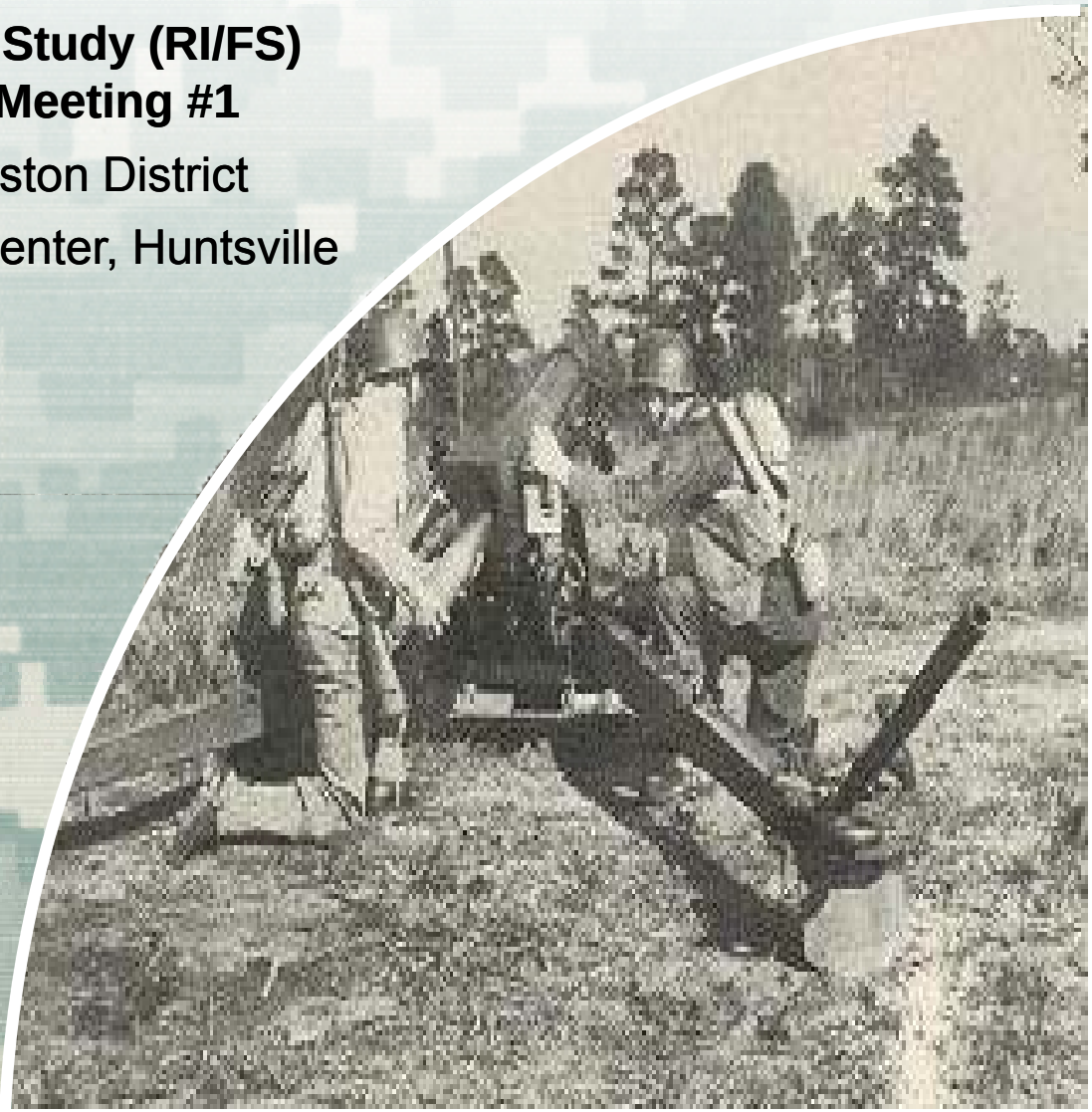
Former Camp Croft
Spartanburg, South Carolina

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
BUILDING STRONG®

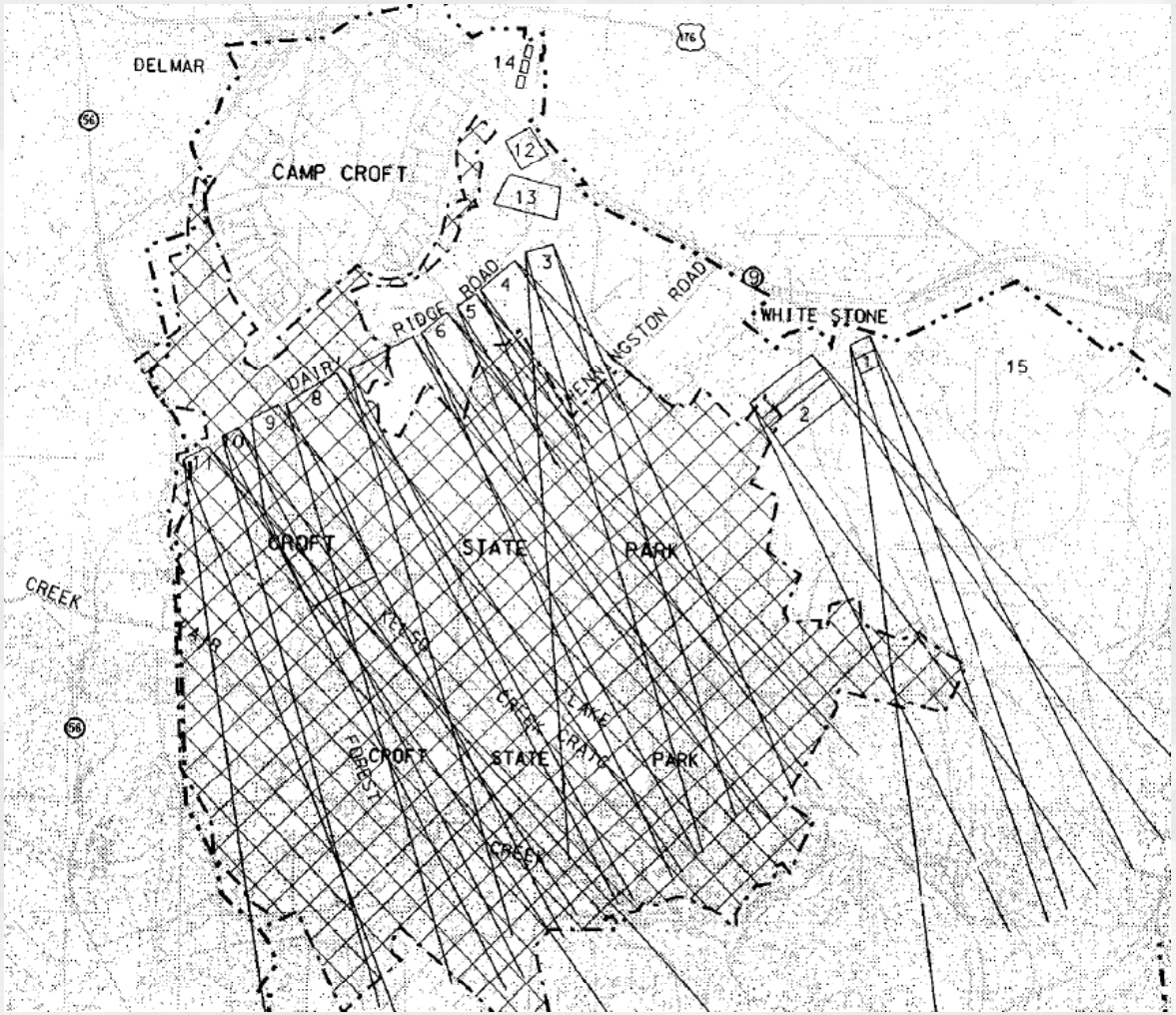
History

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

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*

Project Object

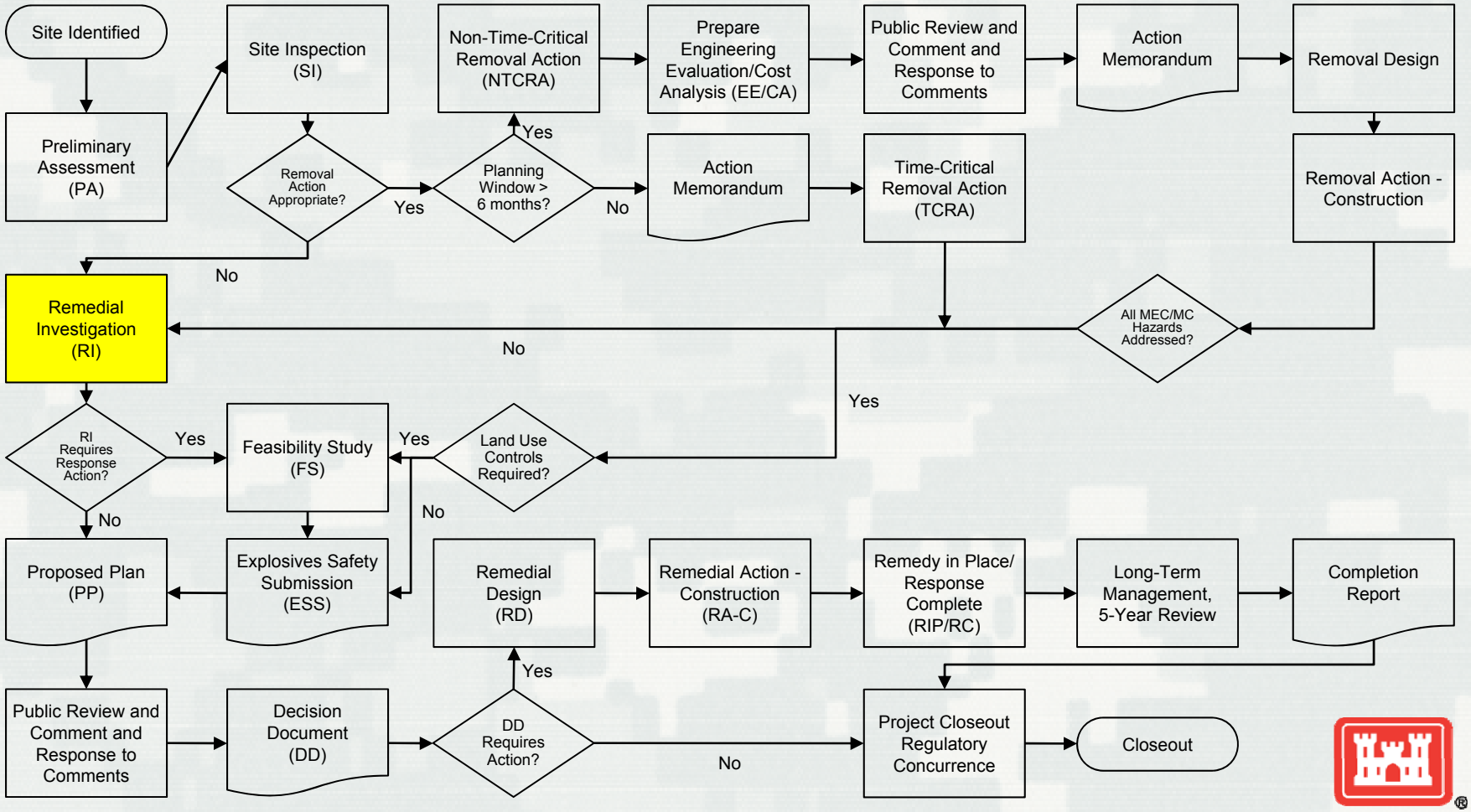
- Achieve acceptance of Decision Document (DD) at
  - Gas Chambers MRS,
  - Grenade Court MRS, and
  - Land Range Complex MRS by 31 January 2013.
- Achieve acceptance of DD in compliance with
  - factors listed in 40 Code of Federal Regulations (CFR) 300.430(d)(2),
  - the Comprehensive Environmental 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

Munitions Response Process Under CERCLA



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.

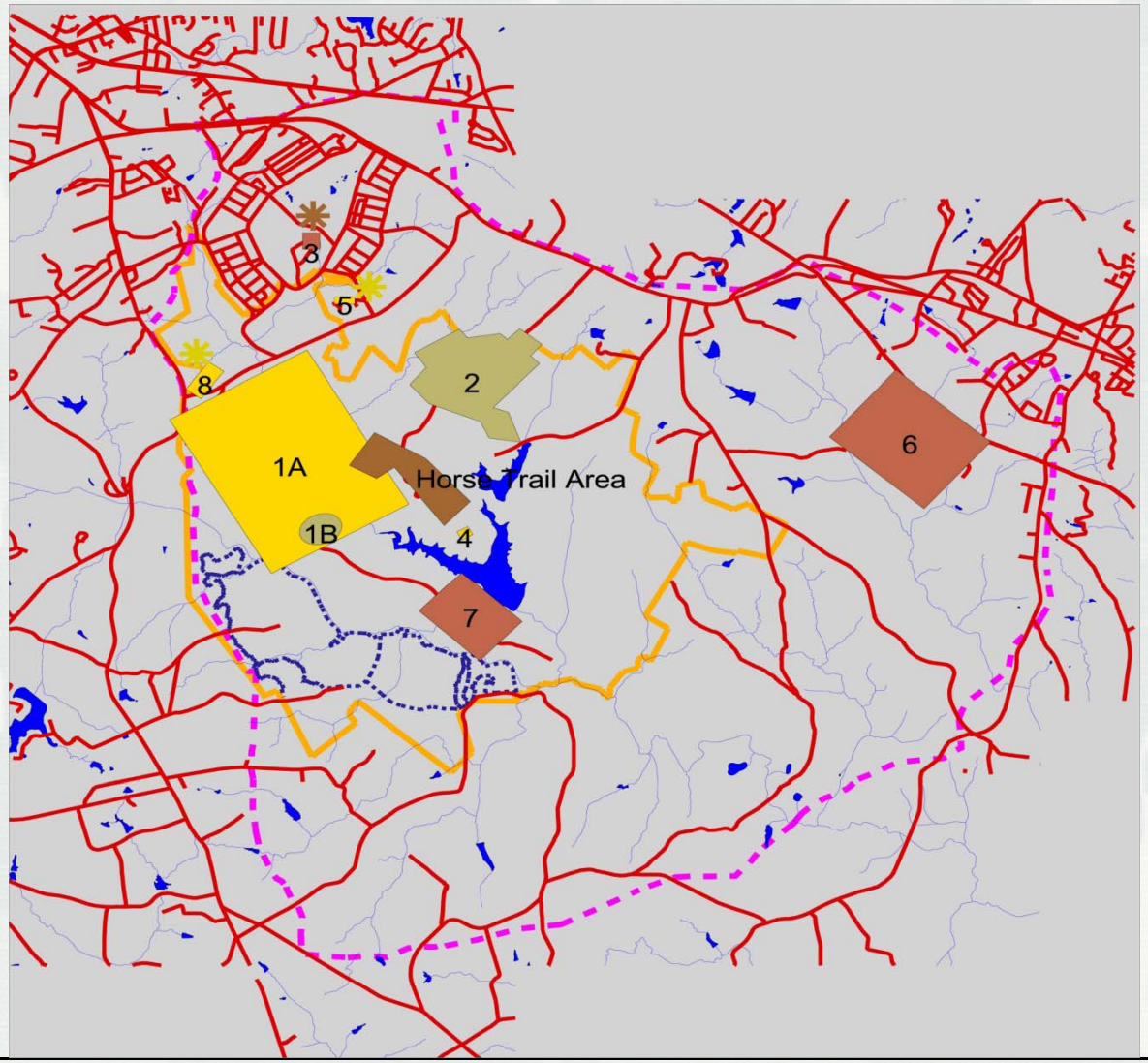
Phase I - January 1996
Action Memorandum dated February 1996
Phase II - January 1998
Action Memorandum dated March 1999

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

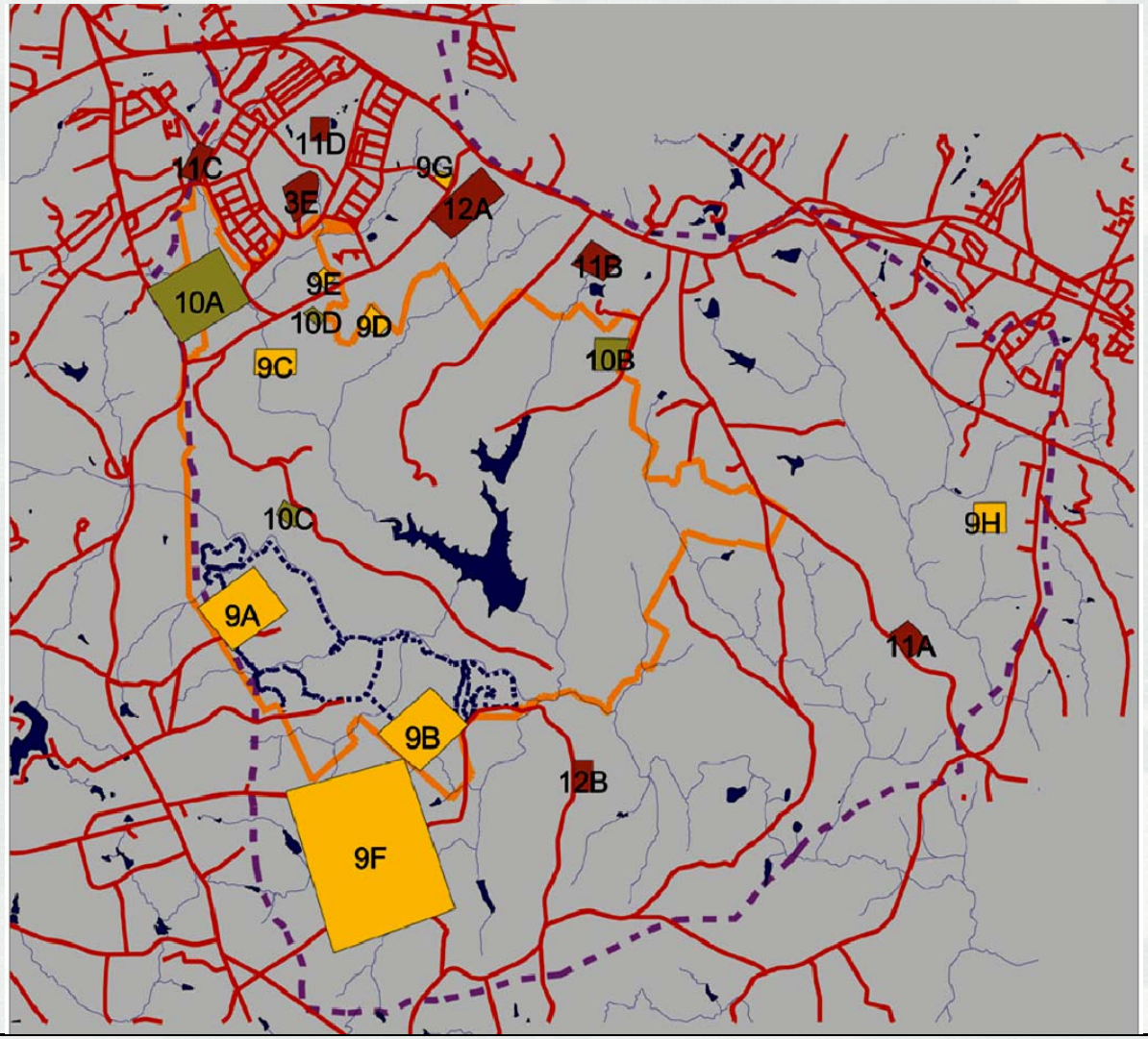
Croft OOU

- Clearance to Depth
- Surface Clearance
- No Further Action

Explanation

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

Phase II EE/CA



Risk Reduction Alternatives

Croft OOU

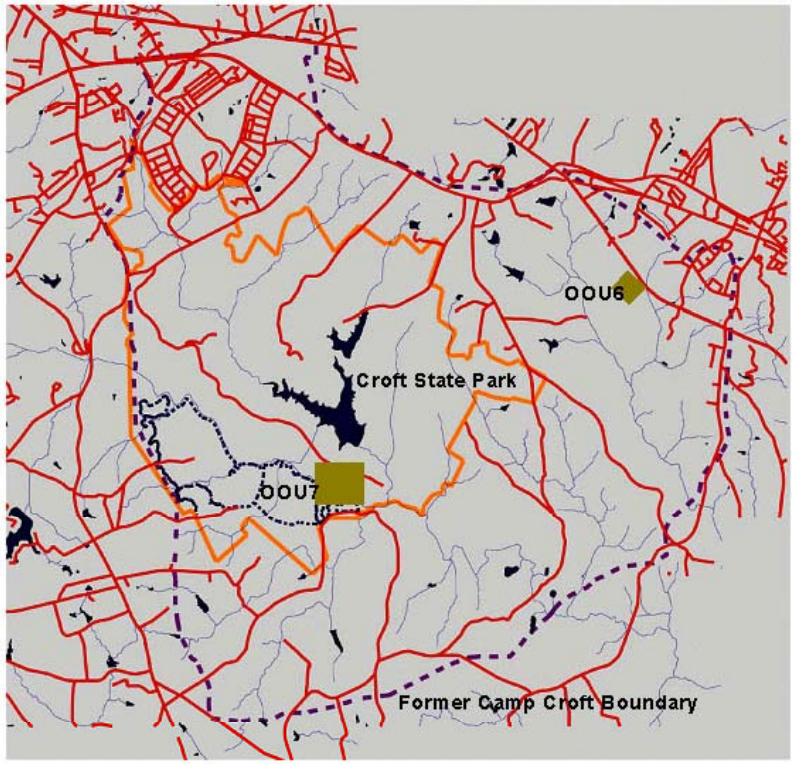
- Clearance to Depth
- Surface Clearance
- No Further Action

Explanation

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

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:

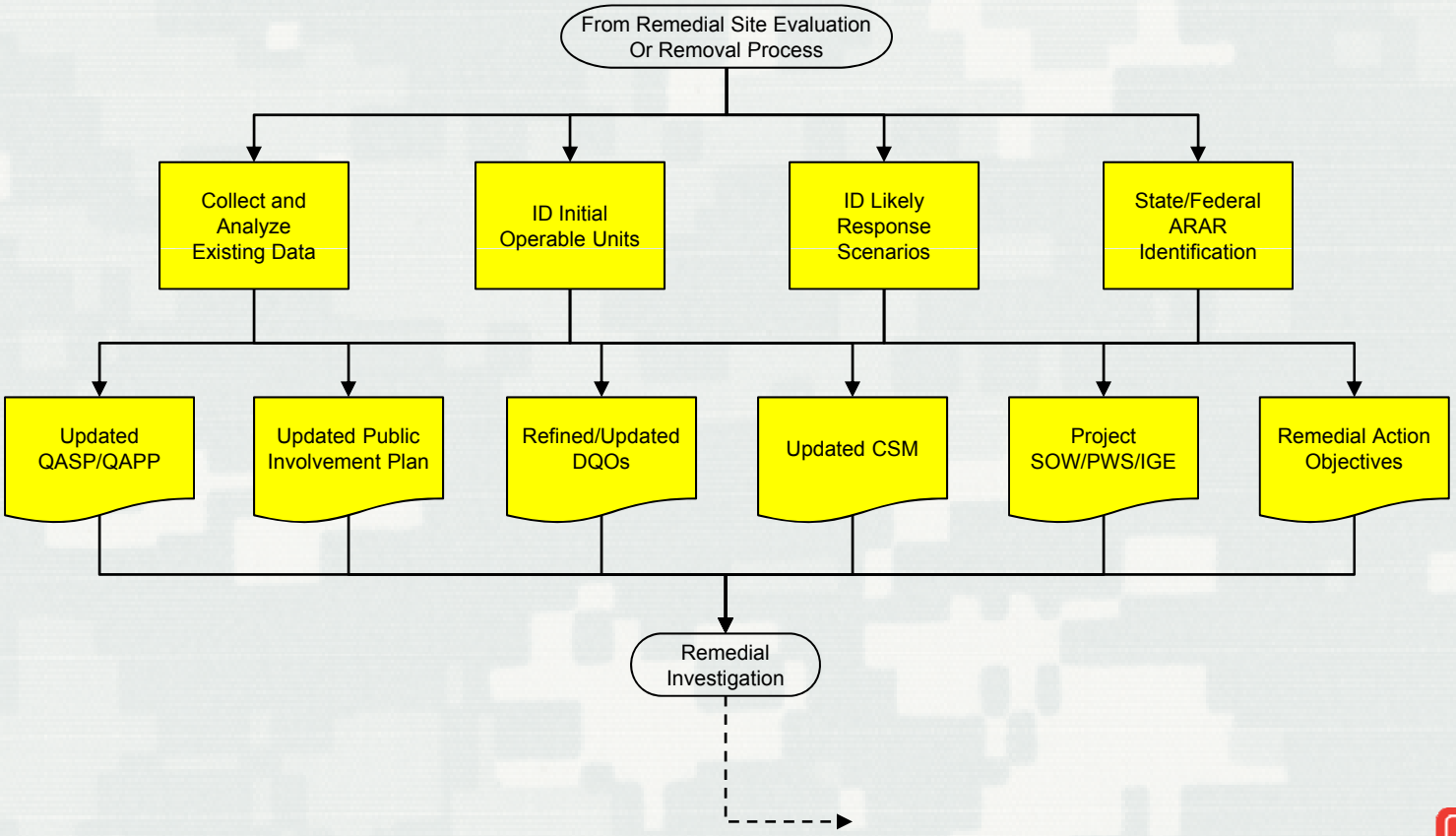
36 – 60mm mortar
1 – 155mm projectile w/ burster tube
3 – 2.36" rockets (expended)
1 – 105mm projectile
14,000 pounds scrap

Response Actions to Date

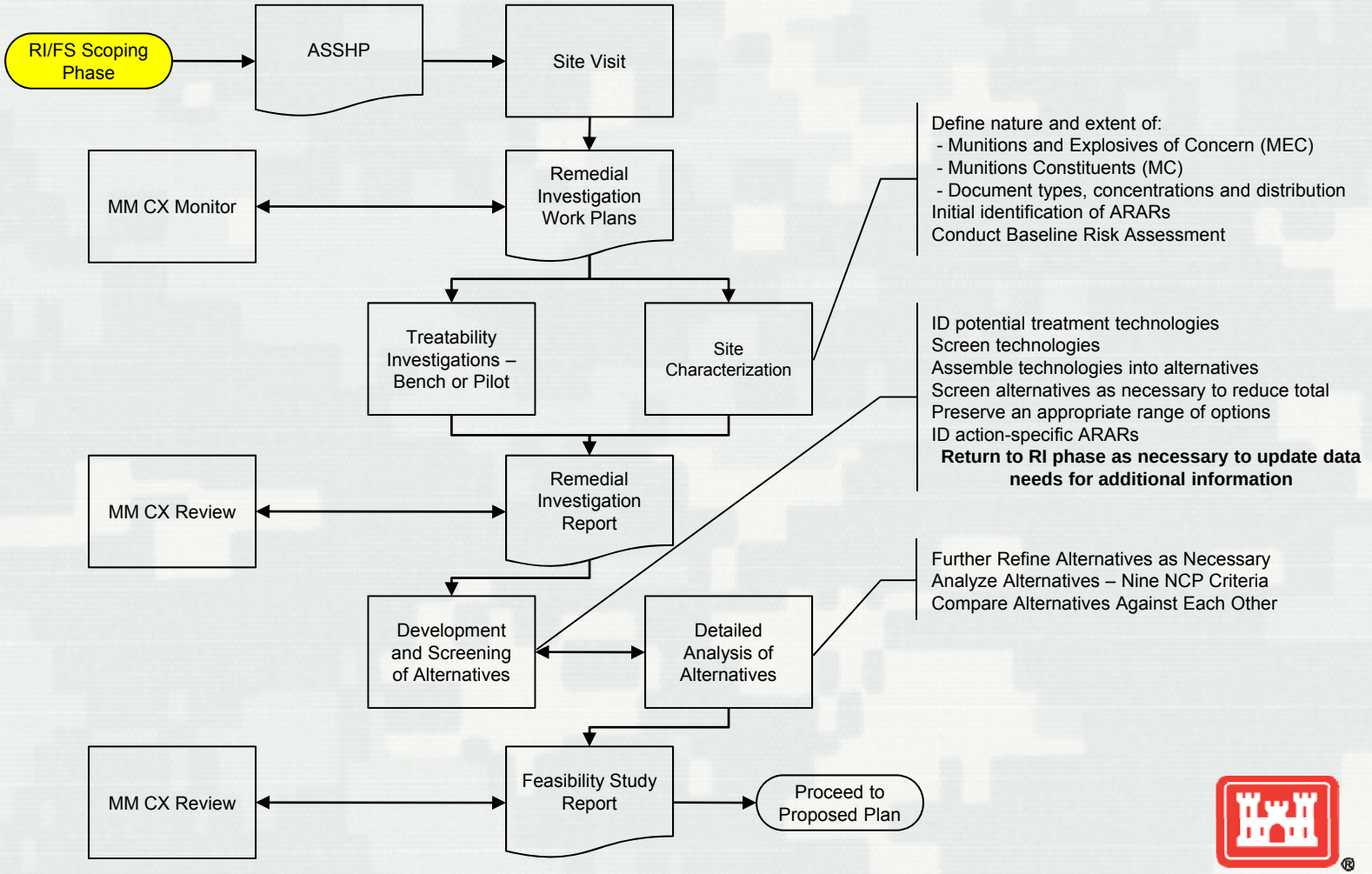
The following non-time critical removal actions have occurred:

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

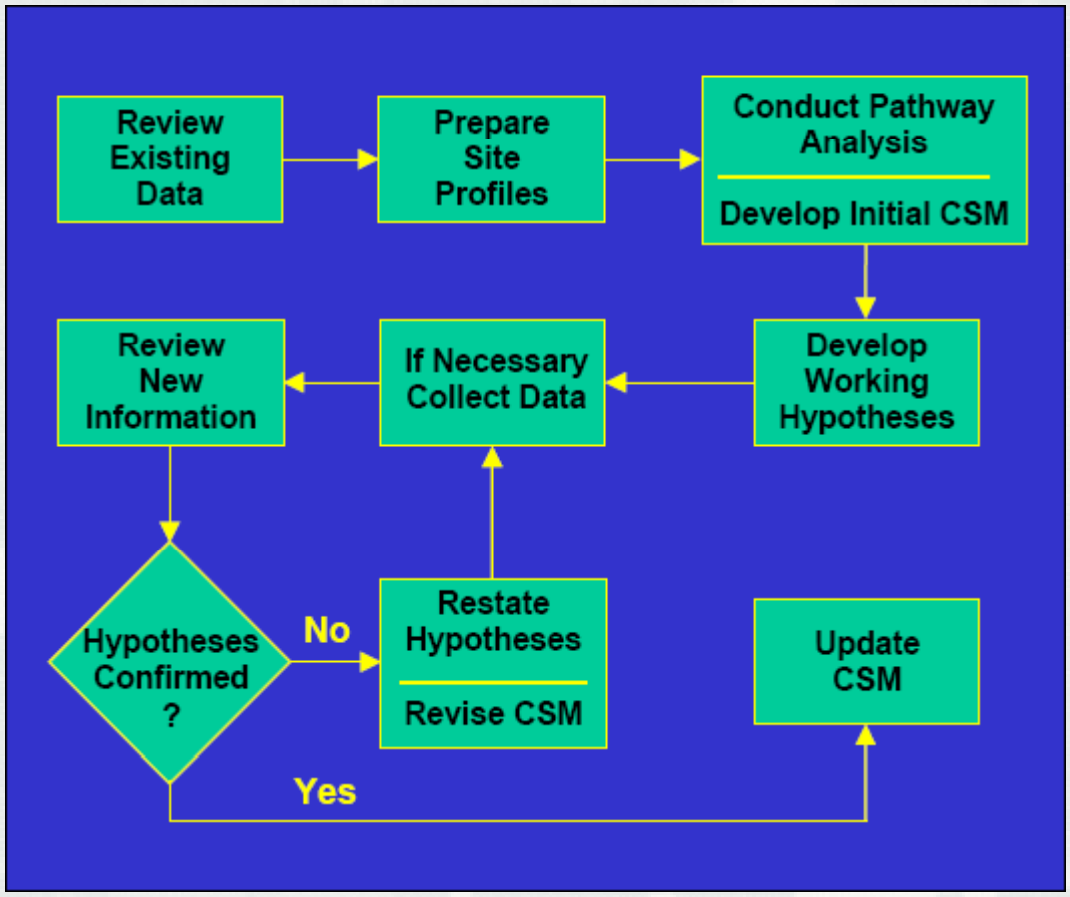
RI/FS Process



RI/FS Process (Con't.)



CSM Development Process



Ref.: EM 1110-1-1200

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

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

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)	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 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
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

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

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

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

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

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

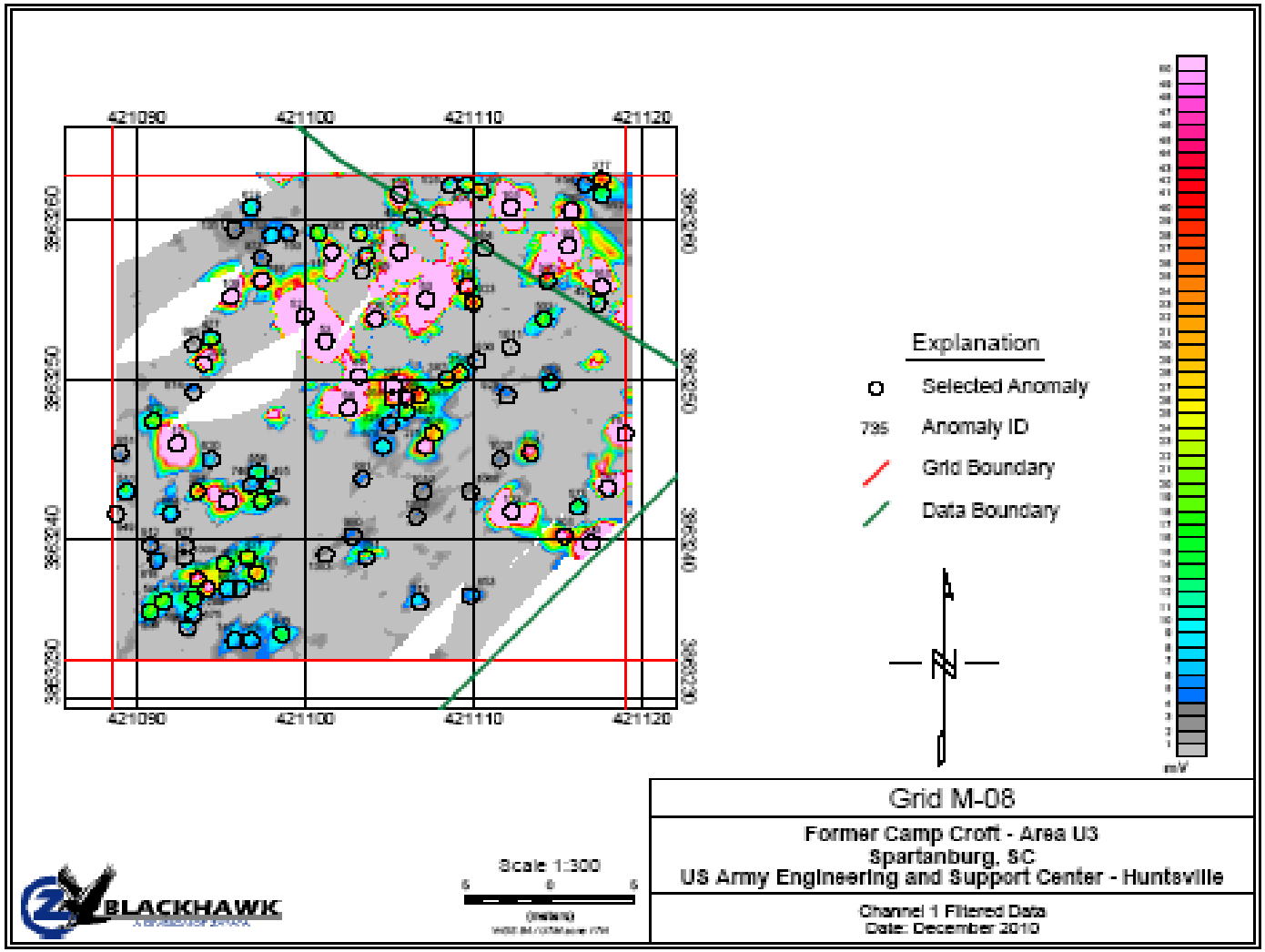
- Produces an audible signal to indicate subsurface metallic items

Data Collection

Digital Geophysical Mapping

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

Data Collection

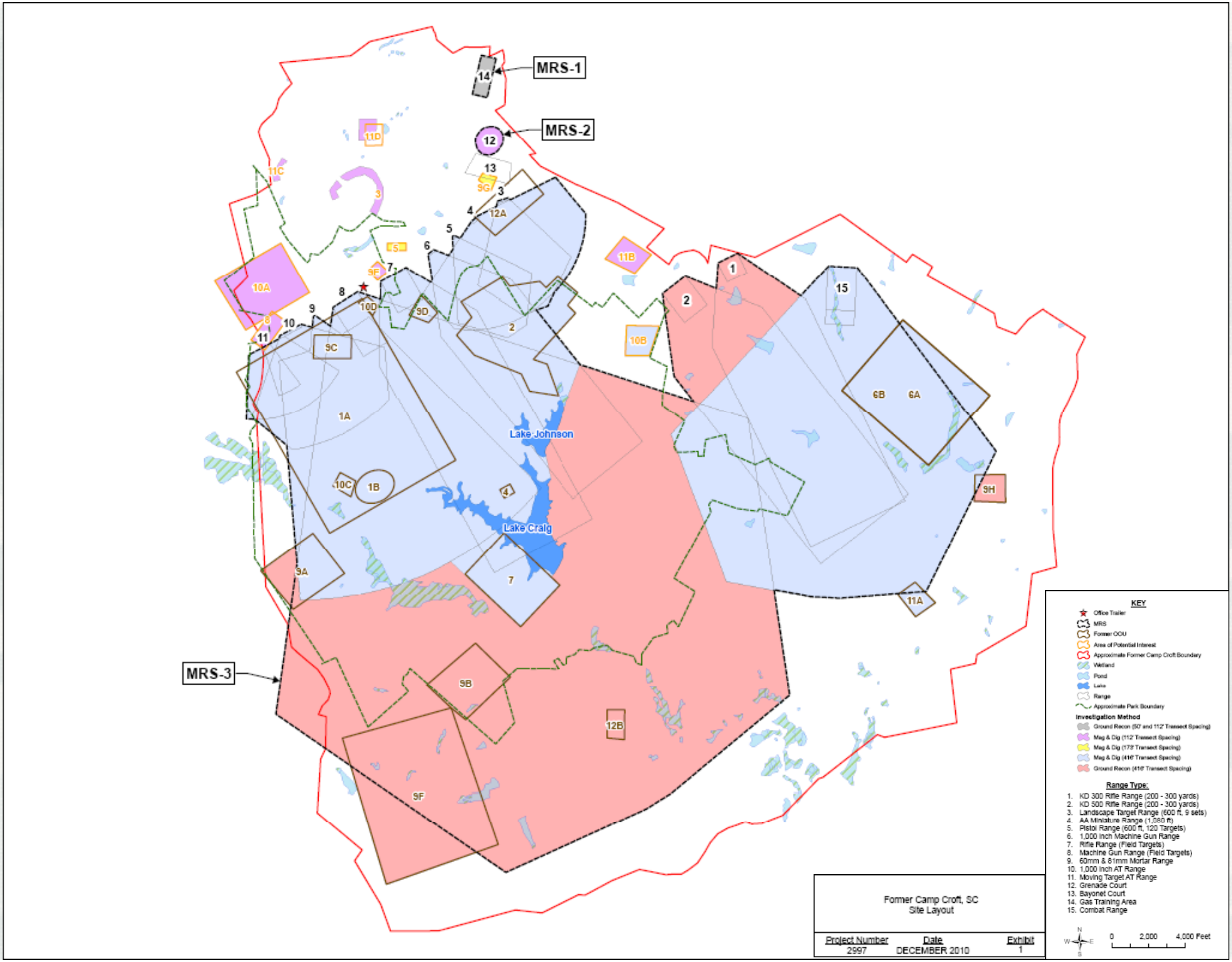


Data Collection

Anomalies selected for investigation/removal

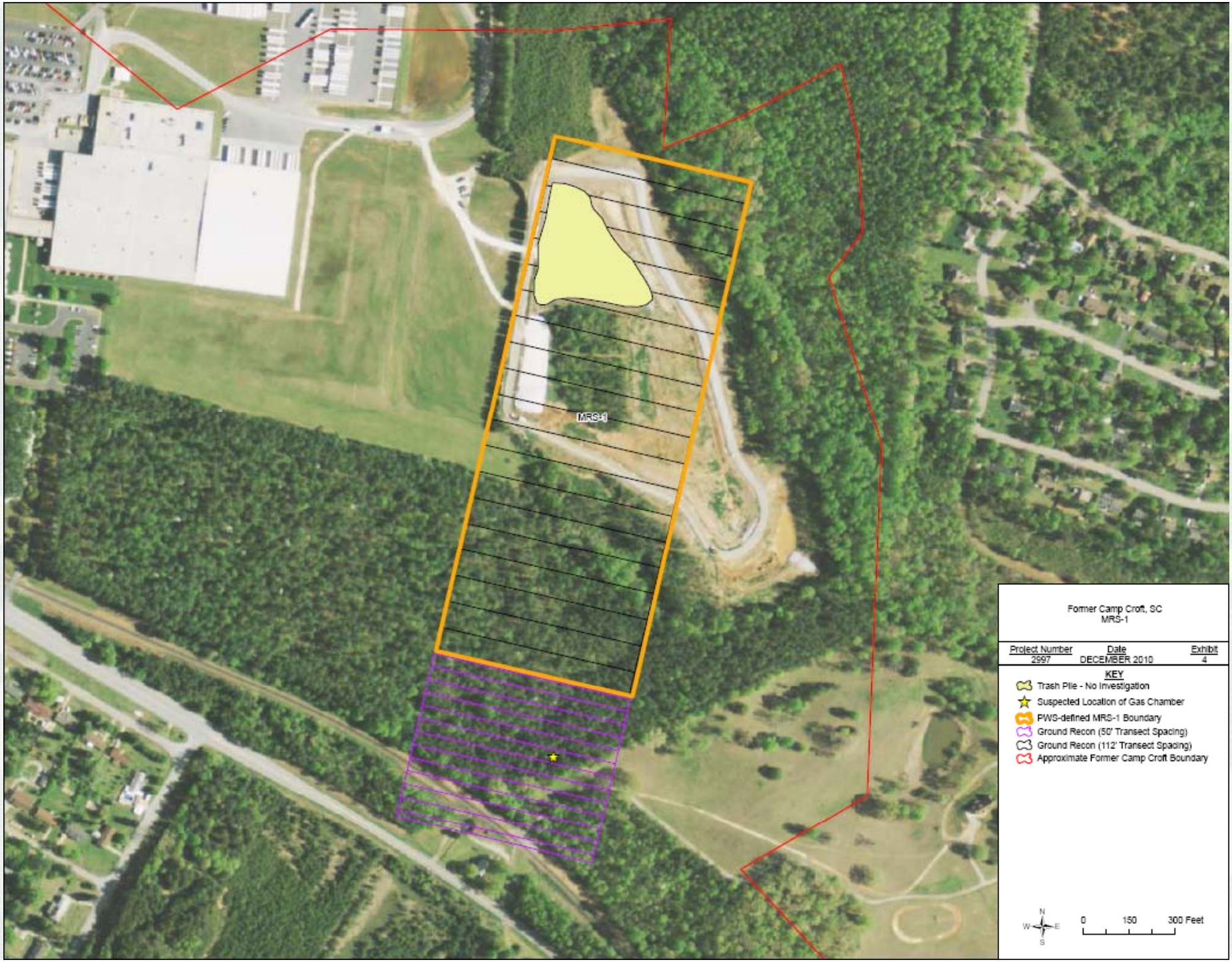
MC Sampling

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


MRS-1
MRS-2
MRS-3
Lake Johnson
Lake Craig
KEY
Office Trailer
MRS
Former OOU
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 (1,080 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

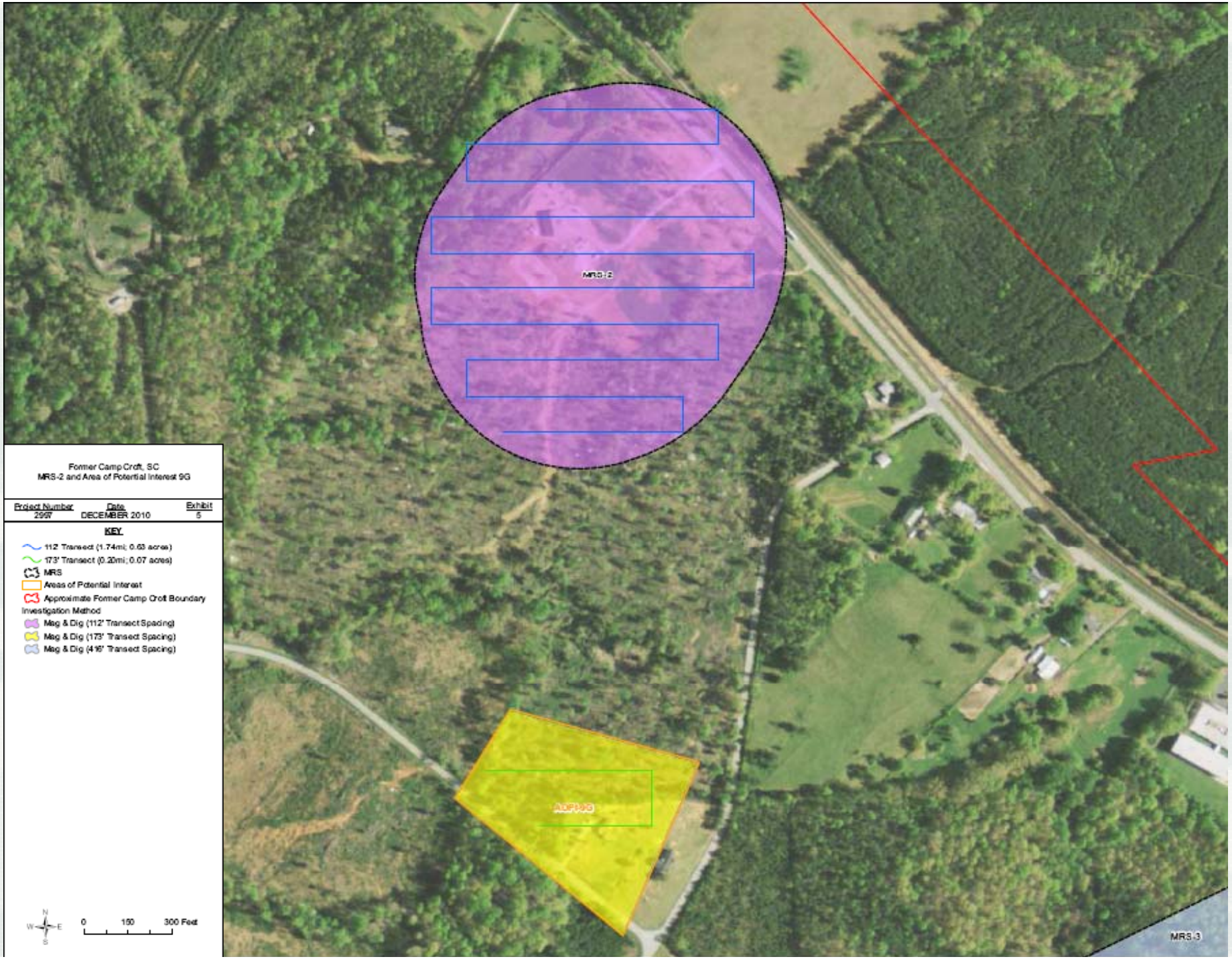
MRS 1

- 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

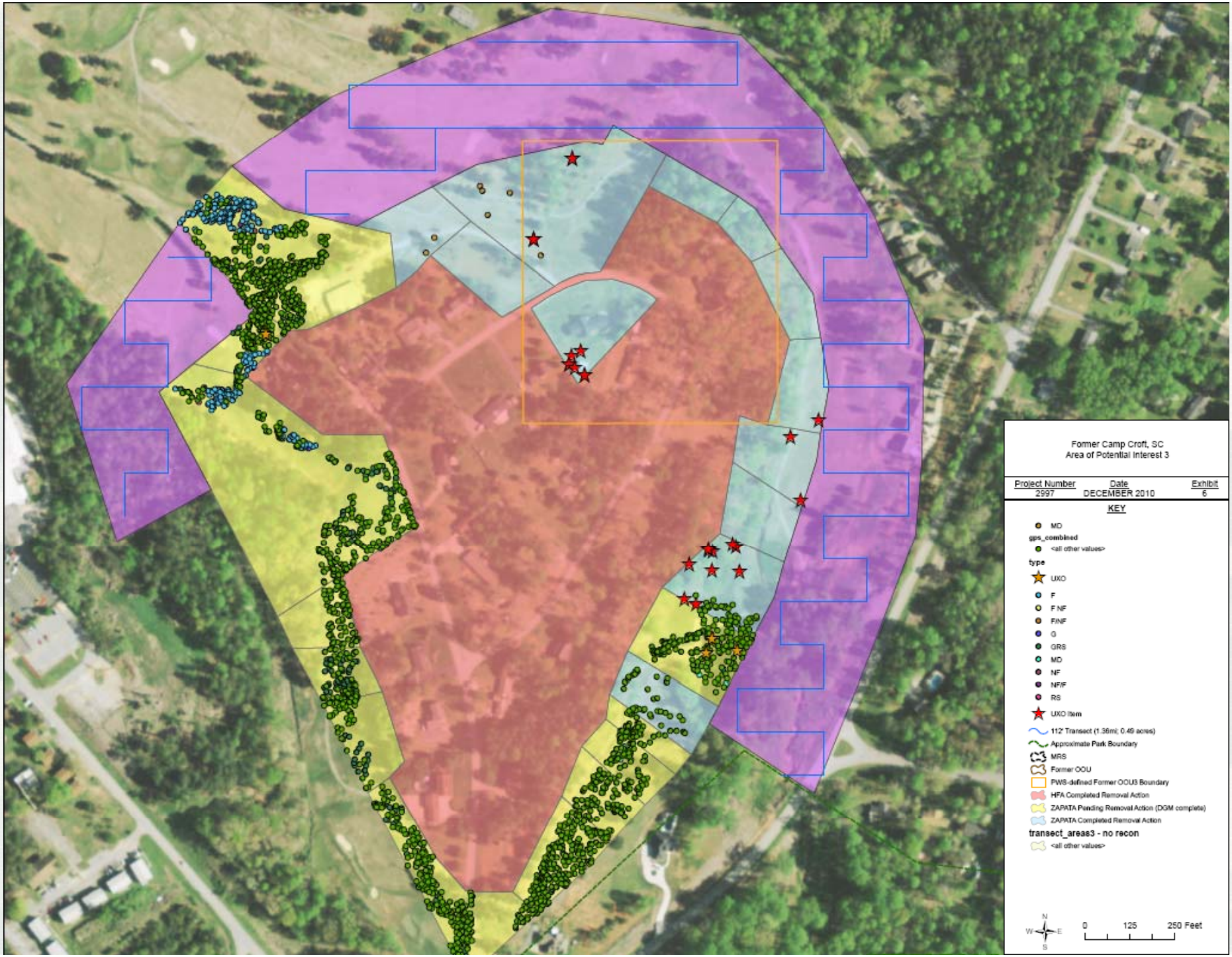
MRS 2 and AoPI 9G

- 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


MRS-2
ADPIA3
MRS-3
Former Camp Croft, SC
MRS-2 and Area of Potential Interest 9G
Project Number 299F
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

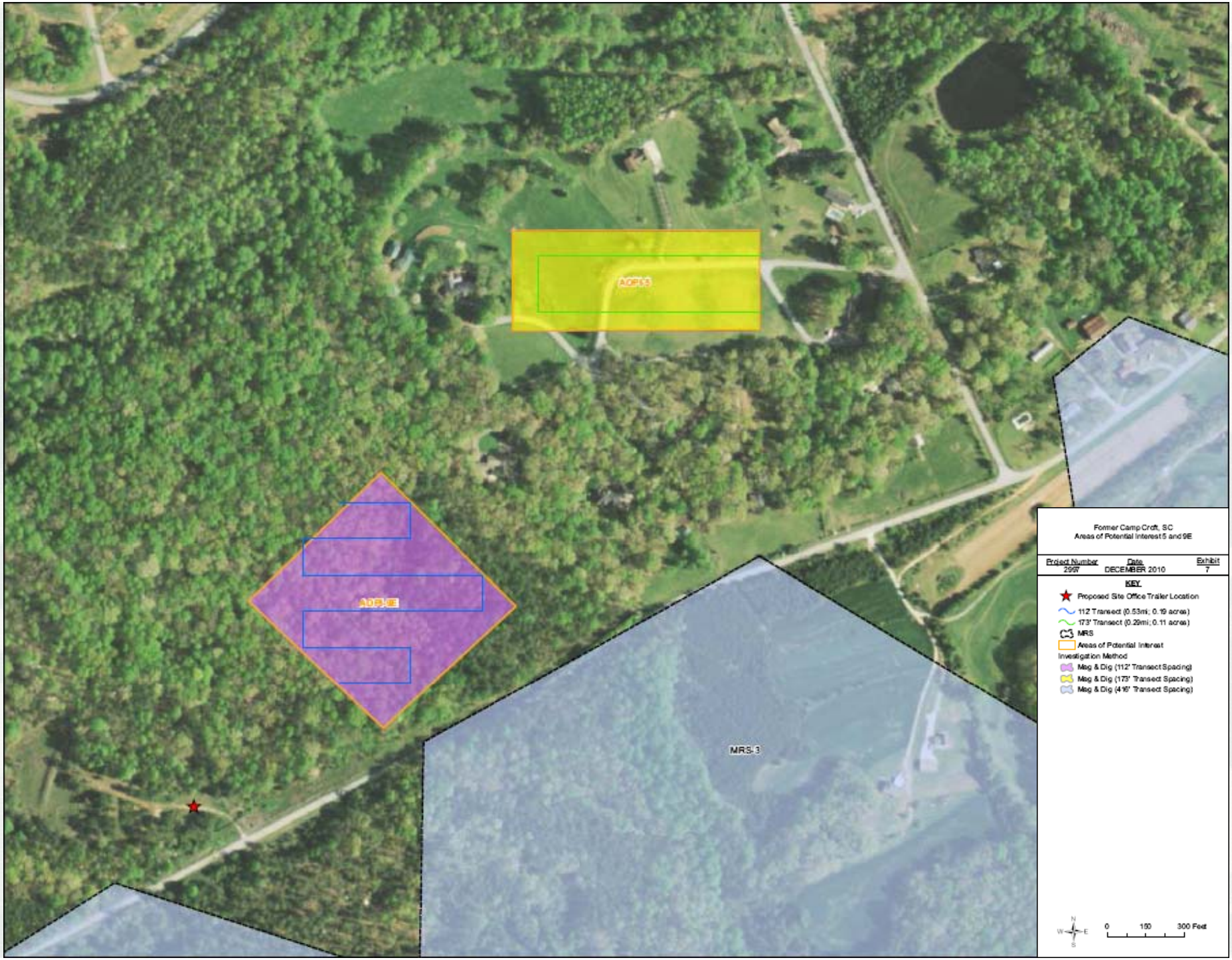
AoPI 3

- 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 OOU3 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


AOP5S
AOP9E
MRS-3
Former Camp Croft, SC
Areas of Potential Interest 5 and 9E
Project Number
299F
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

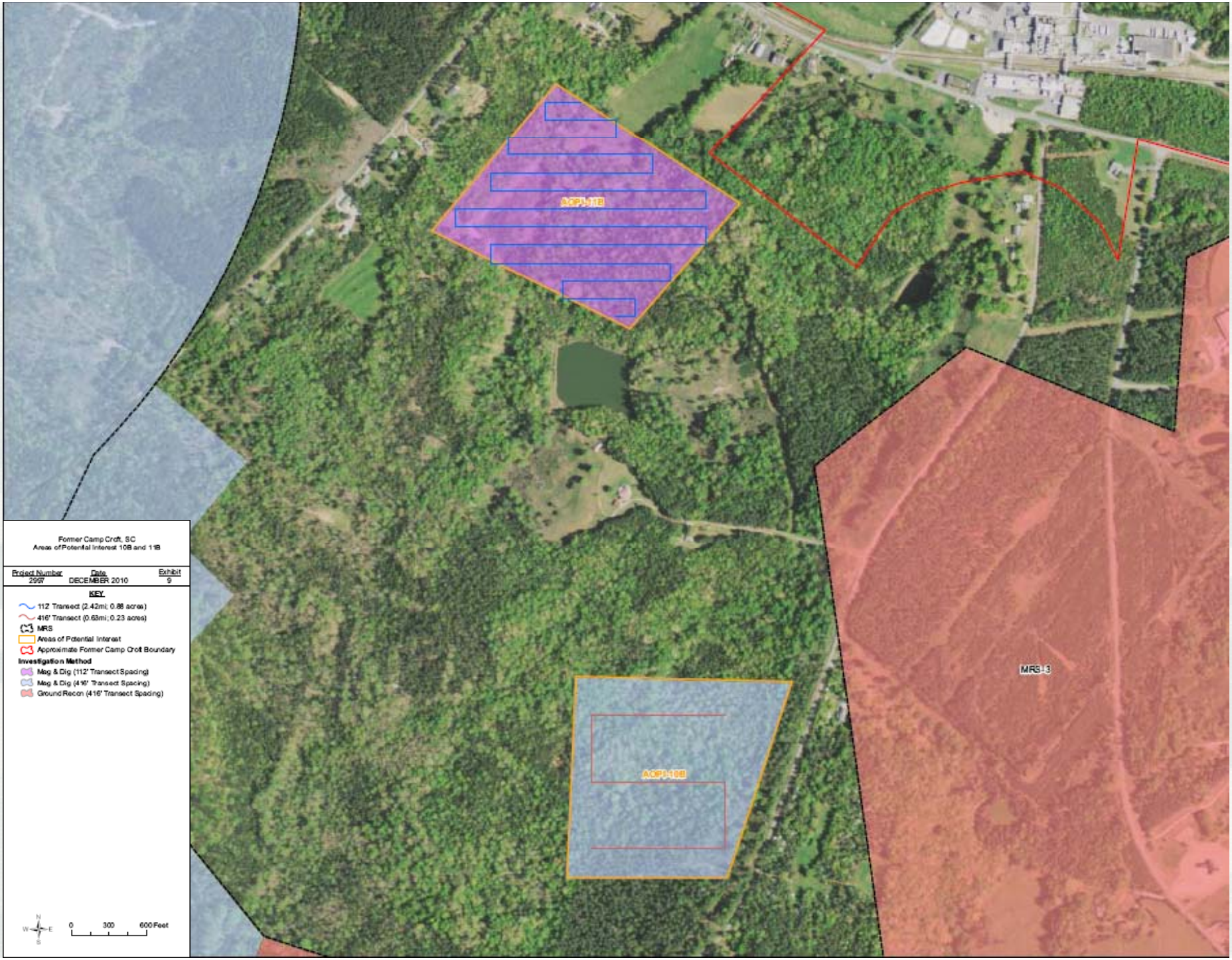
AoPI 8 and 10A

- 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


AOP-10A
AOP-8
MRS-3
Former Camp Croft, SC
Areas of Potential Interest 8 and 10A
Project Number
299F
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

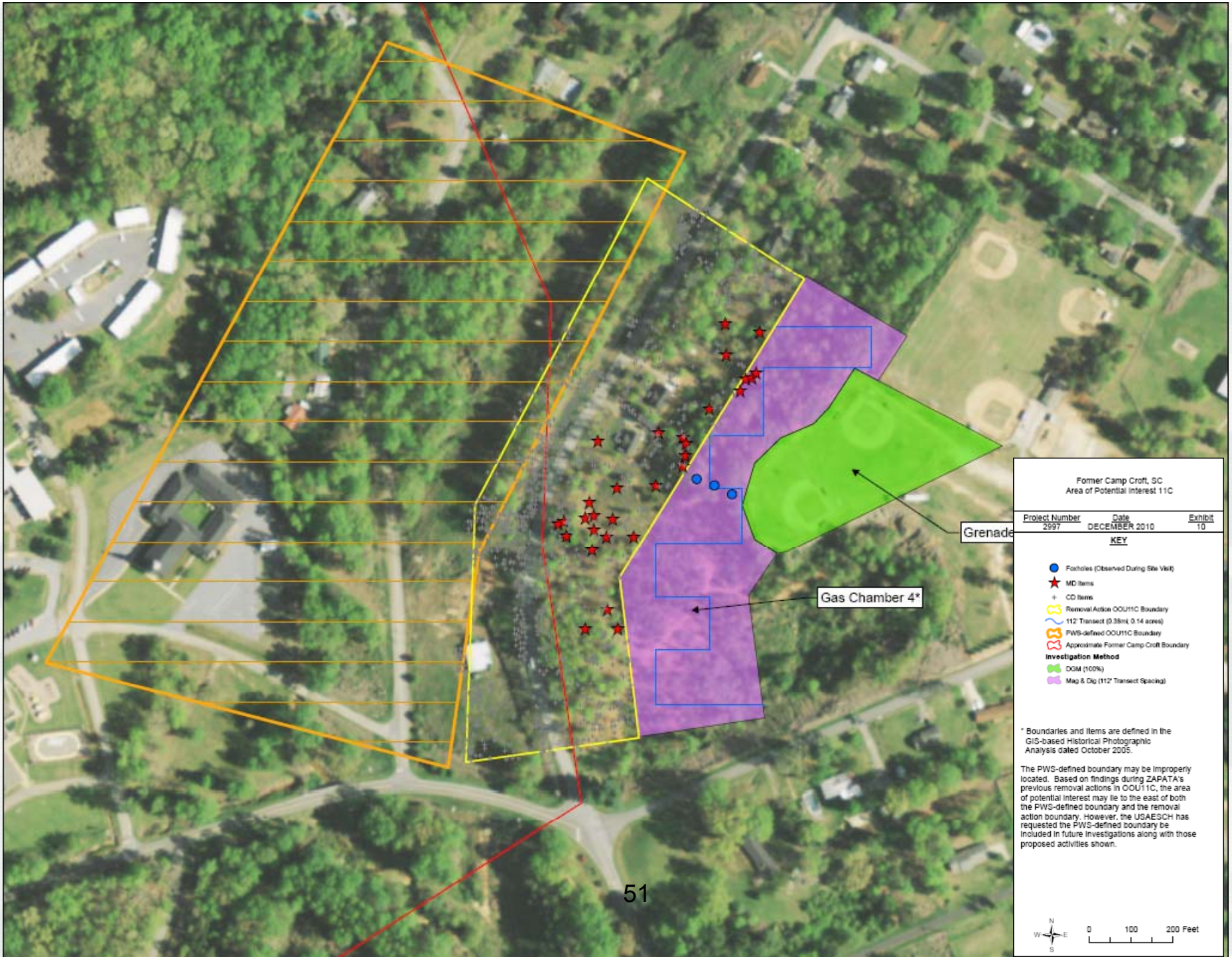
AoPI 10B and 11B

- 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 299F
Date DECEMBER 2010
Exhibit 9
KEY
112' Transect (2.42mi; 0.88 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

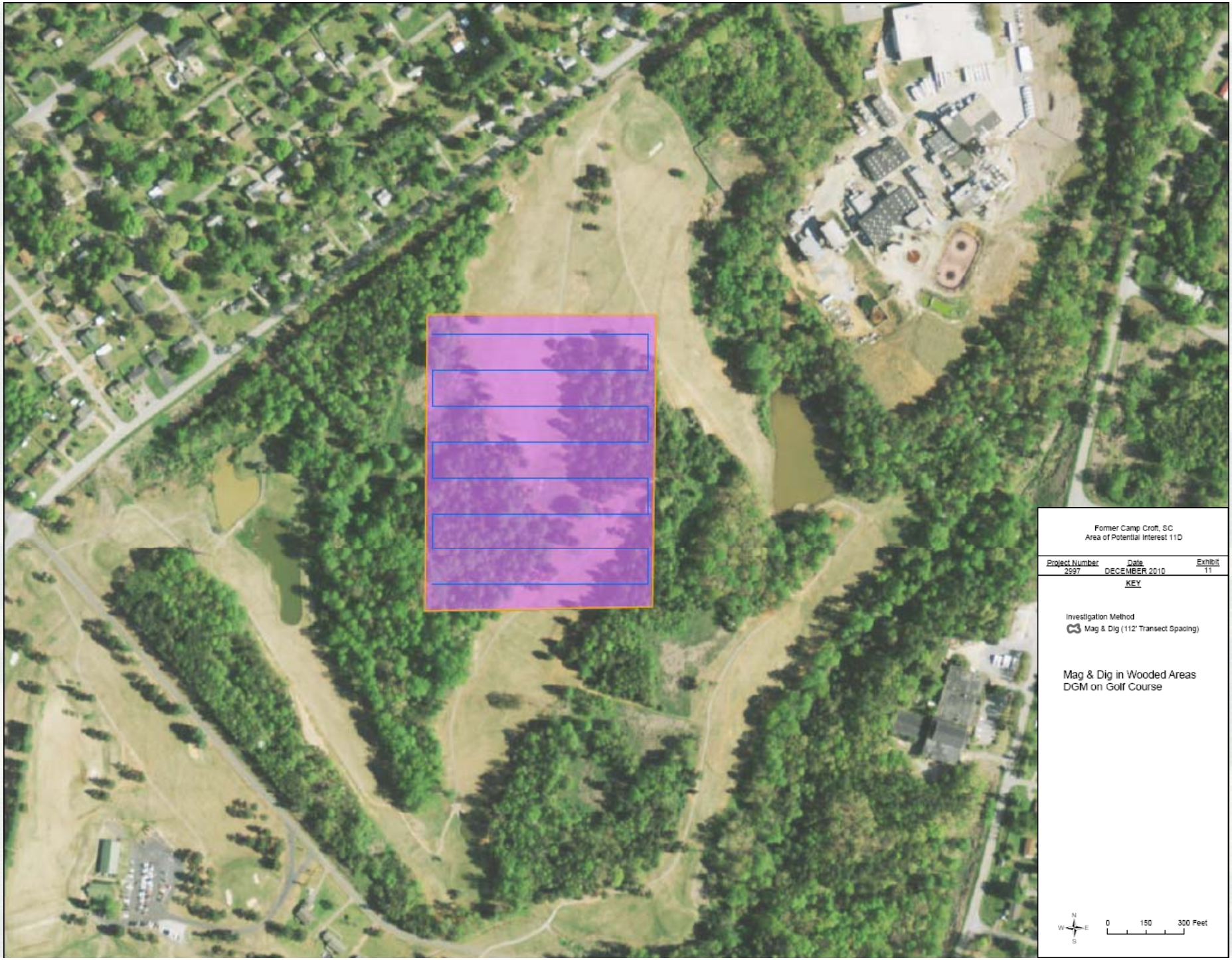
AoPI 11C

- 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

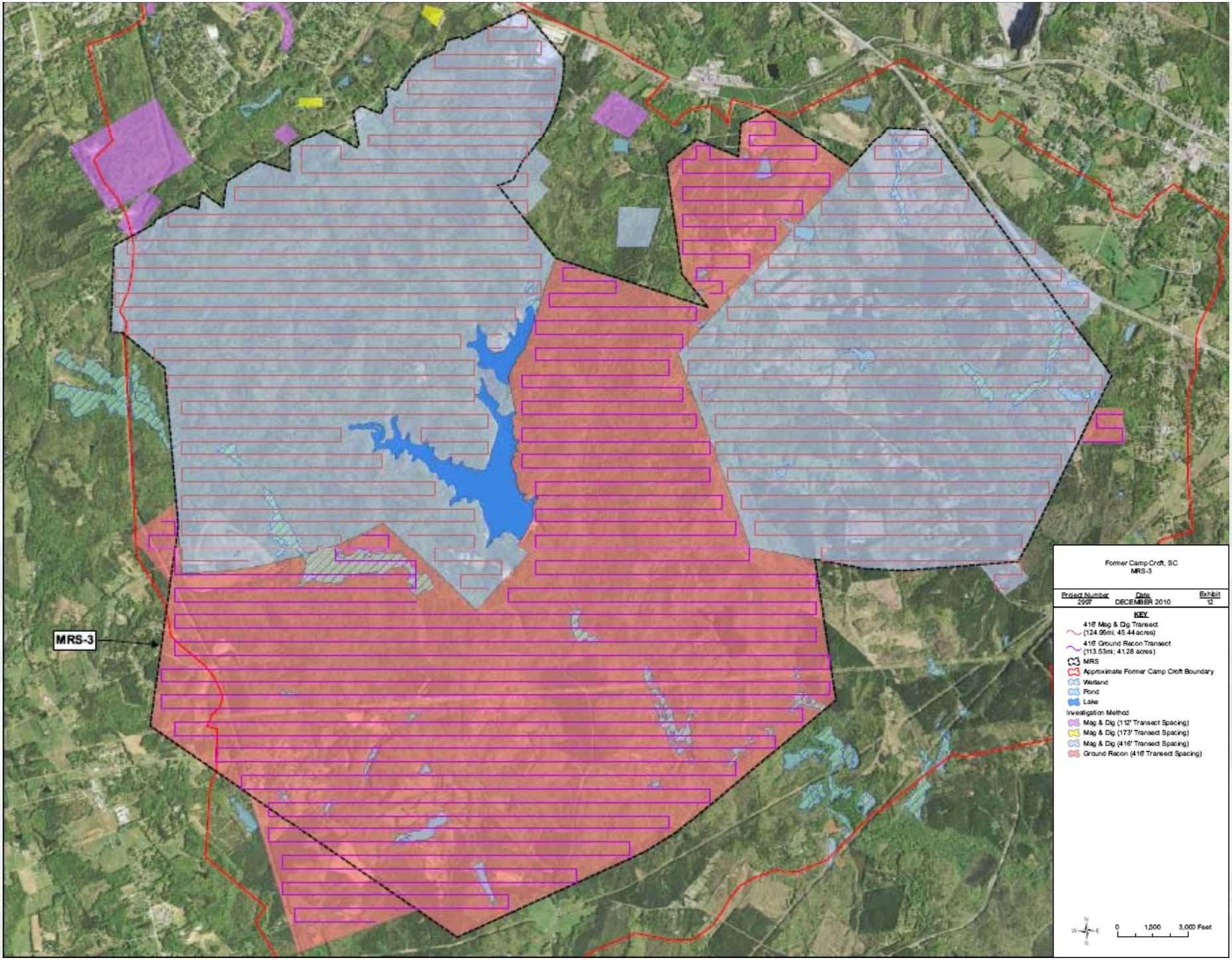
AoPI 11D

- 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

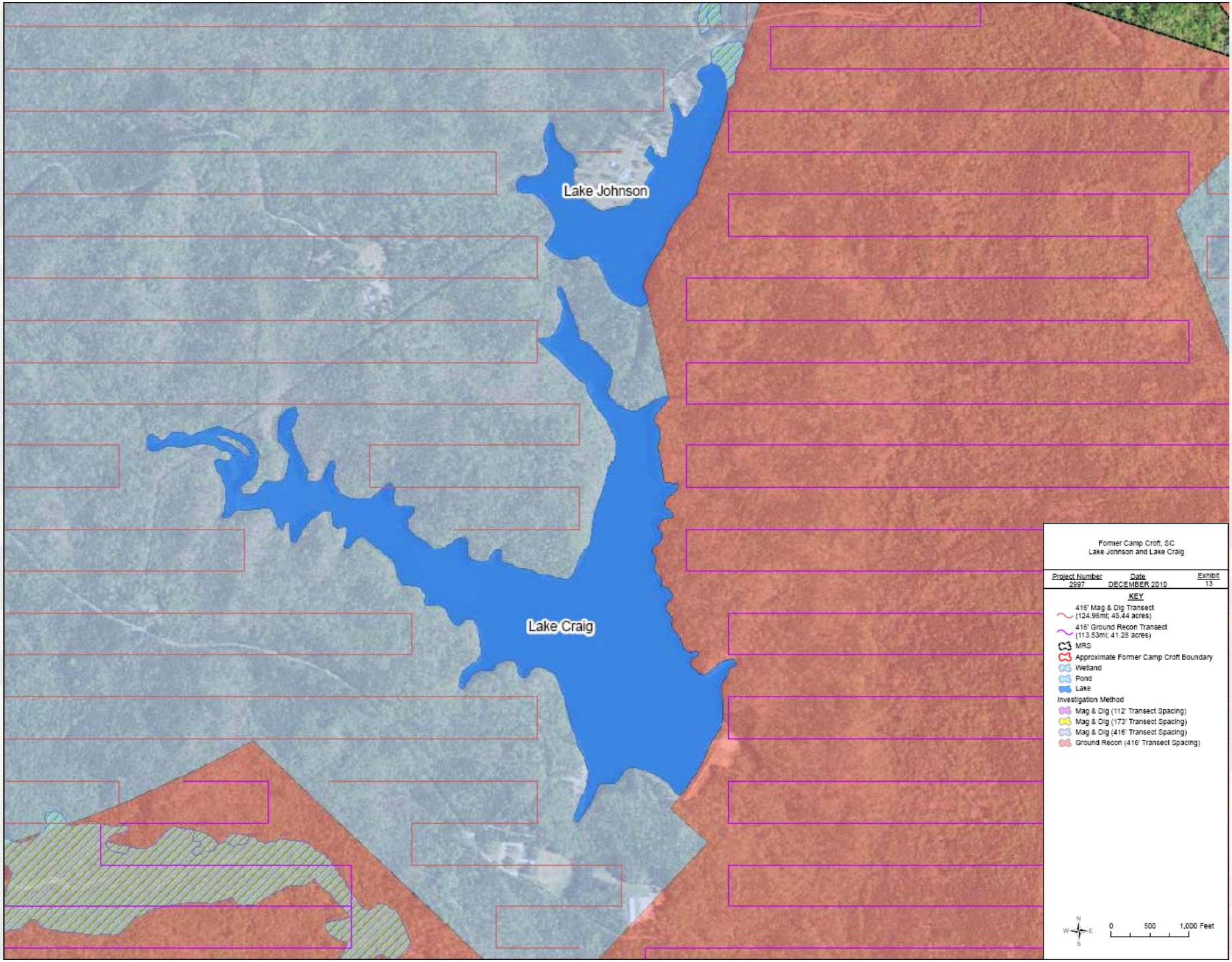
MRS 3

- 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


MRS-3
Former Camp Croft, SC
MRS-3
Project Number
299F
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