

6.0 SITE CHARACTERIZATION PLANNING AND OPERATIONS

This information is discussed in Section 5.5 of the General Site Wide Work Plan.

6.1 Site Characterization Goals

The goal of the site characterization effort is to obtain sufficient geophysical and intrusive data to characterize the Bravo Area of Fort McClellan with regard to the location, extent, amount, and types of UXO/OE present at the site. This characterization must provide sufficient quantity and quality of data to perform a risk assessment, response alternative evaluation, and to develop cost estimates for response alternatives that can be feasibly implemented at this site.

6.2 Site Characterization Procedural Overview

Chapter 4.0 of this document details the approach to be taken during the EE/CA activities. The procedures that Foster Wheeler Environmental will follow in performing the individual work elements are described in Chapters 6.6, 6.7, and 7 of this Work Plan.

6.3 OE SAMPLING LOCATIONS

As described in Chapter 2.5 of this document, OE sampling sectors were defined at Fort McClellan based on historical information and site reconnaissance. This process is described in detail in *Reconnaissance Findings, Conceptual Plan, and Proposed Scope of Work*, prepared by Foster Wheeler Environmental and included as Appendix C in this document. A statistical analysis was performed to determine the sampling acreage necessary to characterize each sector, and the number of sampling grids and miles of transects necessary to obtain sufficient data was determined. The sampling quantity was based on performing enough investigation to be able to show that a relatively low OE/UXO density (i.e., 0.1 acre) is or is not present with relatively high confidence (i.e., 90 %). One-half acre of data will be collected within each one-acre sampling grid, and ¼ acre of data will be collected within each ½ acre-sampling grid, the oversized grid methodology is discussed in detail in Chapter 6.6.2.2.1 of this Report. During transects, a 1 meter swath of data will be collected along the length of the path walked.

6.3.1 For the Bravo Area, the total sampling area, as well as the number of grids and transects required for each sampling sector, is as follows:

Sector	Sampling Areas	½ Acre Grids	¼ Acre Grid	Data Transect Acres	Mtn. Transect Acres	Delineation Transects
M3-1L	43	79		3.5	7.5	
M3-1M	22.5	4		20.5		
M3-2M	21.5	25		9.0		
M3-1H	2.5		10			2.8
M3-2H	2.5		10			4.8
M3-3H	2.5		10			2.0
M4-1L	20	40				
M4-1M	22.5	45				
M4-1H	3.5		14			4.48
M4-2H	3.0		12			3.92
Totals (Acres)	(*143.5 acres)	193 grids (96.5 acres)	56 grids (14 acres)	(33 acres)	(7.5)	(18 acres)

* Not including mountain transects and delineation transects.

6.3.2 Within each sector 80% of the grid locations were chosen at random and 20 per cent of the grid locations were chosen at the discretion of Foster Wheeler Environmental. The discretionary grids were located to clarify or confirm the findings of prior reconnaissance work or indications of possible OE related activity from the historical record. Transects were located to provide wide coverage of the sampling sectors while avoiding areas that are too steep for data collection activities. Figures 6-1 through 6-10 show the locations of sampling grids and transects to be utilized in the ten sectors contained within the Bravo Area.

6.3.3 The selection of random grids used for EE/CA sampling was completed with the use of a random number generator and GIS tools. First, a controlled number of locations were derived through the establishment of a uniform network of one-acre grids. Each of the grids was then assigned an identification number and tagged. Externally generated random numbers were then used to select the required number of random grids. From the random samples, a center point has been established from which coordinates have been generated which will be used for surveying in the sampling grid locations. Randomly selected grids that fell partially outside of the sampling sector were shifted the minimum distance necessary to bring them within the sector boundary.

6.3.4 The 20% of grid locations chosen by Foster Wheeler Environmental were positioned with bias based on the criteria listed here. Grids were placed: 1) In areas where ordnance were found during field reconnaissance; 2) In areas where known range fans or suspect training areas were historically located; 3) Along topographic features which may have served as a backstop for firing of artillery; 4) In areas along sector boundaries to determine if those boundaries between probable areas of differing OE density are appropriately located, and; 5) To fill in larger gaps in coverage where no randomly selected grids happened to fall.

6.3.5 The actual final grid locations and orientations will differ slightly from those depicted in this Work Plan. The final grid location and orientation will be determined at the time the grids are surveyed in the field by a UXO Technician III familiar with the Ultrasonic Ranging and Data System (USRADS) operation. Grids will be positioned around the center points of the locations depicted in Figures 6-1 through 6-10, but grid boundaries will be adjusted slightly to encompass the areas of least vegetative cover in order to minimize the brush cutting required prior to data collection in a given grid.

6.3.6 The actual final transect locations walked will be chosen based on field conditions and topographic features encountered in the field during data collection. In general, straight line transects will be walked along delineation transect routes, ribbon-walk (data collection) transects will be walked using switch-backs in more steeply sloped areas, but less than 40 degrees, and the mountain transects will generally be walked along contours in areas steeper than 40 degrees. Figures 6-1 through 6-10 show areas to be covered by transects.

6.3.7 These three types of transects are shown in the table located in 6.3.1, and their locations are indicated on sampling sector figures. If additional suspected high OE density areas are discovered during data collection activities, additional delineation transects may be recommended. A map showing the proposed locations of additional transects will be provided to CEHNC, and will be subject to approval by CEHNC. Transects are further discussed in Chapter 6.6.2.1.

6.4 OE Sampling Procedures

Descriptions of the procedures used during the intrusive sampling activities in the Bravo Area are presented in Chapter 7.1.2 of this Work Plan.

6.5 Surveying and Site Lay Out and Control

6.5.1 Surveying and navigational control are discussed in Sections 5 and 7 of the General Site Wide Work Plan.

6.5.2 Using the method described in Chapter 6.2.2 and 6.2.3 of this plan, a listing of the coordinates for grid location points ('center points') will be generated and provided to the surveyors. The surveyors will mobilize to the field, accompanied by a UXO Technician III familiar with USRADS operation, to begin placement of grids. Once the location point for a given grid has been marked in the field, the UXO Technician III will assess the vegetation within an approximate 200-foot radius around that point to determine the area with the least ground vegetation. The UXO Technician III will then direct the surveyors to place the four grid corner points, defining a one-acre or one half-acre grid which encompasses both the original grid location point and the area of least vegetation in the vicinity of the point.

6.5.3 Descriptions of Site Access and Control, the Field Office/Command Post, Traffic Control/Parking, and Communications have been provided in Chapter 3.11 of this document.

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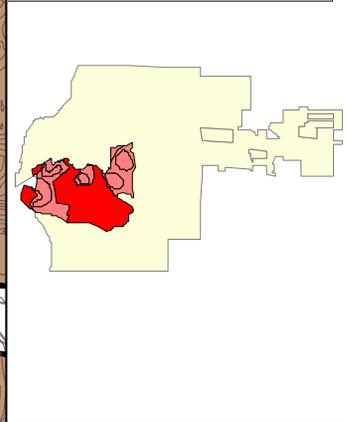
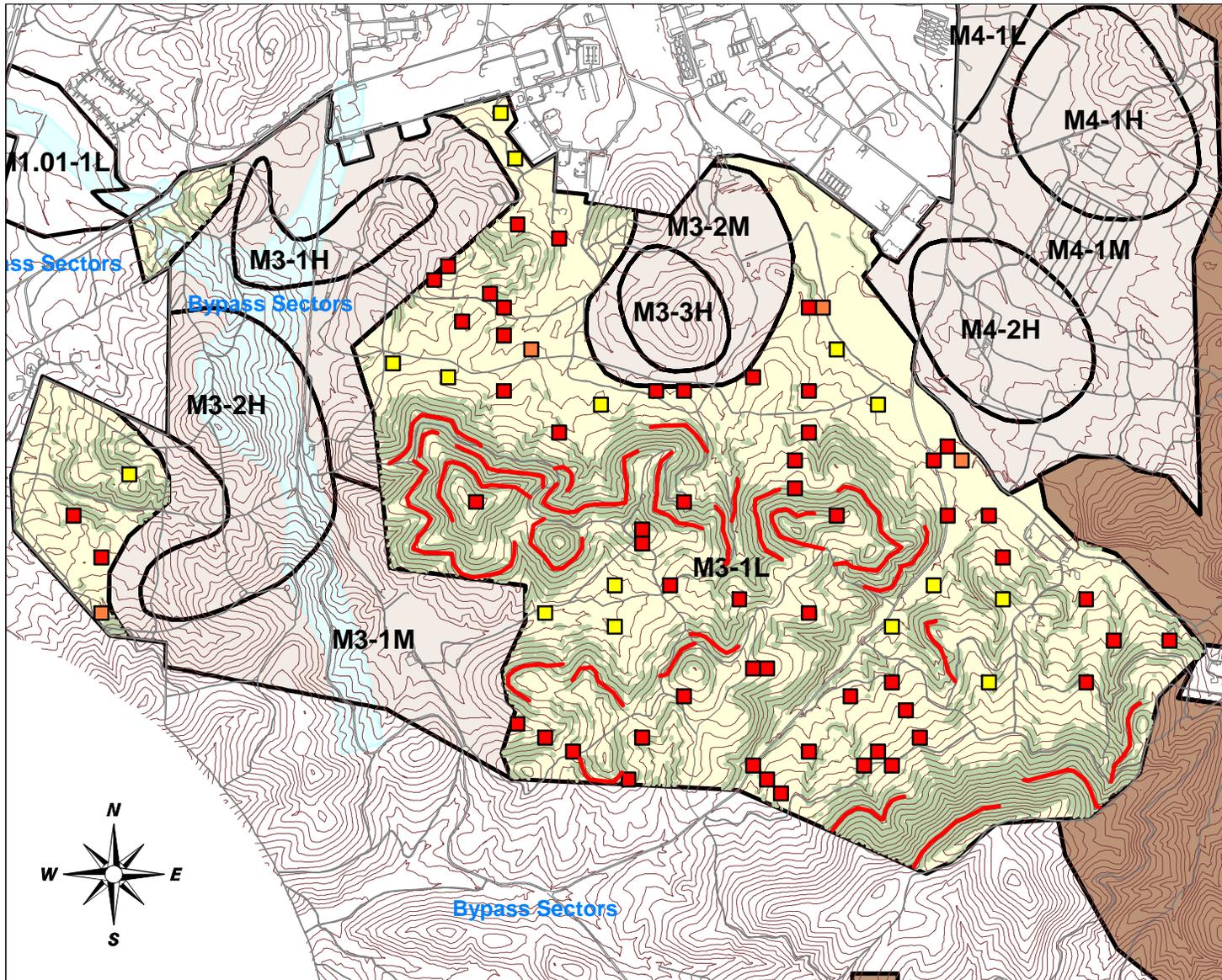


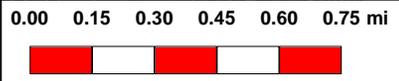
Figure 6-1
Bravo Area
EE/CA
Sector
M3-1L

Fort McClellan
Calhoun County
Alabama

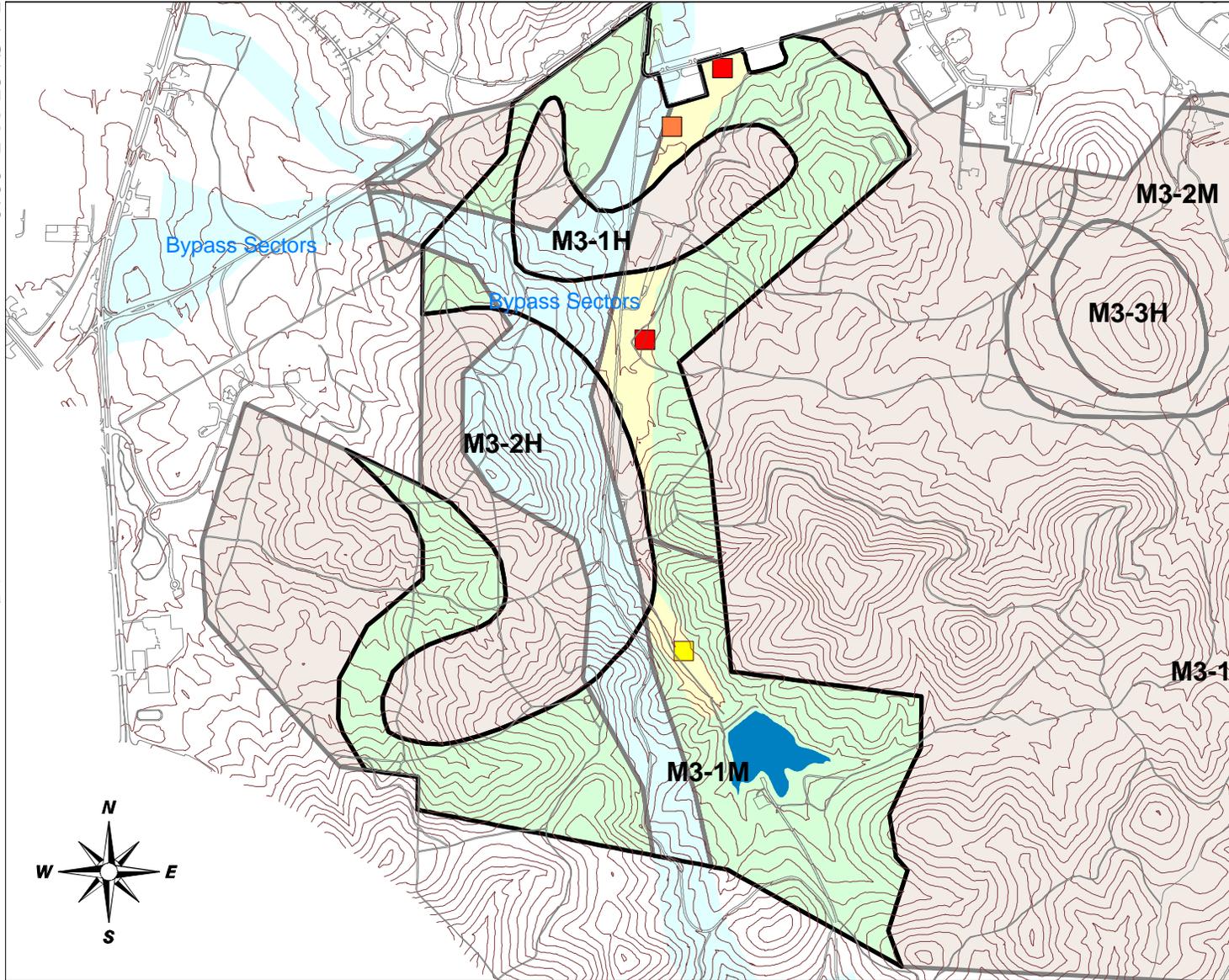
12 November 2001

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FM: WWM



- Location of 1 acre Grids**
-  Random Grids
 -  Shifted Random Grids
 -  Discretionary Grids
 -  Mountain Transect Areas
 -  Proposed Mountain Transects



Fort McClellan
Alabama

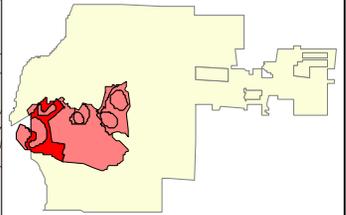


Figure 6-2
Bravo Area
EE/CA
Sector
M3-1M

Fort McClellan
Calhoun County
Alabama

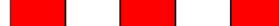
8 Oct 2001



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0 500 1000 1500 2000 2500 ft



Locations of 1 acre Grids

- Random Grids
- Shifted Random Grids
- Discretionary Grids
- Transect Areas



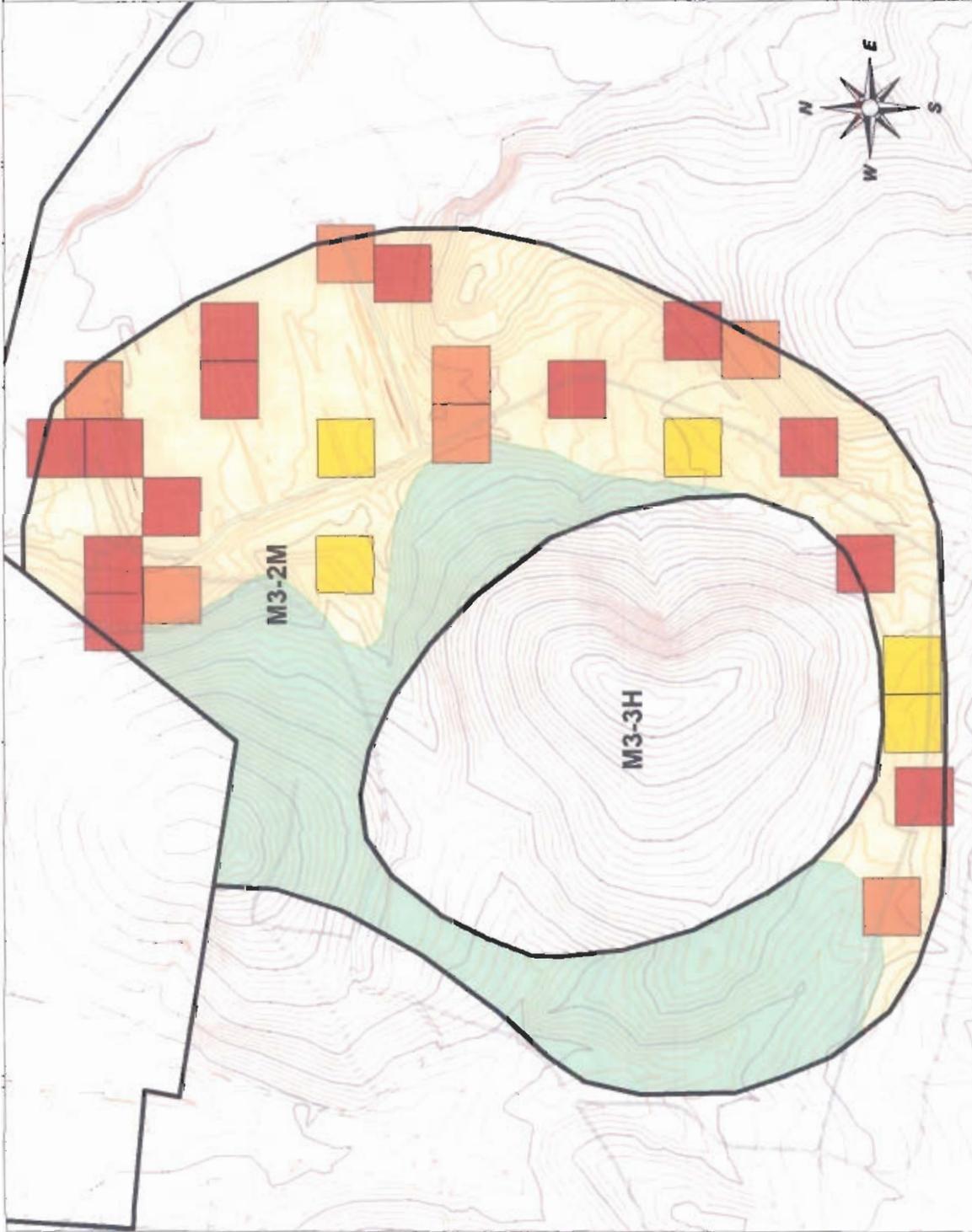
Fort McClellan
Alabama



Figure 6-3 Bravo Area EE/CA Sector M3-2M

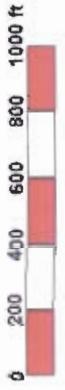
Fort McClellan
Calhoun County
Alabama

29 Mar 2001



Locations of 1 acre Grids

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- Shifted Random Grids (Orange square)
- Discretionary Grids (Yellow square)
- Transect Areas (Green square)

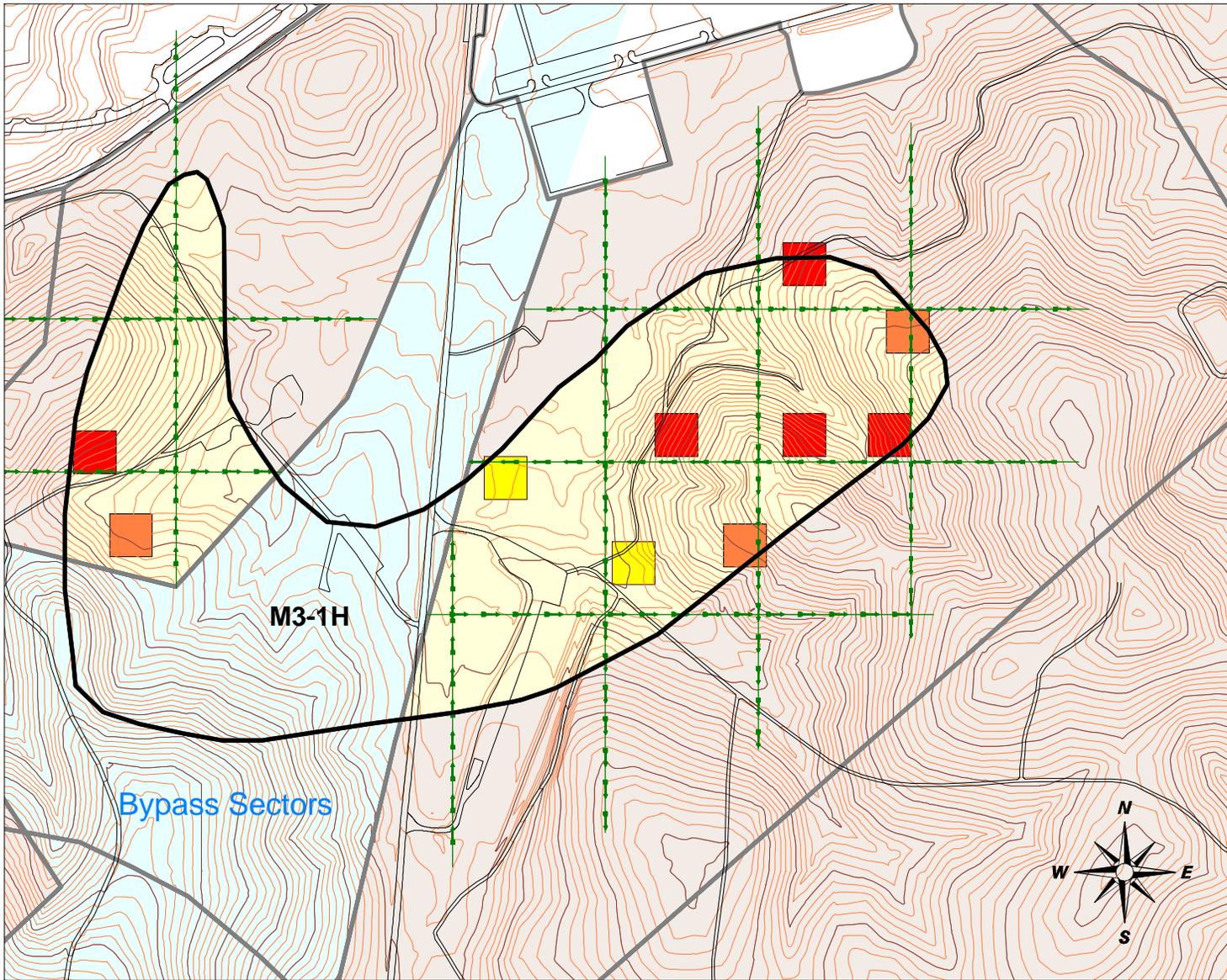


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6-7



Fort McClellan
Alabama

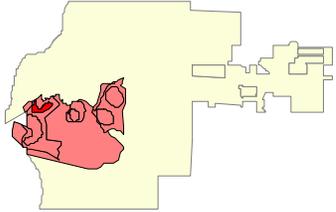


Figure 6- 4
Bravo Area
EE/CA
Sector
M3-1H

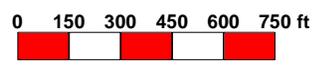
Fort McClellan
Calhoun County
Alabama

8 Oct 2001



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HU:DCR



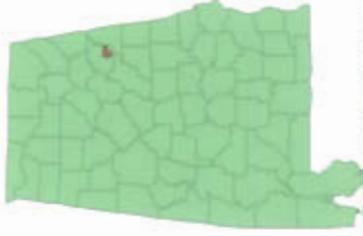
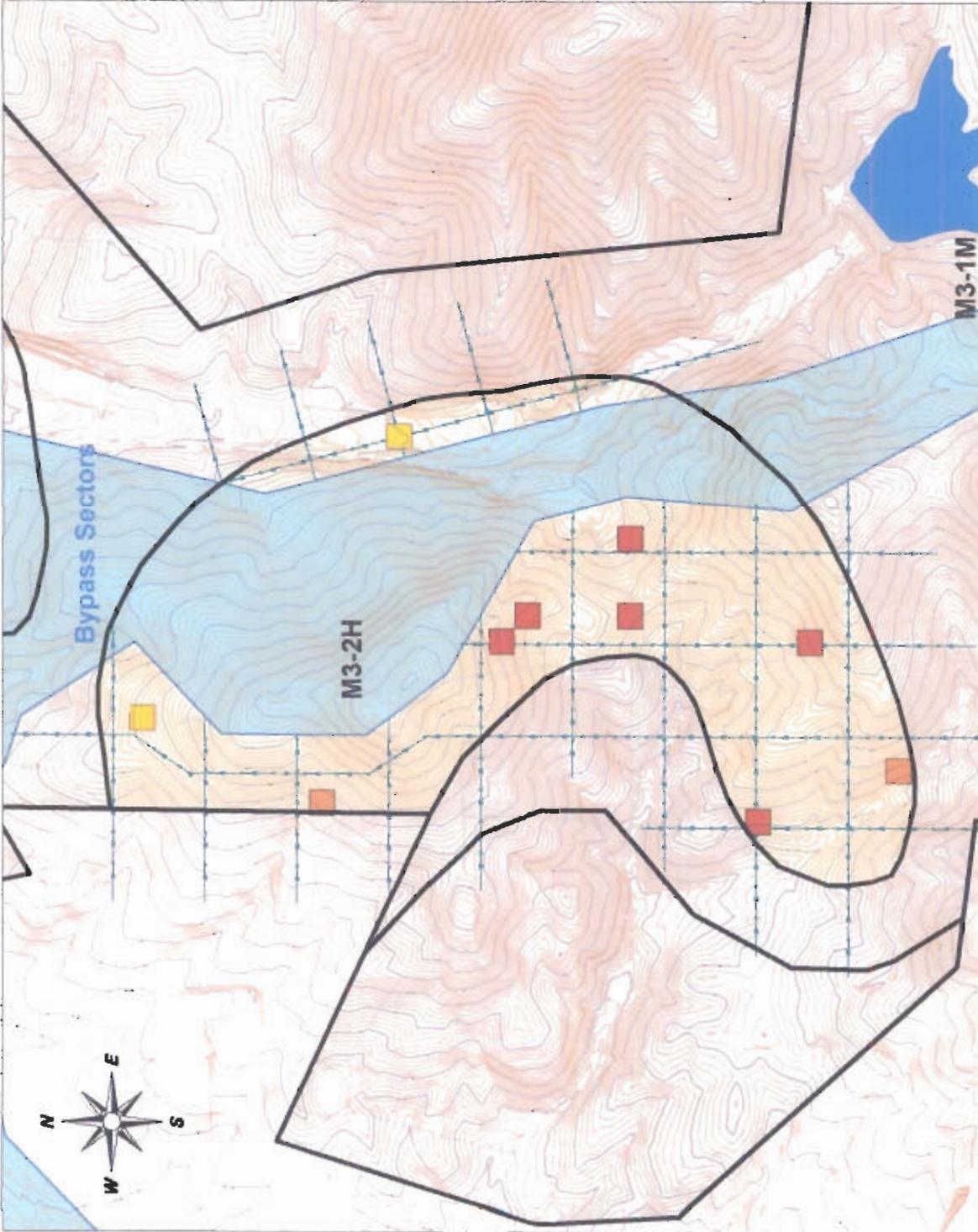
 Locations of 1/2 acre Grids

 Random Grids

 Shifted Random Grids

 Discretionary Grids

 Transects



Fort McClellan
Alabama



Figure 6-5 Bravo Area EE/CA Sector M3-2H

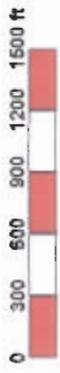
Fort McClellan
Calhoun County
Alabama

29 Mar 2001

Locations of 1/2 acre Grids

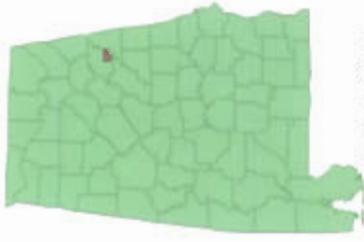
- Random Grids
- Shifted Random Grids
- Discretionary Grids

Transsects



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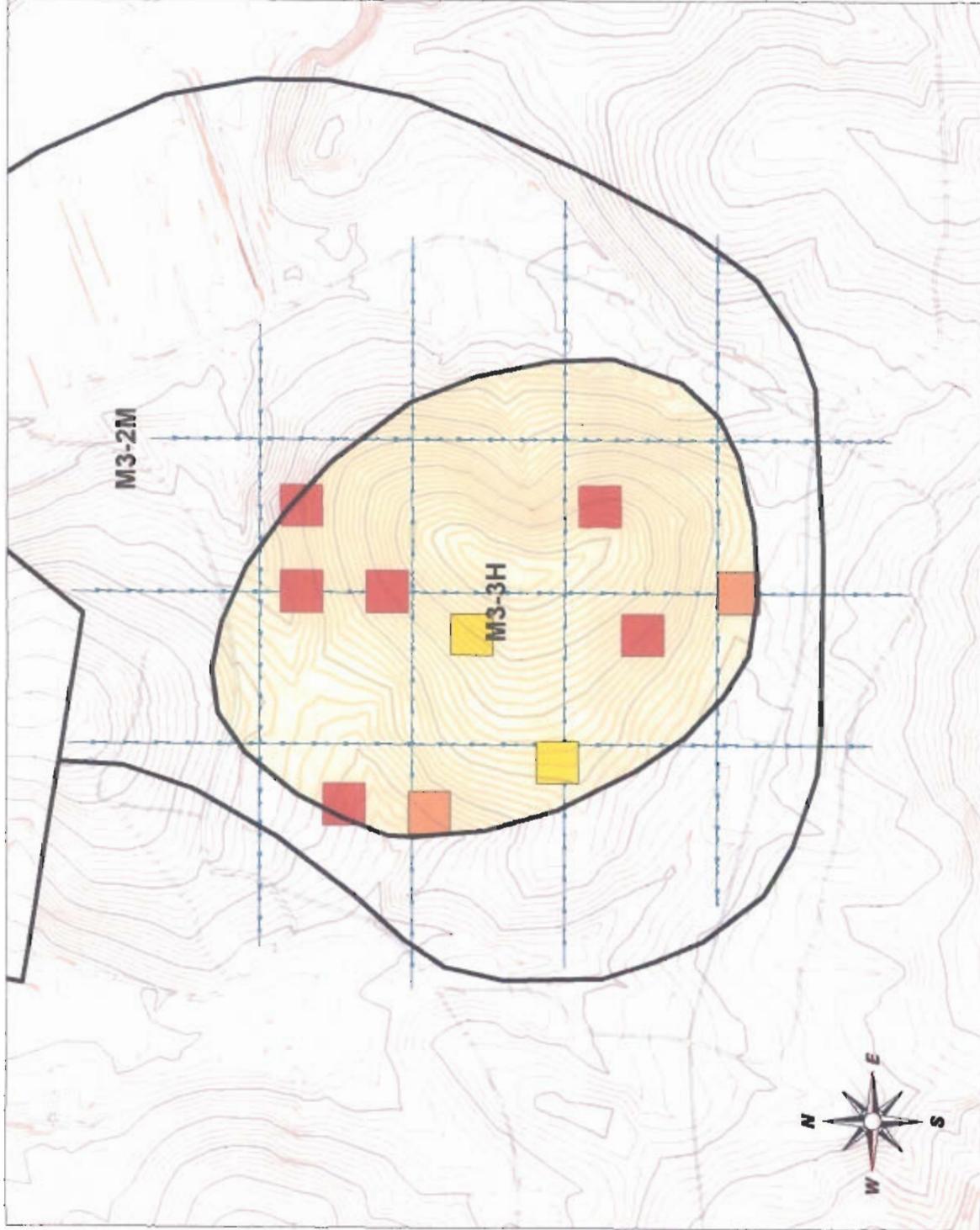
Fort McClellan
Alabama



Figure 6-6 Bravo Area EE/CA Sector M3-3H

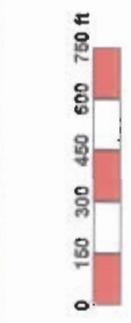
Fort McClellan
Calhoun County
Alabama

29 Mar 2001



Locations of 1/2 acre Grids

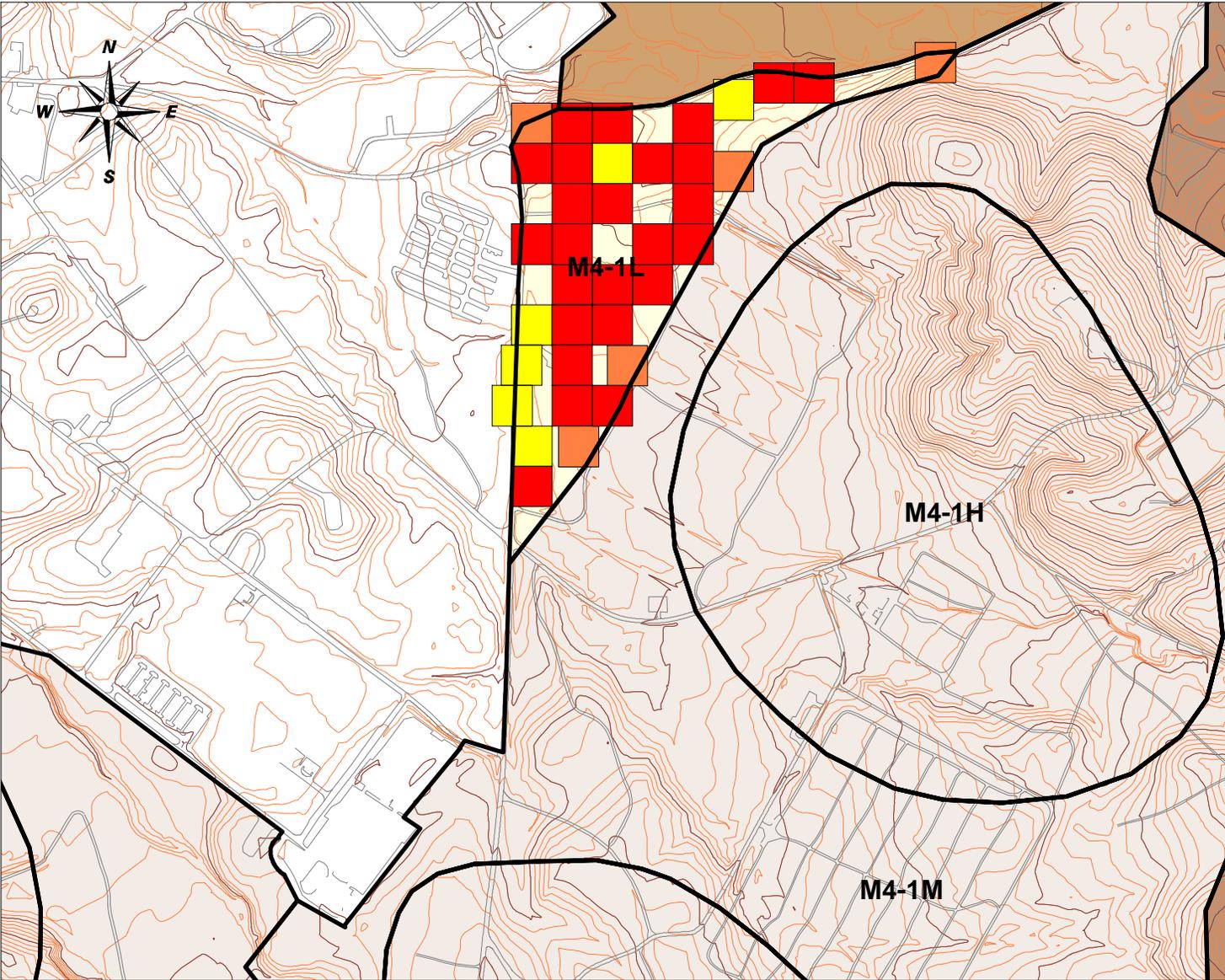
- Random Grids (Red square)
- Shifted Random Grids (Orange square)
- Discretionary Grids (Yellow square)
- Transects (Blue line)



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6-10



Fort McClellan
Alabama

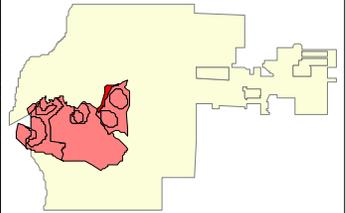


Figure 6-7
Bravo Area
EE/CA
Sector
M4-1L

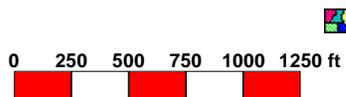
Fort McClellan
Calhoun County
Alabama

8 Oct 2001



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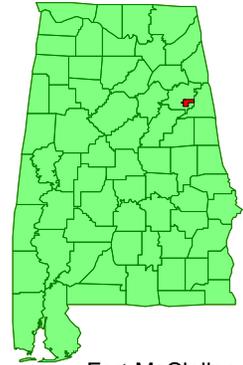
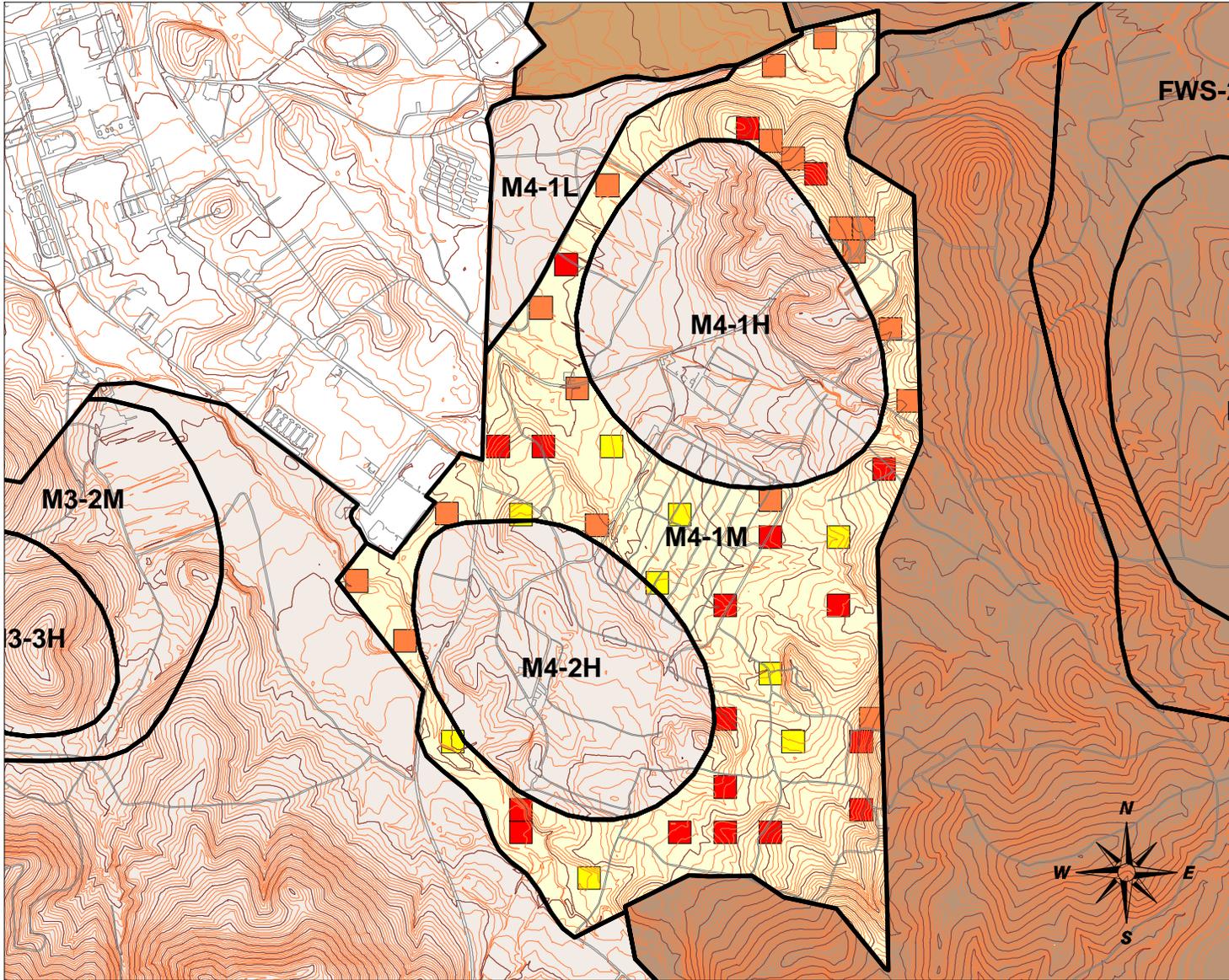


Locations of 1 acre Grids

- Random Grids
- Shifted Random Grids
- Discretionary Grids

DACAS87-99-D-0010

6-11



Fort McClellan
Alabama

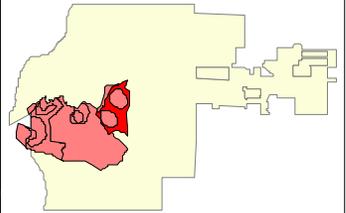


Figure 6-8
Bravo Area
EE/CA
Sector
M4-1M

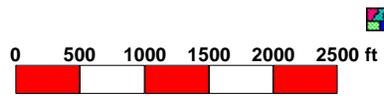
Fort McClellan
Calhoun County
Alabama

8 Oct 2001



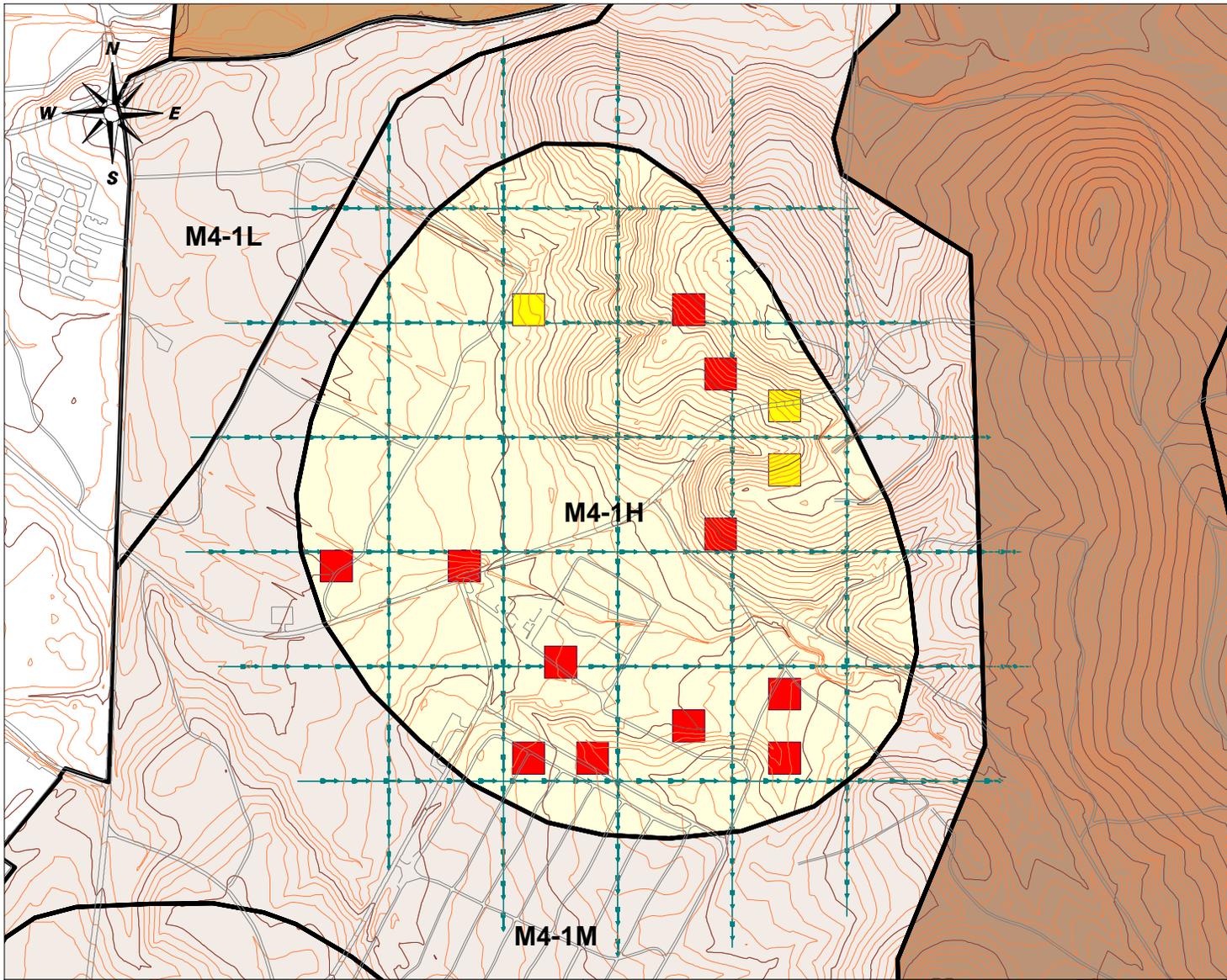
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Locations of 1 acre Grids

- Random Grids
- Discretionary Grids
- Shifted Random Grids



Fort McClellan
Alabama

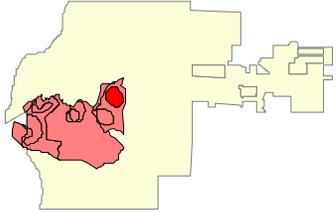


Figure 6-9
Bravo Area
EE/CA
Sector
M4-1H

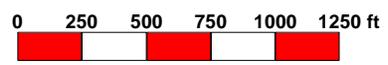
Fort McClellan
Calhoun County
Alabama

8 Oct 2001



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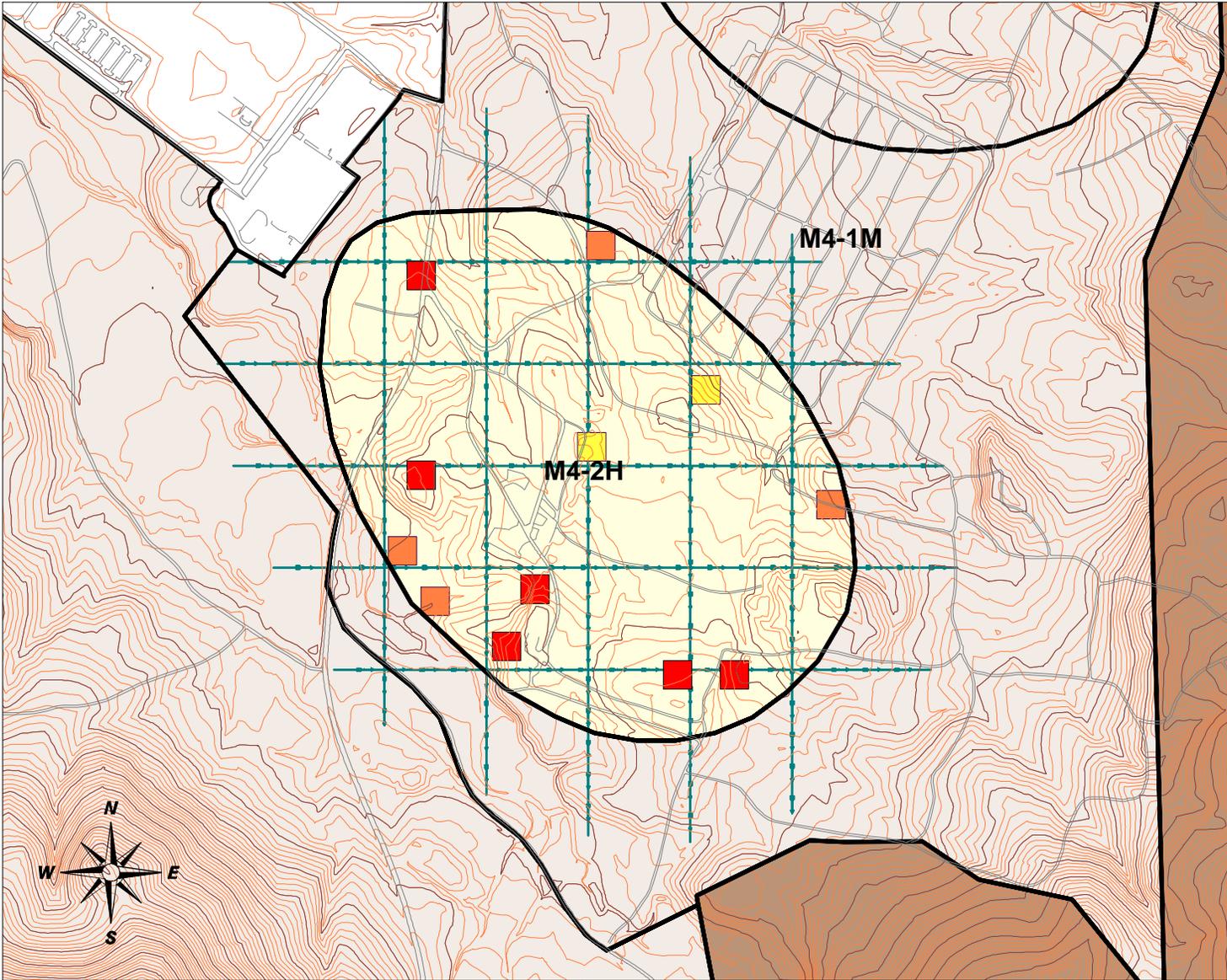
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-  Locations of 1/2 acre Grids
-  Random Grids
-  Discretionary Grids
-  Transects

DACAS87-99-D-0010

6-13



Fort McClellan
Alabama

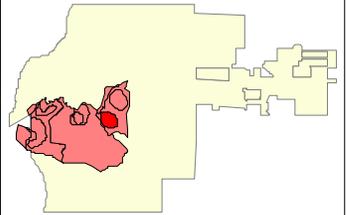


Figure 6-10
Bravo Area
EE/CA
Sector
M4-2H

Fort McClellan
Calhoun County
Alabama

8 Oct 2001



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HU:DCR

0 250 500 750 1000 1250 ft



Locations of 1/2 acre grids

Random Grids

Shifted Random Grids

Discretionary Grids



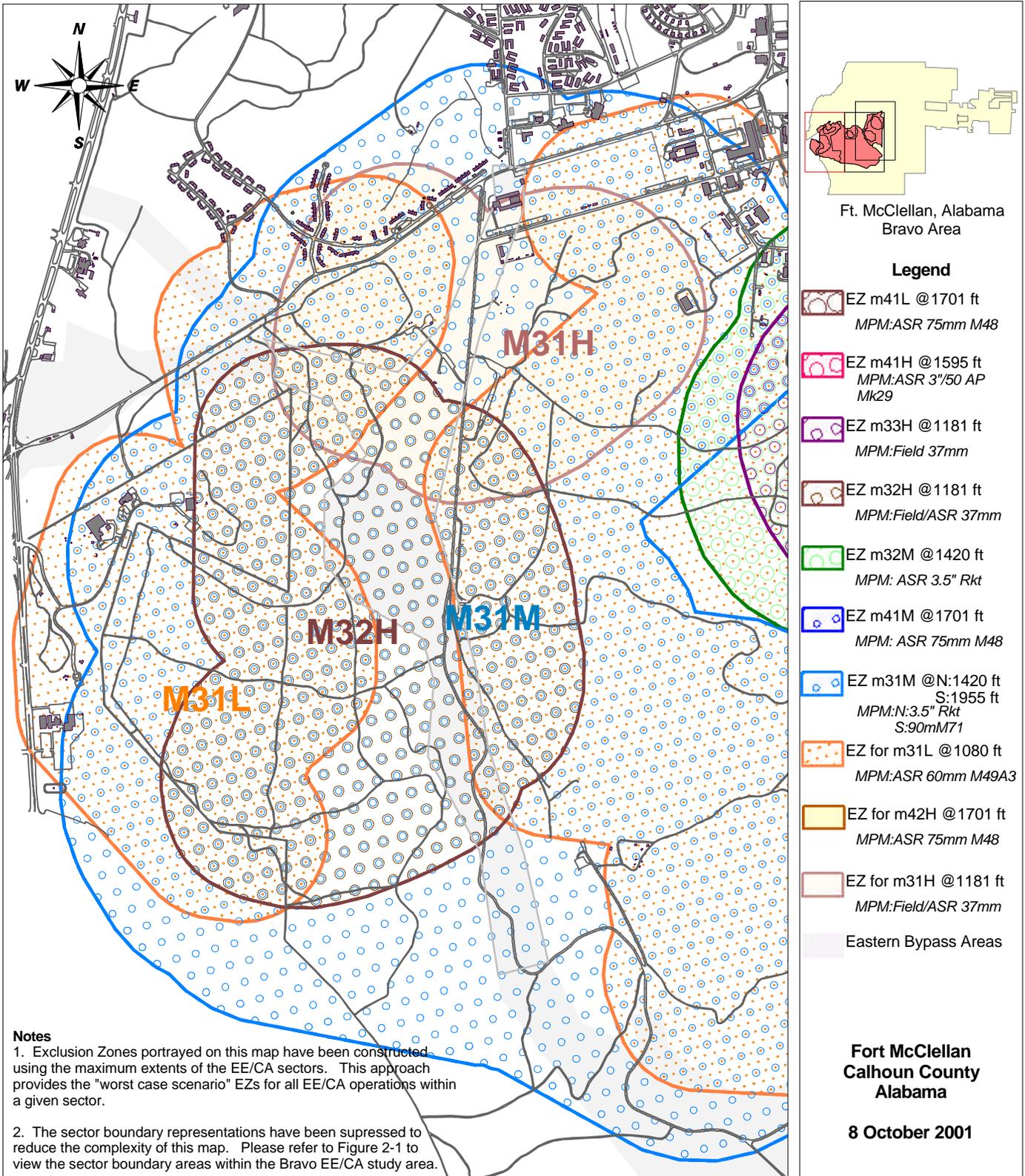
Transects

6.5.4 Exclusion Zones

Exclusion zones for each sector will be based on the largest fragmentation distance of OE expected to be present within that sector. Table 3.1 shows the ordnance items potentially present in the Bravo Area. CEHNC has reviewed Most Probable Munitions (MPM) for each individual Bravo sector. Calculations are shown in Appendix D, and results are in Table 6.1 below. Figures 6-11 through 6-13 show the exclusion zones. There are buildings within the exclusion zone that are currently inhabited. People will be evacuated out of the exclusion zone during intrusive activities. If evacuation of personnel from these buildings proves too disruptive, FWENC will evaluate applying for the 1 in 600 Rule and/ or use engineering controls during intrusive activities on a case by case basis. As the investigation progresses and other munitions are encountered, it may become necessary to change the exclusion zone. Note that Table 6.1 does not contain an exclusion zone for sector M4-1L. The exclusion zone to be used for this sector will be based on the MPM associated with sector M4-1M located immediately to the east. If ordnance is found that is not listed in Table 3.1, a request for MPM and exclusion zone review will be submitted to CEHNC.

Table 6.1
Exclusion Zones for Bravo Area Most Probable Munitions

Sector	Most Probable Munition	Minimum Separation Distance (ft)
M3-1H	60 mm Mortar	1080
M3-2H	60 mm Mortar	1080
M3-3H	37 mm	980
M3-1M (North)	3.5" Rocket	1420
M3-1M (South)	60 mm Mortar	1080
M3-2M	3.5" Rocket	1420
M3-1L (North)	3.5" Rocket	1420
M3-1L (South)	155 mm M107	2577
M4-1H	3" /50 AP Mk 29	1595
M4-2H	75 mm M48	1701
M4-1M	75 mm M48	1701

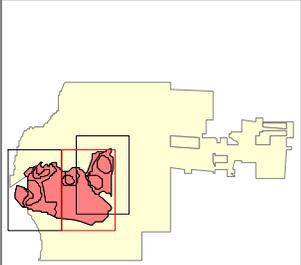
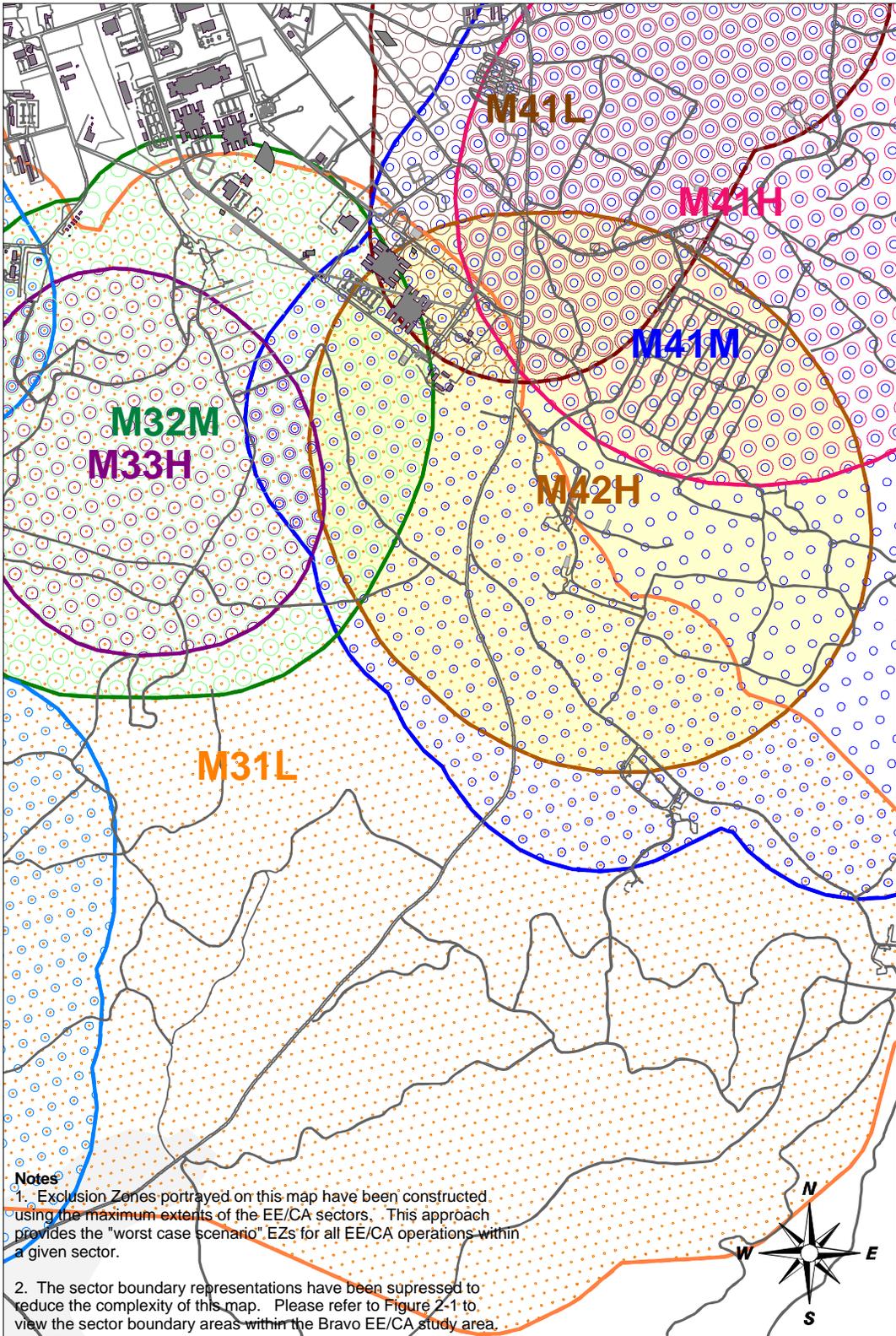


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Figure 6-11
Bravo Area (West)
EE/CA Exclusion Zones



Ft. McClellan, Alabama
Bravo Area

Legend

- EZ m41L @1701 ft
MPM:ASR 75mm M48
- EZ m41H @1595 ft
MPM:ASR 3"/50 AP Mk29
- EZ m33H @1181 ft
MPM:Field 37mm
- EZ m32H @1181 ft
MPM:Field/ASR 37mm
- EZ m32M @1420 ft
MPM: ASR 3.5" Rkt
- EZ m41M @1701 ft
MPM: ASR 75mm M48
- EZ m31M @N:1420 ft
S:1955 ft
MPM:N:3.5" Rkt
S:90mM71
- EZ for m31L @1080 ft
MPM:ASR 60mm M49A3
- EZ for m42H @1701 ft
MPM:ASR 75mm M48
- EZ for m31H @1181 ft
MPM:Field/ASR 37mm
- Eastern Bypass Areas

**Fort McClellan
Calhoun County
Alabama**

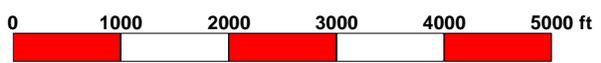
8 October 2001

Notes

1. Exclusion Zones portrayed on this map have been constructed using the maximum extents of the EE/CA sectors. This approach provides the "worst case scenario" EZs for all EE/CA operations within a given sector.
2. The sector boundary representations have been suppressed to reduce the complexity of this map. Please refer to Figure 2-1 to view the sector boundary areas within the Bravo EE/CA study area.



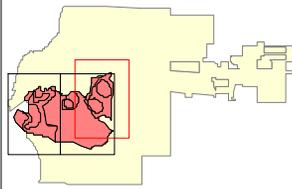
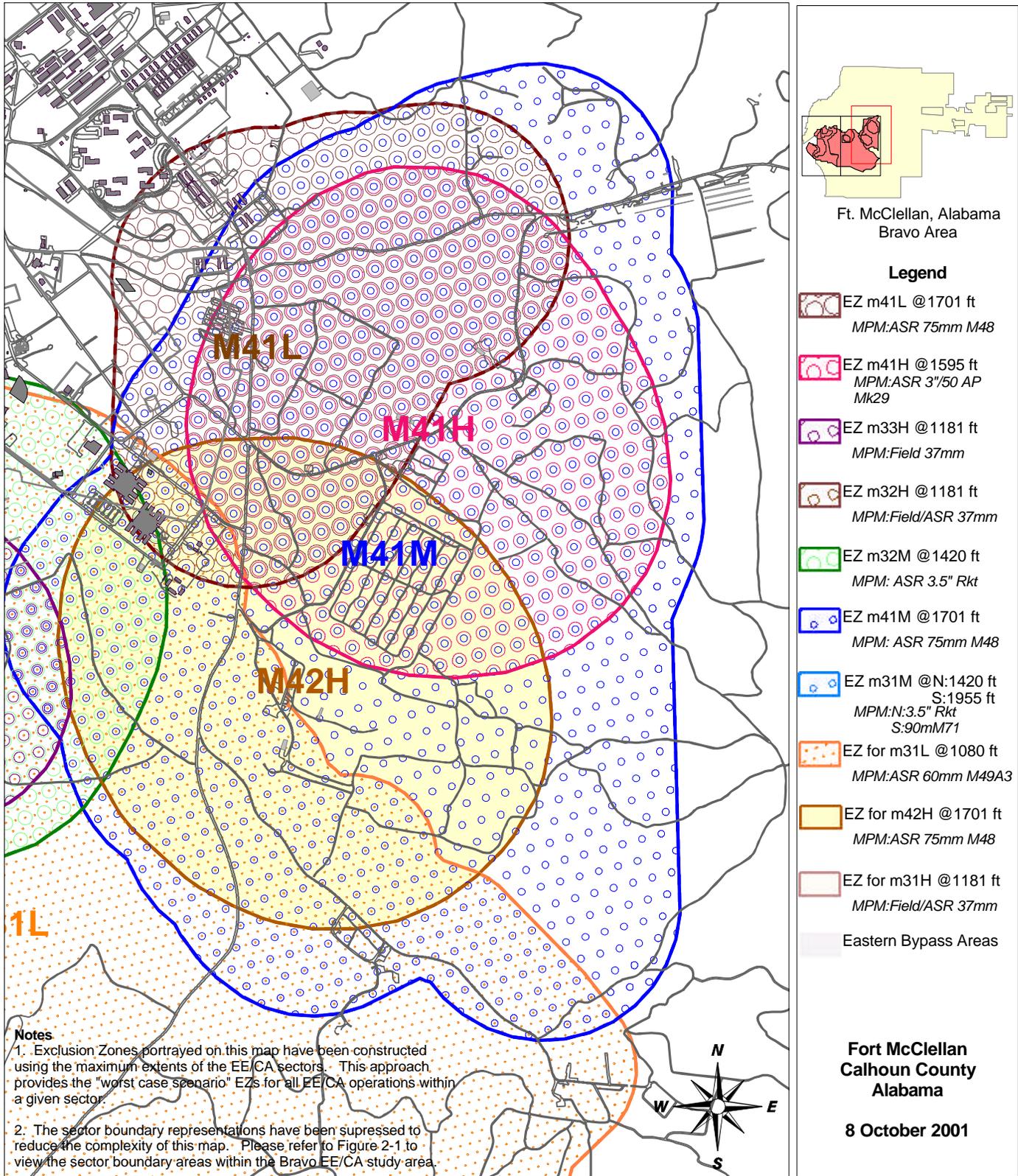
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Figure 6-12

**Bravo Area (Central)
EE/CA Exclusion Zones**



Ft. McClellan, Alabama
Bravo Area

Legend

- EZ m41L @1701 ft
MPM:ASR 75mm M48
- EZ m41H @1595 ft
MPM:ASR 3"/50 AP Mk29
- EZ m33H @1181 ft
MPM:Field 37mm
- EZ m32H @1181 ft
MPM:Field/ASR 37mm
- EZ m32M @1420 ft
MPM: ASR 3.5" Rkt
- EZ m41M @1701 ft
MPM: ASR 75mm M48
- EZ m31M @N:1420 ft
S:1955 ft
MPM:N:3.5" Rkt
S:90mM71
- EZ for m31L @1080 ft
MPM:ASR 60mm M49A3
- EZ for m42H @1701 ft
MPM:ASR 75mm M48
- EZ for m31H @1181 ft
MPM:Field/ASR 37mm
- Eastern Bypass Areas

**Fort McClellan
Calhoun County
Alabama**

8 October 2001

Notes

1. Exclusion Zones portrayed on this map have been constructed using the maximum extents of the EE/CA sectors. This approach provides the "worst case scenario" EZs for all EE/CA operations within a given sector.
2. The sector boundary representations have been suppressed to reduce the complexity of this map. Please refer to Figure 2-1 to view the sector boundary areas within the Bravo EE/CA study area.



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0 1000 2000 3000 4000 5000 ft



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Figure 6-13

**Bravo Area (East)
EE/CA Exclusion Zones**

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