APPENDIX A

Draft

Geophysical Survey Report
Landfill No. 2
Parcel 79(6)
Fort McClellan, Alabama

August 2001

Table of Contents

List of Figures

List of Acronyms

EBS	Environmental Baseline Study
EM	electromagnetic
EM31	Geonics Limited EM31 Terrain Conductivity Meter
ESE	Environmental Science and Engineering
G-856AX	Geometrics, Inc. G-856AX magnetometer
G-858G	Geometrics, Inc. G-858G magnetic gradiometer
GPS	global positioning system
GPR	ground-penetrating radar
IT	IT Corporation
mS/m	millisiemens per meter
NAD	North American Datum
N-S	north to south
nT	nanoTeslas
ppt	parts per thousand
RTK	real-time kinematic
TERC	Total Environmental Restoration Contract
USACE	U.S. Army Corps of Engineers

A.1.0 Introduction

IT Corporation (IT) conducted a surface geophysical survey at Landfill No.2, [Parcels 79(6)], at Fort McClellan in Calhoun County, Alabama, on January 17, January 24 and February 7, 2000. This survey was conducted for the U.S. Army Corps of Engineers (USACE) Mobile District, under Total Environmental Restoration Contract (TERC) No. DACA21-96-D-0018, Delivery Order CK005. The geophysical survey objectives were to determine the boundaries of the fill areas and to locate the proposed trench and sampling locations in the area of concern. The total area surveyed was approximately 497,800 square feet (11.4 acres). The Vicinity Map (Figure A79-1) shows the approximate location of the survey area.

To accomplish the objectives of the investigation, magnetic and frequency-domain electromagnetic (EM) induction methods were used. All geophysical data were processed and color-enhanced to aid in interpreting subtle anomalies. Following geophysics fieldwork, a survey-grade global positioning system (GPS) and a total station system were used to document the location of the site.

The survey area has rolling topography with a steep slope forming a U- shaped feature in the southern-central part of the survey area. The area generally slopes downward to the southwest and is bounded by a stream to the south . The site is primarily tree covered with small areas of brush and grass as shown on the site map with geophysical interpretation (Figure A79-2).

Field procedures used during the investigation are described in Chapter A.2.0. The data processing methods used during the investigation are presented in Chapter A.3.0. Data interpretation and criteria used to interpret geophysical anomalies are presented in Chapter A.4.0. Conclusions and recommendations derived from the geophysical surveys are presented in Chapter A.5.0. A description of the equipment and a theoretical discussion of the geophysical methods are presented in the Attachment.

A.2.0 Field Procedures

Field procedures are presented in this chapter, including discussions of the survey control and site map, field equipment, data acquisition parameters, and field verification of geophysical anomalies.

A.2.1 Survey Control

The geophysical survey area was identified in the site specific work plan based on historical site information compiled by IT and the Environmental Baseline Study (EBS), (ESE, 1998). The geophysics crew established a base grid on 100-foot centers throughout the site. Using the base grid as a reference, a line spacing of 20 feet with control points marked on 10-foot centers with surveyor's paint was used to provide the spatial control required for the investigation. Due to the uncertainty of true field positions inherent when establishing a survey area using 300-foot fiberglass tapes in the presence of wind and surface obstructions (e.g., trees and rough terrain), the lateral precision for the survey areas and anomalies is estimated to be within +/- 5 feet. Following geophysics field work, a GPS survey was conducted at the site referencing the U.S. State Plane Coordinate System (Alabama East Zone, North American Datum [NAD]1983). The GPS survey was performed in the real-time kinematic (RTK) mode which provided nominal sub-centimeter resolution in XY coordinates for the site.

A detailed site map was hand-drawn in the field. The map included any surface cultural features within the survey area, or near the perimeter, that could potentially affect the geophysical data (e.g., asphalt and concrete pavement, topographic slopes, creeks, and fences). The map also shows reference features, such as buildings, fences, asphalt patches, and survey monuments that could later aid in reconstructing the site boundaries. All pertinent reference information documented on the hand-drawn site map was placed on the site interpretation map (Figure A79-2). Also included on the site map are GPS coordinates to help relocate the survey area.

A.2.2 Geophysical Survey

Field Instruments. The magnetic instruments used during the investigation consisted of a Geometrics Inc. G-858G magnetic gradiometer (G-858G) for collecting survey data and a Geometrics G-856AX magnetometer (G-856AX) for collecting magnetic base station data. Frequency-domain EM induction equipment consisted of a Geonics EM31 Terrain Conductivity

Meter (EM31) coupled to an Omnidata DL720 digital data logger. A Trimble 4000SSI Total Station GPS and a Sokkia SET5F Total Station were used to conduct the civil survey work.

All geophysical data were collected using the following IT standard operating procedures:

- ITGP-001 Surface Magnetic Surveys
- ITGP-002 Surface Frequency-Domain Electromagnetic Surveys
- ITGP-005 Global Positioning System Survey
- ITGP-012 Geophysical Data Management.

Field Instrument Base Station. A field instrument base station was established at the Landfill No.2 site to provide quality control for the geophysical survey data collected. The base station location was chosen to be free of surface and subsurface cultural features that could affect the geophysical data. Standard field procedures were to occupy the base station and collect readings with the survey instruments (magnetic and EM31) before and after each data collection session. These base station files were then reviewed to assess instrument operation. Base station file names and average data values within them were recorded on base station summary forms.

A.2.2.1 Magnetic Survey

Magnetic Base Station. A magnetic base station was established at Fort McClellan to record the background fluctuation (diurnal drift) of the Earth's magnetic field. The magnetic base station was located in a field of small pine trees on the south side of Sixth Avenue (near Parcel 151), a location which was determined to be free of surface and subsurface cultural features that could affect the data. A G-856AX was used for the magnetic base station, however, instrument problems prevented collecting adequate background magnetic field data to "drift correct" the survey data, in addition non Y2K compliant software prevented proper drift correcting of the data. Regional magnetic field data from the time of data collection were reviewed, and it was determined that the survey was conducted during a time of quiescence.

G-858G Data Collection. Magnetic field measurements were made with the two sensors of the G858-G spaced 2.5 feet (0.76 meters) apart; the lower sensor was 2.0 feet above the ground surface and the upper sensor was 4.5 feet above the ground surface. At the start and end of each data collection session, approximately 60 readings were recorded with the G-858G at the field instrument base station to verify that the instrument was operating properly and to provide a quantitative record of instrument variation during the survey period. A review of these base station files indicates that the instrument was operating properly and the instrument drift was within acceptable limits. Magnetic survey data were collected at 0.5-second intervals (approximately 2.0- to 2.5-foot intervals) along north to south (N-S) oriented survey lines spaced 20 feet apart, for a total of approximately 24,650 linear feet of survey coverage.

The magnetic data were stored in the internal memory of the G-858G, along with corresponding line and station numbers and time of acquisition. Magnetic survey data were screened in the field to assess data quality prior to completing the investigation. All magnetic survey and base station data were downloaded to a personal computer, backed up on IOMEGA® compatible zip disks, and are retained in project files.

A.2.2.2 Frequency-Domain EM Survey

EM31 Data Collection. Prior to conducting the EM31 survey, the instrument was calibrated, and the in-phase component zeroed at the field instrument base station. The instrument was operated in the vertical dipole mode, measuring the in-phase and out-of-phase components of the EM field. At the start and end of each data collection session approximately 20 readings were recorded at the field instrument base station to verify that the instrument was operating properly and to provide a quantitative record of instrument variation, or drift, during the survey period. A review of these base station files indicates that the instrument was operating properly and instrument drift was within acceptable limits. Survey data were collected at 5-foot intervals along N-S oriented survey lines spaced 20 feet apart, for a total of approximately 24,650 linear feet of survey coverage.

The EM31 data were stored in the digital data logger along with corresponding line and station numbers. EM31 line profiles were reviewed in the field using the DAT31® program to verify data quality prior to completing the survey. All EM31 survey and base station data were downloaded to a personal computer, backed up on IOMEGA® compatible zip disks, and are retained in project files.

A.2.2.3 Anomaly Verification and Sampling Locations

Anomaly Verification. Preliminary color-contour maps of the magnetic and EM31 data were generated and field-checked to differentiate between anomalies caused by surface and subsurface sources. Geophysical anomalies verified as being caused by surface features were labeled as such on the field data map. Anomalies caused by buried metallic objects were carefully located in the field and marked on the site map.

Sampling Locations. After the geophysical data interpretation was complete all anomalies interpreted to represent fill were marked on data maps and provided to the site manager. The site geophysicist and site manager then determined the sample locations that would meet the criteria established in Site-Specific Field Sampling Plan sampling rationale and ensure the safety of the drilling/sampling team.

A.3.0 Data Processing

Color Contour Maps. Plots of magnetic and EM31 data were generated using the OASIS Montaj® geophysical mapping system from Geosoft, Inc. These maps were color-enhanced to aid with interpreting subtle anomalies. Select contour maps from this site are presented as Figures A79-3 through A79-5.

A series of data processing steps were required to generate the contour maps. Magnetic gradiometer data were downloaded from the field instrument and converted to an ASCII file using Geometrics, Inc. MAGMAP96® program. EM31 data were downloaded from the data logger and converted to ASCII files using DAT31® software from Geonics, Inc. The ASCII data files were then reviewed to assess line numbers, station ranges, and overall data quality. Field data file names and corresponding base station data files were recorded on the data file tracking form. Data screening results were then recorded on the base station summary form. Following data quality assessment, geometry corrections to field data files were made, if necessary, using a text editor and recorded on the geophysical data editing form.

Final, corrected magnetic and EM data files containing local geophysical station coordinates (X,Y) and the geophysical measurement (Z) were converted to OASIS Montaj® format and imported into the geophysical mapping software. The data were then gridded using bi-directional gridding with an Akima spline. The grid cell size for the magnetic and EM31 data was chosen to be 2.5 and 5.0 feet, respectively. Color contouring was used to enhance data anomalies. The names of files generated and processing parameters used were recorded on data processing forms. Final processed map names are shown in the data processing box found in the lower left corner of each contour map presented. All completed forms of magnetic and EM data collected during the investigation are retained in project files.

A.4.0 Interpretation of Geophysical Data

The method by which the geophysical data were interpreted and the results of that interpretation are presented in this chapter.

Figure A79-2 presents the site map with geophysical interpretation. The interpreted color-contour map of total magnetic field for the upper sensor is presented as Figure A79-3. Interpreted color-contour maps of EM31 conductivity and in-phase component data collected along N-S survey lines are presented as Figures A79-4 and A79-5, respectively. A theoretical background is presented as an Attachment to this appendix. The attachment discusses the factors influencing the observed geophysical response for the various methods and equipment used to conduct the survey at Landfill No. 2.

In addition to the geophysical interpretation the site map (Figures A79-2) contains detailed information on reference features (e.g., asphalt and concrete pavement, topographic slopes, creeks, and fences), so that the survey area and the geophysical anomaly locations can be relocated in the future. Anomalies shown on the site interpretation map correspond to those seen in the magnetic and EM data. Surface reference features shown on the site interpretation map were translated from the hand-drawn site map made in the field. The site interpretation map also references the Alabama East State Plane, NAD 1983 Coordinate System.

A.4.1 Data Interpretation Criteria

Color Contour Map Anomalies. Anomalies shown on the magnetic and EM contour maps range from high to low and from negative to positive values, depending on the type of data displayed. The observed anomalies in the contour map of total magnetic field for the upper sensor have values above and below the average magnetic field intensity of 51,300 nanoTeslas (nT) for Anniston, Alabama. The typical magnetic data response to near-surface ferrous metallic debris is an asymmetric south high/north low signature. The upper sensor magnetic data are more useful than the lower sensor data for locating large buried objects because the lower sensor is more sensitive to small near-surface objects; hence the upper sensor magnetic data are presented. The characteristic EM31 anomaly over a near-surface metallic conductor consists of a narrow zone having strong negative amplitude centered over the target and a broader lobe of weaker, positive amplitude on either side of the target. As the depth of the target feature increases, the characteristic EM31 response changes to a positive amplitude centered over the target.

Anomalies present on the contour maps of magnetic and EM31 data were field-checked and correlated with known metallic surface objects and other cultural surface features so that anomalies caused by subsurface sources could be determined. Many of the high-amplitude anomalies seen in the contour maps of the magnetic and EM31 data (Figures A79-3 through A79-5) are caused by cultural features including roads, underground utilities, and metallic debris. Anomalies caused by surface metal are labeled as such on the data contour maps, and the locations of these features are indicated on the geophysical interpretation map. Anomalies interpreted to be caused by buried metal objects, buried construction debris, underground utilities, etc. are labeled on the data contour maps.

A.4.2 Landfill No. 2 Data Interpretation

Many of the high-amplitude anomalies seen in the contour maps of the magnetic and EM31 data (Figures A79-3 through A79-5) are caused by surface metal objects and/or partially buried objects. The geophysical interpretation map (Figure A79-2) shows the locations of the fill area, an anomalous high conductivity area, buried metal objects and surface metal that were observed in the data. Small anomalies that are interpreted to represent discrete, buried metal objects are not discussed in the text but are labeled on all data maps.

The landfill is seen in the geophysical data as a horseshoe - (open ended to the north) shaped anomalous area consisting of buried metal and conductive zones. The geophysical data indicates burial depths range from shallow near the boundary of the landfill and deep near the center of the site. Within the landfill area there are pit-like and trench-like features. Eight geophysical anomalies, encompassed by the interpreted landfill boundary, have typical subsurface source signatures. Each anomaly is labeled on the data maps and discussed in the text.

Anomaly A-1. Anomaly A-1 is located in the west central portion of the survey area as an isolated area and occurs in both the magnetic data and the EM31 data. Anomaly A-1 has a low-amplitude magnetic response of approximately 500 nT (Figure A79-3). A moderate response of less than -10 milliSiemens per meter (mS/m) (Figure A79-4) and a response of less than -7 parts per thousand (ppt) in the in-phase component data (Figure A79-5) are observed in the EM data. Anomaly A-1 is interpreted to be caused by a localized disposal area containing a low to moderate concentration of buried metal. The source materials are likely located within the upper few feet of the subsurface.

Anomaly A-2. Anomaly A-2 is located in the west central portion of the survey area and is characterized by moderate-amplitude magnetic response of up to 1,500 nT (Figure A79-3). Low conductivity values less than – 15 mS/m (Figure A79-4) and in-phase values down to less than – 9 ppt (Figure A79-5) characterize Anomaly A-2. Isolated negative in-phase component readings of approximately –2.0 ppt indicate areas of near surface metallic debris. Anomaly A-2 is interpreted to represent a disposal area within the landfill containing a low to moderate concentrations of buried metal.

Anomaly A-3. Anomaly A-3 is located in the northeastern portion of the survey area and occurs in both methods of investigation. Anomaly A-3 has a moderate-amplitude response of approximately 1,200 nT in the magnetic data (Figure A79-3), a moderate to high-amplitude response in the conductivity response of approximately -15 mS/m in the western region of the anomaly and approximately –6.0 mS/m in the eastern portion of the anomaly (Figure A79-4), and a moderate response of approximately –6 to 6 ppt in the in-phase component data (Figure A79-5). The EM31 in-phase component data (Figure A79-5) shows both positive and negative deflections indicating areas of deep and shallow buried metallic debris respectively. Anomaly A-3 is interpreted to represent a disposal area within the landfill containing a moderate concentration of buried metal.

Anomaly A-4. Anomaly A-4 is located in the central portion of the survey area and occurs in both the magnetic and EM31 data sets as several isolated areas of buried metal. Anomaly A-4 has a low amplitude responses of approximately 1,000nT (Figure A79-3) in the magnetic data. The EM31 data show 0 to 10 mS/m conductive responses (Figure A79-4) and in-phase responses ranges 10 ppt (Figure A79-5). Anomaly A-4 in interpreted to represent a disposal area within the landfill containing low-to-moderate concentrations of deeply buried metal.

Anomaly A-5. Anomaly A-5 is located in the south central portion of the survey area, bounded to the south by a steep slope with surface and partially buried metal and concrete debris. Anomaly A-5 is clearly evident in both magnetic and EM31 data sets as a series of large magnitude linear features trending to the east-west. In the upper sensor total magnetic field data (Figure A79-3) Anomaly A-5 is seen as multiple dipolar signatures with high magnetic responses generally greater than 3,000 nT. This is typical of high volumes of buried metal. Anomaly A-5 shows a moderate to high-amplitude response in the EM31 conductivity data peaking at over 40 mS/m (Figure A79-4). The high conductive response may indicate the presence of surface or near-surface conductive fill material. The EM31 in-phase component data (Figure A79-5) show moderate to high-amplitude response peaking higher than 10 ppt with isolated responses of less than –6 ppt. Anomaly A-5 is interpreted to represent an area containing moderate to high concentratins of buried metal at depth ranging from shallow to deep.

Anomaly A-6. Anomaly A-6 is located in the eastern portion of the survey area and occurs in both methods of the investigation. Anomaly A-6 is characterised by a moderate to high-amplitude magnetic response of approximately 2,000 nT (Figure A79-3). Moderate conductivity responses of less than –10 mS/m (Figure A79-4) and isolated low in-phase features are evident in the data in-phase response of approximately 6.0 ppt is observed in the EM31 data. Anomaly A-6 is interpreted to be caused by a disposal area within the landfill containing a moderate concentration of buried metal.

Anomaly A-7. Anomaly A-7 is located in the southern portion of the survey area. Anomaly A-7 is characterized by an area of high-amplitude magnetic response that exceeds 3,000 nT (Figure A79-3). A high-amplitude conductive anomaly of up to 30 mS/m (Figure A79-4) and a high-amplitude in-phase response of greater than 10 ppt (Figure A79-5) are observed in the EM31 data. Anomaly A-7 is interpreted to represent a disposal area within the landfill containing a moderate to high concentration of deeply buried metal.

Anomaly A-8. Anomaly A-8 occurs in only the EM31 conductivity data (Figure A79-4). The anomaly is an area of high conductivity, greater than 10.0 mS/m, that occurs in the southwestern portion of the site. The anomaly extends over a broad area between the southern boundary of the survey area and the western boundary of the landfill area. The exact cause of the elevated conductivity readings is uncertain. Possible reasons for the anomaly include: 1) surface disposal or placement of conductive fill materials; 2) a local increase in the volume of fine-grained sands at the surface associated with surface soil erosion; 3) saturated soil conditions; 4) possible leachate material migrating away from the landfill area. The EM31 conductivity data (Figure A79-4) also show that the land surface area to the north and up-slope from the fill area generally shows lower conductivity, and the area south and down slope from the fill area shows higher conductivity. This may indicate the migration of conductive fluids down-slope and down gradient from the fill area.

After the geophysical data interpretation was complete all anomalies interpreted to represent fill were marked on data maps and provided to the site manager. The site geophysicist and the site manager then determined the sample and trench locations that would meet the criteria established in the SSFSP sampling rationale and ensure the safety of the drilling/sampling team.

A.5.0 Conclusions and Recommendations

A surface geophysical survey using magnetic and EM methods were conducted on January 17, January 24, and February 7, 2000 at Landfill No.2. The survey objectives were to determine the boundaries of the fill areas and to locate the proposed trench locations in the area of concern.

Geophysical data analysis indicates that two fill areas containing low to high concentration of buried metal, several fill areas with low to moderate concentrations of buried metal, anomalous areas of high conductivity, and numerous isolated buried metal objects/debris exist within site boundaries. The interpretation map (Figure A79-2) also shows the locations of individual surface metal objects and areas of low to moderate concentrations of surface metal.

After the geophysical data interpretation was complete all anomalies interpreted to represent fill were marked on data maps and provided to the site manager. The site geophysicist and site manager then determined the trench locations that would meet the criteria established in the SSFSP sampling rationale and ensure the safety of the drilling/sampling team.

A hand drawn field map and GPS survey of site features provided a permanent record of the survey boundaries and anomaly locations. Positions on the site map generated (Figure A79-2) are conservatively estimated to be accurate to within +/- 5 feet.

Pipeline locations are indicated on the site interpretation map where evident in the geophysical data. However, the map should not be considered clearance for exploratory trenching or other invasive investigations. Should such clearance be necessary, IT recommends proper geophysical clearance using available utility maps, EM utility locator, and ground-penetrating radar.

Beyond the recommendation above, and based on the objectives and results of the geophysical survey presented in this report, no further geophysical effort is recommended at the Landfill No.2 site.

DWG. NO.: ...\796886ES.099
PROJ. NO.: 796886
INITIATOR: C. SCHMALZ
PROJ. MGR.: J. YACOUB
DRAFT. CHCK. BY:
ENGR. CHCK. BY: J. HACKWORTH
DATE LAST REV.:
DRAWN BY:
STARTING DATE: 04/03/01
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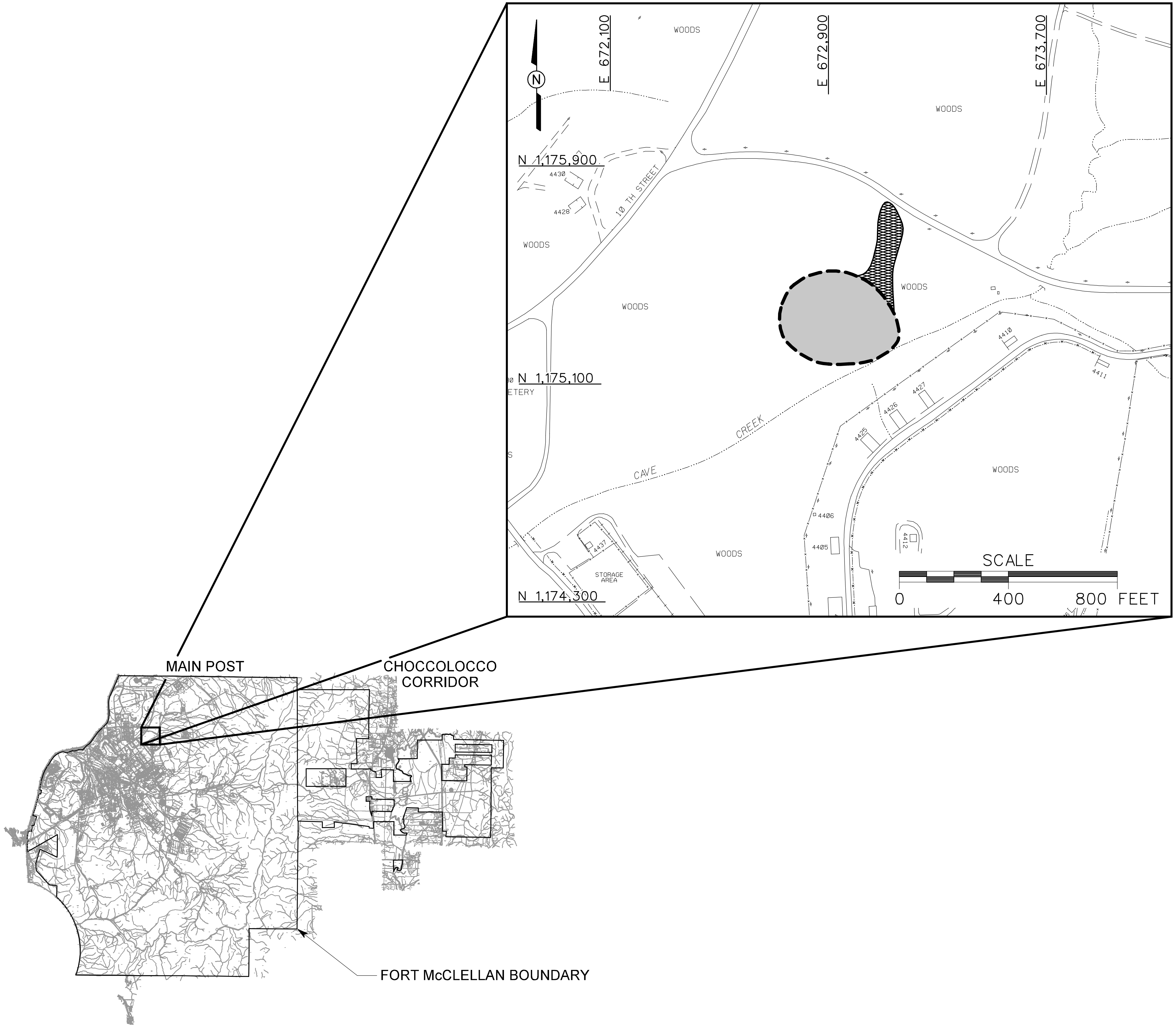

LEGEND

- UNIMPROVED ROADS AND PARKING
- PAVED ROADS AND PARKING
- BUILDING
- PARCEL BOUNDARY (DASHED WHERE APPROXIMATE)
- FILL MATERIAL OBSERVED BY IT CORP.
- CULVERT WITH HEADWALL
- SURFACE DRAINAGE / CREEK
- FENCE
- UTILITY POLE

FIGURE A79-1
VICINITY MAP
LANDFILL NO. 2
PARCEL 79(6)

U. S. ARMY CORPS OF ENGINEERS
MOBILE DISTRICT
FORT McCLELLAN
CALHOUN COUNTY, ALABAMA
Contract No. DACA21-96-D-0018

IT CORPORATION
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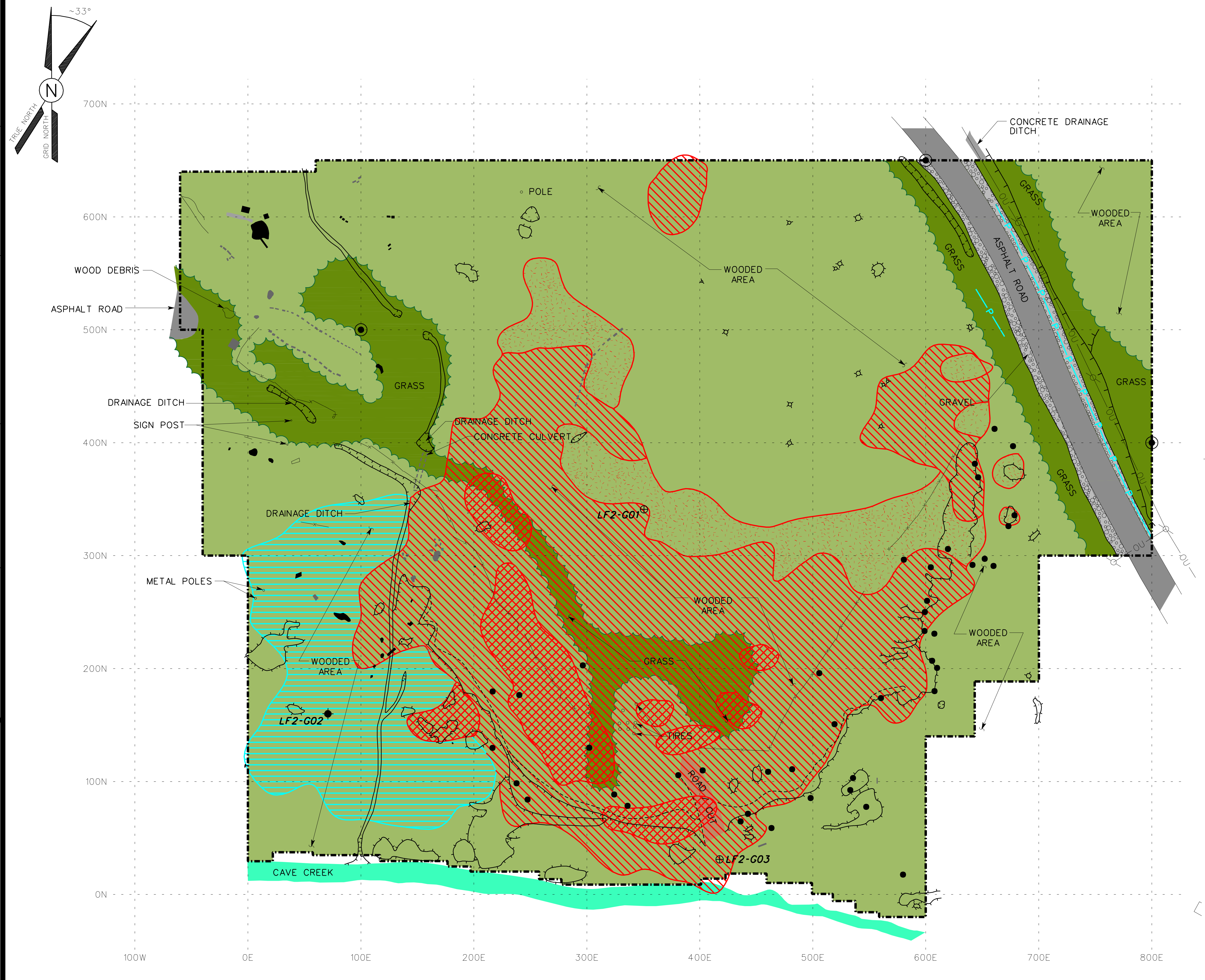

LEGEND

- GEOPHYSICAL SURVEY BOUNDARY
- CIVIL SURVEY STAKE LOCATION
- LOW CONCENTRATION OF BURIED METAL
- MODERATE CONCENTRATION OF BURIED METAL
- HIGH CONCENTRATION OF BURIED METAL
- HIGH CONDUCTIVITY ANOMALY
- CONCRETE/REINFORCED CONCRETE
- SURFACE METAL OBJECT
- MOUND
- DEPRESSION
- CREST OF SLOPE
- TOE OF SLOPE
- FENCE
- TREE/ TREELINE
- PIPE/BURIED UTILITY
- OVERHEAD UTILITY LINES
- UTILITY POLE
- RESIDUUM MONITORING WELL LOCATION
- BEDROCK MONITORING WELL LOCATION

NAD 83 SPHEROID, ALABAMA EAST STATE PLANE DATUM		
LOCAL GRID COORDINATES	STATE PLANE COORDINATES	
400N,800E	1175769.24N	673248.26E
650N,600E	1175872.07N	672944.99E
500N,100E	1175476.40N	672604.64E

SCALE

0 90 180 FEET

FIGURE A79-2
LANDFILL NO.2
SITE MAP WITH GEOPHYSICAL INTERPRETATION
PARCEL 79(6)

U. S. ARMY CORPS OF ENGINEERS
MOBILE DISTRICT
FORT McCLELLAN
CALHOUN COUNTY, ALABAMA
Contract No. DACA21-96-D-0018

IT CORPORATION
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DWG. NO.: ...\796886es.100
PROJ. NO.: 796886
INITIATOR: C. SCHMALZ
PROJ. MGR.: J. YACOUB
DRAFT. CHCK. BY:
ENGR. CHCK. BY: J. HACKWORTH
DATE LAST REV.:
DRAWN BY:
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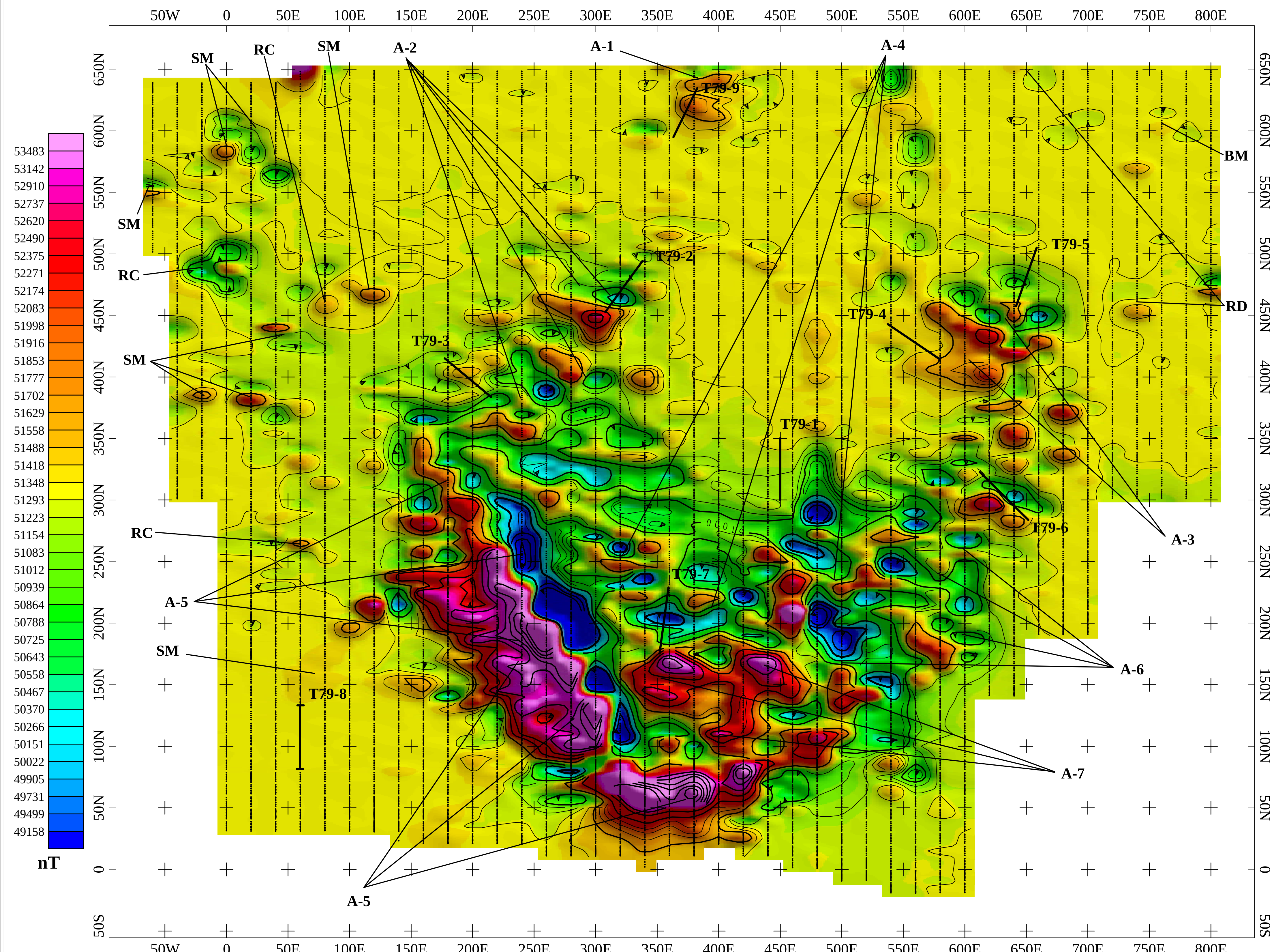
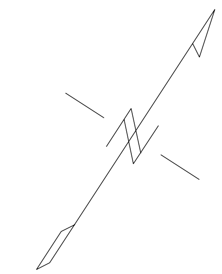




LEGEND

.... GEOPHYSICAL SURVEY LINES

A-1 GEOPHYSICAL ANOMALY DISCUSSED IN TEXT

BM ANOMALY CAUSED BY BURIED METAL

RC ANOMALY CAUSED BY REINFORCED CONCRETE

RD ANOMALY CAUSED BY ROAD

SM ANOMALY CAUSED BY SURFACE METAL

—— T79-1 TRENCH LOCATION

Scale 1:1080

50 0 50 100 150 200

feet

Minimum Contour Interval: 100 nanoTeslas

FIGURE A79-3

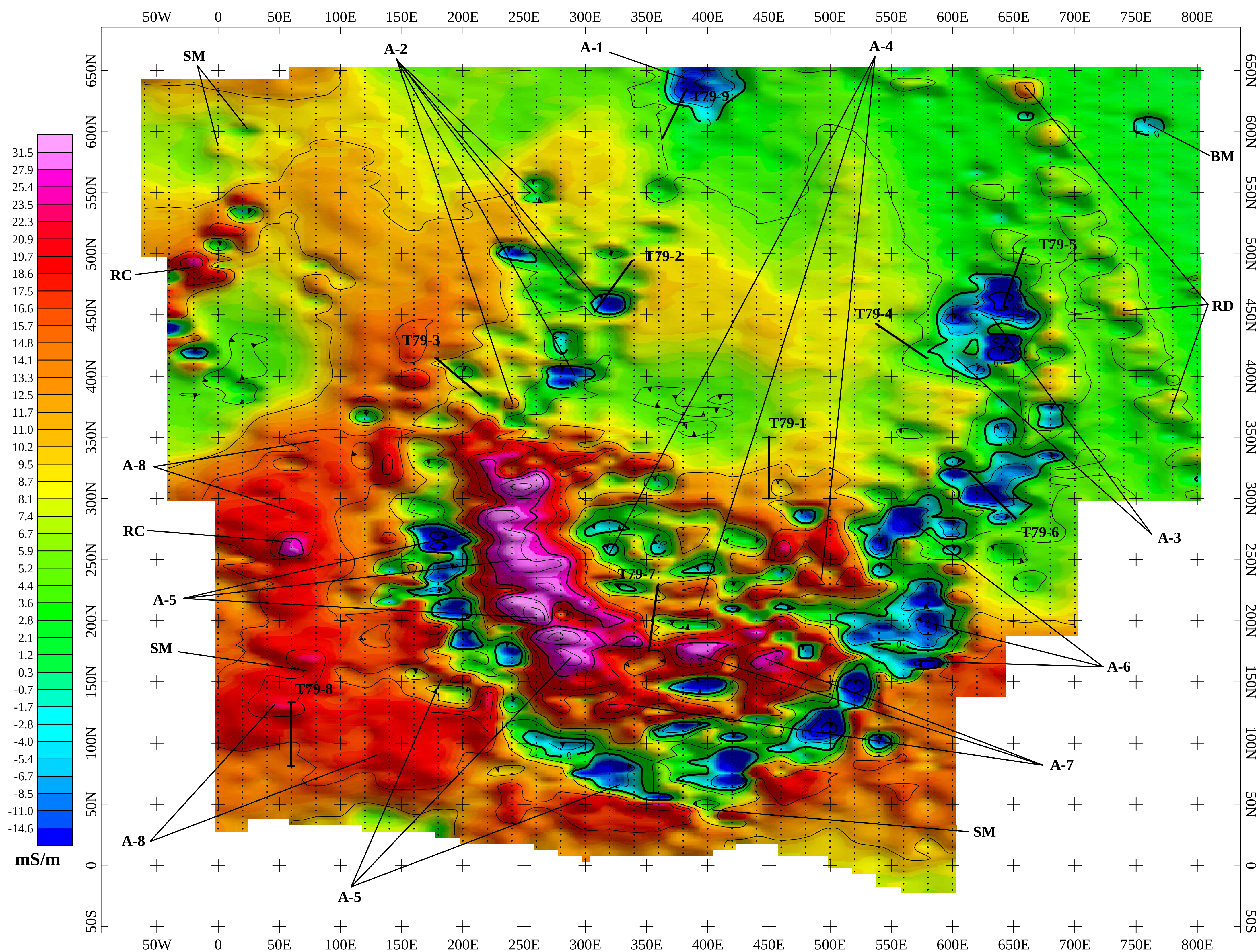
LANDFILL No. 2
PARCEL 79(6)
FORT McCLELLAN

G-858G TOTAL MAGNETIC FIELD
UPPER SENSOR (4.5 FT ABOVE GROUND SURFACE)
NORTH-SOUTH SURVEY LINES

U.S. ARMY CORPS OF ENGINEERS
MOBILE DISTRICT
FORT McCLELLAN
CALHOUN COUNTY, ALABAMA
Contract No. DACA21-96-D-0018

IT CORPORATION
A Member of The IT Group

NAME: Nicholas Muloshi	DATE: May 12, 2000
PROJECT NUMBER: 774645	LOCATION: C:\IT Projects\Ft McClellan\Landfill2\Mag\LF2Ua.map



LEGEND

.... GEOPHYSICAL SURVEY LINES

A-1 GEOPHYSICAL ANOMALY DISCUSSED IN TEXT

BM ANOMALY CAUSED BY BURIED METAL

RC ANOMALY CAUSED BY REINFORCED CONCRETE

RD ANOMALY CAUSED BY ROAD

SM ANOMALY CAUSED BY SURFACE METAL

—— T79-1 TRENCH LOCATION

Scale 1:1080

50 0 50 100 150 200

feet

Minimum Contour Interval: 5 milliSiemens per meter

FIGURE A79-4

LANDFILL No. 2
PARCEL 79(6)
FORT McCLELLAN

EM31 CONDUCTIVITY
VERTICAL DIPOLE (3.0 FT ABOVE GROUND SURFACE)
NORTH-SOUTH SURVEY LINES

U.S. ARMY CORPS OF ENGINEERS
MOBILE DISTRICT
FORT McCLELLAN
CALHOUN COUNTY, ALABAMA
Contract No. DACA21-96-D-0018

IT CORPORATION
A Member of The IT Group

NAME: Nicholas Muloshi	DATE: May 12, 2000
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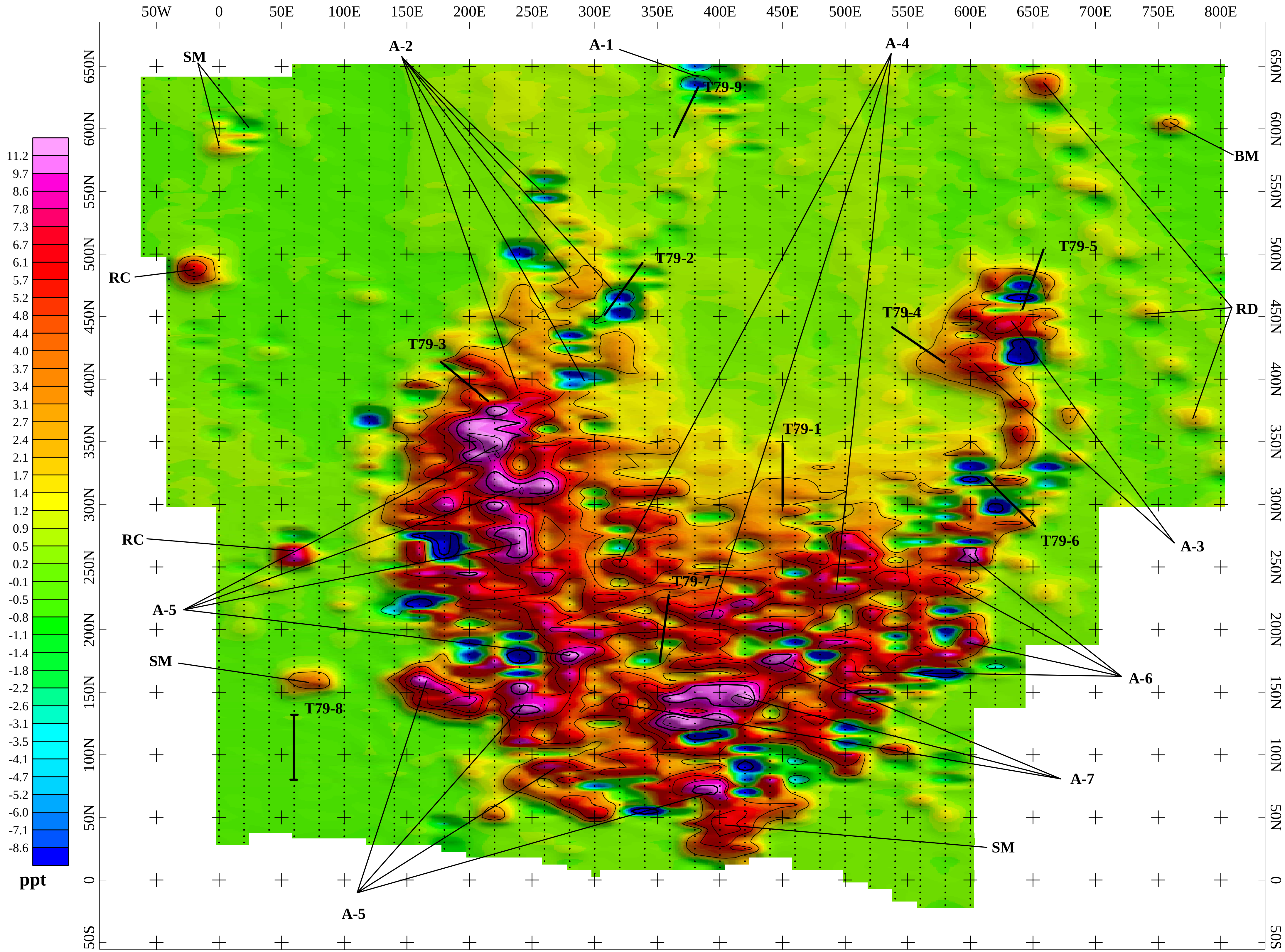

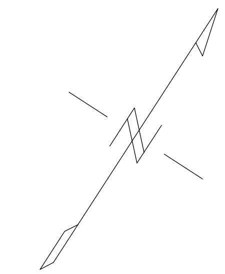

LEGEND

.... GEOPHYSICAL SURVEY LINES

A-1 GEOPHYSICAL ANOMALY DISCUSSED IN TEXT

BM ANOMALY CAUSED BY BURIED METAL

RC ANOMALY CAUSED BY REINFORCED CONCRETE

RD ANOMALY CAUSED BY ROAD

SM ANOMALY CAUSED BY SURFACE METAL

—— T79-1 TRENCH LOCATION

Scale 1:1080

50 0 50 100 150 200

feet

Minimum Contour Interval: 2 ppt Secondary to Primary Field

FIGURE A79-5

LANDFILL No. 2
PARCEL 79(6)
FORT McCLELLAN

EM31 IN-PHASE COMPONENT
VERTICAL DIPOLE (3.0 FT ABOVE GROUND SURFACE)
NORTH-SOUTH SURVEY LINES

U.S. ARMY CORPS OF ENGINEERS
MOBILE DISTRICT
FORT McCLELLAN
CALHOUN COUNTY, ALABAMA
Contract No. DACA21-96-D-0018

IT CORPORATION
A Member of The IT Group

NAME: Nicholas Muloshi	DATE: May 12, 2000
PROJECT NUMBER: 774645	LOCATION: C:\IT Projects\Ft McClellan\Landfill2\EM31\LF2EM31_editedl.map