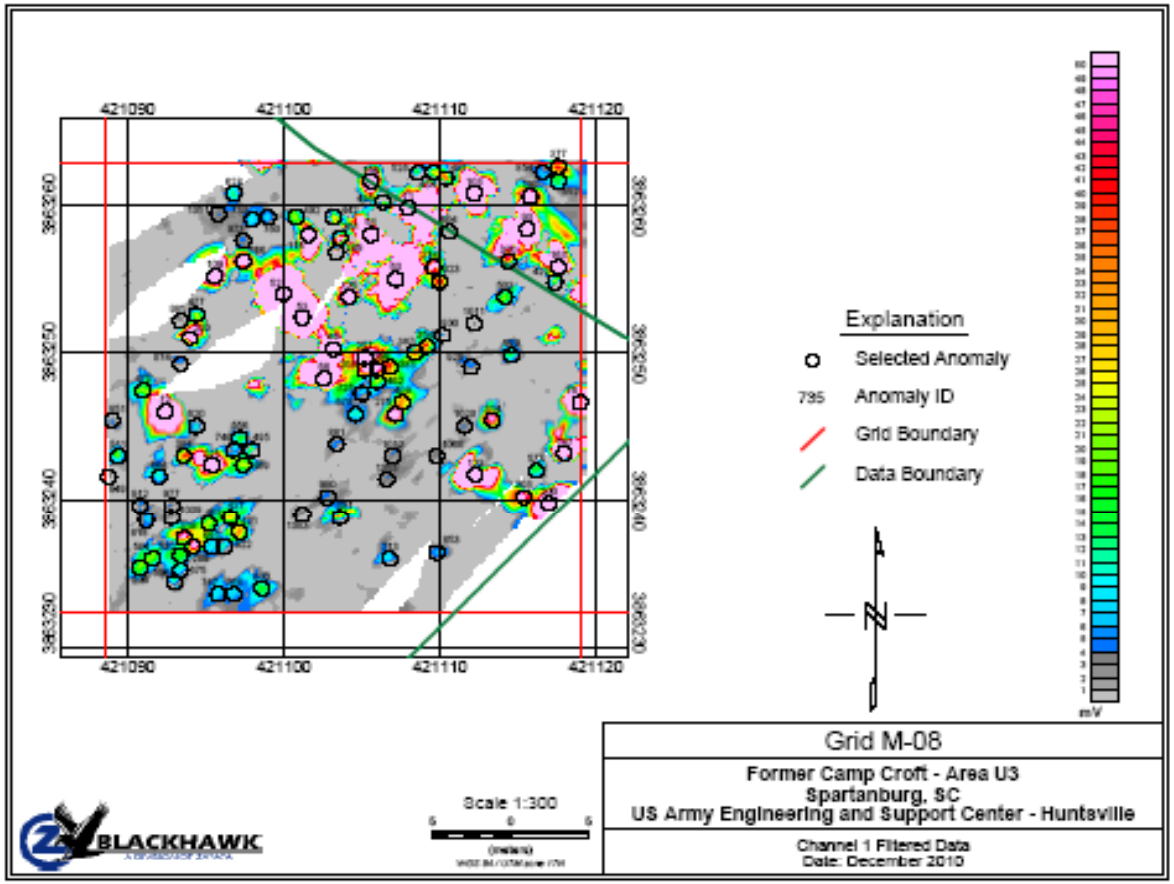
Data Collection



Data Collection

Anomalies selected for investigation/removal

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MC Sampling

- Collection of soil samples to determine presence of munitions constituents (explosives, and select metals)

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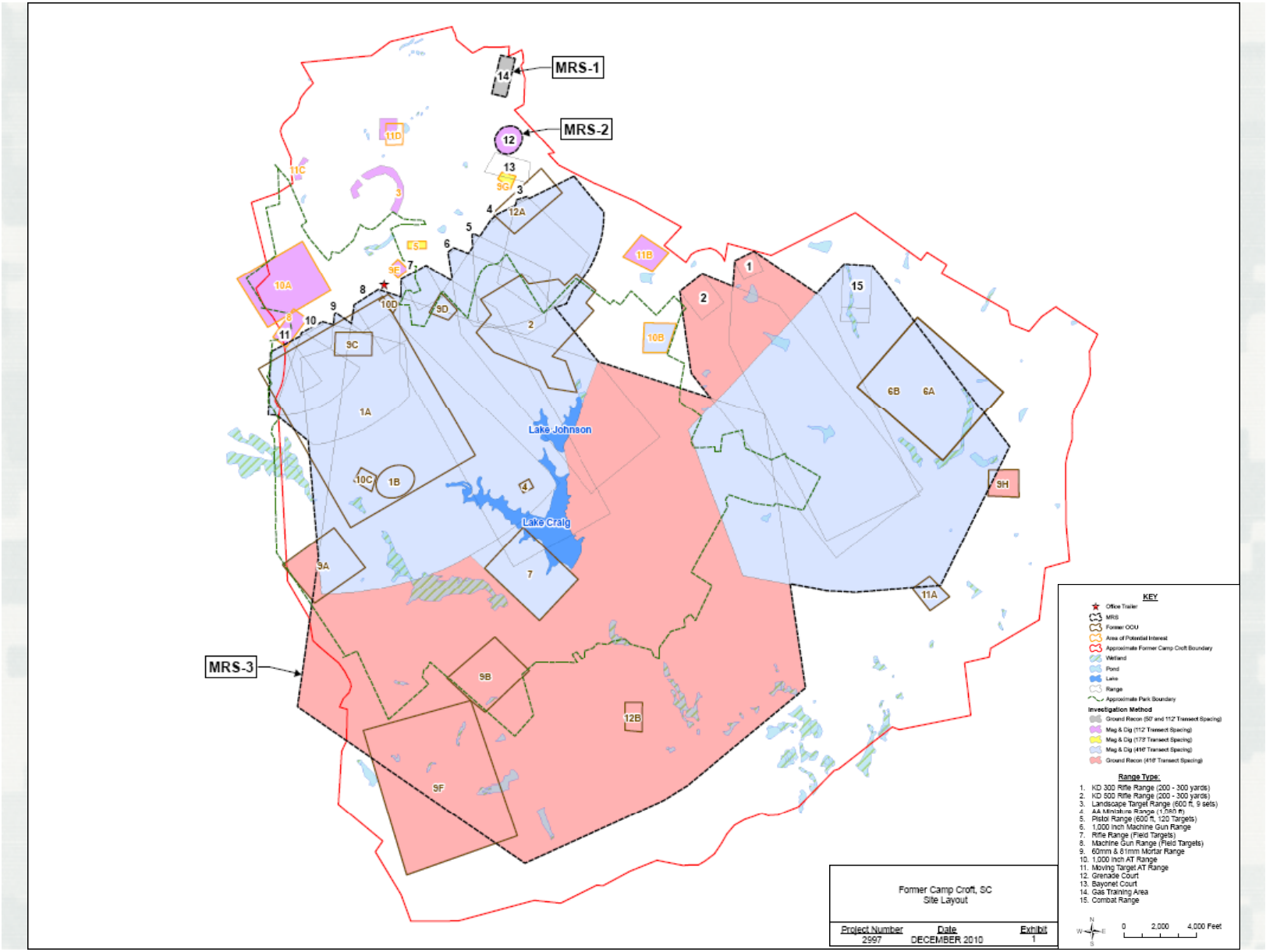
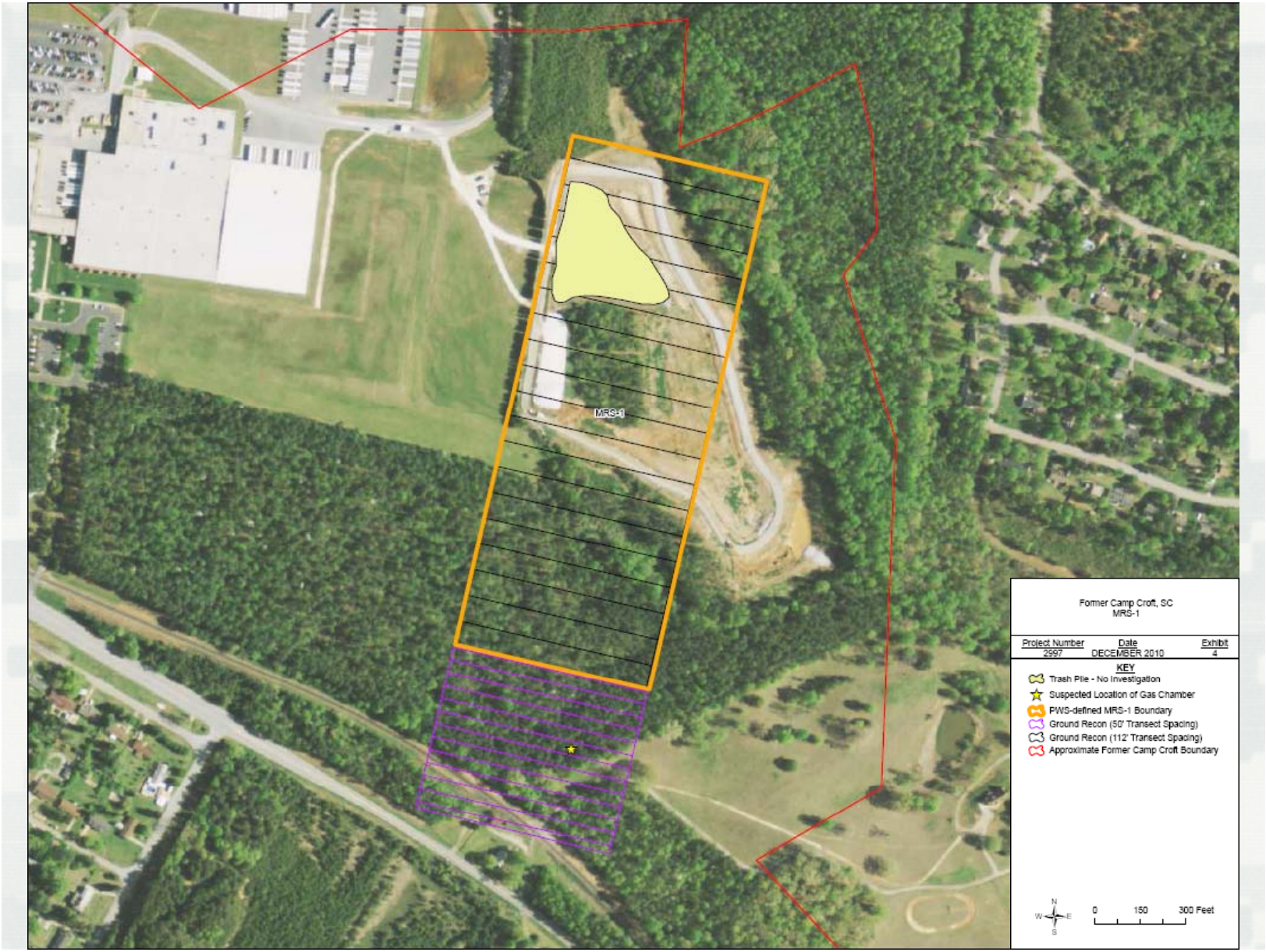

MRS-1
MRS-2
MRS-3
Lake Johnson
Lake Craig
KEY
Office Trailer
MRS
Former OCU
Area of Potential Interest
Approximate Former Camp Croft Boundary
Wetland
Pond
Lake
Range
Approximate Park Boundary
Investigation Method
Ground Recon (50' and 112' Transect Spacing)
Mag & Dig (112' Transect Spacing)
Mag & Dig (173' Transect Spacing)
Mag & Dig (416' Transect Spacing)
Ground Recon (416' Transect Spacing)
Range Type:
1. KD 300 Rifle Range (200 - 300 yards)
2. KD 500 Rifle Range (200 - 300 yards)
3. Landscape Target Range (600 ft, 9 sets)
4. AA Miniature Range (1,000 ft)
5. Pistol Range (600 ft, 120 Targets)
6. 1,000 Inch Machine Gun Range
7. Rifle Range (Field Targets)
8. Machine Gun Range (Field Targets)
9. 60mm & 81mm Mortar Range
10. 1,000 Inch AT Range
11. Moving Target AT Range
12. Grenade Court
13. Bayonet Court
14. Gas Training Area
15. Combat Range
Former Camp Croft, SC
Site Layout
Project Number 2997
Date DECEMBER 2010
Exhibit 1
0 2,000 4,000 Feet

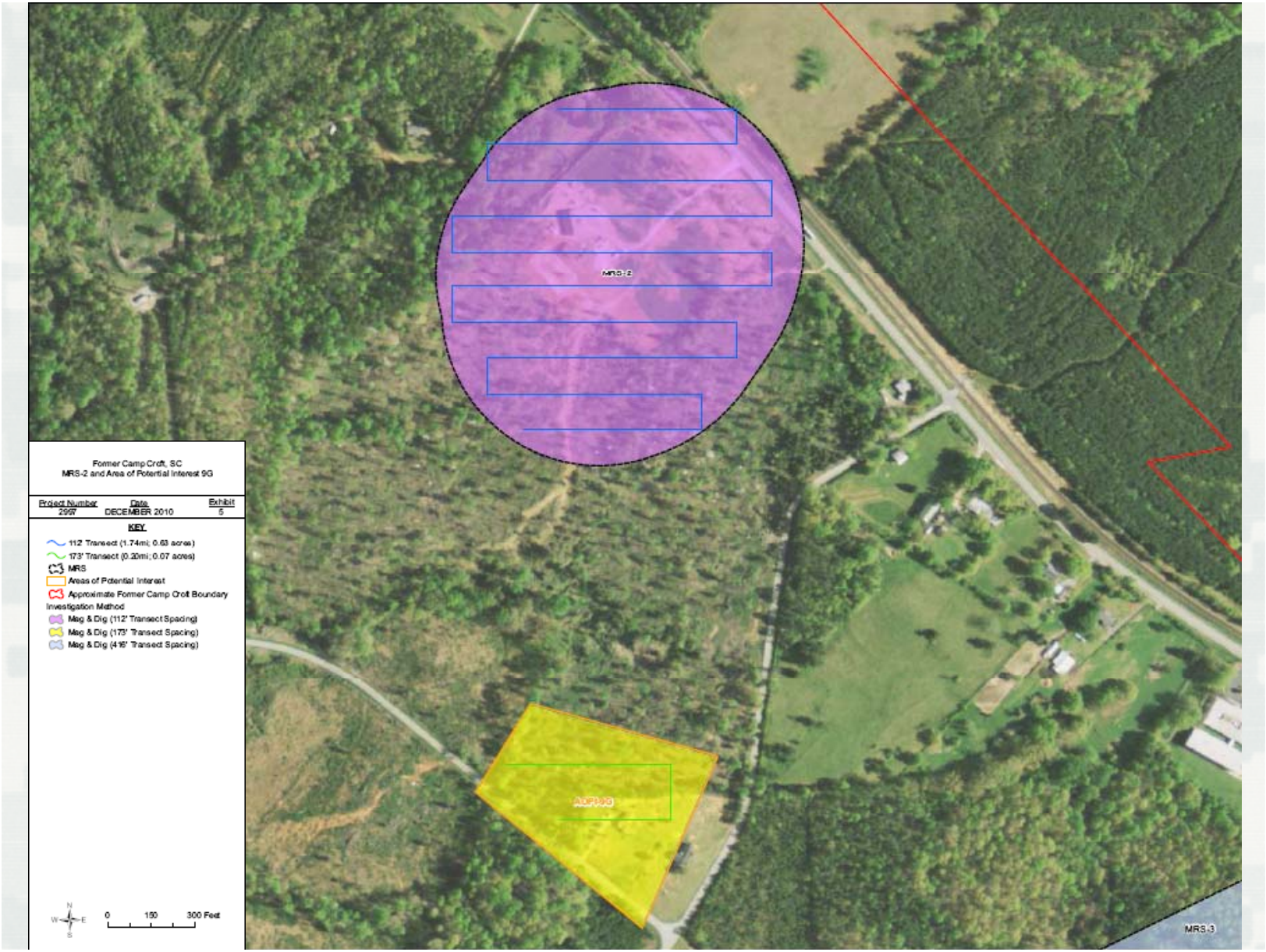
MRS 1

- Gas chamber #1 is located south of the southern boundary of MRS1.
- Perform AIR along transects to identify areas of potential munitions contamination.
  - 112 ft spacing within the PWS-defined MRS boundary (based on grenades)
  - 50 ft spacing to south of PWS-defined MRS boundary
- Develop anomaly density maps and document MD, CD and MEC.
- Use EM61 in 50'x50' grids at locations (TBD) to locate disposal pits and/or consolidated disposal area. Within grids, intrusively investigate 100% discrete anomalies. If a large indistinguishable anomaly is present, i.e. a disposal pit, a test trench will be excavated.
- MC sampling – None.
  - Per the ASR Supplement, it is unlikely that CS is present after 50 years.
  - This is not a compound routinely analyzed by certified laboratories, and is currently not included in the ADR software database.
  - Smoke canisters are not expected to be comprised of metals of concern.


MRS-1
Former Camp Croft, SC
MRS-1
Project Number
2997
Date
DECEMBER 2010
Exhibit
4
KEY
Trash Pile - No Investigation
Suspected Location of Gas Chamber
PWS-defined MRS-1 Boundary
Ground Recon (50' Transect Spacing)
Ground Recon (112' Transect Spacing)
Approximate Former Camp Croft Boundary
N
W
E
S
0
150
300 Feet

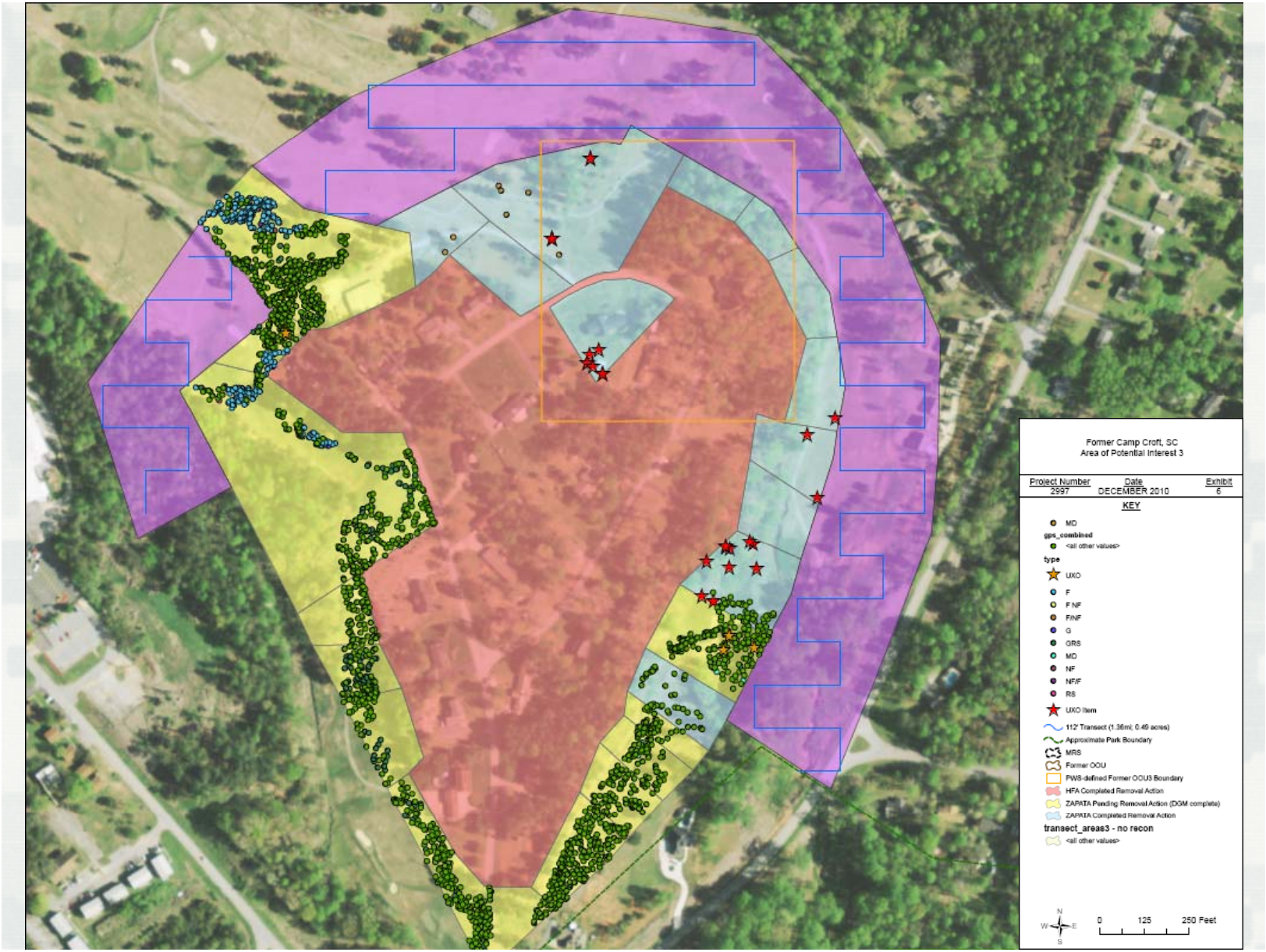
MRS 2 and AoPI 9G

- MRS 2
  - Perform mag-and-dig along transects spaced 112 ft apart to identify areas of potential munitions contamination
  - Develop anomaly density maps and document MD, CD, and MEC
  - Place grids (50 ft by 50 ft equivalent) in areas of high, medium, and low density
  - Within grids, intrusively investigate 100% discrete anomalies
  - MC Sampling – One sampling unit (SU) for explosives and select metals; and possibly discrete sampling for white phosphorous
- AoPI 9G
  - Perform mag-and-dig along transects spaced 173 ft apart to identify areas of potential munitions contamination
  - Develop anomaly density maps and document MD, CD, and MEC
  - Place grids (50 ft by 50 ft equivalent) in areas of high, medium, and low density
  - Within grids, intrusively investigate 100% discrete anomalies
  - MC Sampling – One sampling unit (SU) for explosives and select metals


Former Camp Croft, SC
MRS-2 and Area of Potential Interest 9G
Project Number
299
Date
DECEMBER 2010
Exhibit
5
KEY
112' Transect (1.74mi; 0.63 acres)
173' Transect (0.20mi; 0.07 acres)
MRS
Areas of Potential Interest
Approximate Former Camp Croft Boundary
Investigation Method
Mag & Dig (112' Transect Spacing)
Mag & Dig (173' Transect Spacing)
Mag & Dig (416' Transect Spacing)
N
W
E
S
0
150
300 Feet
MRS-3

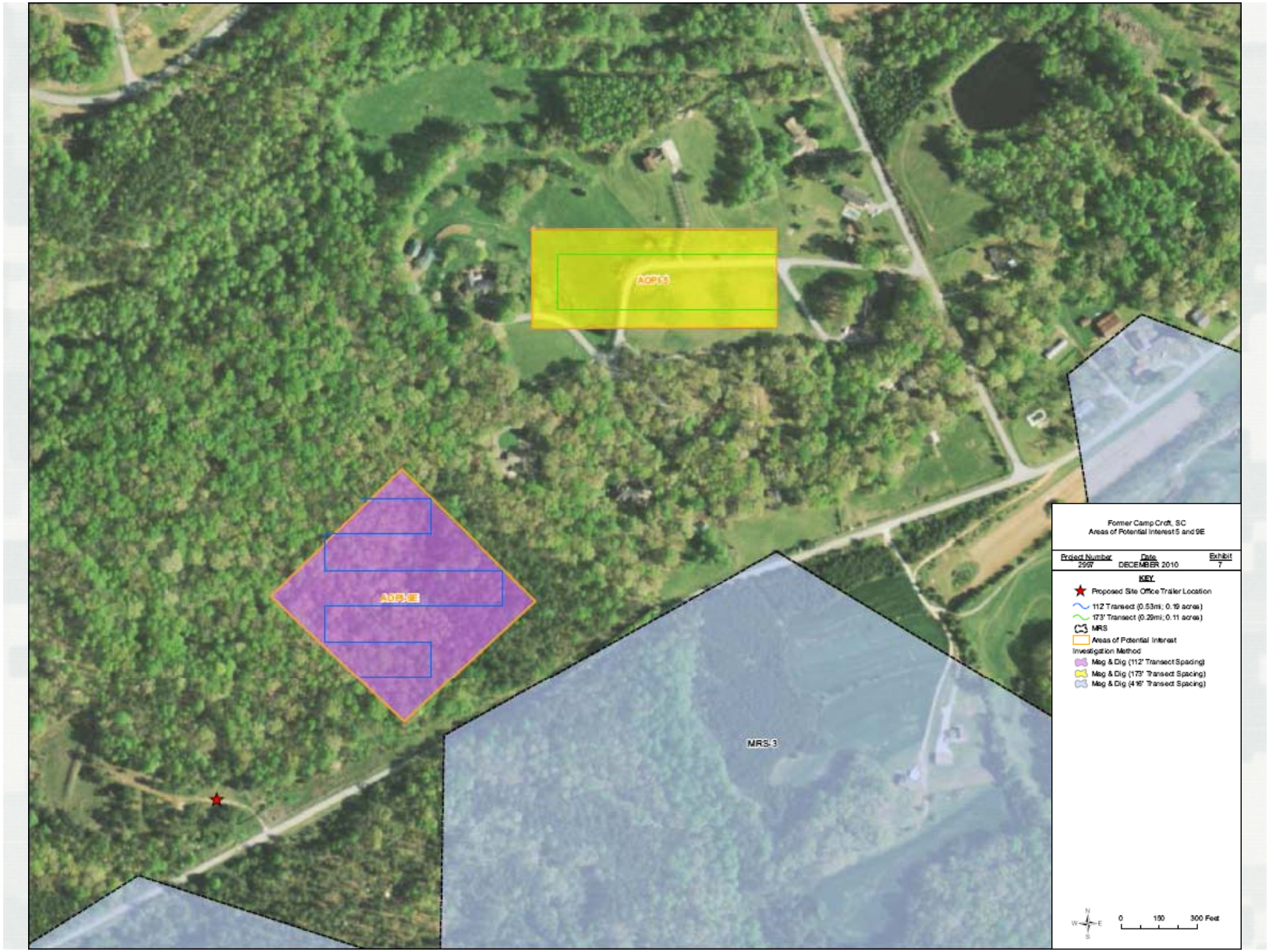
AoPI 3

- Areas that have undergone previous MEC removals will be excluded
- Extent of MEC has not been defined
- Perform operations along transects spaced 112 ft apart to identify areas of potential munitions contamination
  - During the kick-off meeting, the method of investigation was not agreed upon; potential ideas include mag-and-dig, DGM with EM61 and/or the Metal Mapper, or some combination of these.
- Develop anomaly density maps and document MD, CD, and MEC
- Place grids (50 ft by 50 ft equivalent) in areas of high, medium, and low density
- Within grids, intrusively investigate 100% discrete anomalies
- MC Sampling – One sampling unit (SU) for explosives and select metals; and possibly discrete sampling for white phosphorous


Former Camp Croft, SC
Area of Potential Interest 3
Project Number
2997
Date
DECEMBER 2010
Exhibit
6
KEY
MD
gps_combined
<all other values>
type
UXO
F
F NF
FINF
G
GRS
MD
NF
NF/F
RS
UXO Item
112' Transect (1.36mi; 0.49 acres)
Approximate Park Boundary
MRS
Former OOU
PWS-defined Former OOUS Boundary
HFA Completed Removal Action
ZAPATA Pending Removal Action (DGM complete)
ZAPATA Completed Removal Action
transect_areas3 - no recon
<all other values>
N
W
E
S
0
125
250 Feet

AoPI 5 and 9E

- AoPI 5
  - Perform mag-and-dig along transects spaced 173 ft apart to identify areas of potential munitions contamination
  - Develop anomaly density maps and document MD, CD, and MEC
  - Place grids (50 ft by 50 ft equivalent) in areas of high, medium, and low density
  - Within grids, intrusively investigate 100% discrete anomalies
  - MC Sampling – One sampling unit (SU) for explosives and select metals
- AoPI 9E
  - Perform mag-and-dig along transects spaced 112 ft apart to identify areas of potential munitions contamination
  - Develop anomaly density maps and document MD, CD, and MEC
  - Place grids (50 ft by 50 ft equivalent) in areas of high, medium, and low density
  - Within grids, intrusively investigate 100% discrete anomalies
  - MC Sampling – One sampling unit (SU) for explosives and select metals


AOPI-5
AOPI-9E
MRS-3
Former Camp Croft, SC
Areas of Potential Interest 5 and 9E
Project Number
299W
Date
DECEMBER 2010
Exhibit
7
KEY
Proposed Site Office Trailer Location
112' Transect (0.53mi; 0.19 acres)
173' Transect (0.29mi; 0.11 acres)
MRS
Areas of Potential Interest
Investigation Method
Mag & Dig (112' Transect Spacing)
Mag & Dig (173' Transect Spacing)
Mag & Dig (416' Transect Spacing)
N
W
E
S
0
150
300 Feet

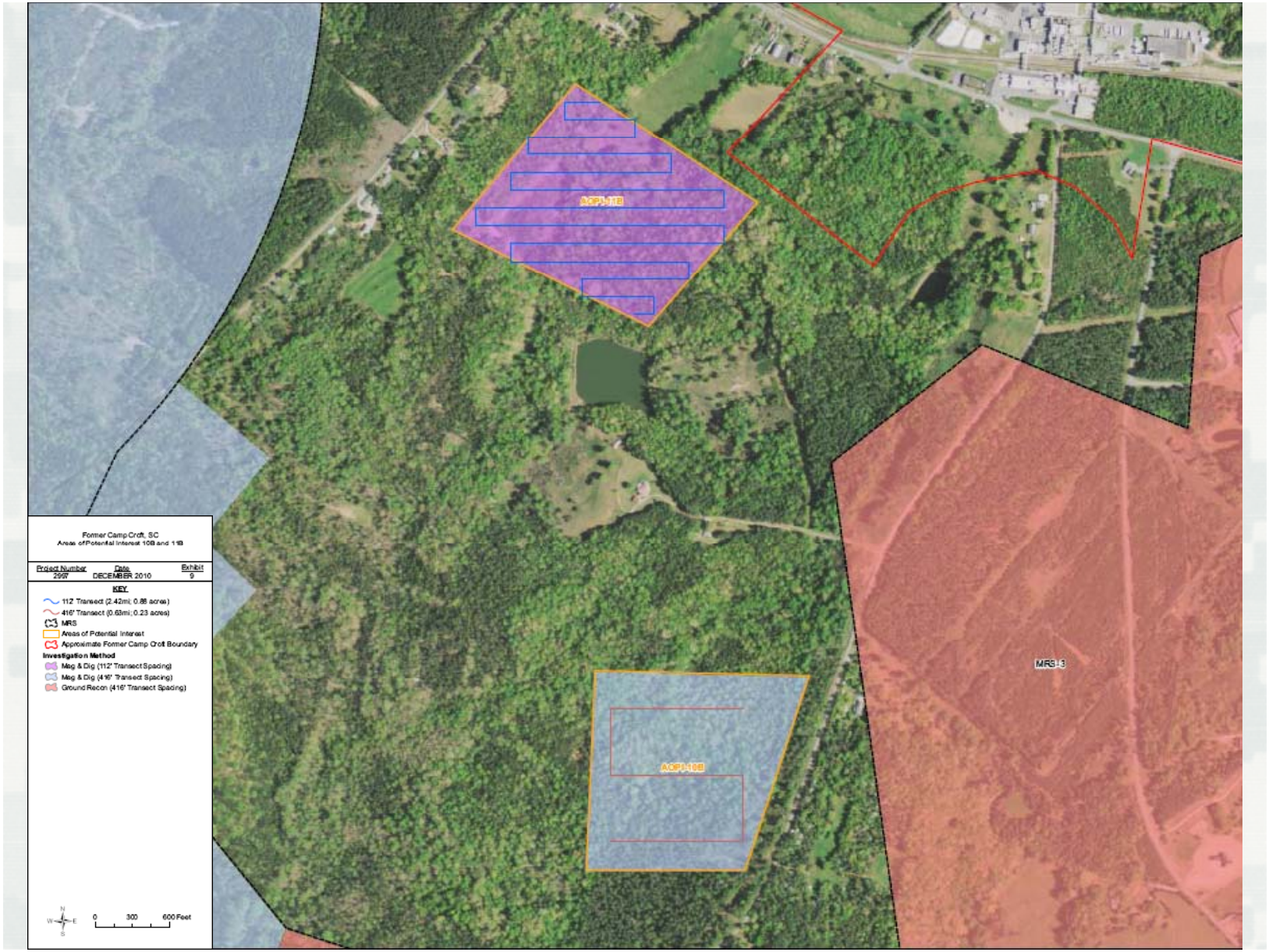
AoPI 8 and 10A

- AoPI 8
  - Perform mag-and-dig along transects spaced 112 ft apart to identify areas of potential munitions contamination
  - Develop anomaly density maps and document MD, CD, and MEC
  - Place grids (50 ft by 50 ft equivalent) in areas of high, medium, and low density
  - Within grids, intrusively investigate 100% discrete anomalies
  - MC Sampling – One sampling unit (SU) for explosives and select metals
- AoPI 10A
  - Perform mag-and-dig along transects spaced 112 ft apart to identify areas of potential munitions contamination
  - Develop anomaly density maps and document MD, CD, and MEC
  - Place grids (50 ft by 50 ft equivalent) in areas of high, medium, and low density
  - Within grids, intrusively investigate 100% discrete anomalies
  - MC Sampling – One sampling unit (SU) for explosives and select metals


AOPI-10A
AOPI-8
MRS-3
Former Camp Croft, SC
Areas of Potential Interest 8 and 10A
Project Number
299T
Date
DECEMBER 2010
Exhibit
8
KEY
112' Transect (2.16mi; 0.79 acres)
112' Transect (12.09mi; 4.40 acres)
MRS
Areas of Potential Interest
Approximate Former Camp Croft Boundary
Investigation Method
Mag & Dig (112' Transect Spacing)
Mag & Dig (416' Transect Spacing)
N
W
E
S
0
250
500 Feet

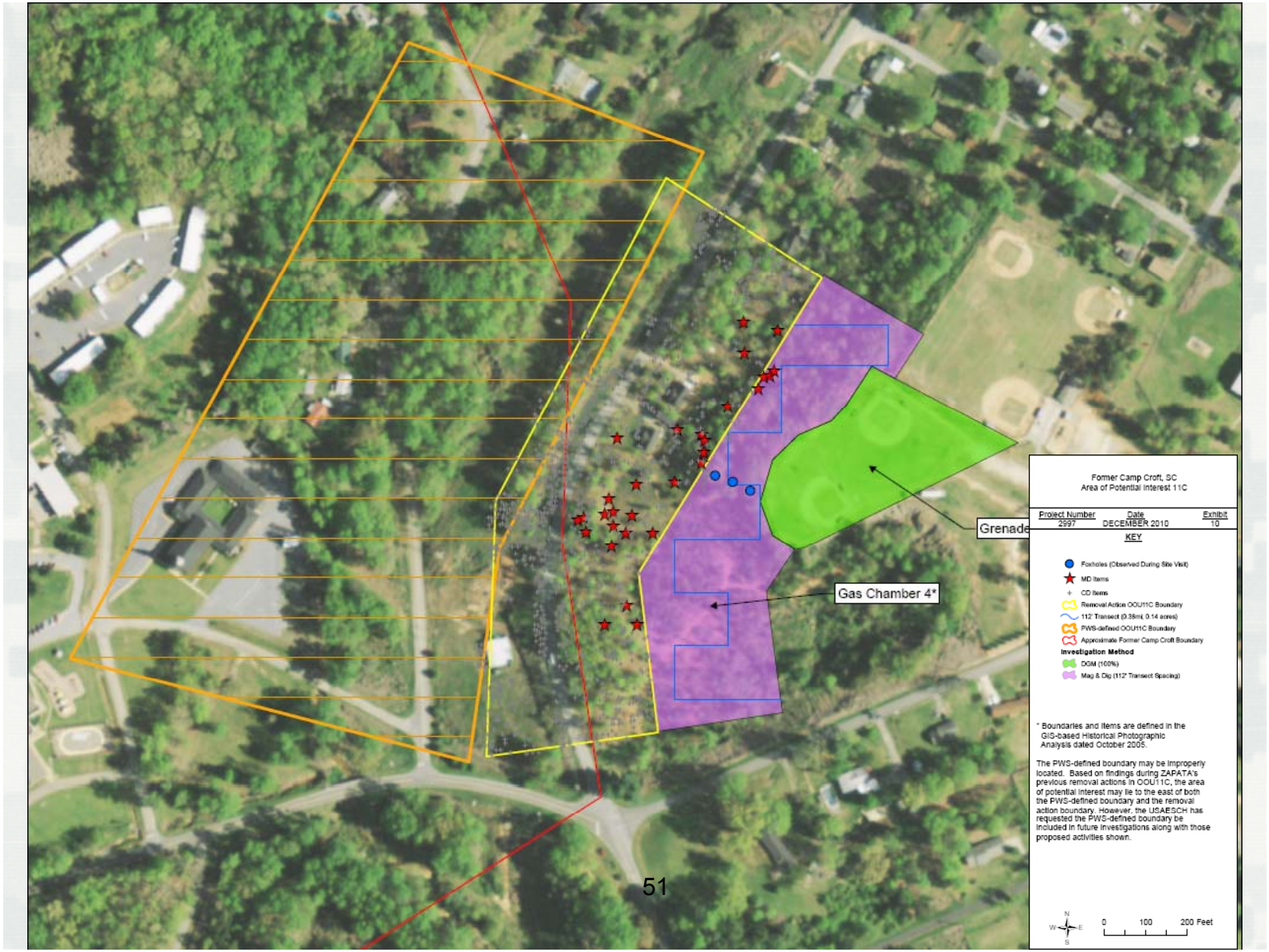
AoPI 10B and 11B

- AoPI 10B
  - Perform mag-and-dig along transects spaced 416 ft apart to identify areas of potential munitions contamination
  - Develop anomaly density maps and document MD, CD, and MEC
  - Place grids (50 ft by 50 ft equivalent) in areas of high, medium, and low density
  - Within grids, intrusively investigate 100% discrete anomalies
  - MC Sampling – One sampling unit (SU) for explosives and select metals
- AoPI 11B
  - Perform mag-and-dig along transects spaced 112 ft apart to identify areas of potential munitions contamination
  - Develop anomaly density maps and document MD, CD, and MEC
  - Place grids (50 ft by 50 ft equivalent) in areas of high, medium, and low density
  - Within grids, intrusively investigate 100% discrete anomalies
  - MC Sampling – One sampling unit (SU) for explosives and select metals


AOPI-11B
AOPI-10B
MRS-3
Former Camp Croft, SC
Areas of Potential Interest 10B and 11B
Project Number
2997
Date
DECEMBER 2010
Exhibit
9
KEY
112' Transect (2.42mi; 0.86 acres)
416' Transect (0.63mi; 0.23 acres)
MRS
Areas of Potential Interest
Approximate Former Camp Croft Boundary
Investigation Method
Mag & Dig (112' Transect Spacing)
Mag & Dig (416' Transect Spacing)
Ground Recon (416' Transect Spacing)
N
W
E
S
0
300
600 Feet

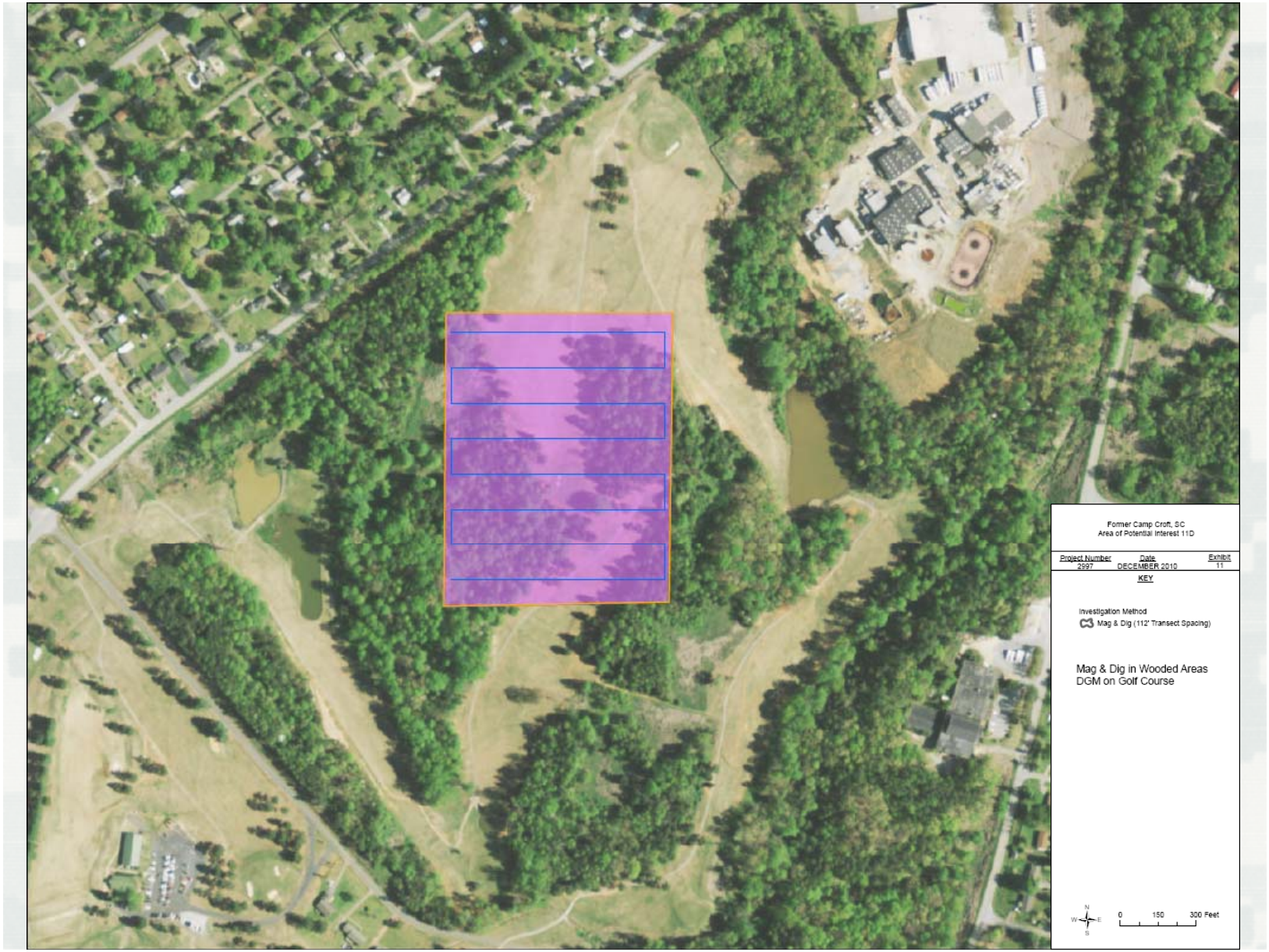
AoPI 11C

- Areas that have undergone previous MEC removals will be excluded
- Based on findings during ZAPATA's previous removal actions in OOU11C, we recommend conducting investigations to the east of both the PWS-defined boundary and the removal action boundary
- Perform mag-and-dig along transects spaced 112 ft apart to identify areas of potential munitions contamination (PWS-defined area & east of removal action boundary)
- Develop anomaly density maps and document MD, CD, and MEC
- Perform 100% DGM of two ball fields
- Place grids (50 ft by 50 ft equivalent) in areas of high, medium, and low density
- Within grids, intrusively investigate 100% discrete anomalies
- MC Sampling – One sampling unit (SU) for explosives and select metals


Former Camp Croft, SC
Area of Potential Interest 11C
Project Number
2997
Date
DECEMBER 2010
Exhibit
10
KEY
Foxholes (Observed During Site Visit)
MD Items
CD Items
Removal Action OOU11C Boundary
112' Transect (0.38mi, 0.14 acres)
PWS-defined OOU11C Boundary
Approximate Former Camp Croft Boundary
Investigation Method
DGM (100%)
Mag & Dig (112' Transect Spacing)
Grenade
Gas Chamber 4*
* Boundaries and items are defined in the GIS-based Historical Photographic Analysis dated October 2005.
The PWS-defined boundary may be improperly located. Based on findings during ZAPATA's previous removal actions in OOU11C, the area of potential interest may lie to the east of both the PWS-defined boundary and the removal action boundary. However, the USAESCH has requested the PWS-defined boundary be included in future investigations along with those proposed activities shown.
N
W
E
S
0
100
200 Feet
51

AoPI 11D

- Perform operations along transects spaced 112 ft apart to identify areas of potential munitions contamination
  - Wooded areas – mag-and-dig along transects
  - Golf course – 100% DGM along transects
  - Overlap these two methods
- Develop anomaly density maps and document MD, CD, and MEC
- Place grids (50 ft by 50 ft equivalent) in areas of high, medium, and low density
- Within grids, intrusively investigate 100% discrete anomalies
- MC Sampling – One sampling unit (SU) for explosives and select metals


Former Camp Croft, SC
Area of Potential Interest 11D
Project Number
2997
Date
DECEMBER 2010
Exhibit
11
KEY
Investigation Method
Mag & Dig (112' Transect Spacing)
Mag & Dig in Wooded Areas
DGM on Golf Course
N
W
E
S
0
150
300 Feet

MRS 3

- Sub-divide MRS into two areas
- MC Sampling – 10 sampling units (SU) across both sub-areas for explosives and select metals
- Sub-area 1
  - Perform mag-and-dig along transects spaced 416 ft apart to identify areas of potential munitions contamination
  - Develop anomaly density maps and document MD, CD, and MEC
  - Place grids (50 ft by 50 ft equivalent) in areas of high, medium, and low density
  - Within grids, intrusively investigate 100% discrete anomalies
- Sub-area 2
  - Perform AIR along transects spaced 416 ft apart to identify areas of potential munitions contamination
  - Develop anomaly density maps and document MD, CD, and MEC

54

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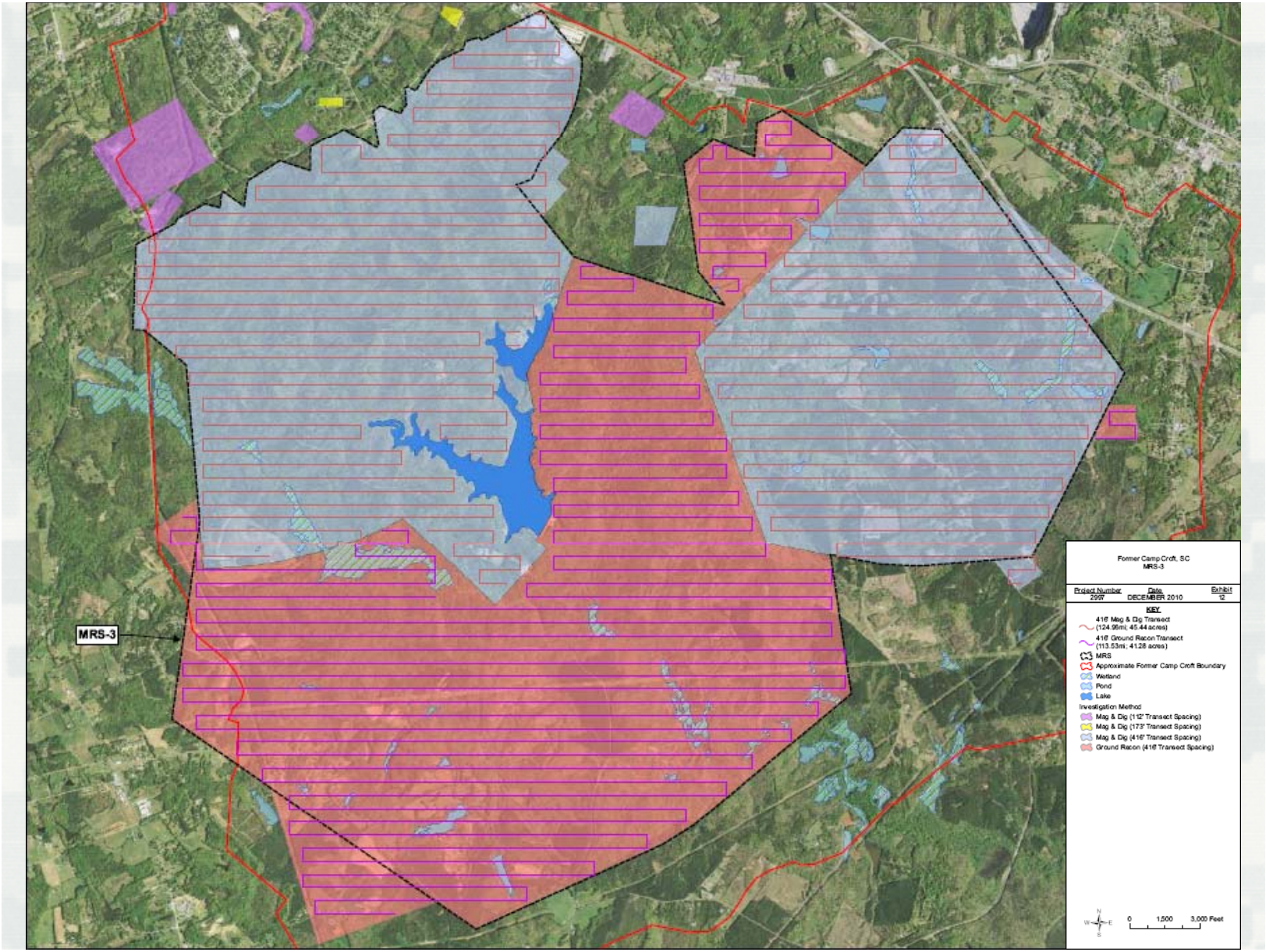
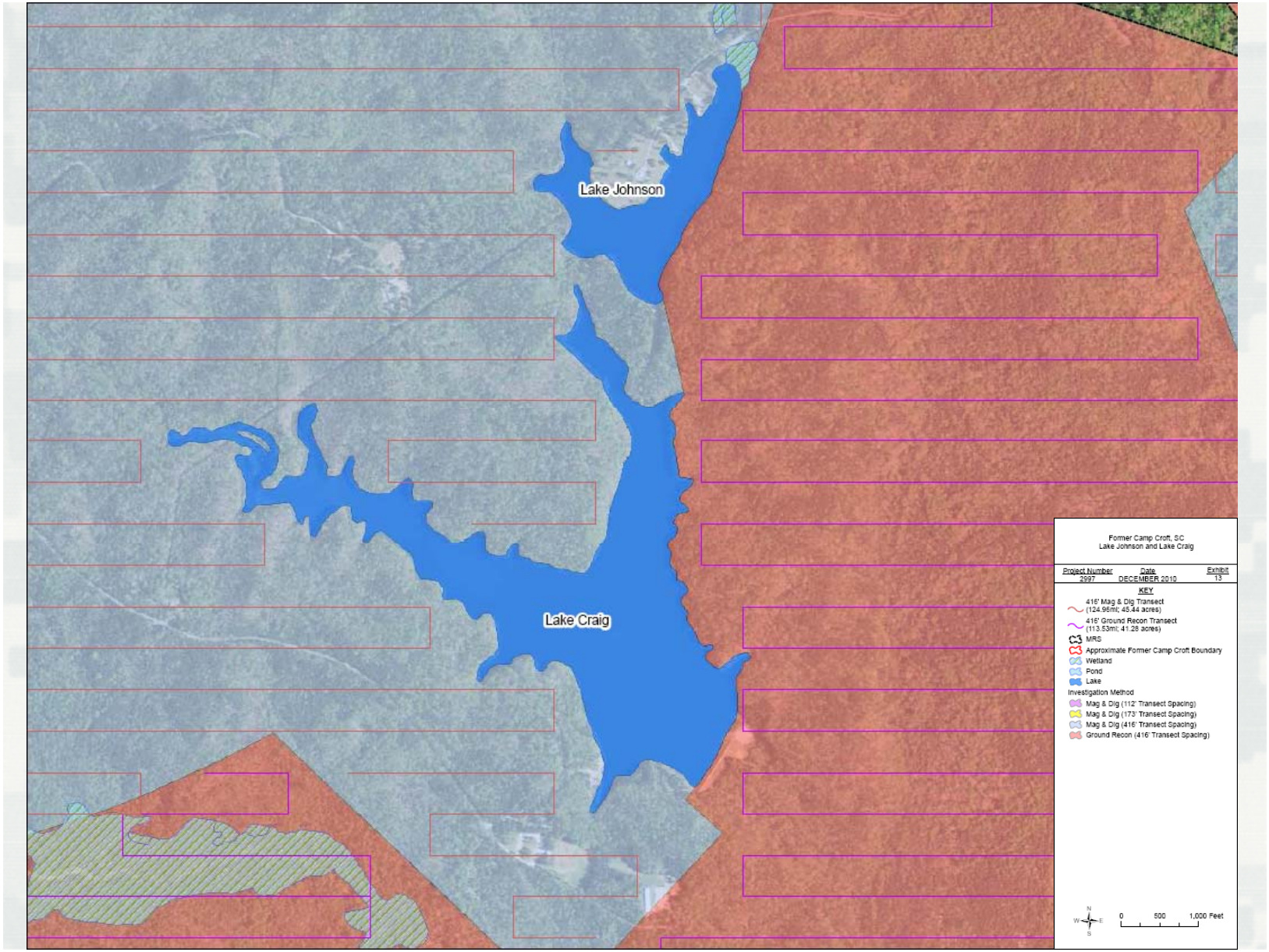

MRS-3
Former Camp Croft, SC
MRS-3
Project Number
299
Date
DECEMBER 2010
Exhibit
12
KEY
416' Mag & Dig Transect
(124.95mi; 45.44 acres)
416' Ground Recon Transect
(113.53mi; 41.28 acres)
MRS
Approximate Former Camp Croft Boundary
Wetland
Pond
Lake
Investigation Method
Mag & Dig (112' Transect Spacing)
Mag & Dig (173' Transect Spacing)
Mag & Dig (416' Transect Spacing)
Ground Recon (416' Transect Spacing)
N
W
E
S
0
1,500
3,000 Feet

Lakes Craig and Johnson

- Based on site restrictions, no data will be collected in the Lakes
- Transects (both mag-and-dig and AIR) will be conducted up to and along the shoreline of the lakes
- Develop anomaly density maps and document MD, CD, and MEC
- No MC samples will be collected


Lake Johnson
Lake Craig
Former Camp Croft, SC
Lake Johnson and Lake Craig
Project Number
2997
Date
DECEMBER 2010
Exhibit
13
KEY
416' Mag & Dig Transect
(124.96mi; 45.44 acres)
416' Ground Recon Transect
(113.53mi; 41.28 acres)
MRS
Approximate Former Camp Croft Boundary
Wetland
Pond
Lake
Investigation Method
Mag & Dig (112' Transect Spacing)
Mag & Dig (173' Transect Spacing)
Mag & Dig (416' Transect Spacing)
Ground Recon (416' Transect Spacing)
N
W
E
S
0
500
1,000 Feet

Safety

UXO Safety Procedures

The Three R's

Recognize - Military munitions/ordnance becomes a danger only when it is disturbed. When you see an item, STOP.

Retreat - Do not move closer to get a better look! Never attempt to remove anything near it. Do not touch, move, or disturb. MOVE AWAY.

Report - Immediately report any suspected military munitions. Call 911

US Army Corps of Engineers®

D H E C
PROMOTE PROTECT PROSPER

South Carolina State Parks

Technical Project Planning Memorandum – No. 1

Subject: FUDS Military Munitions Response Program Documentation of Technical Project Planning Project Team Meeting for a Remedial Investigation/Feasibility Study (RI/FS)

Site: Former Camp Croft, Spartanburg, SC

Contract: Contract Number W912DY-10-D-0028, Task Order 0005

The Technical Project Planning (TPP) meeting was conducted on 16 March 2011 at the Spartanburg Marriott at Renaissance Park in Spartanburg, South Carolina from 8:30am to 3:30pm. The Project Delivery Team (PDT) is composed of the participants listed below; all were present (sign-in sheet attached). Meeting participants introduced themselves.

1. Shawn Boone	Project Manager, US Army Corps of Engineers (USACE), Charleston District
2. Spencer O'Neal	Project Manager, US Army Engineering and Support Center, Huntsville (USAESCH)
3. Teresa Carpenter	Technical Lead, USAESCH
4. Deb Edwards	Geophysicist, USAESCH
5. Susan Byrd	South Carolina Department of Health and Environmental Control (DHEC)
6. John Moon	South Carolina Department of Parks, Recreation & Tourism (DPRT), Croft State Natural Area
7. Jason Shiflet	Project Manager, Zapata Incorporated (ZAPATA)
8. Suzy McKinney	Quality Control Manager, ZAPATA

Meeting Discussion Summary:

The purpose of the meeting was to establish the PDT team and to begin the TPP process for the RI/FS at the former Camp Croft. Mr. Shiflet opened the meeting with a brief presentation to explain the RI/FS process and where this task is within that process. The project includes Munitions Response Sites (MRS) 1, 2, and 3, Areas of Potential Interest (AoPI) 3, 5, 8, 9E, 9G, 10A, 10B, 11B, 11C, 11D, and Lakes Craig and Johnson. The presentation and general discussions about the Former Camp Croft RI/FS task order led to numerous questions (for clarification) from Mr. Moon. These general discussions continued until just before noon, when Mr. Moon had to leave. After a short break, the PDT continued project specific discussions until the meeting adjourned at 3:30pm. The outcome of these discussions resulted in the refinement of the preliminary conceptual site model, the conceptual site exposure model, and preliminary MEC DQOs, and established the framework for the Draft Work Plans. The bullet points listed below are highlights from the day's discussions.

1) The Croft State Natural Area allows three two-day bow hunts for deer between September and November, each year.
2) The Croft State Natural Area hosts Horse Shows on the third Saturday of each month between February and November, each year.
3) Shawn has had recent discussions with the public regarding the potential existence of various munitions items in and around the Former Camp Croft. For example, Jimmy Tobias noted that "howitzer like munitions" were found in and along the creek (*possibly Fairforest Creek*) during the bridge construction along SC Highway 150. Mr. Tobias also noted that he's seen lots of military munitions east of AoPI 9G and north of AoPI 12A. The PDT agreed that it would be prudent to solicit site-specific information from local, knowledgeable persons.
4) The PDT agreed that Spartanburg County Sheriff's Office munitions responses should be incorporated into the project Geographic Information System (GIS).
5) The PDT agreed that Lieutenant Dyas of the Spartanburg County Sheriff's Office should be invited to the next TPP meeting.
6) Previously cleared areas (i.e., areas where removal actions have been completed) should be incorporated into the project GIS.
7) Soil sample analytical results for munitions constituents (MC), namely explosives and metals (Cu, Pb, Sb, and Zn), will first be compared to the EPA Regional Screening Level (RSL) Summary Table (dated November 2010). These can be found at http://www.epa.gov/region9/superfund/prg/. Once any contamination is delineated to the RSL table, EPA Region IV Ecological Screening Values will be used for ecological risk assessment purposes. These can be found at http://www.epa.gov/region4/waste/ots/epatab4.pdf.
8) If a risk assessment is required, the munitions Center of Expertise (CX) may require that surface and subsurface samples be included in the risk assessment. The USAESCH agreed to discuss the issue with the CX. If both surface and subsurface samples are required for the risk assessment, then those similar depth intervals would likely be required for background samples.
9) The PDT agreed that all soil samples will be discrete. Those samples will be collected from the ground surface to a depth of two inches. If burrowing animals are present, deeper samples may be required.
10) Background soil sampling will not be required unless there are analytical results that exceed the EPA RSLs. If background soil sampling is required, field teams must document the soil type during sampling so that sample results can be compared to similar soil types. DHEC recommended that ZAPATA should consider submitting a Freedom of Information Act (FOIA) request to local agencies requesting available background data sets.
11) The PDT discussed data collection needs on golf course property, particularly in the fairways and greens. It was agreed that the USACE should initiate a meeting with the golf course

owners as soon as possible to discuss investigation options. Potential options include using an EM61 or the MetalMapper system, followed by some amount of intrusive investigation.

12) AoPI 12A is partially within MRS 3. In MRS 3 (and within AoPI 12A), transect spacings should be set at 112 ft based on a MKII grenade.

13) Previous work conducted in AoPI 12B indicated the existence of a rifle grenade. Rather than compressing the transect spacing within AoPI 12B, the PDT requested that ZAPATA place a transect through AoPI 12B.

14) The PDT discussed the possibility of using ZAPATA's existing geophysical prove-out (from earlier site work). The USAESCH agreed to consider the possibility and will follow up with ZAPATA.

15) For mag-and-dig transects, the PDT was unable to define the anomaly density threshold that would be considered excessive and thus would trigger the need to sample only a statistically significant portion of the anomalies along the transect. Examples of 40 and 60 anomalies per 100 ft segment were provided as possible values. The USAESCH agreed to seek clarification and provide input.

16) The PDT discussed collecting MC samples in areas with high anomaly densities. Tentatively, those high density areas are defined as those areas where the anomaly density count is > the 97th percentile of all anomaly densities.

17) The PDT agreed that pre-blow-in-place (BIP) samples would not be used in the risk assessment (if a risk assessment is required).

18) The question was raised whether there should be more coverage near the horse ring and park office, due to higher concentration of visitors/access. The USAESCH agreed to seek clarification and provide input.

19) The PDT discussed tighter transect line spacing in areas where grenades have been found; perhaps a DQO using tighter line spacing in the HFD (from the boundary of the grid where the grenade was found) and increase line spacing from point at which the last grenade fragment was found. The PDT ultimately decided against this approach from an implementability stand point. If evidence of grenades is prevalent, and the PDT feels that more data are required, the PDT may elect to place grid(s) in the area, and/or add transects in between existing transects for better characterization.

20) The PDT discussed AoPI 3 and the need (or lack thereof) for additional data. Extensive activities have been conducted in and around AoPI 3. Based on the amount of data available from those previous activities, the question of whether or not the nature of contamination at AoPI 3 has been defined was posed. Furthermore, since the PDT has defined the lateral extent of MEC in the data quality objectives (DQO) table as the distance equal to the transect spacing determined for the respective area (i.e., 112 ft for AoPI 3) beyond the last MEC discovered, it is possible to place a 112 ft buffer around AoPI 3 and conclude that both the nature and extent of the contamination has been defined. The USAESCH agreed to discuss the matter with the CX and provide comment to the PDT.

21) The PDT agreed that grids placed in mag-and-dig areas will be digitally geophysically mapped (DGM). From those DGM grids, all MEC-like anomalies will be investigated. MEC-like anomalies will be based on results determined during the geophysical proveout; those selections will be discussed with the PDT prior to intrusive investigation. In analog instrument-assisted reconnaissance (AIR) areas, grids will be evaluated by mag-and-dig methods. In those grid, all anomalies will be intrusively investigated since the nature and extent of munitions along AIR transects will be unknown.

22) The PDT agreed that investigations at AoPI 11C should be conducted east of those previously conducted along Cedar Springs Drive. Investigation within the area identified as AoPI 11C in the Performance Work Statement (PWS) is not required.

23) DHEC requested that the Uniform Federal Policy for Quality Assurance Project Plan (UFP-QAPP) include a) rationale for how selected group of metals were determined and b) how and when the need for background samples will be determined.

24) The PDT requested that ZAPATA confirm Accutest and TestAmerica have certifications for South Carolina. ZAPATA has confirmed, in writing, that both labs hold South Carolina certification.

25) The PDT discussed the preferred format of the Work Plans. ZAPATA made some suggestions to improve clarity and readability based on recent experiences with another RI/FS. The PDT agreed to review the proposed format (see attached).

Attachments:

Meeting Agenda
Sign-in Sheet
RI/FS Presentation
Conceptual Site Models
Conceptual Site Exposure Models
Munitions and Explosives of Concern Data Quality Objective Tables
EM 200-1-2 Worksheets
Work Plans outline
Project Figures
Project Schedule

Exhibit 2 – Preliminary Conceptual Site Model

MRS/Area of Potential Interest (AoPI)	Approximate Acres	Suspect Past DoD Activities based on the ASR, ASR Supplement, and GIS-based Historical Photographic Analysis	Potential MEC/MD	Previous Investigation / Clearance Actions	Adjusted RI acreage	Post-DoD / Current Land Use and Potential Receptors	RI Field Sampling * *Transect spacing is based on VSP, using 1.5x HFD from the HE item (90% confidence for that item or larger)
MRS 1 GAS CHAMBERS	23.8	Training using CS smoke pots/grenades. Assume disposal of canisters in pits or tossed away from the gas chamber (gas chamber #1) in the same general area. Training trenches may also be associated with gas chambers. **NOTE:** Three other gas chambers are identified in historical photographic analysis. Gas chamber # 2 and gas chamber #3 are in the vicinity of the 10th and 3rd holes of the golf course, respectively, adjacent to AoPI 3 (previously referred to as OOU3). Gas chamber # 4 is due east of AoPI 11C (previously referred to as OOU 11C) near the ball fields.	CS smoke pots/grenades. No documented finds since site closure.	General location of gas chamber #3 has been geophysically mapped while investigating OOU3. Anomalies will be intrusively investigated in January 2011.	23.8	Private/commercial. Receptors: residents, landowners, employees. Site is publicly accessible other than the commercial property, which has restricted access.	Upon review of the historical photographic analysis, gas chamber #1 is located south of the southern boundary of MRS1. As such, the field investigation will be focused south of the delineated MRS1. Field investigation will be expanded to include general vicinity of gas chambers #2 and 3 as part of the AoPI 3 investigation, and gas chamber #4 as part of the AoPI 11C investigation. Within the PWS-defined MRS boundary, perform a surface reconnaissance along transects spaced 112 ft apart based on grenades to identify areas of potential munitions contamination. Develop anomaly density maps and document MD, CD and MEC. To the south of the PWS-defined boundary, perform a surface reconnaissance along transects spaced 50 ft apart, to determine anomaly density. Use EM61 in 50'x50' grids to locate disposal pits and/or consolidated disposal area. Within grids, intrusively investigate all MEC-like anomalies. If a large indistinguishable anomaly is present, i.e. a disposal pit, a test trench will be excavated to characterize the anomalous area. ***MC sampling*** – None. Per the ASR Supplement, it is unlikely that CS is present after 50 years. In addition, this is not a compound routinely analyzed by certified laboratories, and is currently not included in the ADR software database. There is no need to sample for metals – smoke canisters are not expected to be comprised of metals of concern for risk analysis.
MRS 2 GRENADE COURT	24.9	Live and practice grenade training.	Live and practice grenades. No documented finds since site closures.	None.	24.9	Private property. Receptors: landowners, residents. Area is publicly accessible.	Mag and dig 100% of anomalies using a MineLab detector along transects spaced at 112' based on a grenade. Develop anomaly density maps and document MD, CD and MEC. The MineLab was selected for use in MRS 2 and MRS 3 based on the magnetic rocks and responsive soils throughout the project site. Place grids (50'x50' equivalent) in areas of high, medium and low-density areas. Grid acreage will be at least 10% of the total transect acreage. DGM grids using EM61. Intrusively investigate MEC-like anomalies. ***MC sampling*** – One discrete soil sample (from 0 to 2" bgs) for explosives and select metals (Pb, Sb, Zn, Cu). If evidence of white phosphorus is discovered, discrete soil samples will be collected for chemical analysis.
MRS 3 OPERATIONAL RANGE COMPLEX	12,102.4 (not including Lake Johnson and Lake Craig)	Artillery training and combat range using live and practice munitions. Documented and undocumented firing points. 15 ranges, as documented in the Supplemental ASR.	60mm mortars, 81mm mortars, 1,000" AT, rifle grenades. Items found since site closure include: 37mm, 57mm, 60mm, 81mm, 105mm, 2.36" rockets, grenades, rifle	EE/CA (1996 and 1998). MEC surface removals at OOU1B, OOU2, and OOU7 in 1997. MEC removal at	12,102.4	State park, private property. Receptors: recreational users (hikers, bikers, camping, horseback riding), residents,	Due to the nature of the previous clearances, the minimal amount of acreage that was cleared, and the difficulty in accurately relocating the exact grids/acreage that was cleared more than 10 years ago, these areas will be included in the investigation, as described below. These data will allow the PDT to evaluate the effectiveness of the past removal actions, for consideration in the RI and FS documents. MRS 3 will be divided into sub-areas based on past land use. *Sub-area 1* is inclusive of the range complex most likely to have MK II grenades, 37mm, and 60mm mortars or larger munitions, based

Exhibit 2 – Preliminary Conceptual Site Model

MRS/Area of Potential Interest (AoPI)	Approximate Acres	Suspect Past DoD Activities based on the ASR, ASR Supplement, and GIS-based Historical Photographic Analysis	Potential MEC/MD	Previous Investigation / Clearance Actions	Adjusted RI acreage	Post-DoD / Current Land Use and Potential Receptors	RI Field Sampling * *Transect spacing is based on VSP, using 1.5x HFD from the HE item (90% confidence for that item or larger)
			grenades, 155mm with burster tube. Specifically: *1A* - 37mm and 57mm inert projectiles. *1B* – 60mm and 81mm mortar parts. *2* – 60mm and 81mm mortar parts, 4.2" mortar parts. *6A/6B* – M43 81mm mortars, M49 60mm mortar, M84 105mm HC smoke round. *7* – 60mm mortars, 81mm mortars, 2.36" rocket parts. *9F* – 37mm APT with tracer (expended), grenade ring. *10C* – MKII practice grenade scrap. *10D* – Grenade frag, part of a white phosphorus grenade. *11A* – Grenade top, 60mm mortar (expended). *12A* – Grenade spoon, M9 HEAT rifle grenades practice rifle grenades, 2.36" rocket motors, frag, and scrap, MKII hand grenades and scrap. *12B* – M9 rifle grenade.	OOU6A/6B in 2001. Less than 1% of the MRS has undergone MEC clearance, most of which was surface or shallow depth clearance as part of Time Critical Removal Actions.		landowners. Some timber harvesting on private property. Public access; some of the southern areas may be inaccessible due to limited road, dense vegetation.	on documented MEC finds. *Sub-area 2* represents all remaining portions where only sporadic and small quantities of munitions have been found. If MEC/MD is found up to the boundary of the MRS, including formerly identified OOUs, ZAPATA will coordinate with the Project Delivery Team to expand the investigation via instrument-assisted reconnaissance or mag and dig, to increase confidence that the boundary of MEC is defined. ***Sub-area 1*** - Mag and dig 100% anomalies using a MineLab detector at various transect spacings, those being 112 ft for MK II grenades, 242 ft for 37mm projectiles, and 416 ft for 60mm mortars. Develop anomaly density maps and document MD, CD and MEC. Conduct an instrument-assisted recon along transects in wetlands, documenting anomaly counts. There will be no intrusive investigation of anomalies in the wetlands. Place grids (50'x50' equivalent) in areas of high, medium and low density areas. Grid acreage will be at least 10% of the total transect acreage. DGM grids using EM61. Intrusively investigate MEC-like anomalies. ***Sub-area 2*** – Perform a surface reconnaissance along transects spaced 416 ft apart based on a 60mm mortar to identify areas of potential munitions contamination. Develop anomaly density maps and document MD, CD and MEC. ***MC sampling -*** Ten (10) discrete soil samples (from 0 to 2" bgs) for explosives and select metals (Pb, Sb, Zn, Cu) based on range fans/firing points, terrestrial targets, and findings from mag-and-dig.

Exhibit 2 – Preliminary Conceptual Site Model

MRS/Area of Potential Interest (AoPI)	Approximate Acres	Suspect Past DoD Activities based on the ASR, ASR Supplement, and GIS-based Historical Photographic Analysis	Potential MEC/MD	Previous Investigation / Clearance Actions	Adjusted RI acreage	Post-DoD / Current Land Use and Potential Receptors	RI Field Sampling * *Transect spacing is based on VSP, using 1.5x HFD from the HE item (90% confidence for that item or larger)
RANGE COMPLEX (LAKE CRAIG AND LAKE JOHNSON)	Total ~ 185.6 Lake Johnson footprint = 37.5 acres. ZAPATA contacted State Park personnel on 12/3/10 and SC DNR on 12/6/10 concerning lake water levels. Officials indicated that Lake Johnson has been drained but is currently being naturally filled and has approximately 7 acres of water. Lake Craig is 148.1 acres.	Situated within MRS 3.	60mm and 81mm mortars. No documented finds since site closure.	None	185.6	State park. Receptors: recreational users (boating, fishing). Site is publicly accessible.	Two investigation methodologies are proposed for MRS; mag-and-dig and surface reconnaissance, with variable transect spacings. Based on site restrictions, no data collection within the lakes is proposed. Mag-and-dig transects proposed for areas west of the lakes will be performed up to the water boundary, will turn and follow the shoreline until the point at which the transects turn and lead away from the lake. This will allow for data collection to occur along the lake shorelines. A similar method will be employed during surface reconnaissance east of the lakes. As with MRS 3, those data will be used to develop anomaly density maps and document MD, CD and MEC. ***MC sampling –*** No samples will be collected.
AREAS OF POTENTIAL INTEREST – GENERAL COMMENTS		Mixed use.					Field work in AoPI is contingent upon rights-of-entry. If MEC/MD is found up to the boundary of any AoPI, ZAPATA will coordinate with the Project Delivery Team to expand the investigation via instrument-assisted reconnaissance or mag and dig, to increase confidence that the boundary of MEC is defined.

Exhibit 2 – Preliminary Conceptual Site Model

MRS/Area of Potential Interest (AoPI)	Approximate Acres	Suspect Past DoD Activities based on the ASR, ASR Supplement, and GIS-based Historical Photographic Analysis	Potential MEC/MD	Previous Investigation / Clearance Actions	Adjusted RI acreage	Post-DoD / Current Land Use and Potential Receptors	RI Field Sampling * *Transect spacing is based on VSP, using 1.5x HFD from the HE item (90% confidence for that item or larger)
AREA OF POTENTIAL INTEREST 3	PWS AoPI = 11 acres. Previous defined OOU 3 (Wedgewood) = 46 acres.	Cantonment area.	Grenades. Items found since site closure include: grenades, 2.36" rocket fragmentation.	EE/CA (1996), multiple removal reports. Subsurface clearance to depth in approximately 40 acres in the Wedgewood development that encompasses the majority of AoPI 3. DGM and some clearance in golf course buffer. General location of gas chamber #3 has been geophysically mapped while investigating OOU3. Anomalies will be intrusively investigated in January 2011. Results of this clearance may alter the CSM.	Approx. 3 acres.	Residential and recreational (golf course). Receptors: Residents, golfers, and golf course maintenance personnel. Site is publicly accessible.	Areas that have undergone previous MEC removals will be excluded from the acres investigated under this RI based upon coordinates provided in removal documents. Extent of MEC has not been defined. MEC has been encountered beyond the currently delineated boundary of AoPI 3 as documented during the MEC removal at OOU3. Field investigation will occur beyond this boundary to the west, north and east to the road depicted in the historical photo analysis. While the 112 ft transect spacing is proposed for these extend areas of investigation, it is unclear what method of investigation is most appropriate; potential ideas include mag-and-dig, DGM with EM61 and/or the MetalMapper, or some combination of these. The method should be determined during the TPP process. ZAPATA believes that the location of gas chamber #2, as shown in the historical photographic analysis, has been investigated during previous MEC investigations/removals. In the event that this area was not characterized, the proposed line spacing is adequate to identify gas canisters. ***MC sampling*** - One discrete soil sample (from 0 to 2" bgs) for explosives and select metals (Pb, Sb, Zn, Cu).
AREA OF POTENTIAL INTEREST 5	5.5	North of the Range 7 firing point; southwest of grenade court.	Grenades. Items found since site closure include: rifle grenade.	EE/CA (1996)	5.5	Residential. Receptors: landowners, residents. Area is publicly accessible.	Mag and dig 100% transects using a MineLab detector at 173' line spacing, based on a rifle grenade. Develop anomaly density maps and document MD, CD and MEC. Place grids (50'x50' equivalent) in areas of high, medium and low-density areas. Grid acreage will be at least 10% of the total transect acreage. DGM grids using EM61. Intrusively investigate MEC-like anomalies. ***MC sampling*** - One discrete soil sample (from 0 to 2" bgs) for explosives and select metals (Pb, Sb, Zn, Cu).

Exhibit 2 – Preliminary Conceptual Site Model

MRS/Area of Potential Interest (AoPI)	Approximate Acres	Suspect Past DoD Activities based on the ASR, ASR Supplement, and GIS-based Historical Photographic Analysis	Potential MEC/MD	Previous Investigation / Clearance Actions	Adjusted RI acreage	Post-DoD / Current Land Use and Potential Receptors	RI Field Sampling * *Transect spacing is based on VSP, using 1.5x HFD from the HE item (90% confidence for that item or larger)
AREA OF POTENTIAL INTEREST 8	23.9	North of the Range 11 firing point.	Small arms ammunition. No documented finds since site closure.	EE/CA (1996)	23.9	State Park. Receptors: recreational users (hikers, bikers, camping, horseback riding). Site is publicly accessible.	Mag and dig 100% transects using a MineLab detector at 112' spacing. Develop anomaly density maps and document MD, CD and MEC. Place grids (50'x50' equivalent) in areas of high, medium and low-density areas. Grid acreage will be at least 10% of the total transect acreage. DGM grids using EM61. Intrusively investigate MEC-like anomalies. ***MC sampling*** - One discrete soil sample (from 0 to 2" bgs) for explosives and select metals (Pb, Sb, Zn, Cu).
AREA OF POTENTIAL INTEREST 9E	7.6	Northwest of the Range 7 firing point.	Small arms ammunition; which have also been found since site closure.	EE/CA (1998)	7.6	State Park. Receptors: recreational users (hikers, bikers, camping, horseback riding). Area is publicly accessible.	Mag and dig 100% transects using a MineLab detector at 112' spacing. Develop anomaly density maps and document MD, CD and MEC. Place grids (50'x50' equivalent) in areas of high, medium and low-density areas. Grid acreage will be at least 10% of the total transect acreage. DGM grids using EM61. Intrusively investigate MEC-like anomalies. ***MC sampling*** - One discrete soil sample (from 0 to 2" bgs) for explosives and select metals (Pb, Sb, Zn, Cu).
AREA OF POTENTIAL INTEREST 9G	6.6	North of the Range 3 firing point.	Small arms ammunition; which have also been found since site closure. Anecdotal evidence of grenades has been provided by the public.	EE/CA (1998)	6.6	Private property. Receptors: Residents. Area is publicly accessible.	Based on anecdotal information provided by the public and the Spartanburg County Sheriff's Office, it is recommended that AoPI 9G be expanded to the east, up to the MRS 3 boundary. Mag and dig 100% transects using a MineLab detector at 112' line spacing. Develop anomaly density maps and document MD, CD and MEC. Place grids (50'x50' equivalent) in areas of high, medium and low-density areas. Grid acreage will be at least 10% of the total transect acreage. DGM grids using EM61. Intrusively investigate MEC-like anomalies. ***MC sampling*** - One discrete soil sample (from 0 to 2" bgs) for explosives and select metals (Pb, Sb, Zn, Cu).
AREA OF POTENTIAL INTEREST 10A	171.5	North of AoPI 8 and Ranges 10 and 11 firing points.	Grenades and mortars. Items found since site closure include: rifle grenade parts, land mine parts , practice grenade, 2.36" rocket, small arms ammunition.	EE/CA (1998)	171.5	State Park Receptors: recreational users (hikers, bikers, camping, horseback riding). Area is publicly accessible.	Mag and dig 100% transects at 112' line spacing using a MineLab detector. Develop anomaly density maps and document MD, CD and MEC. Place grids (50'x50' equivalent) in areas of high, medium and low-density areas. Grid acreage will be at least 10% of the total transect acreage. DGM grids using EM61. Intrusively investigate MEC-like anomalies. ***MC sampling*** - One discrete soil sample (from 0 to 2" bgs) for explosives and select metals (Pb, Sb, Zn, Cu).

Exhibit 2 – Preliminary Conceptual Site Model

MRS/Area of Potential Interest (AoPI)	Approximate Acres	Suspect Past DoD Activities based on the ASR, ASR Supplement, and GIS-based Historical Photographic Analysis	Potential MEC/MD	Previous Investigation / Clearance Actions	Adjusted RI acreage	Post-DoD / Current Land Use and Potential Receptors	RI Field Sampling * *Transect spacing is based on VSP, using 1.5x HFD from the HE item (90% confidence for that item or larger)
AREA OF POTENTIAL INTEREST 10B	33.6	Southwest of Range 2 firing point.	Undetermined. Items found since site closure include: small arms ammunition, 60mm mortar.	EE/CA (1998)	33.6	State Park Receptors: recreational users (hikers, bikers, camping, horseback riding). Area is publicly accessible.	Mag and dig 100% transects at 416' line spacing using a Mine Lab detector. Develop anomaly density maps and document MD, CD and MEC. Place grids (50'x50' equivalent) in areas of high, medium and low-density areas. Grid acreage will be at least 10% of the total transect acreage. DGM grids using EM61. Intrusively investigate MEC-like anomalies. ***MC sampling*** - One discrete soil sample (from 0 to 2" bgs) for explosives and select metals (Pb, Sb, Zn, Cu).
ARE OF POTENTIAL INTEREST 11B	34.7	Northwest of Range 2 firing point.	Undetermined. Items found since site closure include: small arms ammunition, grenade part.	EE/CA (1998)	34.7	Private property. Receptors: residents. Area is publicly accessible.	Mag and dig 100% transects using a MineLab detector at 112' line spacing. Develop anomaly density maps and document MD, CD and MEC. Place grids (50'x50' equivalent) in areas of high, medium and low-density areas. Grid acreage will be at least 10% of the total transect acreage. DGM grids using EM61. Intrusively investigate MEC-like anomalies. ***MC sampling*** - One discrete soil sample (from 0 to 2" bgs) for explosives and select metals (Pb, Sb, Zn, Cu).

Exhibit 2 – Preliminary Conceptual Site Model

MRS/Area of Potential Interest (AoPI)	Approximate Acres	Suspect Past DoD Activities based on the ASR, ASR Supplement, and GIS-based Historical Photographic Analysis	Potential MEC/MD	Previous Investigation / Clearance Actions	Adjusted RI acreage	Post-DoD / Current Land Use and Potential Receptors	RI Field Sampling * *Transect spacing is based on VSP, using 1.5x HFD from the HE item (90% confidence for that item or larger)
AREA OF POTENTIAL INTEREST 11C	23.0	Undetermined.	Undetermined. Items found since site closure include: grenades grenade fuzes, anti-tank mines.	EE/CA (1998) Clearance to depth of 11 acres (2010).	12	Private property. Receptors: residents, landowners. Area is publicly accessible.	Areas that have undergone previous MEC removals will be excluded from the acres investigated under this RI. The PWS-defined boundary may be improperly located. Based on findings during ZAPATA's previous removal actions in OOU11C, the area of potential interest may lie to the east of both the PWS-defined boundary and the removal action boundary. However, the USAESCH has requested the PWS-defined boundary be included in future investigations along with those proposed activities to the east. Investigate additional acres to the east of the AoPI based on the 2010 removal action data and site knowledge. Additional acreage will include the approximate location of gas chamber #4, based on historical photographic analysis. Conduct mag and dig of 100% anomalies at 112' transect spacing using a MineLab detector. Develop anomaly density maps and document MD, CD and MEC. 100% digital geophysical mapping of ball fields east of AoPI 11C to illustrate extent of anomaly density. Based upon findings of mag and dig, and discussions w/PDT, MEC-like items may be intrusively investigated. Place grids (50'x50' equivalent) in areas of high, medium and low density mag and dig areas. ***MC sampling*** - One discrete soil sample (from 0 to 2" bgs) for explosives and select metals (Pb, Sb, Zn, Cu).
AREA OF POTENTIAL INTEREST 11D	15.1	Cantonment area.	Undetermined. Items found since site closure include: grenade, mortars (reported to sheriff).	EE/CA (1998)	15.1	Private property / recreational. Receptors: golfers and golf course maintenance personnel. Area is publicly accessible.	Location of AoPI in PWS appears to be offset, based on evaluation of the historic photo analysis. AoPI will be shifted due west. Mag and dig 100% transects using a MineLab at 112' line spacing in area identified in the historic photographic analysis. Develop anomaly density maps and document MD, CD and MEC. Place grids (50'x50' equivalent) in areas of high, medium and low-density areas. Grid acreage will be at least 10% of the total transect acreage. DGM grids using EM61. Intrusively investigate MEC-like anomalies. ***MC sampling*** - One discrete soil sample (from 0 to 2" bgs) for explosives and select metals (Pb, Sb, Zn, Cu).

NOTES: The proposed methodology assures that the following metrics will be met.

- Transect spacing and numbers of anomalies to be investigated results in 90% confidence that all MEC contaminated areas have been identified.
- Boundaries of MEC contaminated areas will be delineated to an accuracy of +/- half of the transect spacing for each MRS/AoPI.
- All land outside of the areas likely to contain MEC have less than or equal to .1 UXO/acre when public use is significant, .5 UXO/acre when public use is moderate, 1 UXO/acre when public use is low by using UXO density as recommended by UXO Estimator.
- Transect spacing and rationale for grid placement will result in 90% confidence that the nature of MEC and MEC debris for each homogenous MEC contaminated area has been achieved.
- Transect spacing, mag and dig along transects, development of anomaly density maps, and intrusive investigation in grids will provide comprehensive data to ensure FS cost estimates are within an accuracy of +50%/-30%.

Table 1 – Munitions and Explosives of Concern Data Quality Objectives – MRS 1

DQO	Problem Statement	Project Goals	Required Information Inputs	Input Boundaries	Analytical Approach	Performance Criteria	Plan for Obtaining Data
Explanation	*Define the problem that necessitates the study*	*Identify study questions*	*Identify data and information needed to answer study questions*	*Specify the target population and define spatial limits*	*Develop the logic for drawing conclusions from findings*	*Specify probability limits for false rejections and false acceptance decision errors*	*Select the plan that meets the performance criteria*
MRS Characterization	• Determine the nature and extent of MEC.	• Determine the location and type of MEC present. • Determine the spatial extent of MEC. • Determine if MEC exposure pathways for humans are complete. • Determine if MEC pose a human health risk. --- Possible Actions: • No DoD Action Indicated • Institutional Controls • MEC Removal • Combination of Actions	• Data collected during previous activities. • Results of visual observations along transects and in grids. • Analog (density) and/or digital (instrument response) geophysical data. • Results of intrusive investigation of identified anomalies. • Survey of site receptors, demographics and land use.	• During field activities, transects will be spaced approximately 112 ft apart in the MRS boundary and 50 ft apart south of the MRS boundary; grids will equate to 50 ft by 50 ft areas within the MRS. • Transect spacing is designed to search for areas where the smoke grenade (the smallest found item with an explosive hazard) would explode on impact with the ground, detonate and fragment. • Grid locations in areas of high, medium, and low anomaly count areas will be determined based on results of transect investigations. • The anomaly selection threshold in DGM grids is based on the maximum value determined during the geophysical proveout. The initial value is set at 11x the diameter of the MK II grenade (the smallest found item with an explosive hazard across all MRSs/AoPIs). • Intrusively investigate potential MEC items. --- Constraints: Rights-of-entry, weather, current land use activities.	• Maximum depth at which each type of MEC was encountered will be used to define the vertical extent for that type of MEC. • The location and spatial extent of MEC will be used to define the lateral extent for each type of MEC encountered; the extent beyond the last MEC discovered will be equal to the transect spacing for the area in question. • If evidence of MEC is found, then discovery location may be within a zone where ordnance landed that did not function as designed. • All MD, frag, and targets will be evaluated as possibly indicative of the location of MEC. --- Alternative actions will be formulated in the Feasibility Study based on the location and density of MEC, land use, and other data gathered during the investigation and comparison of those data with criteria established herein.	• Anomaly reacquisition (from DGM data) within 1 meter accuracy. • Transect pathway positional accuracy is +/- 20 %, as an average across the MRS. • Depth of detection for DGM data (i.e., the failure criteria) is 7x the diameter of the smoke grenade. • QC/QA blind seed items will be detected and identified.	• Visually inspect and determine anomaly density within transects using AIR. • Perform DGM in grids. • Data collection along 0.99 acres/2.71 miles of transects and 0.29 acres/5 grids. • Overlap DGM and analog data collection methods along a sample of transects for comparability. • Synthesize anomaly density data into figures for PDT review and anomaly selection. • Select grid placement locations. Grids will be placed in high, medium, and low anomalous areas, based on AIR data and discussions with the PDT; biased placement of percentage of grids to define location of potential MEC in areas beyond target zone. • Intrusive investigation of a representative number of anomalies (to be determined by PDT) for AIR transects. • Intrusive investigation of all MEC-like anomalies for DGM grids. • Test trench of large anomalies.

Reference: Guidance on Systematic Planning Using the Data Quality Objectives Process, EPA QA//G-4, EPA/240/B-06/001, February 2006.
NOTE: MEC performance criteria are included in Section 4.0; MC DQOs are included in the UFP-QAPP (Appendix E).

Table 2 – Munitions and Explosives of Concern Data Quality Objectives – MRS 2

DQO	Problem Statement	Project Goals	Required Information Inputs	Input Boundaries	Analytical Approach	Performance Criteria	Plan for Obtaining Data
Explanation	*Define the problem that necessitates the study*	*Identify study questions*	*Identify data and information needed to answer study questions*	*Specify the target population and define spatial limits*	*Develop the logic for drawing conclusions from findings*	*Specify probability limits for false rejections and false acceptance decision errors*	*Select the plan that meets the performance criteria*
MRS Characterization	• Determine the nature and extent of MEC.	• Determine the location and type of MEC present. • Determine the spatial extent of MEC. • Determine if MEC exposure pathways for humans are complete. • Determine if MEC pose a human health risk. --- Possible Actions: • No DoD Action Indicated • Institutional Controls • MEC Removal • Combination of Actions	• Data collected during previous activities. • Results of visual observations along transects and in grids. • Analog (density) and/or digital (instrument response) geophysical data. • Results of intrusive investigation of identified anomalies. • Survey of site receptors, demographics and land use.	• During field activities, transects will be spaced approximately 112 ft apart and grids will equate to 50 ft by 50 ft areas within the MRS. • Transect spacing is designed to search for areas where the MK II grenade (the smallest found item with an explosive hazard) would explode on impact with the ground, detonate and fragment. • Grid locations in areas of high, medium, and low anomaly count areas will be determined based on results of transect investigations. • The anomaly selection threshold in DGM grids is based on the maximum value determined during the geophysical proveout. The initial value is set at 11x the diameter of the MK II grenade (the smallest found item with an explosive hazard across all MRSs/AoPIs). • Intrusively investigate potential MEC items. --- Constraints: Rights-of-entry, weather, current land use activities.	• Maximum depth at which each type of MEC was encountered will be used to define the vertical extent for that type of MEC. • The location and spatial extent of MEC will be used to define the lateral extent for each type of MEC encountered; the extent beyond the last MEC discovered will be equal to the transect spacing for the area in question. • If evidence of MEC is found, then discovery location may be within a zone where ordnance landed that did not function as designed. • All MD, frag, and targets will be evaluated as possibly indicative of the location of MEC. --- Alternative actions will be formulated in the Feasibility Study based on the location and density of MEC, land use, and other data gathered during the investigation and comparison of those data with criteria established herein.	• Anomaly reacquisition (from DGM data) within 1 meter accuracy. • Transect pathway positional accuracy is +/- 20 %, as an average across the MRS. • Depth of detection for DGM data (i.e., the failure criteria) is 7x the diameter of the MK II grenade. • QC/QA blind seed items will be detected and identified.	• Visually inspect and determine anomaly density within transects using DGM, AIR and/or mag-and-dig. • Data collection along 0.63 acres/1.74 miles of transects and 0.11 acres/2 grids. • Overlap DGM and analog data collection methods along a sample of transects for comparability. • Synthesize anomaly density data into figures for PDT review and anomaly selection. • Select grid placement locations. Grids will be placed in high, medium, and low anomalous areas, based on DGM data and discussions with the PDT; biased placement of percentage of grids to define location of potential MEC in areas beyond target zone. • Intrusive investigation of all anomalies for mag-and-dig transects. • Intrusive investigation of all MEC-like anomalies for DGM grids.

Reference: Guidance on Systematic Planning Using the Data Quality Objectives Process, EPA QA//G-4, EPA/240/B-06/001, February 2006.
NOTE: MEC performance criteria are included in Section 4.0; MC DQOs are included in the UFP-QAPP (Appendix E).

Table 3 – Munitions and Explosives of Concern Data Quality Objectives – MRS 3

DQO	Problem Statement	Project Goals	Required Information Inputs	Input Boundaries	Analytical Approach	Performance Criteria	Plan for Obtaining Data
Explanation	*Define the problem that necessitates the study*	*Identify study questions*	*Identify data and information needed to answer study questions*	*Specify the target population and define spatial limits*	*Develop the logic for drawing conclusions from findings*	*Specify probability limits for false rejections and false acceptance decision errors*	*Select the plan that meets the performance criteria*
MRS Characterization	• Determine the nature and extent of MEC.	• Determine the location and type of MEC present. • Determine the spatial extent of MEC. • Determine if MEC exposure pathways for humans are complete. • Determine if MEC pose a human health risk. --- Possible Actions: • No DoD Action Indicated • Institutional Controls • MEC Removal • Combination of Actions	• Data collected during previous activities. • Results of visual observations along transects and in grids. • Analog (density) and/or digital (instrument response) geophysical data. • Results of intrusive investigation of identified anomalies. • Survey of site receptors, demographics and land use.	• During field activities, transects will be variously spaced apart (i.e., 112 ft, 242 ft, or 416 ft) and grids will equate to 50 ft by 50 ft areas within the MRS. • Transect spacing is designed to search for areas where the MK II grenades, 37mm, or 60mm mortars (the smallest found item with an explosive hazard) would explode on impact with the ground, detonate and fragment. • Grid locations in areas of high, medium, and low anomaly count areas will be determined based on results of transect investigations. • The anomaly selection threshold in DGM grids is based on the maximum value determined during the geophysical proveout. The initial value is set at 11x the diameter of the MK II grenade (the smallest found item with an explosive hazard across all MRSs/AoPIs). • Intrusively investigate potential MEC items. --- Constraints: Rights-of-entry, weather, current land use activities.	• Maximum depth at which each type of MEC was encountered will be used to define the vertical extent for that type of MEC. • The location and spatial extent of MEC will be used to define the lateral extent for each type of MEC encountered; the extent beyond the last MEC discovered will be equal to the transect spacing for the area in question. • If evidence of MEC is found, then discovery location may be within a zone where ordnance landed that did not function as designed. • All MD, frag, and targets will be evaluated as possibly indicative of the location of MEC. --- Alternative actions will be formulated in the Feasibility Study based on the location and density of MEC, land use, and other data gathered during the investigation and comparison of those data with criteria established herein.	• Anomaly reacquisition (from DGM data) within 1 meter accuracy. • Transect pathway positional accuracy is +/- 20 %, as an average across the MRS. • Depth of detection for DGM data (i.e., the failure criteria) is 7x the diameter of the MK II grenades, 37mm, or 60mm mortars. • QC/QA blind seed items will be detected and identified.	• Visually inspect and determine anomaly density within transects using DGM, AIR and/or mag-and-dig. • Data collection along 91.87 acres/252.63 miles of transects and 9.24 acres/161 grids. • Overlap DGM and analog data collection methods along a sample of transects for comparability. • Synthesize anomaly density data into figures for PDT review and anomaly selection. • Select grid placement locations. Grids will be placed in high, medium, and low anomalous areas, based on DGM and AIR data and discussions with the PDT; biased placement of percentage of grids to define location of potential MEC in areas beyond target zone. • Intrusive investigation of all anomalies for mag-and-dig transects. • Intrusive investigation of a representative number of anomalies (to be determined by PDT) for AIR transects. • Intrusive investigation of all anomalies for AIR grids. • Intrusive investigation of all MEC-like anomalies for DGM grids.

Reference: Guidance on Systematic Planning Using the Data Quality Objectives Process, EPA QA//G-4, EPA/240/B-06/001, February 2006.
NOTE: MEC performance criteria are included in Section 4.0; MC DQOs are included in the UFP-QAPP (Appendix E).

Table 4 – Munitions and Explosives of Concern Data Quality Objectives – AoPI 3

DQO	Problem Statement	Project Goals	Required Information Inputs	Input Boundaries	Analytical Approach	Performance Criteria	Plan for Obtaining Data
Explanation	*Define the problem that necessitates the study*	*Identify study questions*	*Identify data and information needed to answer study questions*	*Specify the target population and define spatial limits*	*Develop the logic for drawing conclusions from findings*	*Specify probability limits for false rejections and false acceptance decision errors*	*Select the plan that meets the performance criteria*
MRS Characterization	• Determine the nature and extent of MEC.	• Determine the location and type of MEC present. • Determine the spatial extent of MEC. • Determine if MEC exposure pathways for humans are complete. • Determine if MEC pose a human health risk. --- Possible Actions: • No DoD Action Indicated • Institutional Controls • MEC Removal • Combination of Actions	• Data collected during previous activities. • Results of visual observations along transects and in grids. • Analog (density) and/or digital (instrument response) geophysical data. • Results of intrusive investigation of identified anomalies. • Survey of site receptors, demographics and land use.	• During field activities, transects will be spaced approximately 112 ft apart and grids will equate to 50 ft by 50 ft areas within the AoPI. • Transect spacing is designed to search for areas where the MK II grenade (the smallest found item with an explosive hazard) would explode on impact with the ground, detonate and fragment. • Grid locations in areas of high, medium, and low anomaly count areas will be determined based on results of transect investigations. • The anomaly selection threshold in DGM grids is based on the maximum value determined during the geophysical proveout. The initial value is set at 11x the diameter of the MK II grenade (the smallest found item with an explosive hazard across all MRSs/AoPIs). • Intrusively investigate potential MEC items. --- Constraints: Rights-of-entry, weather, current land use activities.	• Maximum depth at which each type of MEC was encountered will be used to define the vertical extent for that type of MEC. • The location and spatial extent of MEC will be used to define the lateral extent for each type of MEC encountered; the extent beyond the last MEC discovered will be equal to the transect spacing for the area in question. • If evidence of MEC is found, then discovery location may be within a zone where ordnance landed that did not function as designed. • All MD, frag, and targets will be evaluated as possibly indicative of the location of MEC. --- Alternative actions will be formulated in the Feasibility Study based on the location and density of MEC, land use, and other data gathered during the investigation and comparison of those data with criteria established herein.	• Anomaly reacquisition (from DGM data) within 1 meter accuracy. • Transect pathway positional accuracy is +/- 20 %, as an average across the AoPI. • Depth of detection for DGM data (i.e., the failure criteria) is 7x the diameter of the MK II grenade. • QC/QA blind seed items will be detected and identified.	• Visually inspect and determine anomaly density within transects using DGM and mag-and-dig. • Data collection along 0.69 acres/1.89 miles of transects and 0.11 acres/2 grids. • Overlap DGM and analog data collection methods along a sample of transects for comparability. • Synthesize anomaly density data into figures for PDT review and anomaly selection. • Select grid placement locations. Grids will be placed in high, medium, and low anomalous areas, based on DGM data and discussions with the PDT; biased placement of percentage of grids to define location of potential MEC in areas beyond target zone. • Intrusive investigation of all anomalies for mag-and-dig transects. • Intrusive investigation of all MEC-like anomalies for DGM grids.

Reference: Guidance on Systematic Planning Using the Data Quality Objectives Process, EPA QA//G-4, EPA/240/B-06/001, February 2006.
NOTE: MEC performance criteria are included in Section 4.0; MC DQOs are included in the UFP-QAPP (Appendix E).
(The DQOs presented here, for AoPI 3, may change following meetings between the USAESCH and the golf course owners.)

Table 5 – Munitions and Explosives of Concern Data Quality Objectives – AoPI 5

DQO	Problem Statement	Project Goals	Required Information Inputs	Input Boundaries	Analytical Approach	Performance Criteria	Plan for Obtaining Data
Explanation	*Define the problem that necessitates the study*	*Identify study questions*	*Identify data and information needed to answer study questions*	*Specify the target population and define spatial limits*	*Develop the logic for drawing conclusions from findings*	*Specify probability limits for false rejections and false acceptance decision errors*	*Select the plan that meets the performance criteria*
MRS Characterization	• Determine the nature and extent of MEC.	• Determine the location and type of MEC present. • Determine the spatial extent of MEC. • Determine if MEC exposure pathways for humans are complete. • Determine if MEC pose a human health risk. --- Possible Actions: • No DoD Action Indicated • Institutional Controls • MEC Removal • Combination of Actions	• Data collected during previous activities. • Results of visual observations along transects and in grids. • Analog (density) and/or digital (instrument response) geophysical data. • Results of intrusive investigation of identified anomalies. • Survey of site receptors, demographics and land use.	• During field activities, transects will be spaced approximately 173 ft apart and grids will equate to 50 ft by 50 ft areas within the AoPI. • Transect spacing is designed to search for areas where the rifle grenade (the smallest found item with an explosive hazard) would explode on impact with the ground, detonate and fragment. • Grid locations in areas of high, medium, and low anomaly count areas will be determined based on results of transect investigations. • The anomaly selection threshold in DGM grids is based on the maximum value determined during the geophysical proveout. The initial value is set at 11x the diameter of the MK II grenade (the smallest found item with an explosive hazard across all MRSs/AoPIs). • Intrusively investigate potential MEC items. --- Constraints: Rights-of-entry, weather, current land use activities.	• Maximum depth at which each type of MEC was encountered will be used to define the vertical extent for that type of MEC. • The location and spatial extent of MEC will be used to define the lateral extent for each type of MEC encountered; the extent beyond the last MEC discovered will be equal to the transect spacing for the area in question. • If evidence of MEC is found, then discovery location may be within a zone where ordnance landed that did not function as designed. • All MD, frag, and targets will be evaluated as possibly indicative of the location of MEC. --- Alternative actions will be formulated in the Feasibility Study based on the location and density of MEC, land use, and other data gathered during the investigation and comparison of those data with criteria established herein.	• Anomaly reacquisition (from DGM data) within 1 meter accuracy. • Transect pathway positional accuracy is +/- 20 %, as an average across the AoPI. • Depth of detection for DGM data (i.e., the failure criteria) is 7x the diameter of the rifle grenade. • QC/QA blind seed items will be detected and identified.	• Visually inspect and determine anomaly density within transects using DGM and mag-and-dig. • Data collection along 0.11 acres/0.30 miles of transects and 0.06 acres/1 grid. • Overlap DGM and analog data collection methods along a sample of transects for comparability. • Synthesize anomaly density data into figures for PDT review and anomaly selection. • Select grid placement locations. Grids will be placed in high, medium, and low anomalous areas, based on DGM data and discussions with the PDT; biased placement of percentage of grids to define location of potential MEC in areas beyond target zone. • Intrusive investigation of all anomalies for mag-and-dig transects. • Intrusive investigation of all MEC-like anomalies for DGM grids.

Reference: Guidance on Systematic Planning Using the Data Quality Objectives Process, EPA QA//G-4, EPA/240/B-06/001, February 2006.
NOTE: MEC performance criteria are included in Section 4.0; MC DQOs are included in the UFP-QAPP (Appendix E).

Table 6 – Munitions and Explosives of Concern Data Quality Objectives – AoPI 8

DQO	Problem Statement	Project Goals	Required Information Inputs	Input Boundaries	Analytical Approach	Performance Criteria	Plan for Obtaining Data
Explanation	*Define the problem that necessitates the study*	*Identify study questions*	*Identify data and information needed to answer study questions*	*Specify the target population and define spatial limits*	*Develop the logic for drawing conclusions from findings*	*Specify probability limits for false rejections and false acceptance decision errors*	*Select the plan that meets the performance criteria*
MRS Characterization	• Determine the nature and extent of MEC.	• Determine the location and type of MEC present. • Determine the spatial extent of MEC. • Determine if MEC exposure pathways for humans are complete. • Determine if MEC pose a human health risk. --- Possible Actions: • No DoD Action Indicated • Institutional Controls • MEC Removal • Combination of Actions	• Data collected during previous activities. • Results of visual observations along transects and in grids. • Analog (density) and/or digital (instrument response) geophysical data. • Results of intrusive investigation of identified anomalies. • Survey of site receptors, demographics and land use.	• During field activities, transects will be spaced approximately 112 ft apart and grids will equate to 50 ft by 50 ft areas within the AoPI. • Transect spacing is designed to search for areas where the MK II grenade (the smallest found item with an explosive hazard) would explode on impact with the ground, detonate and fragment. • Grid locations in areas of high, medium, and low anomaly count areas will be determined based on results of transect investigations. • The anomaly selection threshold in DGM grids is based on the maximum value determined during the geophysical proveout. The initial value is set at 11x the diameter of the MK II grenade (the smallest found item with an explosive hazard across all MRSs/AoPIs). • Intrusively investigate potential MEC items. --- Constraints: Rights-of-entry, weather, current land use activities.	• Maximum depth at which each type of MEC was encountered will be used to define the vertical extent for that type of MEC. • The location and spatial extent of MEC will be used to define the lateral extent for each type of MEC encountered; the extent beyond the last MEC discovered will be equal to the transect spacing for the area in question. • If evidence of MEC is found, then discovery location may be within a zone where ordnance landed that did not function as designed. • All MD, frag, and targets will be evaluated as possibly indicative of the location of MEC. --- Alternative actions will be formulated in the Feasibility Study based on the location and density of MEC, land use, and other data gathered during the investigation and comparison of those data with criteria established herein.	• Anomaly reacquisition (from DGM data) within 1 meter accuracy. • Transect pathway positional accuracy is +/- 20 %, as an average across the AoPI. • Depth of detection for DGM data (i.e., the failure criteria) is 7x the diameter of the MK II grenade. • QC/QA blind seed items will be detected and identified.	• Visually inspect and determine anomaly density within transects using DGM and mag-and-dig. • Data collection along 0.79 acres/2.16 miles of transects and 0.11 acres/2 grids. • Overlap DGM and analog data collection methods along a sample of transects for comparability. • Synthesize anomaly density data into figures for PDT review and anomaly selection. • Select grid placement locations. Grids will be placed in high, medium, and low anomalous areas, based on DGM data and discussions with the PDT; biased placement of percentage of grids to define location of potential MEC in areas beyond target zone. • Intrusive investigation of all anomalies for mag-and-dig transects. • Intrusive investigation of all MEC-like anomalies for DGM grids.

Reference: Guidance on Systematic Planning Using the Data Quality Objectives Process, EPA QA//G-4, EPA/240/B-06/001, February 2006.
NOTE: MEC performance criteria are included in Section 4.0; MC DQOs are included in the UFP-QAPP (Appendix E).

Table 7 – Munitions and Explosives of Concern Data Quality Objectives – AoPI 9E

DQO	Problem Statement	Project Goals	Required Information Inputs	Input Boundaries	Analytical Approach	Performance Criteria	Plan for Obtaining Data
Explanation	*Define the problem that necessitates the study*	*Identify study questions*	*Identify data and information needed to answer study questions*	*Specify the target population and define spatial limits*	*Develop the logic for drawing conclusions from findings*	*Specify probability limits for false rejections and false acceptance decision errors*	*Select the plan that meets the performance criteria*
MRS Characterization	• Determine the nature and extent of MEC.	• Determine the location and type of MEC present. • Determine the spatial extent of MEC. • Determine if MEC exposure pathways for humans are complete. • Determine if MEC pose a human health risk. --- Possible Actions: • No DoD Action Indicated • Institutional Controls • MEC Removal • Combination of Actions	• Data collected during previous activities. • Results of visual observations along transects and in grids. • Analog (density) and/or digital (instrument response) geophysical data. • Results of intrusive investigation of identified anomalies. • Survey of site receptors, demographics and land use.	• During field activities, transects will be spaced approximately 112 ft apart and grids will equate to 50 ft by 50 ft areas within the AoPI. • Transect spacing is designed to search for areas where the MK II grenade (the smallest found item with an explosive hazard) would explode on impact with the ground, detonate and fragment. • Grid locations in areas of high, medium, and low anomaly count areas will be determined based on results of transect investigations. • The anomaly selection threshold in DGM grids is based on the maximum value determined during the geophysical proveout. The initial value is set at 11x the diameter of the MK II grenade (the smallest found item with an explosive hazard across all MRSs/AoPIs). • Intrusively investigate potential MEC items. --- Constraints: Rights-of-entry, weather, current land use activities.	• Maximum depth at which each type of MEC was encountered will be used to define the vertical extent for that type of MEC. • The location and spatial extent of MEC will be used to define the lateral extent for each type of MEC encountered; the extent beyond the last MEC discovered will be equal to the transect spacing for the area in question. • If evidence of MEC is found, then discovery location may be within a zone where ordnance landed that did not function as designed. • All MD, frag, and targets will be evaluated as possibly indicative of the location of MEC. --- Alternative actions will be formulated in the Feasibility Study based on the location and density of MEC, land use, and other data gathered during the investigation and comparison of those data with criteria established herein.	• Anomaly reacquisition (from DGM data) within 1 meter accuracy. • Transect pathway positional accuracy is +/- 20 %, as an average across the AoPI. • Depth of detection for DGM data (i.e., the failure criteria) is 7x the diameter of the MK II grenade. • QC/QA blind seed items will be detected and identified.	• Visually inspect and determine anomaly density within transects using DGM and mag-and-dig. • Data collection along 0.19 acres/0.53 miles of transects and 0.06 acres/1 grid. • Overlap DGM and analog data collection methods along a sample of transects for comparability. • Synthesize anomaly density data into figures for PDT review and anomaly selection. • Select grid placement locations. Grids will be placed in high, medium, and low anomalous areas, based on DGM data and discussions with the PDT; biased placement of percentage of grids to define location of potential MEC in areas beyond target zone. • Intrusive investigation of all anomalies for mag-and-dig transects. • Intrusive investigation of all MEC-like anomalies for DGM grids.

Reference: Guidance on Systematic Planning Using the Data Quality Objectives Process, EPA QA//G-4, EPA/240/B-06/001, February 2006.
NOTE: MEC performance criteria are included in Section 4.0; MC DQOs are included in the UFP-QAPP (Appendix E).

Table 8 – Munitions and Explosives of Concern Data Quality Objectives – AoPI 9G

DQO	Problem Statement	Project Goals	Required Information Inputs	Input Boundaries	Analytical Approach	Performance Criteria	Plan for Obtaining Data
Explanation	*Define the problem that necessitates the study*	*Identify study questions*	*Identify data and information needed to answer study questions*	*Specify the target population and define spatial limits*	*Develop the logic for drawing conclusions from findings*	*Specify probability limits for false rejections and false acceptance decision errors*	*Select the plan that meets the performance criteria*
MRS Characterization	• Determine the nature and extent of MEC.	• Determine the location and type of MEC present. • Determine the spatial extent of MEC. • Determine if MEC exposure pathways for humans are complete. • Determine if MEC pose a human health risk. --- Possible Actions: • No DoD Action Indicated • Institutional Controls • MEC Removal • Combination of Actions	• Data collected during previous activities. • Results of visual observations along transects and in grids. • Analog (density) and/or digital (instrument response) geophysical data. • Results of intrusive investigation of identified anomalies. • Survey of site receptors, demographics and land use.	• During field activities, transects will be spaced approximately 112 ft apart and grids will equate to 50 ft by 50 ft areas within the AoPI. • Transect spacing is designed to search for areas where the MK II grenade (the smallest found item with an explosive hazard) would explode on impact with the ground, detonate and fragment. • Grid locations in areas of high, medium, and low anomaly count areas will be determined based on results of transect investigations. • The anomaly selection threshold in DGM grids is based on the maximum value determined during the geophysical proveout. The initial value is set at 11x the diameter of the MK II grenade (the smallest found item with an explosive hazard across all MRSs/AoPIs). • Intrusively investigate potential MEC items. --- Constraints: Rights-of-entry, weather, current land use activities.	• Maximum depth at which each type of MEC was encountered will be used to define the vertical extent for that type of MEC. • The location and spatial extent of MEC will be used to define the lateral extent for each type of MEC encountered; the extent beyond the last MEC discovered will be equal to the transect spacing for the area in question. • If evidence of MEC is found, then discovery location may be within a zone where ordnance landed that did not function as designed. • All MD, frag, and targets will be evaluated as possibly indicative of the location of MEC. --- Alternative actions will be formulated in the Feasibility Study based on the location and density of MEC, land use, and other data gathered during the investigation and comparison of those data with criteria established herein.	• Anomaly reacquisition (from DGM data) within 1 meter accuracy. • Transect pathway positional accuracy is +/- 20 %, as an average across the AoPI. • Depth of detection for DGM data (i.e., the failure criteria) is 7x the diameter of the MK II grenade. • QC/QA blind seed items will be detected and identified.	• Visually inspect and determine anomaly density within transects using DGM and mag-and-dig. • Data collection along 0.65 acres/1.78 miles of transects and 0.11 acres/2 grids. • Overlap DGM and analog data collection methods along a sample of transects for comparability. • Synthesize anomaly density data into figures for PDT review and anomaly selection. • Select grid placement locations. Grids will be placed in high, medium, and low anomalous areas, based on DGM data and discussions with the PDT; biased placement of percentage of grids to define location of potential MEC in areas beyond target zone. • Intrusive investigation of all anomalies for mag-and-dig transects. • Intrusive investigation of all MEC-like anomalies for DGM grids.

Reference: Guidance on Systematic Planning Using the Data Quality Objectives Process, EPA QA//G-4, EPA/240/B-06/001, February 2006.
NOTE: MEC performance criteria are included in Section 4.0; MC DQOs are included in the UFP-QAPP (Appendix E).

Table 9 – Munitions and Explosives of Concern Data Quality Objectives – AoPI 10A

DQO	Problem Statement	Project Goals	Required Information Inputs	Input Boundaries	Analytical Approach	Performance Criteria	Plan for Obtaining Data
Explanation	*Define the problem that necessitates the study*	*Identify study questions*	*Identify data and information needed to answer study questions*	*Specify the target population and define spatial limits*	*Develop the logic for drawing conclusions from findings*	*Specify probability limits for false rejections and false acceptance decision errors*	*Select the plan that meets the performance criteria*
MRS Characterization	• Determine the nature and extent of MEC.	• Determine the location and type of MEC present. • Determine the spatial extent of MEC. • Determine if MEC exposure pathways for humans are complete. • Determine if MEC pose a human health risk. --- Possible Actions: • No DoD Action Indicated • Institutional Controls • MEC Removal • Combination of Actions	• Data collected during previous activities. • Results of visual observations along transects and in grids. • Analog (density) and/or digital (instrument response) geophysical data. • Results of intrusive investigation of identified anomalies. • Survey of site receptors, demographics and land use.	• During field activities, transects will be spaced approximately 112 ft apart and grids will equate to 50 ft by 50 ft areas within the AoPI. • Transect spacing is designed to search for areas where the MK II grenade (the smallest found item with an explosive hazard) would explode on impact with the ground, detonate and fragment. • Grid locations in areas of high, medium, and low anomaly count areas will be determined based on results of transect investigations. • The anomaly selection threshold in DGM grids is based on the maximum value determined during the geophysical proveout. The initial value is set at 11x the diameter of the MK II grenade (the smallest found item with an explosive hazard across all MRSs/AoPIs). • Intrusively investigate potential MEC items. --- Constraints: Rights-of-entry, weather, current land use activities.	• Maximum depth at which each type of MEC was encountered will be used to define the vertical extent for that type of MEC. • The location and spatial extent of MEC will be used to define the lateral extent for each type of MEC encountered; the extent beyond the last MEC discovered will be equal to the transect spacing for the area in question. • If evidence of MEC is found, then discovery location may be within a zone where ordnance landed that did not function as designed. • All MD, frag, and targets will be evaluated as possibly indicative of the location of MEC. --- Alternative actions will be formulated in the Feasibility Study based on the location and density of MEC, land use, and other data gathered during the investigation and comparison of those data with criteria established herein.	• Anomaly reacquisition (from DGM data) within 1 meter accuracy. • Transect pathway positional accuracy is +/- 20 %, as an average across the AoPI. • Depth of detection for DGM data (i.e., the failure criteria) is 7x the diameter of the MK II grenade. • QC/QA blind seed items will be detected and identified.	• Visually inspect and determine anomaly density within transects using DGM and mag-and-dig. • Data collection along 4.40 acres/12.09 miles of transects and 0.46 acres/8 grids. • Overlap DGM and analog data collection methods along a sample of transects for comparability. • Synthesize anomaly density data into figures for PDT review and anomaly selection. • Select grid placement locations. Grids will be placed in high, medium, and low anomalous areas, based on DGM data and discussions with the PDT; biased placement of percentage of grids to define location of potential MEC in areas beyond target zone. • Intrusive investigation of all anomalies for mag-and-dig transects. • Intrusive investigation of all MEC-like anomalies for DGM grids.

Reference: Guidance on Systematic Planning Using the Data Quality Objectives Process, EPA QA//G-4, EPA/240/B-06/001, February 2006.
NOTE: MEC performance criteria are included in Section 4.0; MC DQOs are included in the UFP-QAPP (Appendix E).

Table 10 – Munitions and Explosives of Concern Data Quality Objectives – AoPI 10B

DQO	Problem Statement	Project Goals	Required Information Inputs	Input Boundaries	Analytical Approach	Performance Criteria	Plan for Obtaining Data
Explanation	*Define the problem that necessitates the study*	*Identify study questions*	*Identify data and information needed to answer study questions*	*Specify the target population and define spatial limits*	*Develop the logic for drawing conclusions from findings*	*Specify probability limits for false rejections and false acceptance decision errors*	*Select the plan that meets the performance criteria*
MRS Characterization	• Determine the nature and extent of MEC.	• Determine the location and type of MEC present. • Determine the spatial extent of MEC. • Determine if MEC exposure pathways for humans are complete. • Determine if MEC pose a human health risk. --- Possible Actions: • No DoD Action Indicated • Institutional Controls • MEC Removal • Combination of Actions	• Data collected during previous activities. • Results of visual observations along transects and in grids. • Analog (density) and/or digital (instrument response) geophysical data. • Results of intrusive investigation of identified anomalies. • Survey of site receptors, demographics and land use.	• During field activities, transects will be spaced approximately 416 ft apart and grids will equate to 50 ft by 50 ft areas within the AoPI. • Transect spacing is designed to search for areas where the 60mm mortar (the smallest found item with an explosive hazard) would explode on impact with the ground, detonate and fragment. • Grid locations in areas of high, medium, and low anomaly count areas will be determined based on results of transect investigations. • The anomaly selection threshold in DGM grids is based on the maximum value determined during the geophysical proveout. The initial value is set at 11x the diameter of the MK II grenade (the smallest found item with an explosive hazard across all MRSs/AoPIs). • Intrusively investigate potential MEC items. --- Constraints: Rights-of-entry, weather, current land use activities.	• Maximum depth at which each type of MEC was encountered will be used to define the vertical extent for that type of MEC. • The location and spatial extent of MEC will be used to define the lateral extent for each type of MEC encountered; the extent beyond the last MEC discovered will be equal to the transect spacing for the area in question. • If evidence of MEC is found, then discovery location may be within a zone where ordnance landed that did not function as designed. • All MD, frag, and targets will be evaluated as possibly indicative of the location of MEC. --- Alternative actions will be formulated in the Feasibility Study based on the location and density of MEC, land use, and other data gathered during the investigation and comparison of those data with criteria established herein.	• Anomaly reacquisition (from DGM data) within 1 meter accuracy. • Transect pathway positional accuracy is +/- 20 %, as an average across the AoPI. • Depth of detection for DGM data (i.e., the failure criteria) is 7x the diameter of the 60mm mortar. • QC/QA blind seed items will be detected and identified.	• Visually inspect and determine anomaly density within transects using DGM and mag-and-dig. • Data collection along 0.23 acres/0.63 miles of transects and 0.06 acres/1 grid. • Overlap DGM and analog data collection methods along a sample of transects for comparability. • Synthesize anomaly density data into figures for PDT review and anomaly selection. • Select grid placement locations. Grids will be placed in high, medium, and low anomalous areas, based on DGM data and discussions with the PDT; biased placement of percentage of grids to define location of potential MEC in areas beyond target zone. • Intrusive investigation of all anomalies for mag-and-dig transects. • Intrusive investigation of all MEC-like anomalies for DGM grids.

Reference: Guidance on Systematic Planning Using the Data Quality Objectives Process, EPA QA//G-4, EPA/240/B-06/001, February 2006.
NOTE: MEC performance criteria are included in Section 4.0; MC DQOs are included in the UFP-QAPP (Appendix E).

Table 11 – Munitions and Explosives of Concern Data Quality Objectives – AoPI 11B

DQO	Problem Statement	Project Goals	Required Information Inputs	Input Boundaries	Analytical Approach	Performance Criteria	Plan for Obtaining Data
Explanation	*Define the problem that necessitates the study*	*Identify study questions*	*Identify data and information needed to answer study questions*	*Specify the target population and define spatial limits*	*Develop the logic for drawing conclusions from findings*	*Specify probability limits for false rejections and false acceptance decision errors*	*Select the plan that meets the performance criteria*
MRS Characterization	• Determine the nature and extent of MEC.	• Determine the location and type of MEC present. • Determine the spatial extent of MEC. • Determine if MEC exposure pathways for humans are complete. • Determine if MEC pose a human health risk. --- Possible Actions: • No DoD Action Indicated • Institutional Controls • MEC Removal • Combination of Actions	• Data collected during previous activities. • Results of visual observations along transects and in grids. • Analog (density) and/or digital (instrument response) geophysical data. • Results of intrusive investigation of identified anomalies. • Survey of site receptors, demographics and land use.	• During field activities, transects will be spaced approximately 112 ft apart and grids will equate to 50 ft by 50 ft areas within the AoPI. • Transect spacing is designed to search for areas where the MK II grenade (the smallest found item with an explosive hazard) would explode on impact with the ground, detonate and fragment. • Grid locations in areas of high, medium, and low anomaly count areas will be determined based on results of transect investigations. • The anomaly selection threshold in DGM grids is based on the maximum value determined during the geophysical proveout. The initial value is set at 11x the diameter of the MK II grenade (the smallest found item with an explosive hazard across all MRSs/AoPIs). • Intrusively investigate potential MEC items. --- Constraints: Rights-of-entry, weather, current land use activities.	• Maximum depth at which each type of MEC was encountered will be used to define the vertical extent for that type of MEC. • The location and spatial extent of MEC will be used to define the lateral extent for each type of MEC encountered; the extent beyond the last MEC discovered will be equal to the transect spacing for the area in question. • If evidence of MEC is found, then discovery location may be within a zone where ordnance landed that did not function as designed. • All MD, frag, and targets will be evaluated as possibly indicative of the location of MEC. --- Alternative actions will be formulated in the Feasibility Study based on the location and density of MEC, land use, and other data gathered during the investigation and comparison of those data with criteria established herein.	• Anomaly reacquisition (from DGM data) within 1 meter accuracy. • Transect pathway positional accuracy is +/- 20 %, as an average across the AoPI. • Depth of detection for DGM data (i.e., the failure criteria) is 7x the diameter of the MK II grenade. • QC/QA blind seed items will be detected and identified.	• Visually inspect and determine anomaly density within transects using DGM and mag-and-dig. • Data collection along 0.88 acres/2.42 miles of transects and 0.11 acres/2 grids. • Overlap DGM and analog data collection methods along a sample of transects for comparability. • Synthesize anomaly density data into figures for PDT review and anomaly selection. • Select grid placement locations. Grids will be placed in high, medium, and low anomalous areas, based on DGM data and discussions with the PDT; biased placement of percentage of grids to define location of potential MEC in areas beyond target zone. • Intrusive investigation of all anomalies for mag-and-dig transects. • Intrusive investigation of all MEC-like anomalies for DGM grids.

Reference: Guidance on Systematic Planning Using the Data Quality Objectives Process, EPA QA//G-4, EPA/240/B-06/001, February 2006.
NOTE: MEC performance criteria are included in Section 4.0; MC DQOs are included in the UFP-QAPP (Appendix E).

Table 12 – Munitions and Explosives of Concern Data Quality Objectives – AoPI 11C

DQO	Problem Statement	Project Goals	Required Information Inputs	Input Boundaries	Analytical Approach	Performance Criteria	Plan for Obtaining Data
Explanation	*Define the problem that necessitates the study*	*Identify study questions*	*Identify data and information needed to answer study questions*	*Specify the target population and define spatial limits*	*Develop the logic for drawing conclusions from findings*	*Specify probability limits for false rejections and false acceptance decision errors*	*Select the plan that meets the performance criteria*
MRS Characterization	• Determine the nature and extent of MEC.	• Determine the location and type of MEC present within each MRS. • Determine the spatial extent of MEC within each MRS. • Determine if MEC exposure pathways for humans are complete. • Determine if MEC pose a human health risk. --- Possible Actions: • No DoD Action Indicated • Institutional Controls • MEC Removal • Combination of Actions	• Data collected during previous activities. • Results of visual observations along transects and in grids. • Analog (density) and/or digital (instrument response) geophysical data. • Results of intrusive investigation of identified anomalies. • Survey of site receptors, demographics and land use.	• During field activities, transects will be spaced approximately 112 ft apart and grids will equate to 50 ft by 50 ft areas within the AoPI. • Transect spacing is designed to search for areas where the MK II grenade (the smallest found item with an explosive hazard) would explode on impact with the ground, detonate and fragment. • Grid locations in areas of high, medium, and low anomaly count areas will be determined based on results of transect investigations. • The anomaly selection threshold in DGM grids is based on the maximum value determined during the geophysical proveout. The initial value is set at 11x the diameter of the MK II grenade (the smallest found item with an explosive hazard across all MRSs/AoPIs). • Intrusively investigate potential MEC items. --- Constraints: Rights-of-entry, weather, current land use activities.	• Maximum depth at which each type of MEC was encountered will be used to define the vertical extent for that type of MEC. • The location and spatial extent of MEC will be used to define the lateral extent for each type of MEC encountered; the extent beyond the last MEC discovered will be equal to the transect spacing for the area in question. • If evidence of MEC is found, then discovery location may be within a zone where ordnance landed that did not function as designed. • All MD, frag, and targets will be evaluated as possibly indicative of the location of MEC. --- Alternative actions will be formulated in the Feasibility Study based on the location and density of MEC, land use, and other data gathered during the investigation and comparison of those data with criteria established herein.	• Anomaly reacquisition (from DGM data) within 1 meter accuracy. • Transect pathway positional accuracy is +/- 20 %, as an average across the AoPI. • Depth of detection for DGM data (i.e., the failure criteria) is 7x the diameter of the MK II grenade. • QC/QA blind seed items will be detected and identified.	• Visually inspect and determine anomaly density within transects using DGM and mag-and-dig. • Data collection along 0.14 acres/0.38 miles of transects and 5.03 acres of DGM (4.97 acres on ball field and 0.06 acres on 1 grid). • Overlap DGM and analog data collection methods along a sample of transects for comparability. • Synthesize anomaly density data into figures for PDT review and anomaly selection. • Select grid placement locations. Grids will be placed in high, medium, and low anomalous areas, based on DGM data and discussions with the PDT; biased placement of percentage of grids to define location of potential MEC in areas beyond target zone. • Intrusive investigation of all anomalies for mag-and-dig transects. • Intrusive investigation of all MEC-like anomalies for DGM areas/grids.

Reference: Guidance on Systematic Planning Using the Data Quality Objectives Process, EPA QA//G-4, EPA/240/B-06/001, February 2006.
NOTE: MEC performance criteria are included in Section 4.0; MC DQOs are included in the UFP-QAPP (Appendix E).

Table 13 – Munitions and Explosives of Concern Data Quality Objectives – AoPI 11D

DQO	Problem Statement	Project Goals	Required Information Inputs	Input Boundaries	Analytical Approach	Performance Criteria	Plan for Obtaining Data
Explanation	*Define the problem that necessitates the study*	*Identify study questions*	*Identify data and information needed to answer study questions*	*Specify the target population and define spatial limits*	*Develop the logic for drawing conclusions from findings*	*Specify probability limits for false rejections and false acceptance decision errors*	*Select the plan that meets the performance criteria*
MRS Characterization	• Determine the nature and extent of MEC.	• Determine the location and type of MEC present. • Determine the spatial extent of MEC. • Determine if MEC exposure pathways for humans are complete. • Determine if MEC pose a human health risk. --- Possible Actions: • No DoD Action Indicated • Institutional Controls • MEC Removal • Combination of Actions	• Data collected during previous activities. • Results of visual observations along transects and in grids. • Analog (density) and/or digital (instrument response) geophysical data. • Results of intrusive investigation of identified anomalies. • Survey of site receptors, demographics and land use.	• During field activities, transects will be spaced approximately 112 ft apart and grids will equate to 50 ft by 50 ft areas within the AoPI. • Transect spacing is designed to search for areas where the MK II grenade (the smallest found item with an explosive hazard) would explode on impact with the ground, detonate and fragment. • Grid locations in areas of high, medium, and low anomaly count areas will be determined based on results of transect investigations. • The anomaly selection threshold in DGM grids is based on the maximum value determined during the geophysical proveout. The initial value is set at 11x the diameter of the MK II grenade (the smallest found item with an explosive hazard across all MRSs/AoPIs). • Intrusively investigate potential MEC items. --- Constraints: Rights-of-entry, weather, current land use activities.	• Maximum depth at which each type of MEC was encountered will be used to define the vertical extent for that type of MEC. • The location and spatial extent of MEC will be used to define the lateral extent for each type of MEC encountered; the extent beyond the last MEC discovered will be equal to the transect spacing for the area in question. • If evidence of MEC is found, then discovery location may be within a zone where ordnance landed that did not function as designed. • All MD, frag, and targets will be evaluated as possibly indicative of the location of MEC. --- Alternative actions will be formulated in the Feasibility Study based on the location and density of MEC, land use, and other data gathered during the investigation and comparison of those data with criteria established herein.	• Anomaly reacquisition (from DGM data) within 1 meter accuracy. • Transect pathway positional accuracy is +/- 20 %, as an average across the AoPI. • Depth of detection for DGM data (i.e., the failure criteria) is 7x the diameter of the MK II grenade. • QC/QA blind seed items will be detected and identified.	• Visually inspect and determine anomaly density within transects using DGM and mag-and-dig. • Data collection along 0.42 acres/1.17 miles of transects and 0.06 acres/1 grid. • Overlap DGM and analog data collection methods along a sample of transects for comparability. • Synthesize anomaly density data into figures for PDT review and anomaly selection. • Select grid placement locations. Grids will be placed in high, medium, and low anomalous areas, based on DGM data and discussions with the PDT; biased placement of percentage of grids to define location of potential MEC in areas beyond target zone. • Intrusive investigation of all anomalies for mag-and-dig transects. • Intrusive investigation of all MEC-like anomalies for DGM grids.

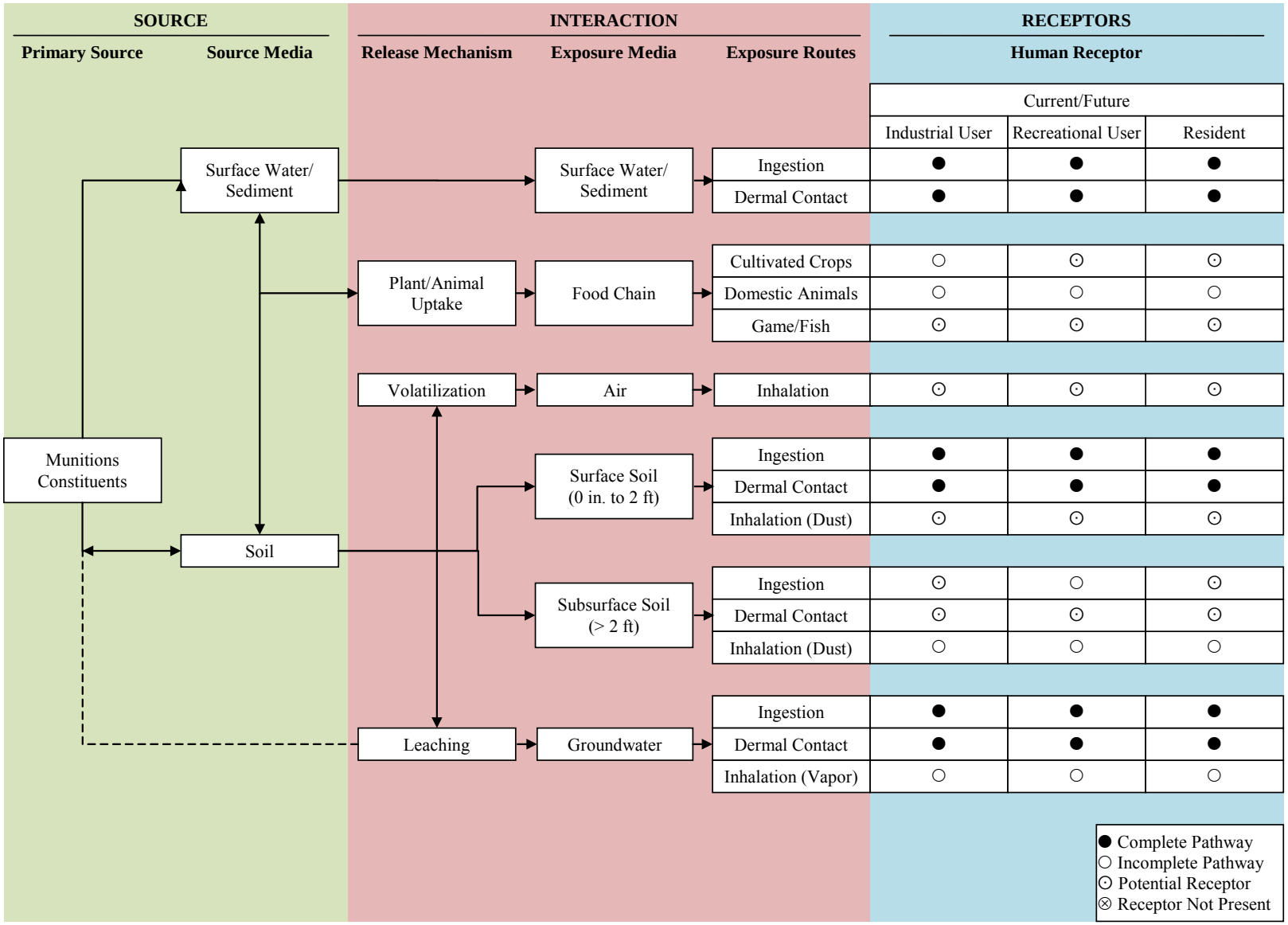
Reference: Guidance on Systematic Planning Using the Data Quality Objectives Process, EPA QA//G-4, EPA/240/B-06/001, February 2006.
NOTE: MEC performance criteria are included in Section 4.0; MC DQOs are included in the UFP-QAPP (Appendix E).

Table 14 – Munitions and Explosives of Concern Data Quality Objectives – Lake Craig and Lake Johnson

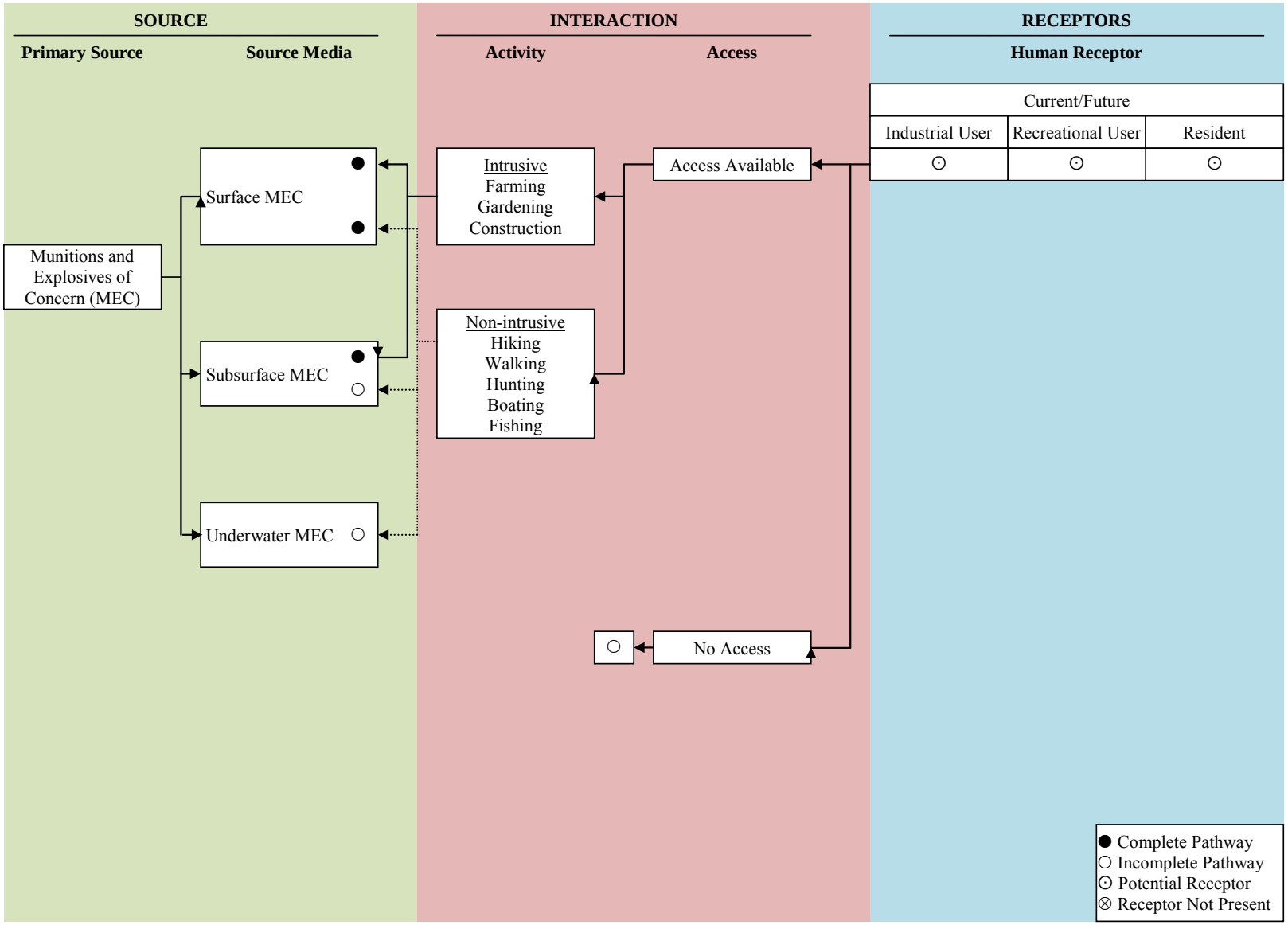
DQO	Problem Statement	Project Goals	Required Information Inputs	Input Boundaries	Analytical Approach	Performance Criteria	Plan for Obtaining Data
Explanation	*Define the problem that necessitates the study*	*Identify study questions*	*Identify data and information needed to answer study questions*	*Specify the target population and define spatial limits*	*Develop the logic for drawing conclusions from findings*	*Specify probability limits for false rejections and false acceptance decision errors*	*Select the plan that meets the performance criteria*
MRS Characterization	• Determine the nature and extent of MEC along the shoreline.	• Determine the location and type of MEC present. • Determine the spatial extent of MEC. • Determine if MEC exposure pathways for humans are complete. • Determine if MEC pose a human health risk. --- Possible Actions: • No DoD Action Indicated • Institutional Controls • MEC Removal • Combination of Actions	• Data collected during previous activities. • Results of visual observations along transects and in grids. • Analog (density) and/or digital (instrument response) geophysical data. • Results of intrusive investigation of identified anomalies. • Survey of site receptors, demographics and land use.	• During field activities, transects will be spaced approximately 416 ft apart and grids will equate to 50 ft by 50 ft areas along the shoreline. • Transect spacing is designed to search for areas where the 60mm mortar (the smallest found item with an explosive hazard) would explode on impact with the ground, detonate and fragment. • Grid locations in areas of high, medium, and low anomaly count areas will be determined based on results of transect investigations. • The anomaly selection threshold in DGM grids is based on the maximum value determined during the geophysical proveout. The initial value is set at 11x the diameter of the MK II grenade (the smallest found item with an explosive hazard across all MRSs/AoPIs). • Intrusively investigate potential MEC items. --- Constraints: Rights-of-entry, weather, current land use activities.	• Maximum depth at which each type of MEC was encountered will be used to define the vertical extent for that type of MEC. • The location and spatial extent of MEC will be used to define the lateral extent for each type of MEC encountered; the extent beyond the last MEC discovered will be equal to the transect spacing for the area in question. • If evidence of MEC is found, then discovery location may be within a zone where ordnance landed that did not function as designed. • All MD, frag, and targets will be evaluated as possibly indicative of the location of MEC. --- Alternative actions will be formulated in the Feasibility Study based on the location and density of MEC, land use, and other data gathered during the investigation and comparison of those data with criteria established herein.	• Anomaly reacquisition (from DGM data) within 1 meter accuracy. • Transect pathway positional accuracy is +/- 20 %, as an average across the study area. • Depth of detection for DGM data (i.e., the failure criteria) is 7x the diameter of the 60mm mortar. • QC/QA blind seed items will be detected and identified.	• Visually inspect and determine anomaly density within transects using AIR or mag-and-dig. • Data collection along 0.60 acres/1.65 miles of transects and 0.11 acres/2 grids. • Overlap DGM and analog data collection methods along a sample of transects for comparability. • Synthesize anomaly density data into figures for PDT review and anomaly selection. • Select grid placement locations. Grids will be placed in high, medium, and low anomalous areas, based on mag-and-dig and AIR data and discussions with the PDT; biased placement of percentage of grids to define location of potential MEC in areas beyond target zone. • Intrusive investigation of all anomalies for mag-and-dig transects. • Intrusive investigation of a representative number of anomalies (to be determined by PDT) for AIR transects. • Intrusive investigation of all anomalies for AIR grids. • Intrusive investigation of all MEC-like anomalies for DGM grids.

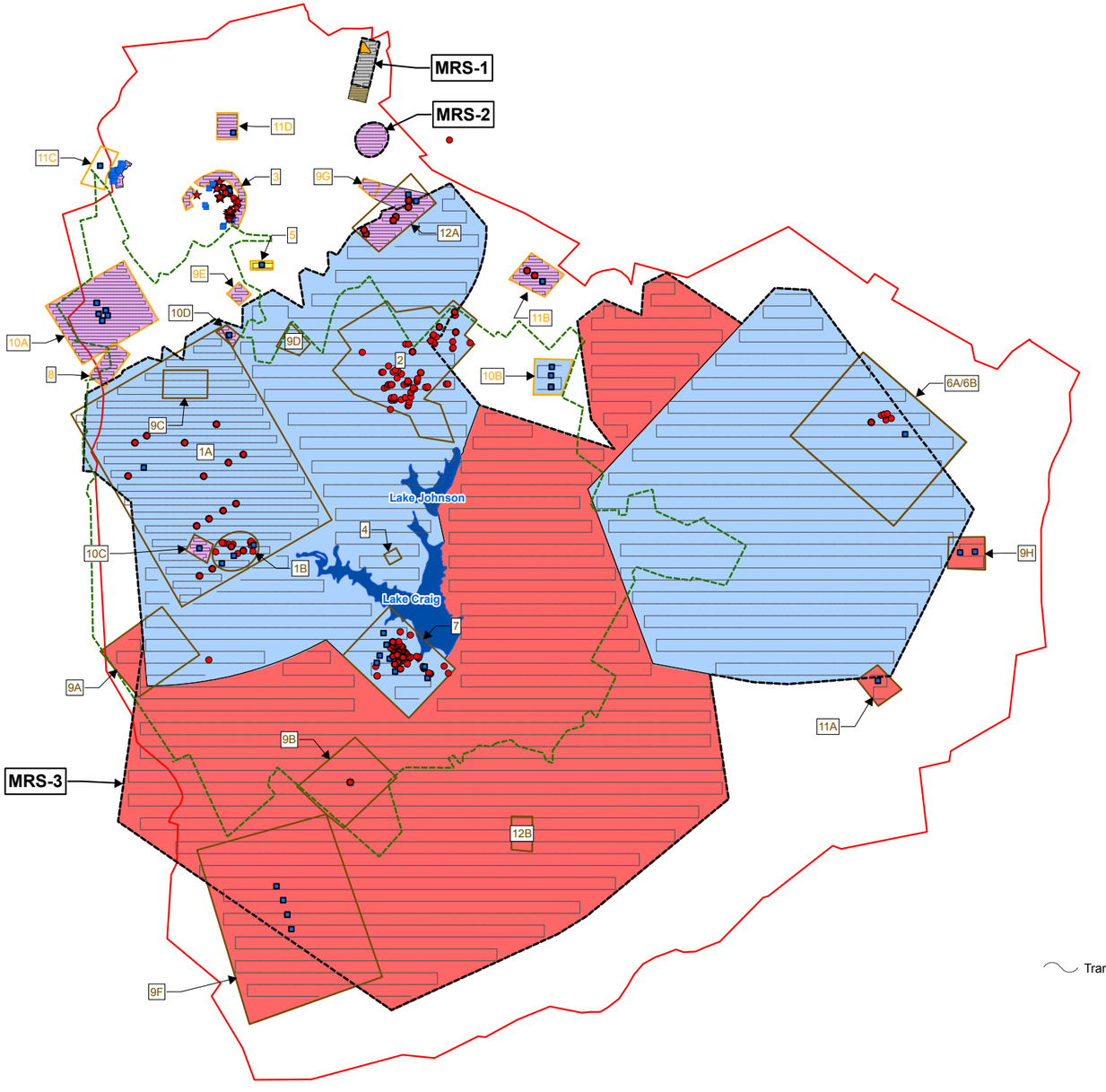
Reference: Guidance on Systematic Planning Using the Data Quality Objectives Process, EPA QA//G-4, EPA/240/B-06/001, February 2006.
NOTE: MEC performance criteria are included in Section 4.0; MC DQOs are included in the UFP-QAPP (Appendix E).

Munitions Constituents Conceptual Site Exposure Model



Munitions and Explosives of Concern Conceptual Site Exposure Model





Former Camp Croft, SC
Transect Spacing

Project Number	Date	Exhibit
00017	APRIL 2011	1

KEY

- UXO
- MD
- MEC
- Approximate Park Boundary
- Trash Pile - No Investigation
- MRS
- Areas of Potential Interest
- Former OOU
- Approximate Former Camp Croft Boundary
- Lake
- Ground Recon - 50' Transect Spacing
- Ground Recon - 112' Transect Spacing
- Ground Recon - 416' Transect Spacing
- Mag & Dig - 112' Transect Spacing
- Mag & Dig - 173' Transect Spacing
- Mag & Dig - 416' Transect Spacing

N
W E
S

0 2,000 4,000 Feet

Source(s)
USAESCH, USGS

Projection
UTM Zone 17 North, NAD83

Notes

Checked By	Engineering Scale	Drawn By
SCM	1"=4,000'	ATD

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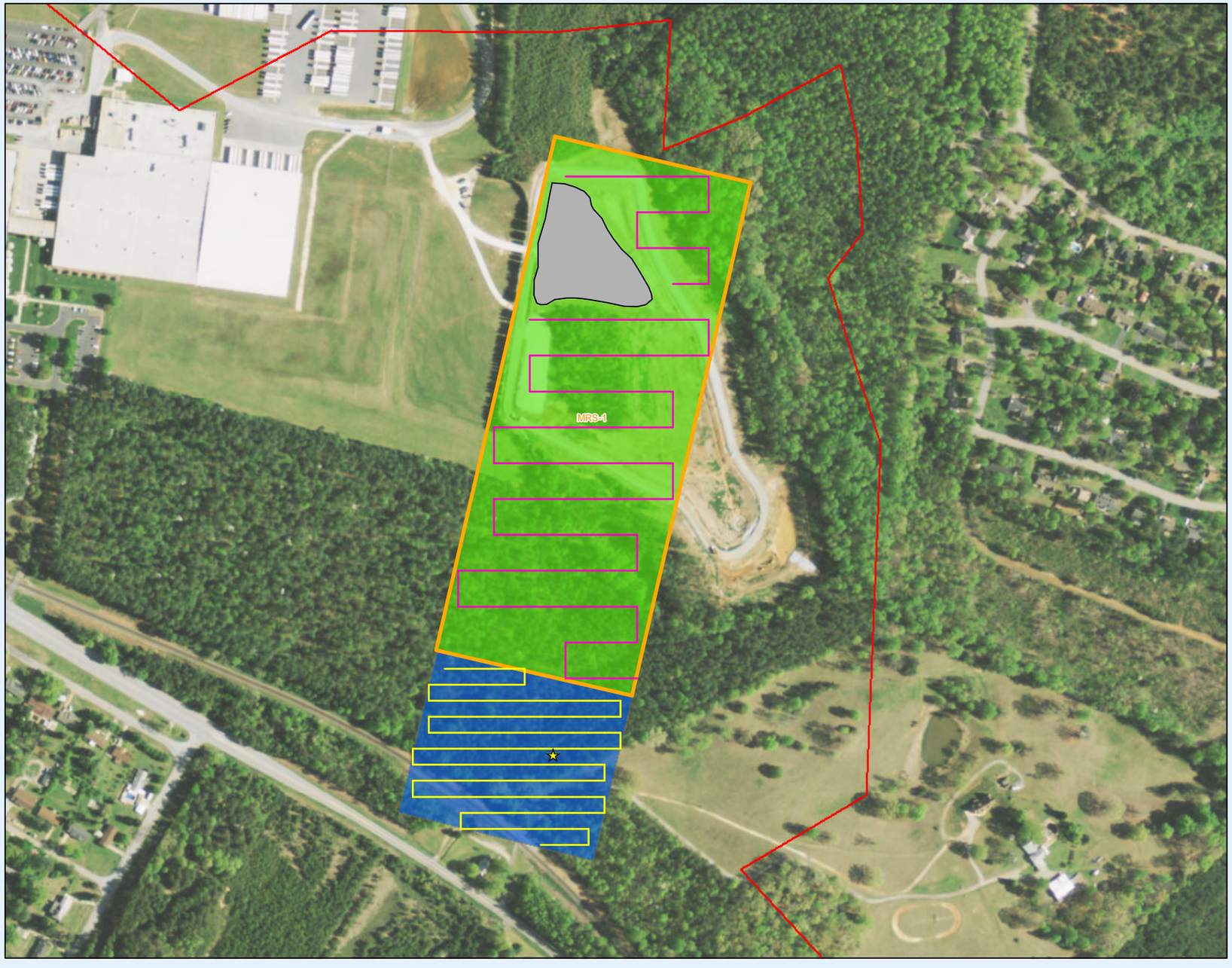

Former Camp Croft, SC
MRS-1

Project Number	Date	Exhibit
00017	DECEMBER 2010	4

KEY

- Trash Pile - No Investigation
- Suspected Location of Gas Chamber
- 112' Ground Recon Transects (1.46 miles)
- 50' Ground Recon Transects (1.20 miles)
- PWS-defined MRS-1 Boundary
- Ground Recon - 50' Transect Spacing
- Ground Recon - 112' Transect Spacing
- Approximate Former Camp Croft Boundary

N W E S

0 150 300 Feet

Source(s)
USAESCH, USGS

Projection
UTM Zone 17 North, NAD83

Note(s)

Checked By	Engineering Scale	Drawn By
SCM	AS SHOWN	ATD

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Former Camp Croft, SC
MRS-2, Area of Potential Interest 9G & 12A

Project Number	Date	Exhibit
00017	APRIL 2011	5

KEY

- 112' Ground Recon Transects (6.83 mi)
- Approximate Park Boundary
- MRS
- Areas of Potential Interest
- Former OOU
- Approximate Former Camp Croft Boundary
- Mag & Dig - 112' Transect Spacing

N W E S

0 250 500 Feet

Source(s)
USAESCH, USGS

Projection
UTM Zone 17 North, NAD83

Note(s)

Checked By	Engineering Scale	Drawn By
SCM	AS SHOWN	ATD

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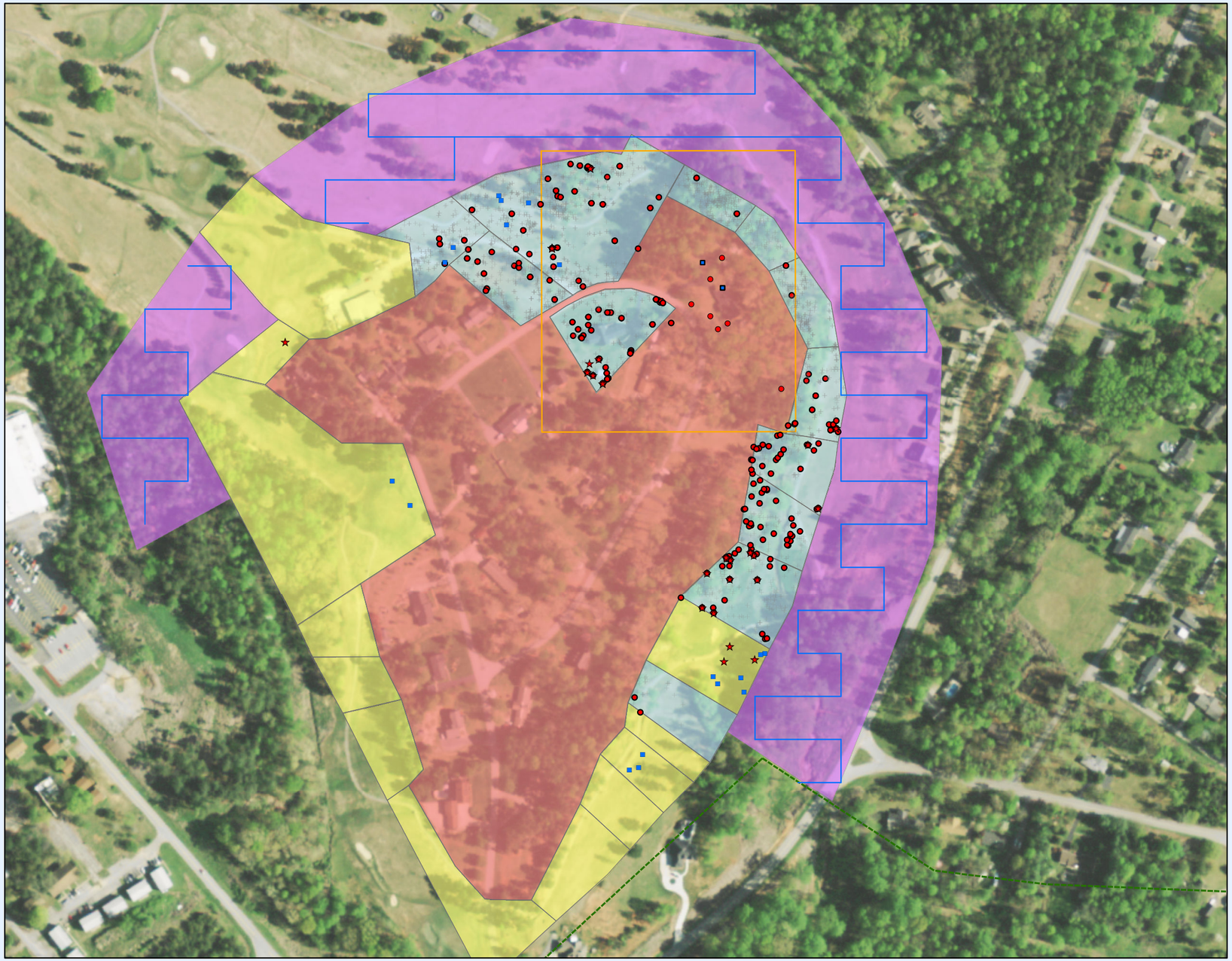

Former Camp Croft, SC
Area of Potential Interest 3

Project Number	Date	Exhibit
00017	APRIL 2011	6

KEY

- UXO
- MD
- MEC
- CD Item
- 112' Ground Recon Transects (1.89 mi)
- Approximate Park Boundary
- MRS
- PWS-defined Former OOU3 Boundary
- HFA Completed Removal Action
- ZAPATA Pending Removal Action (DGM complete)
- ZAPATA Completed Removal Action
- Mag & Dig - 112' Transect Spacing

N W E S

0 125 250 Feet

Source(s)
USAESCH, USGS

Projection
UTM Zone 17 North, NAD83

Note(s)

Checked By	Engineering Scale	Drawn By
SCM	AS SHOWN	ATD

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Former Camp Croft, SC
Areas of Potential Interest 5 and 9E

Project Number	Date	Exhibit
00017	APRIL 2011	7

KEY

- Proposed Site Office Trailer Location
- 173 ft Transect (0.29 mi)
- 112 ft Transect (0.47 mi)
- MRS
- Approximate Former Camp Croft Boundary
- Areas of Potential Interest
- Mag & Dig - 112' Transect Spacing
- Mag & Dig - 173' Transect Spacing
- Mag & Dig - 416' Transect Spacing

N W E S

0 150 300 Feet

Source(s)
USAESCH, USGS

Projection
UTM Zone 17 North, NAD83

Note(s)

Checked By	Engineering Scale	Drawn By
SCM	AS SHOWN	ATD

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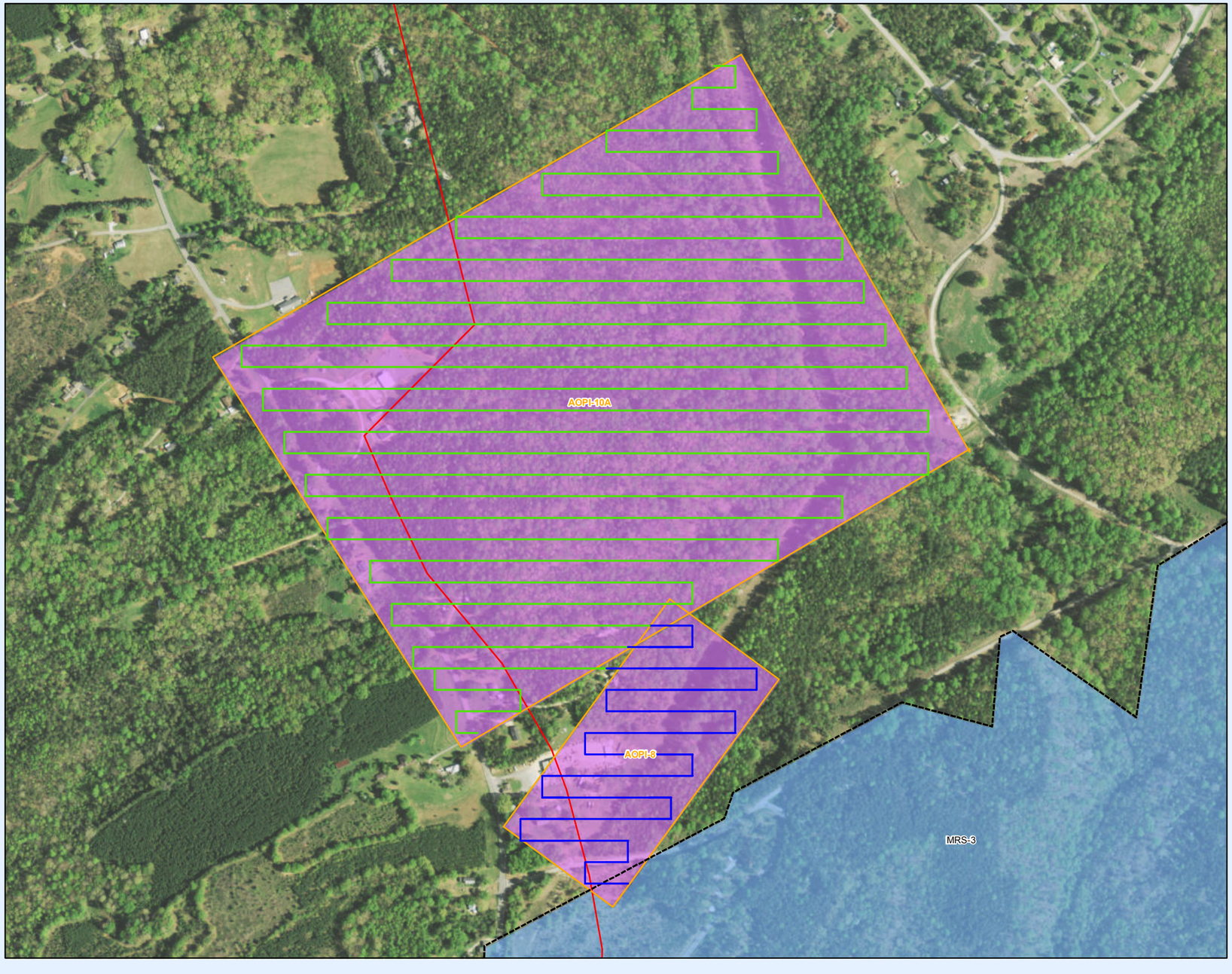

Former Camp Croft, SC
Areas of Potential Interest 8 and 10A

Project Number	Date	Exhibit
00017	APRIL 2011	8

KEY

- 112' Transect (12.13 mi)
- 112' Transect (2.12 mi)
- MRS
- Areas of Potential Interest
- Approximate Former Camp Croft Boundary
- Mag & Dig - 112' Transect Spacing
- Mag & Dig - 416' Transect Spacing

N
W E
S

0 250 500 Feet

Source(s)
USAESCH, USGS

Projection
UTM Zone 17 North, NAD83

Note(s)

Checked By	Engineering Scale	Drawn By
SCM	AS SHOWN	ATD

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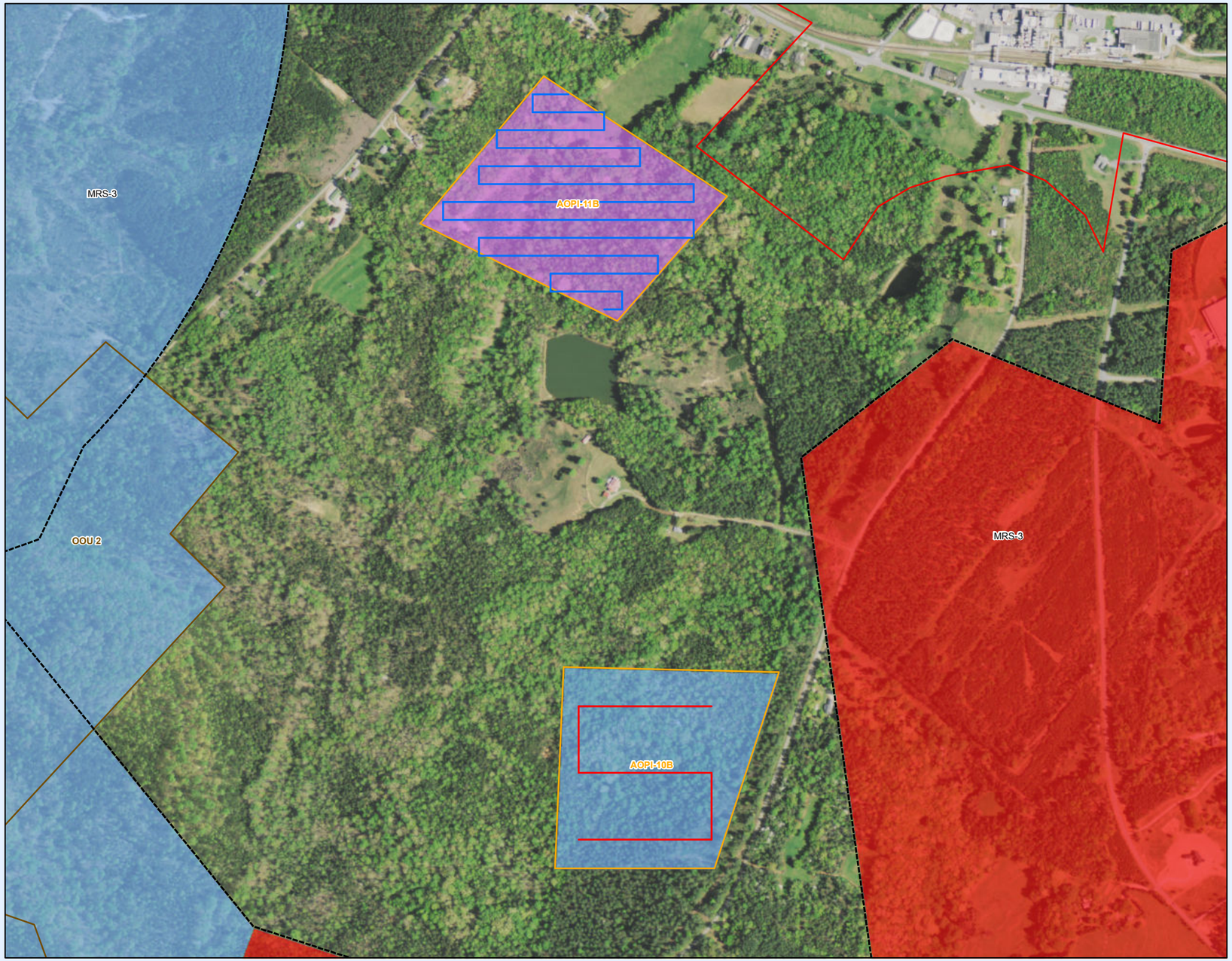

Former Camp Croft, SC
Areas of Potential Interest 10B and 11B

Project Number	Date	Exhibit
00017	APRIL 2011	9

KEY

- 416' Transect (0.63 mi)
- 112' Transect (2.42 mi)
- MRS
- Former OOU
- Areas of Potential Interest
- Approximate Former Camp Croft Boundary
- Ground Recon - 416' Transect Spacing
- Mag & Dig - 112' Transect Spacing
- Mag & Dig - 416' Transect Spacing

N W E S

0 300 600 Feet

Source(s)
USAESCH, USGS

Projection
UTM Zone 17 North, NAD83

Note(s)

Checked By	Engineering Scale	Drawn By
SCM	AS SHOWN	ATD

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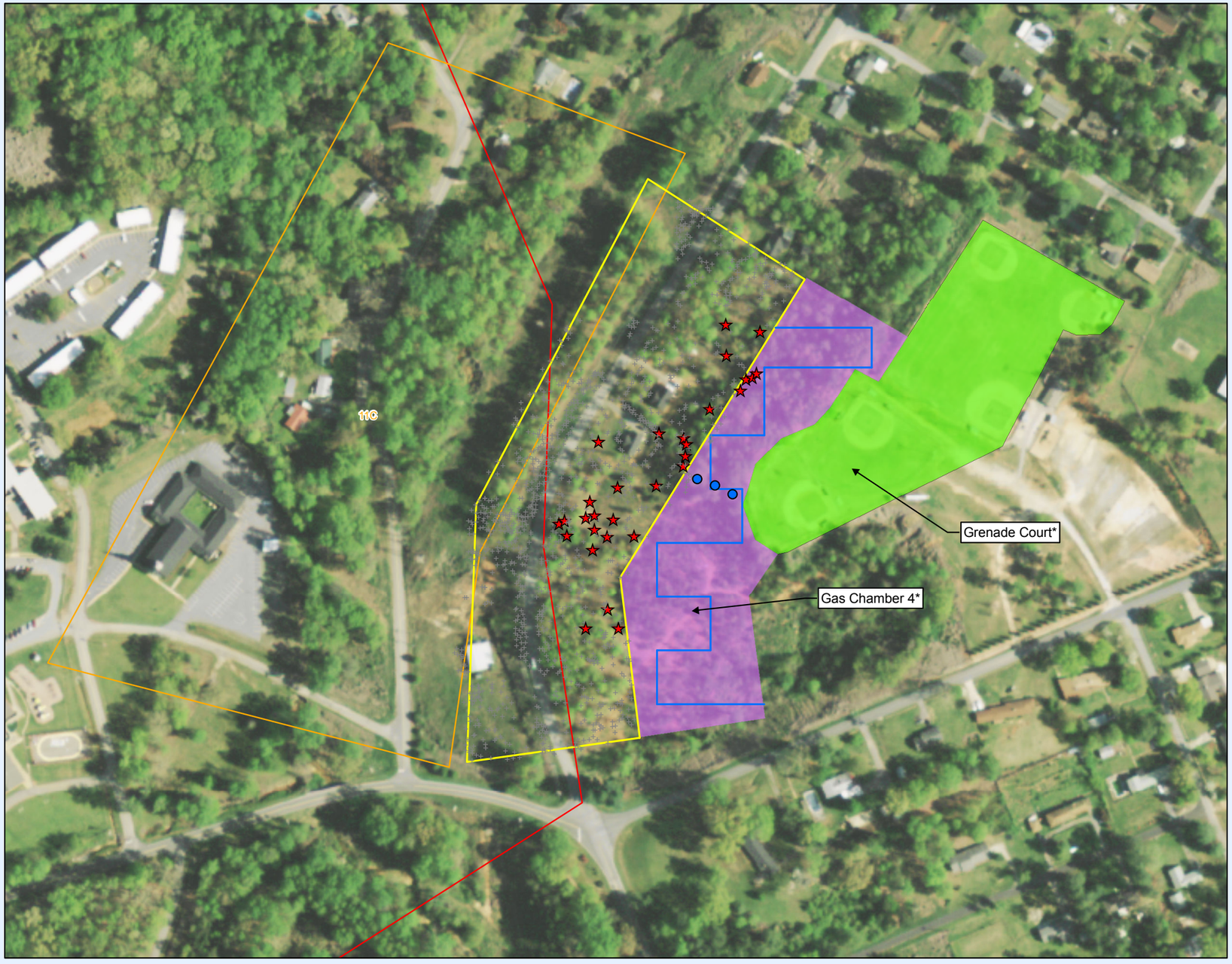

Former Camp Croft, SC
Area of Potential Interest 11C

Project Number	Date	Exhibit
00017	APRIL 2011	10

KEY

- Foxholes (Observed During Site Visit)
- MD Items
- CD Items
- 112' Transect (0.38 mi)
- Removal Action OU11C Boundary
- Areas of Potential Interest
- Approximate Former Camp Croft Boundary
- DGM (100%)
- Mag & Dig - 112' Transect Spacing

* Boundaries and Items are defined in the GIS-based Historical Photographic Analysis dated October 2005.

The PWS-defined boundary may be improperly located. Based on findings during ZAPATA's previous removal actions in OU11C, the area of potential interest may lie to the east of both the PWS-defined boundary and the removal action boundary. However, the USAESCH has requested the PWS-defined boundary be included in future investigations along with those proposed activities shown.

N W E S 0 100 200 Feet

Source(s)
USAESCH, USGS

Projection
UTM Zone 17 North, NAD83

Note(s)

Checked By	Engineering Scale	Drawn By
SCM	AS SHOWN	ATD

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Former Camp Croft, SC
Area of Potential Interest 11D

Project Number	Date	Exhibit
00017	APRIL 2010	11

KEY

- 112' Transect (1.17 mi)
- Areas of Potential Interest
- Mag & Dig / DGM - 112' Transect Spacing*

N
W E
S

0 150 300 Feet

Source(s)
USAESCH, USGS

Projection
UTM Zone 17 North, NAD83

Note(s)
*** Mag & Dig will be conducted in wooded areas and DGM will be conducted on the golf course.**

Checked By	Engineering Scale	Drawn By
SCM	AS SHOWN	ATD

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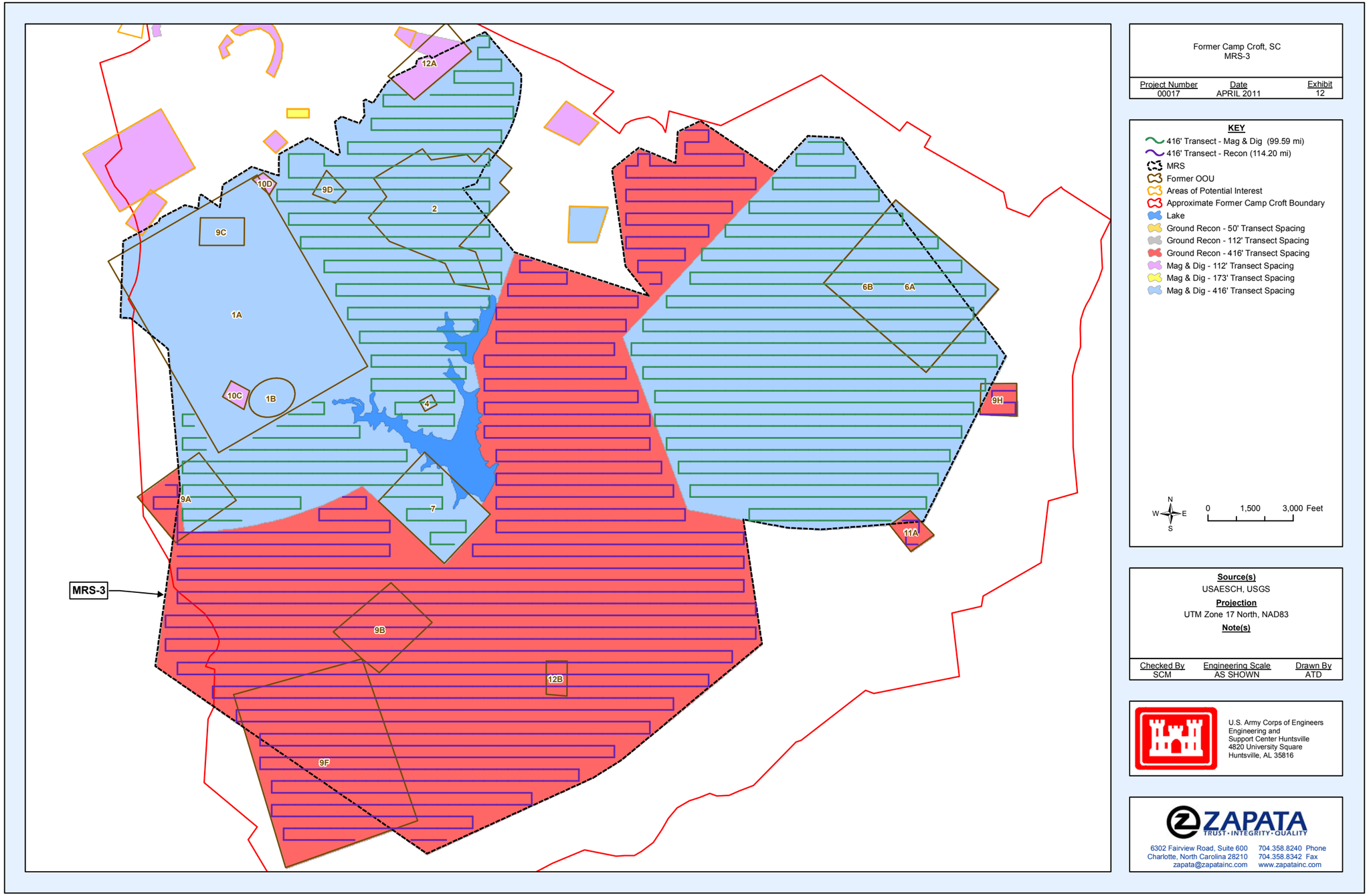

Former Camp Croft, SC
MRS-3

Project Number	Date	Exhibit
00017	APRIL 2011	12

KEY

- 416' Transect - Mag & Dig (99.59 mi)
- 416' Transect - Recon (114.20 mi)
- MRS
- Former OOU
- Areas of Potential Interest
- Approximate Former Camp Croft Boundary
- Lake
- Ground Recon - 50' Transect Spacing
- Ground Recon - 112' Transect Spacing
- Ground Recon - 416' Transect Spacing
- Mag & Dig - 112' Transect Spacing
- Mag & Dig - 173' Transect Spacing
- Mag & Dig - 416' Transect Spacing

N W E S 0 1,500 3,000 Feet

Source(s)
USAESCH, USGS
Projection
UTM Zone 17 North, NAD83
Note(s)

Checked By	Engineering Scale	Drawn By
SCM	AS SHOWN	ATD

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Former Camp Croft, SC
Lake Johnson and Lake Craig

Project Number	Date	Exhibit
00017	APRIL 2011	13

KEY

- 416' Transect
- MRS
- Approximate Former Camp Croft Boundary
- Lake
- Ground Recon - 416' Transect Spacing
- Mag & Dig - 416' Transect Spacing

N W E S

0 500 1,000 Feet

Source(s)
USAESCH, USGS

Projection
UTM Zone 17 North, NAD83

Note(s)

Checked By	Engineering Scale	Drawn By
SCM	AS SHOWN	ATD

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Exhibit 14: Visual Sample Plan (VSP) Input and Results

Munition	Range to No More Than 1 Hazardous Fragment/600 ft^2 Area	1.5 Hazardous Fragment Range (ft)	Survey Design	Survey Area Geometry	Anomaly Distribution	Background Anomaly Density (anom/acre)	False Negative (%)	Decision Rule: % Confidence[1]	Detection Probability[2]	Calculated Transect Spacing (ft)
60mm	166.3	250	Parallel	Circular	Bivariate Normal	15	5	95	90	416
37mm	114	171	Parallel	Circular	Bivariate Normal	15	5	95	90	242
MKII Grenade	62	93	Parallel	Circular	Bivariate Normal	15	5	95	90	112
Rifle Grenade	87	130.5	Parallel	Circular	Bivariate Normal	15	5	95	90	173

Munition	Range to No More Than 1 Hazardous Fragment/600 ft^2 Area	1.5 Hazardous Fragment Range (ft)	1.5 Hazardous Fragment range (m)	Average (ft) Excluding TP	Average (m) Excluding TP
37 mm M54	114	171	52.13414634	156.75	47.78963415
37 mm M63 TP	95	142.5	43.44512195	156.75	47.78963415
37 mm Mk I, LE Practice	68	102	31.09756098	102	31.09756098
37 mm MK II (0.053lb)	90	135	41.15853659	149.5	45.57926829
60 mm M49A2	150	225	68.59756098	249.5	76.06707317
60 mm M49A3	166	249	75.91463415	249.5	76.06707317
60 mm M49A5	183	274.5	83.68902439	249.5	76.06707317
60 mm TP M50	79	118.5	36.12804878	118.5	36.12804878
57 mm M306	162	243	74.08536585	243	74.08536585
81 mm M362A1	243	364.5	111.1280488	345.6	105.3658537
81 mm M374	234	351	107.0121951	345.6	105.3658537
81 mm M43	230	345	105.1829268	345.6	105.3658537
81 mm M45	224	336	102.4390244	345.6	105.3658537
81 mm M56	221	331.5	101.0670732	345.6	105.3658537
81 mm TP M43A1	89	133.5	40.70121951	133.5	40.70121951
MKII Grenade	62	93	28.35365854	93	28.35365854
Rifle Grenade Robust	87	130.5	39.78658537	130.5	39.78658537

Notes:
[1]Anomalies above background
[2] 350 anomalies above background

Project Objective Worksheet

Site: Former Camp Croft, Spartanburg, SC
Project: Remedial Investigation/Feasibility Study

Project Objective						
	Executable Stage					
No.	Current	Future	Description	Source	Data User(s)	Project Objective Classification
1	X		The project objective is to determine the nature and extent of potential MEC/MC contamination associated with the former FUDS and to evaluation potential remedial alternatives for areas where contamination exists.	ASR, ASR Supplement, GIS-Based Historical Photograph Analysis, EE/CAs, and Removal Reports	_X_ Risk _X_ Compliance _X_ Remedy _X_ Responsibility	_X_ Basic ___ Optimum ___ Excessive
2	X		Eliminate from further consideration those releases that pose no significant threat to public health or the environment.		_X_ Risk _X_ Compliance _X_ Remedy _X_ Responsibility	_X_ Basic ___ Optimum ___ Excessive
3		X	Expand the existing project beyond the identified MRSs, AoPIs and FUDS boundary, as necessary based on findings.		_X_ Risk _X_ Compliance _X_ Remedy _X_ Responsibility	___ Basic _X_ Optimum ___ Excessive
4		X	Expansion of the existing project to encompass the entire FUDS property and possibly beyond that boundary.		_X_ Risk _X_ Compliance _X_ Remedy _X_ Responsibility	___ Basic ___ Optimum _X_ Excessive
					___ Risk ___ Compliance ___ Remedy ___ Responsibility	___ Basic ___ Optimum ___ Excessive
					___ Risk ___ Compliance ___ Remedy ___ Responsibility	___ Basic ___ Optimum ___ Excessive

Site Information Worksheet

Site: Former Camp Croft, Spartanburg, SC
Project: Remedial Investigation/Feasibility Study

	Site Information Needed	Potential Source(s) of Site Information	User of Site Information	Suggested Means to Obtain Site Information	Deadline for Obtaining Site Information
1	Determine if threatened or endangered species are known to be present at the site.	SC DHEC	Risk Assessors	Formal request in writing.	Prior to Work Plan development.
2	Obtain historical response information from the Spartanburg County Sheriff's Bomb Disposal Unit.	Spartanburg County Sheriff's Department	All data users	Formal request in writing.	Prior to Work Plan development.
3	Consolidate anecdotal information regarding historical site usage and potential munitions findings from the public.	Public	All data users	Work with existing RAB to request this information.	Prior to Work Plan development.
4					
5					
6					

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Phase 1 MFR Worksheet

US Army Corps of Engineers®

Author(s)/Reviewer(s):
US Army Corps of Engineers, Charleston District (CESAC)
US Army Engineering and Support Center, Huntsville (USAESCH)
Zapata Incorporated (ZAPATA)
South Carolina Department of Health & Environmental Control (SC DHEC)
South Carolina Department of Parks, Recreation & Tourism (SC DPRT)

Revision Date: 06-Apr-11 Review Date: _____

Location:	Spartanburg, SC
Site:	Former Camp Croft (FUDS I04SC001603)
Project:	Remedial Investigation/Feasibility Study (RI/FS)

(Attach Phase I MFR to PMP)

TPP TEAM (EM 200-1-2, Paragraph 1.1.1)

Decision Makers	Data User Perspectives	Data Implementor Perspectives
Customer: - CESAC	Risk: - CESAC & USAESCH	Sampling: - CESAC, USAESCH, ZAPATA
Project Manager: - Mr. Shawn Boone (CESAC)	Compliance: - CESAC & USAESCH	
Regulator(s): - SC DHEC	Remedy: - CESAC & USAESCH	Analysis: - CESAC, USAESCH, ZAPATA
Stakeholders: - SC DHEC, SC DPRT, Private Landowners, Industry, and the Restoration Advisory Board (RAB)	Responsibility: - CESAC & USAESCH	

CUSTOMER'S GOALS (EM 200-1-2, Paragraph 1.1.2)

Future Land Use(s) at Site	Regulatory Compliance Status and Issues	Interim Site Closeout Goal (if applicable)
Various: - Recreational - Residential - Industrial - Agricultural - Undeveloped	This site falls under the Defense Environmental Restoration Program (DERP) – Formerly Used Defense Sites (FUDS) Program. Work will be conducted in accordance with 29 Code of Federal Regulations (CFR) 1910.120, the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) response action, the National Contingency Plan (NCP) to the maximum extent practical, and pursuant to ER 200-3-1, dated 10 May 2004. There are no known areas/parcels within the project site that have a designated compliance status or issue (e.g., National Priority Listing, Resource Conservation and Recovery Act permitting, etc.) other than those described.	Interim Goals: - Completion of RI Stage. - Completion of FS Stage. - Acceptance of a Decision Document (DD).

CUSTOMER'S GOALS (continued)

Site Closeout Statement

Site closeout will be achieved when the exposure potential of munitions of concern (MEC) and munitions constituents (MC) has been as safely mitigated as possible to acceptable risk levels according to the Technical Project Planning (TPP) team members in a manner in which the property is conducive to future land use expectations. In order to achieve site closure, the nature and extent of any potential MEC/MC will have to be characterized, the feasibility of potential remedial alternatives evaluated, and the acceptance of selected alternatives employed, as necessary.

The current RI/FS project specifically identifies three Munitions Response Sites (MRSs) and 11 optional sites of varying sizes located within the FUDS boundary but outside of the three MRSs. The three MRSs include the Gas Chambers (MRS 1), the Grenade Court (MRS 2), and the Land Range Complex (MRS 3). Of the 11 optional sites, 10 are defined in the PWS as "Areas of Potential Interest" (AoPI), and one appears to be associated with MRS 3, that being the Lake Craig and Lake Johnson Range Complex. The AoPIs correspond to areas previously referred to as Ordnance Operable Units (OOUs); those areas include AoPIs 3, 5, 8, 9E, 9G, 10A, 10B, 11B, 11C, and 11D. Eighteen previously defined OOUs exist within or partially within MRS 3; OOUs 1A, 1B, 2, 4, 6A, 6B, 7, 9A, 9B, 9C, 9D, 9F, 9H, 10C, 10D, 11A, 12A, and 12B.

Customer's Schedule Requirements

Acceptance of Decision Documents (DD) at the Gas Chambers MRS, Grenade Court MRS, and Land Range Complex MRS should be achieved by 31 January 2013.

Customer's Site Budget

Budget requirements to achieve site closure are unknown at this time. Potential management/cleanup costs will be evaluated during the FS process.

IDENTIFY SITE APPROACH

EXISTING SITE INFORMATION DATA

Attachment(s) to Phase I MFR	Site Information Repository	Preliminary Conceptual Site Model
Numerous documents including the Archive Search Report (ASR), ASR Supplement, and interim response action documents can be found at http://www.campcroft.net. A Preliminary Conceptual Site Model (CSM) has been attached to this worksheet.	Spartanburg County Library 151 South Church Street Spartanburg, SC 29306 (864) 596-3500	A preliminary conceptual site model was develeoped for this RI/FS project.

POTENTIAL POINTS OF COMPLIANCE

Potential points of compliance include the MRS and AoPI boundaries, the Croft State Natural Area boundary, the former FUDS boundary, and former range fan boundaries.

MEDIA OF POTENTIAL CONCERN

The media of potential concern includes surface and subsurface soil.

Project Objectives

The project objective is to determine the nature and extent of potential MEC/MC contamination associated with the former FUDS and to evaluation potential remedial alternatives for areas where contamination exists.

Eliminate from further consideration those releases that pose no significant threat to public health or the environment.

See attached worksheets developed by PDT.

IDENTIFY SITE APPROACH (continued)

REGULATOR AND STAKEHOLDER PERSPECTIVES

Regulators	Community Interests	Others
(To be added by stakeholder.)	(To be added by stakeholder.)	(To be added by stakeholder.)

PROBABLE REMEDIES

Probable remedies include 1) No DoD Action Indicated, 2) Institutional controls, 3) engineering controls, 4) surface removal, 5) subsurface removal, and 6) any combination of the these options (e.g., surface removal and institutional controls). The selection of the appropriate remedy will be MRS and AoPI specific and will be based on findings from the RI/FS process.

EXECUTABLE STAGES TO SITE CLOSEOUT

Executable stages relevant to the this project are listed below along with a brief description.
1) TPP Process - develop project objectives with project delivery team (PDT),
2) Work Plan - develop the investigation and safety plans into comprehensive document,
3) Fieldwork - conduct various field activities,
4) Remedial Investigation (RI) Report - document the fieldwork findings and risk assessment,
5) Feasibility Study (FS) Report - evaluate the feasibility of remedial options and alternatives,
6) Proposed Plan - allow the public to evaluate the proposed plan as determined following the FS,
7) Decision Document (DD) - document the PDT and public preferences for remedial action, and
8) Public Involvement Plan (PIP) - engage the public throughout the process using the PIP.

IDENTIFY CURRENT PROJECT

SITE CONSTRAINTS AND DEPENDENCIES

Administrative Constraints and Dependencies

1) Funding,
2) Scheduling,
3) Contracting mechanism, and
4) Rights-of-entry (ROE).

Technical Constraints and Dependencies

1) Physical characteristics - geology, topography, vegetation,
2) Aerial extent of project site,
3) Availability of public access on park property,
4) Variable and unknown historical munitions usage,
5) Health and safety requirements (CFR, USACE and ZAPATA SOPs),
6) Certified laboratories (for MC analyses), and
7) Landowner site usage (e.g., recreational golfing, agricultural, timber harvest).

Legal and Regulatory Milestones and Requirements

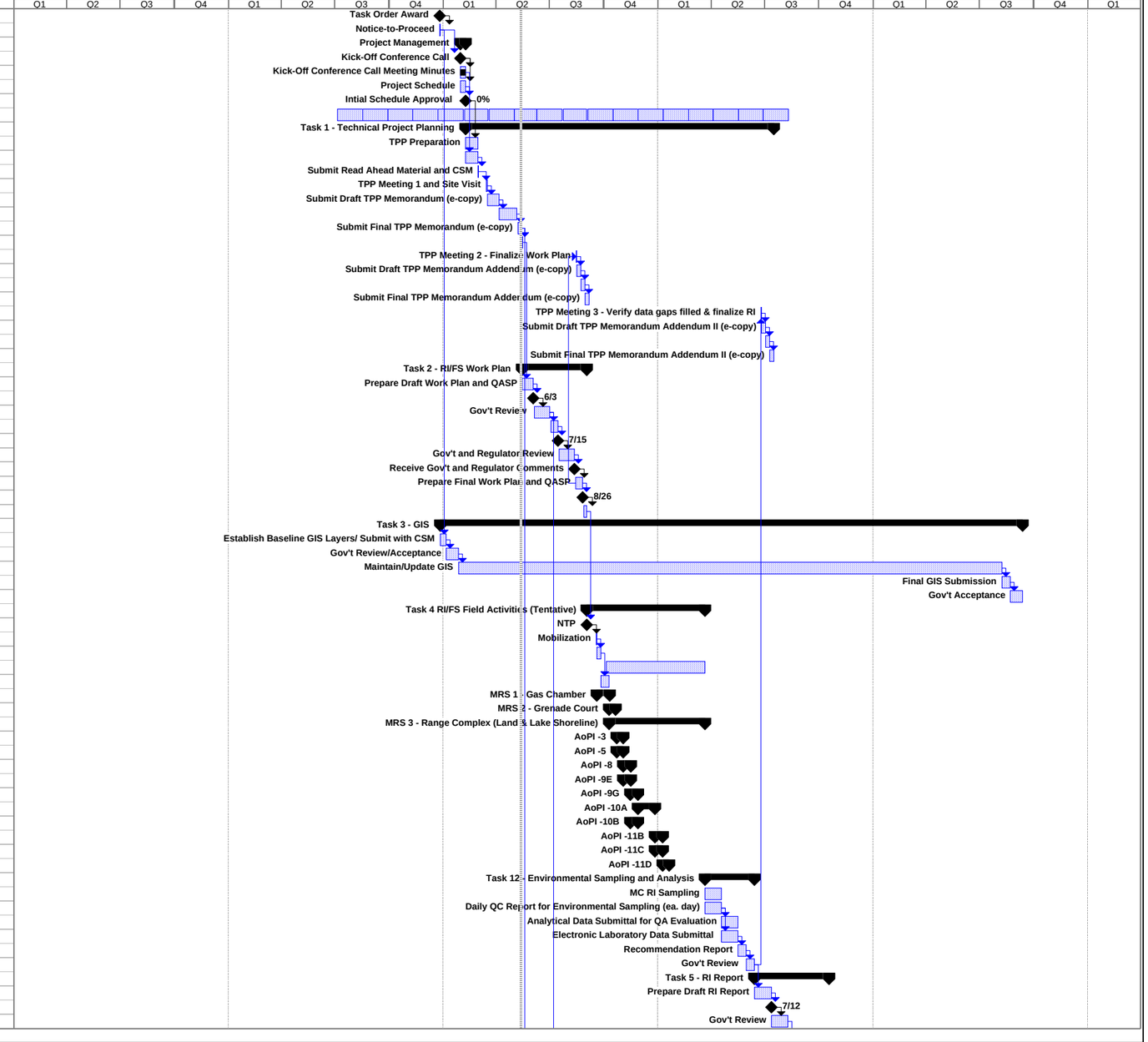
1) Consistent with CERCLA and NCP,
2) Public and stakeholder involvement and review,
3) Contracted obligations, and
4) Funding beyond this RI/FS stage.

CURRENT EXECUTABLE STAGE

This stage of the project includes the RI/FS through the DD.

Basic	Optimum	Excessive
MEC and MC investigation and characterization in MRSs and AoPIs, risk assessment of findings, reporting and documentation of remedial options/alternatives.	Expand the existing project beyond the identified MRSs, AoPIs and FUDS boundary, as necessary based on findings.	Expansion of the existing project to encompass the entire FUDS property and possibly beyond that boundary.

ID	Task Name	Duration	Start	Finish	Predecessors
1	Task Order Award	0 days	Mon 12/27/10	Mon 12/27/10	
2	Notice-to-Proceed	1 day	Mon 12/27/10	Mon 12/27/10	1
3	**Project Management**	**7 days**	**Mon 1/31/11**	**Tue 2/8/11**	
4	Kick-Off Conference Call	0 days	Mon 1/31/11	Mon 1/31/11	2FS+2 days
5	Kick-Off Conference Call Meeting Minutes	7 days	Mon 1/31/11	Tue 2/8/11	4
6	Project Schedule	7 days	Mon 1/31/11	Tue 2/8/11	4
7	Intial Schedule Approval	0 days	Tue 2/8/11	Tue 2/8/11	6
8	**Monthly Report**	**702 days**	**Tue 7/6/10**	**Wed 3/13/13**	
32	**Task 1 - Technical Project Planning**	**374 days**	**Wed 2/9/11**	**Mon 7/16/12**	
33	TPP Preparation	15 days	Wed 2/9/11	Tue 3/1/11	7
34	CSM Revision	15 days	Wed 2/9/11	Tue 3/1/11	5
35	Submit Read Ahead Material and CSM	1 day	Wed 3/2/11	Wed 3/2/11	34
36	TPP Meeting 1 and Site Visit	2 days	Wed 3/16/11	Thu 3/17/11	35FS+9 days
37	Submit Draft TPP Memorandum (e-copy)	14 days	Fri 3/18/11	Wed 4/6/11	36
38	Draft TPP Memorandum - Govt Review	22 days	Thu 4/7/11	Fri 5/6/11	37
39	Submit Final TPP Memorandum (e-copy)	5 days	Mon 5/9/11	Fri 5/13/11	38
40	Receive Gov't. Approval of Final TPP Memorandum	1 day	Mon 5/16/11	Mon 5/16/11	39
41	TPP Meeting 2 - Finalize Work Plan	1 day	Tue 8/16/11	Tue 8/16/11	57SS+1 day
42	Submit Draft TPP Memorandum Addendum (e-copy)	5 days	Wed 8/17/11	Tue 8/23/11	41
43	Draft TPP Memorandum Addendum - Govt Review	5 days	Wed 8/24/11	Tue 8/30/11	42
44	Submit Final TPP Memorandum Addendum (e-copy)	5 days	Wed 8/31/11	Tue 9/6/11	43
45	TPP Meeting 3 - Verify data gaps filled & finalize RI	1 day	Mon 6/25/12	Mon 6/25/12	182FS+7 days
46	Submit Draft TPP Memorandum Addendum II (e-copy)	5 days	Tue 6/26/12	Mon 7/2/12	45
47	Draft TPP Memorandum Addendum II - Govt Review	5 days	Tue 7/3/12	Mon 7/9/12	46
48	Submit Final TPP Memorandum Addendum II (e-copy)	5 days	Tue 7/10/12	Mon 7/16/12	47
49	**Task 2 - RI/FS Work Plan**	**80 days**	**Mon 5/16/11**	**Fri 9/2/11**	
50	Prepare Draft Work Plan and QASP	15 days	Mon 5/16/11	Fri 6/3/11	40FS-1 day
51	Ship Draft Work Plan and QASP (Gov't only)	0 days	Fri 6/3/11	Fri 6/3/11	50
52	Gov't Review	20 days	Mon 6/6/11	Fri 7/1/11	51
53	Prepare Draft-Final Work Plans and QASP	10 days	Mon 7/4/11	Fri 7/15/11	52
54	Ship Draft-Final Work Plans and QASP	0 days	Fri 7/15/11	Fri 7/15/11	53
55	Gov't and Regulator Review	20 days	Mon 7/18/11	Fri 8/12/11	54
56	Receive Gov't and Regulator Comments	0 days	Fri 8/12/11	Fri 8/12/11	55
57	Prepare Final Work Plan and QASP	10 days	Mon 8/15/11	Fri 8/26/11	56
58	Ship Final Work Plans and QASP	0 days	Fri 8/26/11	Fri 8/26/11	57
59	Receive Gov't Approval of Final Work Plans	5 days	Mon 8/29/11	Fri 9/2/11	58
60	**Task 3 - GIS**	**708 days**	**Tue 12/28/10**	**Thu 9/12/13**	
61	Establish Baseline GIS Layers/ Submit with CSM	8 days	Tue 12/28/10	Thu 1/6/11	2
62	Gov't Review/Acceptance	15 days	Fri 1/7/11	Thu 1/27/11	61
63	Maintain/Update GIS	660 days	Fri 1/28/11	Thu 8/8/13	62
64	Final GIS Submission	10 days	Fri 8/9/13	Thu 8/22/13	63
65	Gov't Acceptance	15 days	Fri 8/23/13	Thu 9/12/13	64
66	**Task 4 RI/FS Field Activities (Tentative)**	**143 days**	**Fri 9/2/11**	**Wed 3/21/12**	
67	NTP	0 days	Fri 9/2/11	Fri 9/2/11	59
68	Mobilization	1 day	Mon 9/19/11	Mon 9/19/11	67FS+10 days
69	Site Setup and Site-Specific Training	5 days	Tue 9/20/11	Mon 9/26/11	68
70	Anomaly Density GIS Mapping (Concurrent with Field Activities)	120 days	Thu 10/6/11	Wed 3/21/12	74,95FF
71	Analog and Digital Test Plot Setup, Performance, Report	10 days	Tue 9/27/11	Mon 10/10/11	69
72	**MRS 1 - Gas Chamber**	**16 days**	**Tue 9/20/11**	**Tue 10/11/11**	
80	**MRS 2 - Grenade Court**	**9 days**	**Tue 10/11/11**	**Fri 10/21/11**	
88	**MRS 3 - Range Complex (Land & Lake Shoreline)**	**117 days**	**Tue 10/11/11**	**Wed 3/21/12**	
96	**AoPI -3**	**9 days**	**Mon 10/24/11**	**Thu 11/3/11**	
104	**AoPI -5**	**9 days**	**Mon 10/24/11**	**Thu 11/3/11**	
112	**AoPI -8**	**9 days**	**Fri 11/4/11**	**Wed 11/16/11**	
120	**AoPI -9E**	**9 days**	**Fri 11/4/11**	**Wed 11/16/11**	
128	**AoPI -9G**	**9 days**	**Wed 11/16/11**	**Mon 11/28/11**	
136	**AoPI -10A**	**21 days**	**Tue 11/29/11**	**Tue 12/27/11**	
144	**AoPI -10B**	**9 days**	**Wed 11/16/11**	**Mon 11/28/11**	
152	**AoPI -11B**	**9 days**	**Wed 12/28/11**	**Mon 1/9/12**	
160	**AoPI -11C**	**9 days**	**Wed 12/28/11**	**Mon 1/9/12**	
168	**AoPI -11D**	**9 days**	**Tue 1/10/12**	**Fri 1/20/12**	
176	**Task 12 - Environmental Sampling and Analysis**	**60 days**	**Thu 3/22/12**	**Wed 6/13/12**	
177	MC RI Sampling	20 days	Thu 3/22/12	Wed 4/18/12	95
178	Daily QC Report for Environmental Sampling (ea. day)	20 days	Thu 3/22/12	Wed 4/18/12	95
179	Analytical Data Submittal for QA Evaluation	20 days	Thu 4/19/12	Wed 5/16/12	178
180	Electronic Laboratory Data Submittal	20 days	Thu 4/19/12	Wed 5/16/12	178
181	Recommendation Report	10 days	Thu 5/17/12	Wed 5/30/12	180
182	Gov't Review	10 days	Thu 5/31/12	Wed 6/13/12	181
183	**Task 5 - RI Report**	**91 days**	**Thu 6/14/12**	**Thu 10/18/12**	
184	Prepare Draft RI Report	21 days	Thu 6/14/12	Thu 7/12/12	182
185	Ship Draft RI Report	0 days	Thu 7/12/12	Thu 7/12/12	184
186	Gov't Review	20 days	Fri 7/13/12	Thu 8/9/12	185



RI/FS at Camp Croft, SC
Date: Fri 5/13/11
Zapata Incorporated

Task | Split | Progress | Milestone | Summary | Project Summary | External Tasks | External Milestone | Deadline

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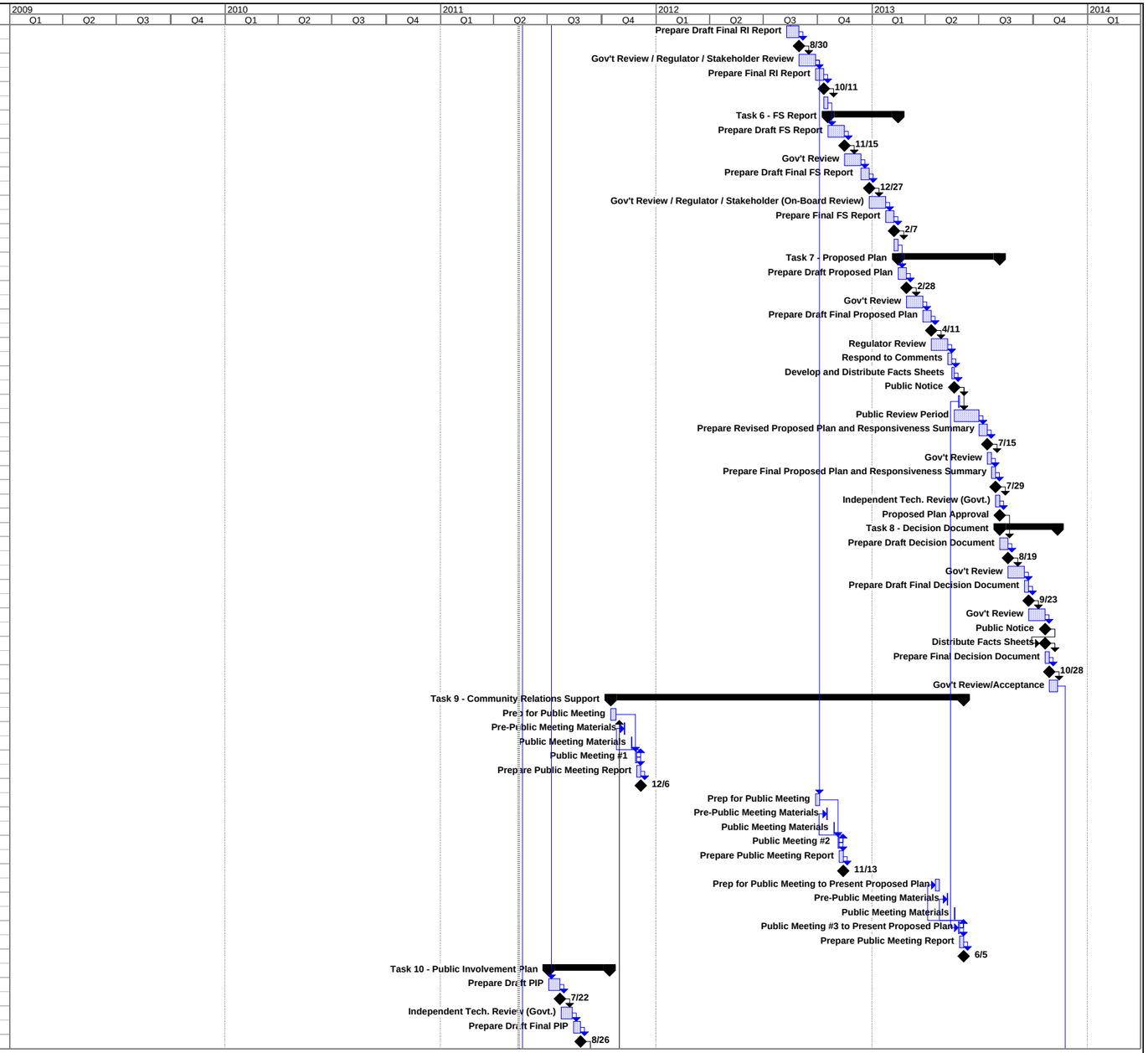
ID	Task Name	Duration	Start	Finish	Predecessors
187	Prepare Draft Final RI Report	15 days	Fri 8/10/12	Thu 8/30/12	186
188	Ship Draft Final RI Report	0 days	Thu 8/30/12	Thu 8/30/12	187
189	Gov't Review / Regulator / Stakeholder Review	20 days	Fri 8/31/12	Thu 9/27/12	188
190	Prepare Final RI Report	10 days	Fri 9/28/12	Thu 10/11/12	189
191	Ship Final RI Report	0 days	Thu 10/11/12	Thu 10/11/12	190
192	Receive Final RI Report Approval	5 days	Fri 10/12/12	Thu 10/18/12	191
193	**Task 6 - FS Report**	**85 days**	**Fri 10/19/12**	**Thu 2/14/13**	
194	Prepare Draft FS Report	20 days	Fri 10/19/12	Thu 11/15/12	192
195	Ship Draft FS Report	0 days	Thu 11/15/12	Thu 11/15/12	194
196	Gov't Review	20 days	Fri 11/16/12	Thu 12/13/12	195
197	Prepare Draft Final FS Report	10 days	Fri 12/14/12	Thu 12/27/12	196
198	Ship Draft Final FS Report	0 days	Thu 12/27/12	Thu 12/27/12	197
199	Gov't Review / Regulator / Stakeholder (On-Board Review)	20 days	Fri 12/28/12	Thu 1/24/13	198
200	Prepare Final FS Report	10 days	Fri 1/25/13	Thu 2/7/13	199
201	Ship Final FS Report	0 days	Thu 2/7/13	Thu 2/7/13	200
202	Receive Final FS Report Approval	5 days	Fri 2/8/13	Thu 2/14/13	201
203	**Task 7 - Proposed Plan**	**122 days**	**Fri 2/15/13**	**Mon 8/5/13**	
204	Prepare Draft Proposed Plan	10 days	Fri 2/15/13	Thu 2/28/13	202
205	Ship Draft Proposed Plan	0 days	Thu 2/28/13	Thu 2/28/13	204
206	Gov't Review	20 days	Fri 3/1/13	Thu 3/28/13	205
207	Prepare Draft Final Proposed Plan	10 days	Fri 3/29/13	Thu 4/11/13	206
208	Ship Draft Final Proposed Plan	0 days	Thu 4/11/13	Thu 4/11/13	207
209	Regulator Review	20 days	Fri 4/12/13	Thu 5/9/13	208
210	Respond to Comments	5 days	Fri 5/10/13	Thu 5/16/13	209
211	Develop and Distribute Facts Sheets	2 days	Fri 5/17/13	Mon 5/20/13	210
212	Public Notice	0 days	Mon 5/20/13	Mon 5/20/13	211
213	Public Meeting w/ Transcriber (aka Public Meeting #3)	2 days	Tue 5/28/13	Wed 5/29/13	212FS+5 days
214	Public Review Period	30 days	Tue 5/21/13	Mon 7/1/13	212
215	Prepare Revised Proposed Plan and Responsiveness Summary	10 days	Tue 7/2/13	Mon 7/15/13	214
216	Submit Revised Proposed Plan and Responsiveness Summary	0 days	Mon 7/15/13	Mon 7/15/13	215
217	Gov't Review	5 days	Tue 7/16/13	Mon 7/22/13	216
218	Prepare Final Proposed Plan and Responsiveness Summary	5 days	Tue 7/23/13	Mon 7/29/13	217
219	Submit Final Proposed Plan and Responsiveness Summary	0 days	Mon 7/29/13	Mon 7/29/13	218
220	Independent Tech. Review (Govt.)	5 days	Tue 7/30/13	Mon 8/5/13	219
221	Proposed Plan Approval	0 days	Mon 8/5/13	Mon 8/5/13	220
222	**Task 8 - Decision Document**	**70 days**	**Tue 8/6/13**	**Mon 11/11/13**	
223	Prepare Draft Decision Document	10 days	Tue 8/6/13	Mon 8/19/13	221
224	Submit Draft Decision Document	0 days	Mon 8/19/13	Mon 8/19/13	223
225	Gov't Review	20 days	Tue 8/20/13	Mon 9/16/13	224
226	Prepare Draft Final Decision Document	5 days	Tue 9/17/13	Mon 9/23/13	225
227	Submit Draft Final Decision Document	0 days	Mon 9/23/13	Mon 9/23/13	226
228	Gov't Review	20 days	Tue 9/24/13	Mon 10/21/13	227
229	Public Notice	0 days	Mon 10/21/13	Mon 10/21/13	228
230	Distribute Facts Sheets	0 days	Mon 10/21/13	Mon 10/21/13	229
231	Prepare Final Decision Document	5 days	Tue 10/22/13	Mon 10/28/13	230
232	Submit Final Decision Document	0 days	Mon 10/28/13	Mon 10/28/13	231
233	Gov't Review/Acceptance	10 days	Tue 10/29/13	Mon 11/11/13	232
234	**Task 9 - Community Relations Support**	**428 days**	**Mon 10/17/11**	**Wed 6/5/13**	
235	Prep for Public Meeting	7 days	Mon 10/17/11	Tue 10/25/11	263
236	Pre-Public Meeting Materials	1 day	Wed 11/9/11	Wed 11/9/11	238FS-15 days
237	Public Meeting Materials	1 day	Mon 11/21/11	Mon 11/21/11	238FS-7 days
238	Public Meeting #1	2 days	Mon 11/28/11	Tue 11/29/11	235FS+23 days
239	Prepare Public Meeting Report	5 days	Wed 11/30/11	Tue 12/6/11	238
240	Submit Public Meeting Report	0 days	Tue 12/6/11	Tue 12/6/11	239
241	Prep for Public Meeting	5 days	Fri 9/28/12	Thu 10/4/12	189
242	Pre-Public Meeting Materials	1 day	Wed 10/17/12	Wed 10/17/12	244FS-15 days
243	Public Meeting Materials	1 day	Mon 10/29/12	Mon 10/29/12	244FS-7 days
244	Public Meeting #2	2 days	Mon 11/5/12	Tue 11/6/12	241FS+21 days
245	Prepare Public Meeting Report	5 days	Wed 11/7/12	Tue 11/13/12	244
246	Submit Public Meeting Report	0 days	Tue 11/13/12	Tue 11/13/12	245
247	Prep for Public Meeting to Present Proposed Plan	5 days	Fri 4/19/13	Thu 4/25/13	250FS-29 days
248	Pre-Public Meeting Materials	1 day	Thu 5/9/13	Thu 5/9/13	250FS-15 days
249	Public Meeting Materials	1 day	Tue 5/21/13	Tue 5/21/13	250FS-7 days
250	Public Meeting #3 to Present Proposed Plan	2 days	Tue 5/28/13	Wed 5/29/13	213SS
251	Prepare Public Meeting Report	5 days	Thu 5/30/13	Wed 6/5/13	250
252	Submit Public Meeting Report	0 days	Wed 6/5/13	Wed 6/5/13	251
253	**Task 10 - Public Involvement Plan**	**75 days**	**Mon 7/4/11**	**Fri 10/14/11**	
254	Prepare Draft PIP	15 days	Mon 7/4/11	Fri 7/22/11	52
255	Submit Draft PIP	0 days	Fri 7/22/11	Fri 7/22/11	254
256	Independent Tech. Review (Govt.)	15 days	Mon 7/25/11	Fri 8/12/11	255
257	Prepare Draft Final PIP	10 days	Mon 8/15/11	Fri 8/26/11	256
258	Submit Draft Final PIP	0 days	Fri 8/26/11	Fri 8/26/11	257



RI/FS at Camp Croft, SC
Date: Fri 5/13/11
Zapata Incorporated

Task | Split | Progress | Milestone | Summary | Project Summary | External Tasks | External Milestone | Deadline

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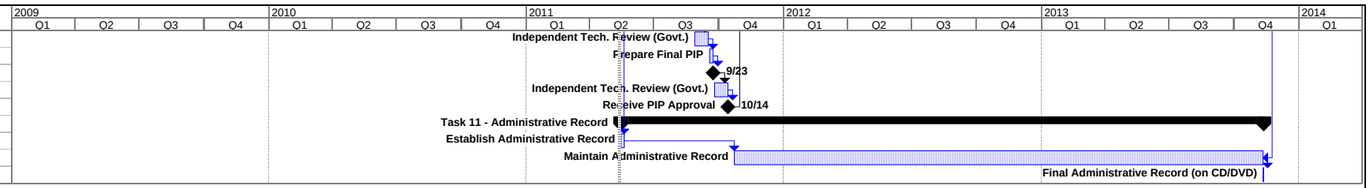
ID	Task Name	Duration	Start	Finish	Predecessors
259	Independent Tech. Review (Govt.)	15 days	Mon 8/29/11	Fri 9/16/11	258
260	Prepare Final PIP	5 days	Mon 9/19/11	Fri 9/23/11	259
261	Submit Final PIP	0 days	Fri 9/23/11	Fri 9/23/11	260
262	Independent Tech. Review (Govt.)	15 days	Mon 9/26/11	Fri 10/14/11	261
263	Receive PIP Approval	0 days	Fri 10/14/11	Fri 10/14/11	262
264	**Task 11 - Administrative Record**	**652 days**	**Mon 5/16/11**	**Tue 11/12/13**	
265	Establish Administrative Record	5 days	Mon 5/16/11	Fri 5/20/11	39
266	Maintain Administrative Record	536 days	Mon 10/24/11	Mon 11/11/13	265,233FF
267	Final Administrative Record (on CD/DVD)	1 day	Tue 11/12/13	Tue 11/12/13	266



RI/FS at Camp Croft, SC
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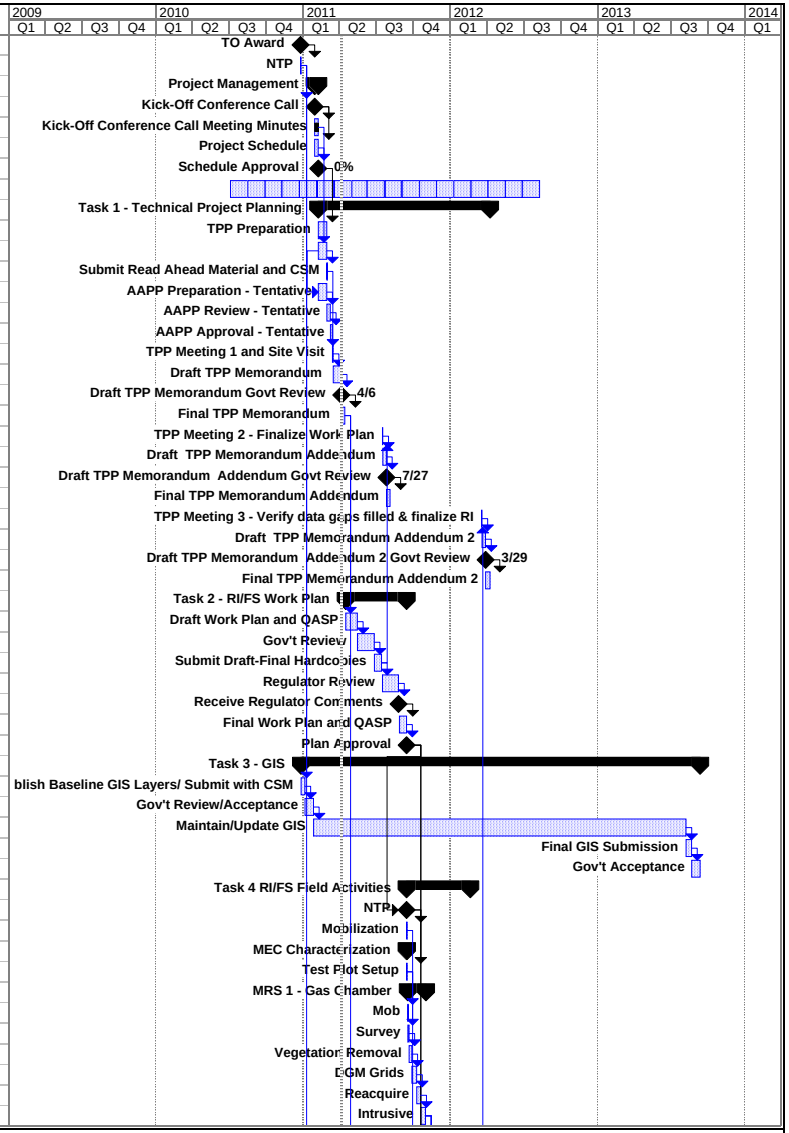
ID	Task Name	Duration	Start	Finish	Predecessors
1	TO Award	0 days	Mon 12/27/10	Mon 12/27/10	
2	NTP	1 day	Mon 12/27/10	Mon 12/27/10	1
3	**Project Management**	**7 days**	**Mon 1/31/11**	**Tue 2/8/11**	
4	Kick-Off Conference Call	0 days	Mon 1/31/11	Mon 1/31/11	2FS+2 days
5	Kick-Off Conference Call Meeting Minutes	7 days	Mon 1/31/11	Tue 2/8/11	4
6	Project Schedule	7 days	Mon 1/31/11	Tue 2/8/11	4
7	Schedule Approval	0 days	Tue 2/8/11	Tue 2/8/11	6
8	**Monthly Report**	**702 days**	**Tue 7/6/10**	**Wed 3/13/13**	
32	**Task 1 - Technical Project Planning**	**304 days**	**Wed 2/9/11**	**Mon 4/9/12**	
33	TPP Preparation	15 days	Wed 2/9/11	Tue 3/1/11	7
34	CSM Revision	15 days	Wed 2/9/11	Tue 3/1/11	5
35	Submit Read Ahead Material and CSM	1 day	Wed 3/2/11	Wed 3/2/11	34
36	AAPP Preparation - Tentative	15 days	Wed 2/9/11	Tue 3/1/11	34SS
37	AAPP Review - Tentative	7 days	Wed 3/2/11	Thu 3/10/11	36
38	AAPP Approval - Tentative	3 days	Fri 3/11/11	Tue 3/15/11	37
39	TPP Meeting 1 and Site Visit	2 days	Wed 3/16/11	Thu 3/17/11	35FS+9 days
40	Draft TPP Memorandum	14 days	Fri 3/18/11	Wed 4/6/11	39
41	Draft TPP Memorandum Govt Review	0 days	Wed 4/6/11	Wed 4/6/11	40
42	Final TPP Memorandum	7 days	Thu 4/7/11	Fri 4/15/11	41
43	TPP Meeting 2 - Finalize Work Plan	1 day	Mon 7/18/11	Mon 7/18/11	54
44	Draft TPP Memorandum Addendum	7 days	Tue 7/19/11	Wed 7/27/11	43
45	Draft TPP Memorandum Addendum Govt Review	0 days	Wed 7/27/11	Wed 7/27/11	44
46	Final TPP Memorandum Addendum	7 days	Thu 7/28/11	Fri 8/5/11	45
47	TPP Meeting 3 - Verify data gaps filled & finalize RI	1 day	Tue 3/20/12	Tue 3/20/12	197FS+7 days
48	Draft TPP Memorandum Addendum 2	7 days	Wed 3/21/12	Thu 3/29/12	47
49	Draft TPP Memorandum Addendum 2 Govt Review	0 days	Thu 3/29/12	Thu 3/29/12	48
50	Final TPP Memorandum Addendum 2	7 days	Fri 3/30/12	Mon 4/9/12	49
51	**Task 2 - RI/FS Work Plan**	**109 days**	**Mon 4/18/11**	**Thu 9/15/11**	
52	Draft Work Plan and QASP	21 days	Mon 4/18/11	Mon 5/16/11	42
53	Gov't Review	30 days	Tue 5/17/11	Mon 6/27/11	52
54	Submit Draft-Final Hardcopies	14 days	Tue 6/28/11	Fri 7/15/11	53
55	Regulator Review	30 days	Mon 7/18/11	Fri 8/26/11	54
56	Receive Regulator Comments	0 days	Fri 8/26/11	Fri 8/26/11	55
57	Final Work Plan and QASP	14 days	Mon 8/29/11	Thu 9/15/11	56
58	Plan Approval	0 days	Thu 9/15/11	Thu 9/15/11	57
59	**Task 3 - GIS**	**708 days**	**Tue 12/28/10**	**Thu 9/12/13**	
60	Establish Baseline GIS Layers/ Submit with CSM	8 days	Tue 12/28/10	Thu 1/6/11	2
61	Gov't Review/Acceptance	15 days	Fri 1/7/11	Thu 1/27/11	60
62	Maintain/Update GIS	660 days	Fri 1/28/11	Thu 8/8/13	61
63	Final GIS Submission	10 days	Fri 8/9/13	Thu 8/22/13	62
64	Gov't Acceptance	15 days	Fri 8/23/13	Thu 9/12/13	63
65	**Task 4 RI/FS Field Activities**	**112 days**	**Thu 9/15/11**	**Mon 2/20/12**	
66	NTP	0 days	Thu 9/15/11	Thu 9/15/11	58
67	Mobilization	1 day	Fri 9/16/11	Fri 9/16/11	66
68	**MEC Characterization**	**1 day**	**Fri 9/16/11**	**Fri 9/16/11**	
69	Test Plot Setup	1 day	Fri 9/16/11	Fri 9/16/11	58
70	**MRS 1 - Gas Chamber**	**33 days**	**Mon 9/19/11**	**Wed 11/2/11**	
71	Mob	1 day	Mon 9/19/11	Mon 9/19/11	69
72	Survey	3 days	Mon 9/19/11	Wed 9/21/11	67
73	Vegetation Removal	5 days	Thu 9/22/11	Wed 9/28/11	72
74	DGM Grids	8 days	Thu 9/29/11	Mon 10/10/11	73
75	Reacquire	8 days	Tue 10/11/11	Thu 10/20/11	74
76	Intrusive	8 days	Fri 10/21/11	Tue 11/1/11	75



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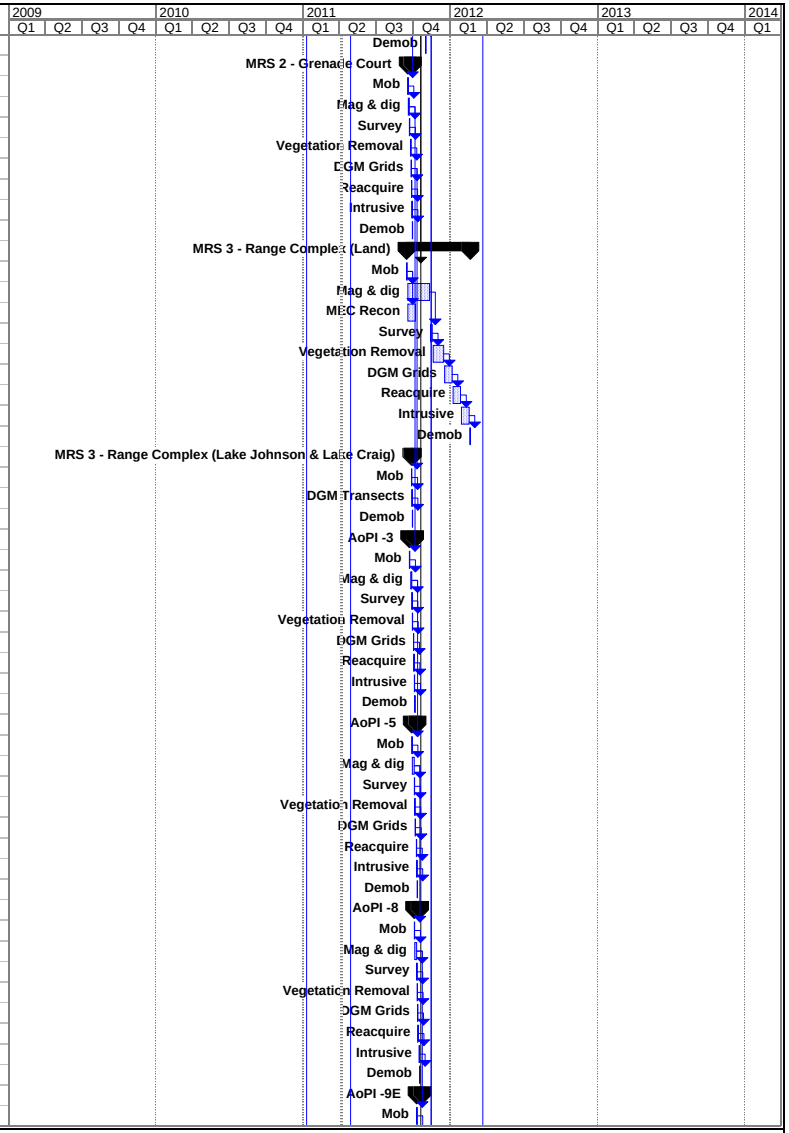
ID	Task Name	Duration	Start	Finish	Predecessors
77	Demob	1 day	Wed 11/2/11	Wed 11/2/11	76
78	**MRS 2 - Grenade Court**	**10 days**	**Mon 9/19/11**	**Fri 9/30/11**	
79	Mob	1 day	Mon 9/19/11	Mon 9/19/11	69
80	Mag & dig	3 days	Tue 9/20/11	Thu 9/22/11	79
81	Survey	1 day	Fri 9/23/11	Fri 9/23/11	80
82	Vegetation Removal	1 day	Mon 9/26/11	Mon 9/26/11	81
83	DGM Grids	1 day	Tue 9/27/11	Tue 9/27/11	82
84	Reacquire	1 day	Wed 9/28/11	Wed 9/28/11	83
85	Intrusive	1 day	Thu 9/29/11	Thu 9/29/11	84
86	Demob	1 day	Fri 9/30/11	Fri 9/30/11	85
87	**MRS 3 - Range Complex (Land)**	**112 days**	**Fri 9/16/11**	**Mon 2/20/12**	
88	Mob	1 day	Fri 9/16/11	Fri 9/16/11	66
89	Mag & dig	40 days	Mon 9/19/11	Fri 11/11/11	88
90	MEC Recon	15 days	Mon 9/19/11	Fri 10/7/11	88
91	Survey	5 days	Mon 11/14/11	Fri 11/18/11	89
92	Vegetation Removal	20 days	Mon 11/21/11	Fri 12/16/11	91
93	DGM Grids	15 days	Mon 12/19/11	Fri 1/6/12	92
94	Reacquire	15 days	Mon 1/9/12	Fri 1/27/12	93
95	Intrusive	15 days	Mon 1/30/12	Fri 2/17/12	94
96	Demob	1 day	Mon 2/20/12	Mon 2/20/12	95
97	**MRS 3 - Range Complex (Lake Johnson & Lake Craig)**	**3 days**	**Wed 9/28/11**	**Fri 9/30/11**	
98	Mob	1 day	Wed 9/28/11	Wed 9/28/11	83
99	DGM Transects	1 day	Thu 9/29/11	Thu 9/29/11	98
100	Demob	1 day	Fri 9/30/11	Fri 9/30/11	99
101	**AoPI -3**	**10 days**	**Fri 9/23/11**	**Thu 10/6/11**	
102	Mob	1 day	Fri 9/23/11	Fri 9/23/11	80
103	Mag & dig	3 days	Mon 9/26/11	Wed 9/28/11	102
104	Survey	1 day	Thu 9/29/11	Thu 9/29/11	103
105	Vegetation Removal	1 day	Fri 9/30/11	Fri 9/30/11	104
106	DGM Grids	1 day	Mon 10/3/11	Mon 10/3/11	105
107	Reacquire	1 day	Tue 10/4/11	Tue 10/4/11	106
108	Intrusive	1 day	Wed 10/5/11	Wed 10/5/11	107
109	Demob	1 day	Thu 10/6/11	Thu 10/6/11	108
110	**AoPI -5**	**10 days**	**Thu 9/29/11**	**Wed 10/12/11**	
111	Mob	1 day	Thu 9/29/11	Thu 9/29/11	103
112	Mag & dig	3 days	Fri 9/30/11	Tue 10/4/11	111
113	Survey	1 day	Wed 10/5/11	Wed 10/5/11	112
114	Vegetation Removal	1 day	Thu 10/6/11	Thu 10/6/11	113
115	DGM Grids	1 day	Fri 10/7/11	Fri 10/7/11	114
116	Reacquire	1 day	Mon 10/10/11	Mon 10/10/11	115
117	Intrusive	1 day	Tue 10/11/11	Tue 10/11/11	116
118	Demob	1 day	Wed 10/12/11	Wed 10/12/11	117
119	**AoPI -8**	**10 days**	**Wed 10/5/11**	**Tue 10/18/11**	
120	Mob	1 day	Wed 10/5/11	Wed 10/5/11	112
121	Mag & dig	3 days	Thu 10/6/11	Mon 10/10/11	120
122	Survey	1 day	Tue 10/11/11	Tue 10/11/11	121
123	Vegetation Removal	1 day	Wed 10/12/11	Wed 10/12/11	122
124	DGM Grids	1 day	Thu 10/13/11	Thu 10/13/11	123
125	Reacquire	1 day	Fri 10/14/11	Fri 10/14/11	124
126	Intrusive	1 day	Mon 10/17/11	Mon 10/17/11	125
127	Demob	1 day	Tue 10/18/11	Tue 10/18/11	126
128	**AoPI -9E**	**10 days**	**Tue 10/11/11**	**Mon 10/24/11**	
129	Mob	1 day	Tue 10/11/11	Tue 10/11/11	121



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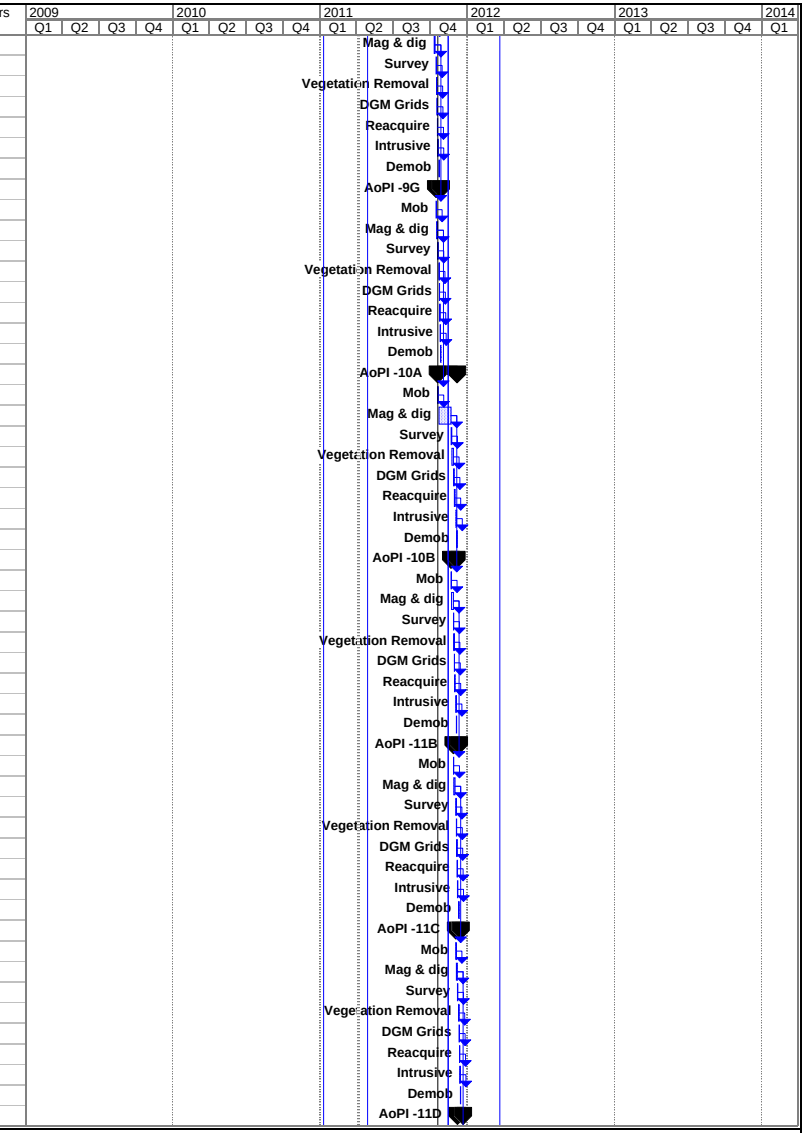
ID	Task Name	Duration	Start	Finish	Predecessors
130	Mag & dig	3 days	Wed 10/12/11	Fri 10/14/11	129
131	Survey	1 day	Mon 10/17/11	Mon 10/17/11	130
132	Vegetation Removal	1 day	Tue 10/18/11	Tue 10/18/11	131
133	DGM Grids	1 day	Wed 10/19/11	Wed 10/19/11	132
134	Reacquire	1 day	Thu 10/20/11	Thu 10/20/11	133
135	Intrusive	1 day	Fri 10/21/11	Fri 10/21/11	134
136	Demob	1 day	Mon 10/24/11	Mon 10/24/11	135
137	**AoPI -9G**	**10 days**	**Mon 10/17/11**	**Fri 10/28/11**	
138	Mob	1 day	Mon 10/17/11	Mon 10/17/11	130
139	Mag & dig	3 days	Tue 10/18/11	Thu 10/20/11	138
140	Survey	1 day	Fri 10/21/11	Fri 10/21/11	139
141	Vegetation Removal	1 day	Mon 10/24/11	Mon 10/24/11	140
142	DGM Grids	1 day	Tue 10/25/11	Tue 10/25/11	141
143	Reacquire	1 day	Wed 10/26/11	Wed 10/26/11	142
144	Intrusive	1 day	Thu 10/27/11	Thu 10/27/11	143
145	Demob	1 day	Fri 10/28/11	Fri 10/28/11	144
146	**AoPI -10A**	**34 days**	**Fri 10/21/11**	**Wed 12/7/11**	
147	Mob	1 day	Fri 10/21/11	Fri 10/21/11	139
148	Mag & dig	22 days	Mon 10/24/11	Tue 11/22/11	147
149	Survey	2 days	Wed 11/23/11	Thu 11/24/11	148
150	Vegetation Removal	2 days	Fri 11/25/11	Mon 11/28/11	149
151	DGM Grids	2 days	Tue 11/29/11	Wed 11/30/11	150
152	Reacquire	2 days	Thu 12/1/11	Fri 12/2/11	151
153	Intrusive	2 days	Mon 12/5/11	Tue 12/6/11	152
154	Demob	1 day	Wed 12/7/11	Wed 12/7/11	153
155	**AoPI -10B**	**10 days**	**Wed 11/23/11**	**Tue 12/6/11**	
156	Mob	1 day	Wed 11/23/11	Wed 11/23/11	148
157	Mag & dig	3 days	Thu 11/24/11	Mon 11/28/11	156
158	Survey	1 day	Tue 11/29/11	Tue 11/29/11	157
159	Vegetation Removal	1 day	Wed 11/30/11	Wed 11/30/11	158
160	DGM Grids	1 day	Thu 12/1/11	Thu 12/1/11	159
161	Reacquire	1 day	Fri 12/2/11	Fri 12/2/11	160
162	Intrusive	1 day	Mon 12/5/11	Mon 12/5/11	161
163	Demob	1 day	Tue 12/6/11	Tue 12/6/11	162
164	**AoPI -11B**	**10 days**	**Tue 11/29/11**	**Mon 12/12/11**	
165	Mob	1 day	Tue 11/29/11	Tue 11/29/11	157
166	Mag & dig	3 days	Wed 11/30/11	Fri 12/2/11	165
167	Survey	1 day	Mon 12/5/11	Mon 12/5/11	166
168	Vegetation Removal	1 day	Tue 12/6/11	Tue 12/6/11	167
169	DGM Grids	1 day	Wed 12/7/11	Wed 12/7/11	168
170	Reacquire	1 day	Thu 12/8/11	Thu 12/8/11	169
171	Intrusive	1 day	Fri 12/9/11	Fri 12/9/11	170
172	Demob	1 day	Mon 12/12/11	Mon 12/12/11	171
173	**AoPI -11C**	**10 days**	**Mon 12/5/11**	**Fri 12/16/11**	
174	Mob	1 day	Mon 12/5/11	Mon 12/5/11	166
175	Mag & dig	3 days	Tue 12/6/11	Thu 12/8/11	174
176	Survey	1 day	Fri 12/9/11	Fri 12/9/11	175
177	Vegetation Removal	1 day	Mon 12/12/11	Mon 12/12/11	176
178	DGM Grids	1 day	Tue 12/13/11	Tue 12/13/11	177
179	Reacquire	1 day	Wed 12/14/11	Wed 12/14/11	178
180	Intrusive	1 day	Thu 12/15/11	Thu 12/15/11	179
181	Demob	1 day	Fri 12/16/11	Fri 12/16/11	180
182	**AoPI -11D**	**10 days**	**Fri 12/9/11**	**Thu 12/22/11**	



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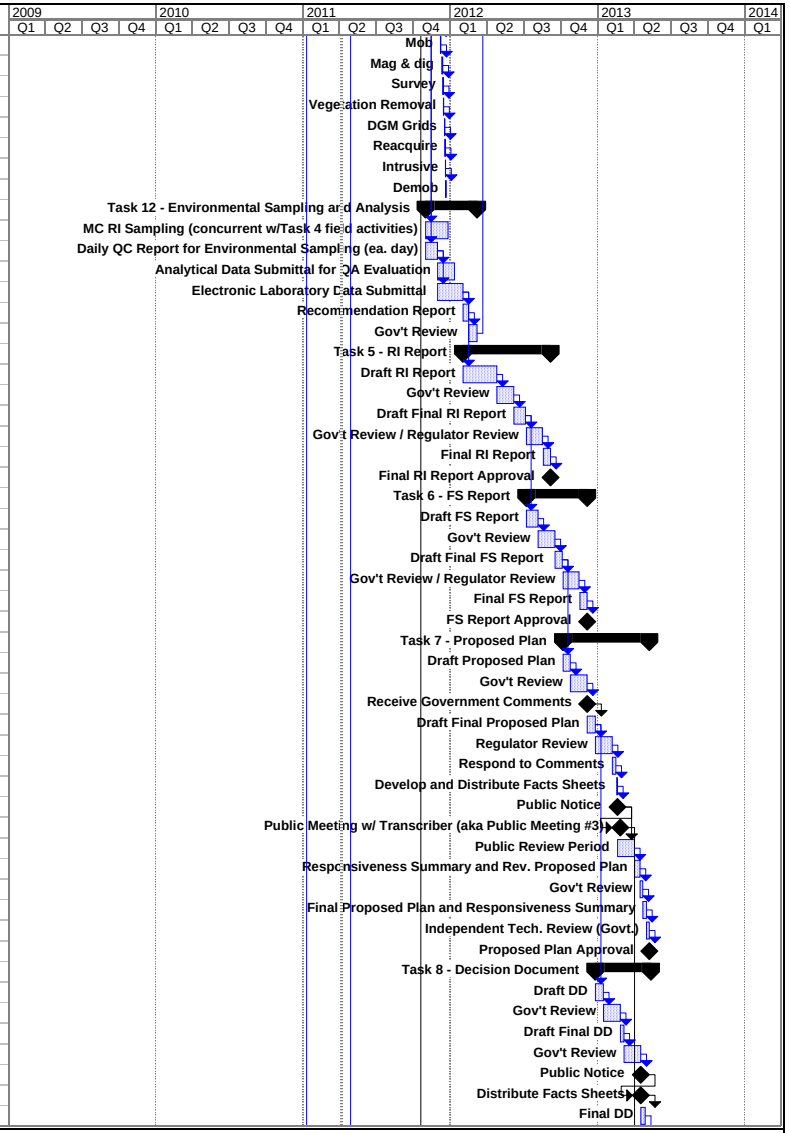
ID	Task Name	Duration	Start	Finish	Predecessors
183	Mob	1 day	Fri 12/9/11	Fri 12/9/11	175
184	Mag & dig	3 days	Mon 12/12/11	Wed 12/14/11	183
185	Survey	1 day	Thu 12/15/11	Thu 12/15/11	184
186	Vegetation Removal	1 day	Fri 12/16/11	Fri 12/16/11	185
187	DGM Grids	1 day	Mon 12/19/11	Mon 12/19/11	186
188	Reacquire	1 day	Tue 12/20/11	Tue 12/20/11	187
189	Intrusive	1 day	Wed 12/21/11	Wed 12/21/11	188
190	Demob	1 day	Thu 12/22/11	Thu 12/22/11	189
191	**Task 12 - Environmental Sampling and Analysis**	**92 days**	**Wed 11/2/11**	**Thu 3/8/12**	
192	MC RI Sampling (concurrent w/Task 4 field activities)	40 days	Wed 11/2/11	Tue 12/27/11	76
193	Daily QC Report for Environmental Sampling (ea. day)	22 days	Wed 11/2/11	Thu 12/1/11	76
194	Analytical Data Submittal for QA Evaluation	30 days	Fri 12/2/11	Thu 1/12/12	193
195	Electronic Laboratory Data Submittal	45 days	Fri 12/2/11	Thu 2/2/12	193
196	Recommendation Report	10 days	Fri 2/3/12	Thu 2/16/12	195
197	Gov't Review	15 days	Fri 2/17/12	Thu 3/8/12	196
198	**Task 5 - RI Report**	**155 days**	**Fri 2/3/12**	**Thu 9/6/12**	
199	Draft RI Report	60 days	Fri 2/3/12	Thu 4/26/12	195
200	Gov't Review	30 days	Fri 4/27/12	Thu 6/7/12	199
201	Draft Final RI Report	21 days	Fri 6/8/12	Fri 7/6/12	200
202	Gov't Review / Regulator Review	30 days	Mon 7/9/12	Fri 8/17/12	201
203	Final RI Report	14 days	Mon 8/20/12	Thu 9/6/12	202
204	Final RI Report Approval	0 days	Thu 9/6/12	Thu 9/6/12	203
205	**Task 6 - FS Report**	**109 days**	**Mon 7/9/12**	**Thu 12/6/12**	
206	Draft FS Report	21 days	Mon 7/9/12	Mon 8/6/12	201
207	Gov't Review	30 days	Tue 8/7/12	Mon 9/17/12	206
208	Draft Final FS Report	14 days	Tue 9/18/12	Fri 10/5/12	207
209	Gov't Review / Regulator Review	30 days	Mon 10/8/12	Fri 11/16/12	208
210	Final FS Report	14 days	Mon 11/19/12	Thu 12/6/12	209
211	FS Report Approval	0 days	Thu 12/6/12	Thu 12/6/12	210
212	**Task 7 - Proposed Plan**	**154 days**	**Mon 10/8/12**	**Thu 5/9/13**	
213	Draft Proposed Plan	14 days	Mon 10/8/12	Thu 10/25/12	208
214	Gov't Review	30 days	Fri 10/26/12	Thu 12/6/12	213
215	Receive Government Comments	0 days	Thu 12/6/12	Thu 12/6/12	214
216	Draft Final Proposed Plan	14 days	Fri 12/7/12	Wed 12/26/12	215
217	Regulator Review	30 days	Thu 12/27/12	Wed 2/6/13	216
218	Respond to Comments	7 days	Thu 2/7/13	Fri 2/15/13	217
219	Develop and Distribute Facts Sheets	2 days	Mon 2/18/13	Tue 2/19/13	218
220	Public Notice	0 days	Tue 2/19/13	Tue 2/19/13	219
221	Public Meeting w/ Transcriber (aka Public Meeting #3)	0 days	Tue 2/26/13	Tue 2/26/13	220FS+5 days
222	Public Review Period	30 days	Wed 2/20/13	Tue 4/2/13	220
223	Responsiveness Summary and Rev. Proposed Plan	10 days	Wed 4/3/13	Tue 4/16/13	222
224	Gov't Review	5 days	Wed 4/17/13	Tue 4/23/13	223
225	Final Proposed Plan and Responsiveness Summary	7 days	Wed 4/24/13	Thu 5/2/13	224
226	Independent Tech. Review (Govt.)	5 days	Fri 5/3/13	Thu 5/9/13	225
227	Proposed Plan Approval	0 days	Thu 5/9/13	Thu 5/9/13	226
228	**Task 8 - Decision Document**	**98 days**	**Thu 12/27/12**	**Mon 5/13/13**	
229	Draft DD	14 days	Thu 12/27/12	Tue 1/15/13	216
230	Gov't Review	30 days	Wed 1/16/13	Tue 2/26/13	229
231	Draft Final DD	7 days	Wed 2/27/13	Thu 3/7/13	230
232	Gov't Review	30 days	Fri 3/8/13	Thu 4/18/13	231
233	Public Notice	0 days	Thu 4/18/13	Thu 4/18/13	232
234	Distribute Facts Sheets	0 days	Thu 4/18/13	Thu 4/18/13	233
235	Final DD	7 days	Fri 4/19/13	Mon 4/29/13	234



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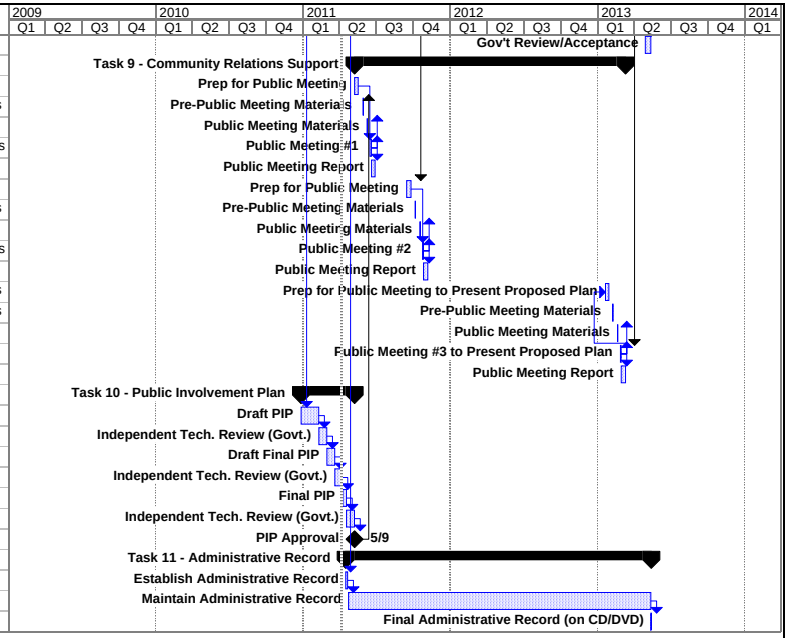
ID	Task Name	Duration	Start	Finish	Predecessors
236	Gov't Review/Acceptance	10 days	Tue 4/30/13	Mon 5/13/13	235
237	**Task 9 - Community Relations Support**	**480 days**	**Tue 5/10/11**	**Mon 3/11/13**	
238	Prep for Public Meeting	7 days	Tue 5/10/11	Wed 5/18/11	260
239	Pre-Public Meeting Materials	1 day	Tue 5/31/11	Tue 5/31/11	241FS-15 days
240	Public Meeting Materials	1 day	Fri 6/10/11	Fri 6/10/11	241FS-7 days
241	Public Meeting #1	2 days	Fri 6/17/11	Mon 6/20/11	238FS+21 days
242	Public Meeting Report	7 days	Tue 6/21/11	Wed 6/29/11	241
243	Prep for Public Meeting	7 days	Fri 9/16/11	Mon 9/26/11	58
244	Pre-Public Meeting Materials	1 day	Fri 10/7/11	Fri 10/7/11	246FS-15 days
245	Public Meeting Materials	1 day	Wed 10/19/11	Wed 10/19/11	246FS-7 days
246	Public Meeting #2	2 days	Wed 10/26/11	Thu 10/27/11	243FS+21 days
247	Public Meeting Report	7 days	Fri 10/28/11	Mon 11/7/11	246
248	Prep for Public Meeting to Present Proposed Plan	7 days	Mon 1/21/13	Tue 1/29/13	251FS-29 days
249	Pre-Public Meeting Materials	1 day	Fri 2/8/13	Fri 2/8/13	251FS-15 days
250	Public Meeting Materials	1 day	Wed 2/20/13	Wed 2/20/13	251FS-7 days
251	Public Meeting #3 to Present Proposed Plan	2 days	Wed 2/27/13	Thu 2/28/13	221
252	Public Meeting Report	7 days	Fri 3/1/13	Mon 3/11/13	251
253	**Task 10 - Public Involvement Plan**	**95 days**	**Tue 12/28/10**	**Mon 5/9/11**	
254	Draft PIP	32 days	Tue 12/28/10	Wed 2/9/11	2
255	Independent Tech. Review (Govt.)	14 days	Thu 2/10/11	Tue 3/1/11	254
256	Draft Final PIP	14 days	Wed 3/2/11	Mon 3/21/11	255
257	Independent Tech. Review (Govt.)	14 days	Tue 3/22/11	Fri 4/8/11	256
258	Final PIP	7 days	Mon 4/11/11	Tue 4/19/11	257
259	Independent Tech. Review (Govt.)	14 days	Wed 4/20/11	Mon 5/9/11	258
260	PIP Approval	0 days	Mon 5/9/11	Mon 5/9/11	259
261	**Task 11 - Administrative Record**	**542 days**	**Mon 4/18/11**	**Tue 5/14/13**	
262	Establish Administrative Record	5 days	Mon 4/18/11	Fri 4/22/11	42
263	Maintain Administrative Record	536 days	Mon 4/25/11	Mon 5/13/13	262
264	Final Administrative Record (on CD/DVD)	1 day	Tue 5/14/13	Tue 5/14/13	263



RI/FS at Camp Croft, SC
Date: Wed 4/6/11
Zapata Incorporated

Task | Progress | Summary | External Tasks | Deadline
Split | Milestone | Project Summary | External Milestone

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Technical Project Planning Memorandum – No. 2

Subject: FUDS Military Munitions Response Program Documentation of Technical Project Planning Project Team Meeting for a Remedial Investigation/Feasibility Study (RI/FS)

Site: Former Camp Croft, Spartanburg, SC

Contract: Contract Number W912DY-10-D-0028, Task Order 0005

The Technical Project Planning (TPP) meeting was conducted on 24 August 2011 by teleconference from 2:00pm to 2:30pm. The Project Delivery Team (PDT) is composed of the participants listed below; all but John Moon and Deb Edwards participated in the call. Meeting participants introduced themselves.

1. Shawn Boone	Project Manager, US Army Corps of Engineers (USACE), Charleston District
2. Spencer O'Neal	Project Manager, US Army Engineering and Support Center, Huntsville (USAESCH)
3. Teresa Carpenter	Technical Lead, USAESCH
4. Deb Edwards	Geophysicist, USAESCH
5. Susan Byrd	South Carolina Department of Health and Environmental Control (DHEC)
6. John Moon	South Carolina Department of Parks, Recreation & Tourism (DPRT), Croft State Natural Area
7. Jason Shiflet	Project Manager, Zapata Incorporated (ZAPATA)
8. Suzy McKinney	Quality Control Manager, ZAPATA

Meeting Discussion Summary:

The purpose of the meeting was to discuss ZAPATA's responses to USAESCH comments on the Draft-Final Work Plans for the Remedial Investigation/Feasibility Study (RI/FS), Former Camp Croft, Spartanburg, South Carolina dated 15 July 2011, along with several outstanding project-related topics. A summary of the items discussed is provided below.

1) Ms. Byrd discussed several comments that Ms. Cindy Carter of SC DHEC had communicated to her; those items are summarized below.
   - In Paragraph 1.5.6.3 of the Draft-Final Work Plan, please edit the text regarding groundwater to indicate ZAPATA's understanding of potential groundwater contamination at the former Camp Croft. ZAPATA recommends the following edits, "The quantity of water available from ground sources is usually less than that which may be obtained from surface water sources. However, the importance of ground water lies in

the fact that it is generally of good quality and available in most parts of the county. ZAPATA found no conclusive existing information regarding groundwater quality within the former Camp Croft boundary during the development of this work plan. As a result, groundwater can satisfy the requirements for most domestic, agricultural, and small industrial uses."

- In Paragraph 1.9 of the Draft-Final Work Plan, please carefully review the statements about chemical warfare materiel. ZAPATA recommends the following edits, "The ASR and ASR Supplement indicate that, in addition to various small arms, a variety of MEC was used at Camp Croft. No evidence of contamination by Chemical Warfare Materiel (CWM) or CWM components has been ~~identified or reported~~ confirmed. Reported encounters with MEC at the site confirm that a variety of munitions were used at Camp Croft and that some MEC does not match documented use at some ranges."
- On 25 August 11, SC DHEC had a follow-up comment; Ms. Byrd asked (via telephone) that ZAPATA be very clear (in the work plan) regarding our plans to investigate potential contamination identified during our fieldwork activities. ZAPATA agreed to add the following statement to the work plan, "Through the course of ZAPATA's investigations, if contamination (munitions or chemical) is discovered in soil, sediment, surface water, or groundwater and that contamination is determined to be attributable to the Department of Defense through activities conducted on the property during ownership, ZAPATA will attempt to determine the source, nature and extent of that contamination to the extent required under CERCLA for remedial investigations."

2) The USAESCH mentioned that the responses to comments (see attached) are acceptable.
3) The USAESCH mentioned that the Draft Public Involvement Plan for the Remedial Investigation/Feasibility Study (RI/FS), Former Camp Croft, Spartanburg, South Carolina dated 10 August 2011 is currently in review.
4) The USACE, Charleston District has begun the process to obtain rights-of-entry (ROEs). ZAPATA and SC DHEC offered to assist in the process should the USACE need support.
5) Mr. Shiflet discussed on-going coordination with Ms. Audrey Nore of USAESCH regarding revisions to the Explosive Siting Plan (ESP). Mr. O'Neal request that ZAPATA continue to support Ms. Nore in that process to facilitate completion of that document; ZAPATA agreed.
6) The PDT decided to include the Draft ESP and Explosive Safety Submission (ESS) in Appendix O of the Final Work Plans, as was done in the Draft-Final Work Plans. ZAPATA will indicate in that appendix that the ESP and ESS are undergoing a separate and parallel review process and will be stand-alone documents. The draft ESP and ESS are included in the Final Work Plans for informational purposes only.
7) The USAESCH requested ZAPATA complete the Final Work Plans as soon as possible, inquiring if 30 August was possible. ZAPATA noted that we would attempt to meet that delivery date.

Upon concurrence with the recommended revisions noted in #1 above, ZAPATA will finalize the work plan for submittal.

Attachments:

Responses to USAESCH comments on the Draft-Final Work Plans for the Remedial Investigation/Feasibility Study (RI/FS), Former Camp Croft, Spartanburg, South Carolina dated 15 July 2011

U. S. ARMY ENGINEERING AND SUPPORT CENTER - HUNTSVILLE — CORPS OF ENGINEERS

DESIGN REVIEW COMMENTS — PROJECT Camp Croft, SC — CN 07-128-11 SD 10AUG11

☐ SITE DEV & GEO	☐ MECHANICAL	☐ SAFETY	☐ SYSTEMS ENG	REVIEW: RI/FS WP Draft Final
■ ENVIR PROT& UTIL	☐ MFG TECHNOLOGY	☐ ADV TECH	☐ VALUE ENG	DATE: 08AUG11
☐ ARCHITECTURAL	☐ ELECTRICAL	☐ ESTIMATING	☐ OTHER	NAME: Teresa Carpenter 256-895-1659
☐ STRUCTURAL	☐ INST & CONTROLS	☐ SPECIFICATIONS		

ITEM	DRAWING NO. OR REFERENCE	COMMENT	RESPONSE TO COMMENT
		All comments have been satisfactorily addressed.	Noted.

ACTION CODES
A - ACCEPTED/CONCUR
D - ACTION DEFERRED
W - WITHDRAWN
N - NON-CONCUR
VE - VE POTENTIAL/VEP ATTACHED

CEHND FORM 7 (Revised)
15 Apr 89

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U. S. ARMY ENGINEERING AND SUPPORT CENTER - HUNTSVILLE — CORPS OF ENGINEERS

DESIGN REVIEW COMMENTS

PROJECT: Camp Croft RI/FS; CN: 07-128-11 ; S: 10 Aug 11

■ SITE DEV & GEO ☐ ENVIR PROT& UTIL ☐ ARCHITECTURAL ☐ STRUCTURAL
☐ MECHANICAL ☐ MFG TECHNOLOGY ☐ ELECTRICAL ☐ INST & CONTROLS
☐ SAFETY ☐ ADV TECH ☐ ESTIMATING ☐ SPECIFICATIONS
☐ SYSTEMS ENG ☐ VALUE ENG ☐ OTHER

REVIEW: Draft Final Work Plan
DATE: 10 August 11
NAME: Debbie Edwards/ED-CS-G/256-895-1626

ITEM	DRAWING NO. OR REFERENCE	COMMENT	ACTION
1.	Table 18	Previous comment: "The term GPO is used frequently throughout the document and it is actually referring to an IVS. Please clarify the terminology." The GPO terminology remains in Table 18, however, the acronym GPO is not previously defined.	A. References to GPO have been revised in Table 18 (and throughout the document) to correctly reference IVS.
		All other comments have been addressed.	Noted.

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U. S. ARMY ENGINEERING AND SUPPORT CENTER – HUNTSVILLE — CORPS OF ENGINEERS

DESIGN REVIEW COMMENTS PROJECT: CN: 07-128-11 NAME: Former Camp Croft, SC SD: 10-AUG-11

☐ SITE DEV & GEO ■ ENVIR PROT& UTIL ☐ ARCHITECTURAL ☐ STRUCTURAL
☐ MECHANICAL ☐ MFG TECHNOLOGY ☐ ELECTRICAL ☐ INST & CONTROLS
☐ SAFETY ☐ ADV TECH ☐ ESTIMATING ☐ SPECIFICATIONS
☐ SYSTEMS ENG ☐ VALUE ENG ☐ OTHER

REVIEW: DRAFT-FINAL RI/FS Work Plan
DATE: August 9, 2011
NAME: Michael D'Auben / 256-895-1460

ITEM	DRAWING NO. OR REFERENCE	COMMENT	ACTION
		Work Plan	
1		Acceptable response.	Noted.
		QAPP	
2	Appendix E Worksheet #2	Acceptable response.	Noted.
3	Appendix E Worksheet #10	Acceptable response.	Noted.
4	Appendix E Worksheet #12	Acceptable response.	Noted.
5	Appendix E Worksheet #12	Acceptable response.	Noted.
6	**Appendix E Worksheet #12**	**Acceptable response with the understanding that the current laboratory values will be presented in the Final Work Plan.**	Noted.
7	Appendix E Worksheet #14	Acceptable response.	Noted.
8	**Appendix E Worksheet #15**	**It is understood that risk-based screening limits are sometimes lower than common and approved laboratory methods are capable of achieving. When this is the case, however, it must be documented and explained in the QAPP so that questions are not raised after the fact when the laboratory results are presented in the final report.**	Noted.

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U. S. ARMY ENGINEERING AND SUPPORT CENTER – HUNTSVILLE — CORPS OF ENGINEERS

DESIGN REVIEW COMMENTS PROJECT: CN: 07-128-11 NAME: Former Camp Croft, SC SD: 10-AUG-11

☐ SITE DEV & GEO ■ ENVIR PROT& UTIL ☐ ARCHITECTURAL ☐ STRUCTURAL
☐ MECHANICAL ☐ MFG TECHNOLOGY ☐ ELECTRICAL ☐ INST & CONTROLS
☐ SAFETY ☐ ADV TECH ☐ ESTIMATING ☐ SPECIFICATIONS
☐ SYSTEMS ENG ☐ VALUE ENG ☐ OTHER

REVIEW: DRAFT-FINAL RI/FS Work Plan
DATE: August 9, 2011
NAME: Michael D'Auben / 256-895-1460

ITEM	DRAWING NO. OR REFERENCE	COMMENT	ACTION
9	Appendix E Worksheet #27	Acceptable response.	Noted.
10	Appendix E Worksheet #28	Acceptable response.	Noted.
11	Appendix E Worksheet #30	Acceptable response.	Noted.
12	Appendix E Worksheet #37	Acceptable response.	Noted.

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U. S. ARMY ENGINEER DIVISION HUNTSVILLE

DESIGN REVIEW COMMENTS

PROJECT: Camp Croft South Carolina
Due Date 10 August 2011

CORPS OF ENGINEERS
CN: 07-128-11

☐ SITE DEV & GEO ☐ MECHANICAL ☒ OED SAFETY ☐ SYSTEMS ENG
☐ ENVIR PROT& UTIL ☐ MFG TECHNOLOGY ☐ ADV TECH ☐ VALUE ENG
☐ ARCHITECTURAL ☐ ELECTRICAL ☐ ESTIMATING ☐ OTHER
☐ STRUCTURAL ☐ INST & CONTROLS ☐ SPECIFICATIONS

REVIEW: Back check Final Work Plan
DATE: 25 July 2011
NAME: John Zimmer

ITEM	DRAWING NO. OR REFERENCE	COMMENT	ACTION
		I have back check the 24 comments from Mr. Randall King dated 20 June 2011 on the work plan dated 15 July 2011. Comments 1-5, 7, 8, 10 -13, 15-24 have been adequately addressed and incorporated into the document but I have the following 3 comments for comments 6, 9, and 14 remaining:	Noted.
1	Comment 6 Para. 3.4.9.9 Pg 3-19	The action was to submit a table #19 in the document. Table #19 is missing add table to the tables section.	A. Table 19 was added to the Draft-Final Work Plan; it is unclear why the reviewer's copy of that table was missing. ZAPATA will make every effort to include all text, tables, figures, and appendices in Final Work Plans.
2	Comment #9 Para 3.4.9.16 Pg. 3-29	As stated by Mr. King, this is a conventional project so the standard basic actions are required to be in the work plan. The information provided goes into too much detail for this conventional RI/FS. Correct the paragraphs and insert the basic actions required for a Conventional MEC removal.	A. Section 3.4.9.16 has been revised to include the basic actions required at conventional MEC sites.
3	Comment 14 Para 5.10 Pg. 5-5	Please provide the USACE KO letter authorizing you to transfer the explosives to another USAESCH project or the local law enforcement bomb squad and provide that letter as an attachment to the work plan.	A. ZAPATA has requested a letter from the USAESCH KO and will include that letter authorizing such actions in the Final Work Plans. (Note: The letter from the USAESCH may be delayed. In that case, ZAPATA will disburse the letter to recipients of the Final Work Plan under separate cover.)
		End of comments	

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U. S. ARMY ENGINEER DIVISION HUNTSVILLE — CORPS OF ENGINEERS

DESIGN REVIEW COMMENTS

PROJECT: Camp Croft Draft-Final Work Plan (Zapata TO 5) 07-128-11

☐ SITE DEV & GEO	☐ MECHANICAL	■ SAFETY	☐ SYSTEMS ENG	REVIEW	Draft-Final (O'Neal)
☐ ENVIR PROT& UTIL	☐ MFG TECHNOLOGY	☐ ADV TECH	☐ VALUE ENG	DATE	5 August 2011
☐ ARCHITECTURAL	☐ ELECTRICAL	☐ ESTIMATING	☐ OTHER	NAME	Kellie Williams / SO/ 256-895-1584-
☐ STRUCTURAL	☐ INST & CONTROLS	☐ SPECIFICATIONS			

ITEM	DRAWING NO. OR REFERENCE	COMMENT	ACTION
1.	General	The SO has no record of reviewing the draft document and does not have any comments to back check.	Noted.

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